

N. J. R. (Bart) Kraakman, PhD, PEng

**Associate Director of Process Engineering /
Principal Water Process Engineer /
Specialist in Odor Control & Air Quality**



Personal Details

Length of service in the profession: 30 years

Year joined Jacobs: 15 years

Summary Biography

Bart Kraakman brings over 30 years of expertise in gas and solids waste treatment processes, covering planning, concept development, and detailed design for both municipal and industrial clients. His career spans Europe, Asia-Pacific, North America, and the United Kingdom, where he contributed to major projects as principal process engineer, design lead and senior reviewer for projects around the world.

Previously, as Technical Director for an equipment manufacturer, Bart oversaw R&D, spearheaded innovative product development, and collaborated with research centres worldwide. He has extensive experience in designing, commissioning, and performance testing advanced biological, chemical, and physical gas treatment facilities globally.

Bart has managed projects involving air quality, ventilation, biogas cleaning, odour control, and sewer asset management—guiding them from planning and design through construction and handover, including training and operational support.

Bart is passionate about implementing (biological) solutions that provide sustainability based on shared values for environmental stewardship and diversity, now and for the generations that follow.

Key Skills/Areas of Expertise

- Globally recognised expert in odour control, air quality, and (biological) gas purification processes.
- Highly experienced in solids waste processes (biosolids and source separated organics).
- Highly experienced in sewer asset management strategy development (sewer process modelling).
- PhD, University of Valladolid, Valladolid, Spain, 2019-2025 awarded with “Cum Laude”.
- Professional Communication (NLP & TA), Phoenix, Utrecht, The Netherlands, 2000-2002.
- M.Sc., Molecular Sciences, Wageningen University and Research Centre, 1988-1993, The Netherlands,
 - Microbiology, Wageningen University and Research Centre, The Netherlands
 - Environmental Engineering, Wageningen University and Research Centre, The Netherlands
 - Plant Pathology, OARDC, Ohio State University, Wooster, OH

Registrations and Certifications

- Chartered Professional Engineer: Engineers Australia, 9 May 2013 (No. 4191940)
- Chartered Chemical Engineer, IChemE, United Kingdom (application pending)

Memberships and Affiliations

- Member, Water & Environment Federation (WEF), USA, since 1998, (Active)
- Member, Institute of Chemical Engineering (ICHEME), UK since 2018 (Active)
- Member, Institute of Air Quality Management, Inst. of Environmental Services, UK since 2023 (Active)
- Member, International Water Association (IWA), USA, since 2008, (Passive)
- Member, Koninklijk Instituut Van Ingenieurs (KIVI), The Netherlands, since 1993, (Passive)

Achievements/Awards

- Guest lecturer at NASA, USA; Purdue University, USA, Aalborg University, Denmark, Technical University Delft, The Netherlands, University of Valladolid, Spain; Portland State University, USA, Water Research Centre, UK.
- NWO research grant, 3-year part-time industrial guest researcher/lecturer, Environmental Biotechnology at the Delft University of Technology, Prof. Mark van Loosdrecht, 2007-2010.
- Member of the external review committee of the Institute of Sustainable Processes, University of Valladolid, Spain, 2019-2023.
- Water Environmental Federation (WEF) –Air Quality and Odor Control Community/ Technical Practice and Publication Advisory Panel (TPP).

Languages

- Dutch (mother tongue)
- English (advanced)
- German (moderate)
- French (basic)

Employment History

- March 2025-present, Jacobs Group Pty Ltd, **Principal Water Process Engineer, Sydney, Australia.**
- Oct 2019 – March 2025, Jacobs Limited, **Ass. Director of Process Engineer, Bristol, UK.**
- Nov 2017 - Oct 2019, Jacobs Limited, **Regional Technology Leader, Portland, OR, USA.**
- March 2017 - Nov 2017, CH2M Hill, **Regional Technology Leader, Portland, OR, USA.**
- May 2010 - Nov 2017, CH2M Hill, **Principal Technologist/Regional Technology Leader, Sydney, Australia.**
- Feb 2007 - Feb 2011, Delft University of Technology, **part-time Lecturer/Guest Researcher, Delft, NL.**
- 2006-2010, Bioway International b.v. **Head R&D / Technical Director - NL and Sydney, Australia.**
- 1997-2006, Bioway b.v., **Head R&D/ Principal Process Engineer - Ede, NL.**
- 1994-1997, Conviro VAM Technology, **Process Engineer / project leader. R&D -, Ede, NL.**
- 1993-1994, VAM . R&D Department, **Researcher/ Process Engineer, Wijster, NL.**
- 1993, Wageningen University and Research Centre, **Researcher. Dep. of Environ. Technology, Wageningen, NL.**

Examples Project Experience

Discipline Design Lead, Dubai Municipality (tender design consortium), Dubai, UAE. Jacobs prepared the Tender Design for Dubai's largest public investment project, which involves the design, construction, and 50-year operation of two large deep tunnel sewage collection systems. System 1 consists of a 42-km long deep tunnel (diameter 4–6.5 m), 10 km link sewers, and a Terminal Pump Station with a capacity of 5,500 MLD located 110 m below ground. System 2 includes a 16-km long deep tunnel (diameter 4 m), 46 km of link sewers, and a Terminal Pump Station with a capacity of 1,600 MLD at a depth of 80 m. Both systems require a comprehensive air management design, which is a critical component of the overall project. This system must meet stringent environmental and sustainability standards while complying with all applicable regulations. The air management system for the deep tunnel sewage system and link sewers has several key objectives: Maintain negative pressure in the deep tunnels and link sewers, provide odour control to eliminate odour emissions at ground level. The airflow management also need to accommodate airflow variations caused by water level changes in the tunnels (e.g., during major wet weather events) and frictional drag from water velocities, without creating excessive pressurization or depressurization that could lead to structural damage, odour release, or hazardous conditions. In addition, it requires high safety standard at Terminal Pump Stations to provide adequate ventilation and odour capture preventing dangerous conditions for operators.

Technical Design Lead, Sustainable Water Solutions (SWS), Abu Dhabi. SWS commissioned Jacobs to lead the concept and tender design for four large odour control facilities ranging from 3 m³/s to 20 m³/s and

500-1500 ppm H₂S and arguably one of the largest odour control projects in the world. The aim of the project is to eliminate odour emissions from the sewerage network. Comprehensive odour design and implementation of optimal solutions to the odour issues in the sewerage networks of Abu Dhabi City and Al Ain City. Jacobs prepared tender designs including contract specifications, drawings and included the replacement of the existing bioreactor media, start-up, and commission and any optimization of controls and operations. Jacobs used building information modelling (BIM) for design in 3D of the proposed technical options develop information. The Final Detail Design and Tender Documents identified the proper locations, preparation of the procurement documents for land acquisition (where necessary) and lay-out, permits, easements, and utility requirements.

Technical lead, Briess, USA. As part of the manufacture of natural specialty ingredients for food and beer industries, the production site roasts barley malt and wheat malt. The total VOC emissions from the roasting process required reduction to meet EPA permit as well the odor impact in the nearby community. On-site wet scrubbing tests were designed and successfully executed together with an extensive option costing evaluation to address the challenges for the facility.

Technical Director, DSD, Hong Kong. A micro-aerobic digestion (MAAD) research pilot plant was designed for construction and installation at DSD Shek Wu Hui Sewage Treatment Works (SWHSTW) in Hong Kong. The pilot plant containing five 200 L digesters is intended to study the benefits of MAAD for improved biogas generation, improved biogas quality and improved digested sludge dewaterability from non-saline mixed sludge (thicken primary sludge and thicken secondary activated sludge) towards the development of an operation program for full-scale implementation at SHWSTW. The research phase will be executed together by DSD, Hong Kong University and Jacobs which is planned to start early 2026.

Technical Director, Abu Dhabi Sewerage Services Company (ADSSC), Abu Dhabi. ADSSC commissioned Jacobs to execute a large root cause analysis study for their problems in their sewage networks in Abu Dhabi City and Al Ain City. Several countries in the Middle East have experienced accelerated growth since the mid-1970's when their current sewerage systems were designed. Abu Dhabi's existing sewerage infrastructure assets were overloaded and reaching the end of their intended life. ADSSC embarked on a major capital improvement program (CIP). One of the key components of the CIP was the construction of a deep tunnel which includes approximately 40 kilometers with internal diameters up to 5.5 meters and 50 km of micro-tunneled link sewers. One of the key challenges faced by the implementation of the deep tunnel was related to tunnel ventilation and odor control. To address the challenges associated with analyzing the complexities associated with the existing tunnel and link sewers, a sewer process computer model was completed for simulating the various operating conditions and gaining understanding of possible root causes for some odor generation and fugitive emissions and associated safety concerns.

Design Lead. Public Works Authority, Doha, Qatar. The Public Works Authority (Ashghal) commissioned CH2M to serve as their Program Management Consultant for heading up a large-scale upgrade/replacement of the existing foul sewerage collection system. For the detail design stage, sewer ventilation models and sewer process models were developed to determine the odour control ventilation requirements. In addition, a two-stage odour treatment approach with biotrickling filtration followed by activated carbon was designed to meet negative pressures, ventilation and treatment performance requirements to obtain no discernible odours from the system while maintaining Ashghal's desire to limit the number of satellite odour control treatment units throughout the collection system.

Technical Director, Bay Area Air Quality Management District, San Francisco, USA. Air Attribute Study. Identify and measure the contribution and variability of odorous and volatile organic compounds (VOCs) from three closely located facilities that impacts the City of Milpitas (City) and surrounding South Bay residential areas. Residents have been impacted by residual and nuisance level odors for many years and are seeking relief and a better quality of life. The approach uses proven odor and VOCs assessment and regulatory-approved sampling and analysis tools, procedures, and methodology to provide a Study that is legally defensible.

QC Reviewer. Abu Dhabi Sewerage Services Company (ADSSC), Abu Dhabi, Strategic Tunnel Enhancement Programme (STEP). ADSSC commissioned CH2M to serve as their Program Management Consultant for heading up two large-scale odour treatment facilities to meet negative pressures, ventilation in the new

deep tunnel and associated sewers and treatment performance requirements to obtain no discernible odours from the system.

QC Reviewer. Public Works Authority, Doha, Qatar. The Public Works Authority (Ashghal) commissioned CH2M to serve as their Program Management Consultant for heading up a large-scale upgrade/replace-ment of the existing foul sewerage collection system. The INTERCEPTOR model was used to determine pre-liminary foul air ventilation and odor treatment requirements. Two-stage odour treatment approach with biotrickling filtration followed by activated carbon was proposed and designed to meet negative pressures, ventilation and treatment performance requirements to obtain no discernible odours from the system while maintaining Ashghal's desire to limit the number of satellite odour control treatment units through-out the collection system.

Technical Lead, EPCOR, Edmonton, Canada. A real-time odour continuous monitoring system. A real-time monitoring system was developed specifically for the Gold Bar Wastewater Treatment Plant (WWTP) to generate accurate, retrievable, and quantifiable data that can trace or support the identification of the odour sources within the WWTP. The system can support the assessment and validation of odour com-plaints around the plant. The scope of this technology review was to review technology, recommend an ap-propriate odor monitoring system, develop a conceptual-level design and identify probable costs for the odour monitoring system, to support informed decision making for EPCOR.

Project Manager subtask TD-9. LASAN, Los Angeles, USA. Central Los Angeles Recycling and Transfer Sta-tion (CLARTS) project. This project studied the impacts of the diversion of food waste slurry to the wastewater conveyance system upstream of the Hyperion WRP. The bench-top study quantified the food waste characteristics and estimated impacts to the conveyance system and the different process units at treatment plant. Sewer process modeling was performed using CH2M's "Interceptor powered by WATS".

Detail Designer. Hawaii, City of Honolulu, USA. A Thermal Belt Dryer System is being built for processing dewatered biosolids at the Honouliuli Wastewater Treatment Plant (HLIWWTP). With the ongoing develop-ment of the new residential housing opposite the plant, treatment of odors from this dryer system is re-quired. The detail design of the odor control involved an acid scrubber combined with activated carbon pol-ishing.

Detail Designer. Fairfax County, Virginia, USA. Noman M. Cole, Jr. Pollution Control Plant Solids Rehabili-tation project included a detail design for the ventilation and odor control which was completed for the gravity thickeners and sludge storage tanks.

Construction and commissioning support. Sacramento Regional County Sanitation District, USA. Primary Effluent Pumping Station Project (PEPS). Construction and commissioning support as part of the EchoWater project for a large biofilter treating foul air from the plant influent channel and the effluent re-distribution channel after the primary treatment units.

Process Design Lead Ventilation & Odour Control. Metro Vancouver, Canada. The Northwest Langley Wastewater Treatment Plant (NLWWTP), which currently serves 30,000 people in Langley, will be expanded on the same site to serve 230,000 people. A Discussion Paper was prepared to establish odour control ob-jectives including off-site odour criteria for the expanded NLWWTP to meet air quality requirements and prevent negative impact to the public from the release of odorous gases. Currently Jacobs is executing the 60% design phase of which ventilation and odour control is a critical performance indicator for the project.

Process Lead. St. Clair Township, Canada. Concept and detail design for the upgrade of an existing odor control systems. The upgrade includes detail design of Activated Sludge Recycling (ASR) as odor control method.

QC Reviewer. San Francisco Public Utilities, USA. The Oceanside Water Pollution Control Plant (OSP) Odor Control Optimization project is a conceptual engineering design for the existing odor control and associated ventilation systems. Recommendations for improvements are made reduce the energy consumption. Odors at the fence line are typically not an issue at the OSP due to adequate odor containment and treatment of odors from odor-emitting process areas. However, as a result of this aggressive containment and treatment strategy, energy consumption at the OSP pertaining to odor control is significant and accounts for about 30 percent of the total OSP energy consumption.

Senior Consultant. Metal forgings manufacturer, Los Angeles, USA. The facility has been the subject of odor complaints from neighbors and resulting scrutiny from the South Coast Air Quality Management District (SCAQMD). The client wanted an independent evaluation of odors in the area surrounding the facility. A campaign was undertaken that included field olfactometry together with bag sampling to characterize odours downwind of the facility in terms of odour intensity, strength, character, hedonic tone.

Senior Consultant. Flavour and Fragrance manufacturer, Singapore. This study explored options for odour treatment at a new industrial facility and included an evaluation of the different technologies including adsorption, biological, chemical oxidation, thermal oxidation, UV photo catalytic and masking agents.

Process Lead. Sydney Water Corporation, Sydney, Australia. NSOOS scrubbers replacement at North Head. Detail design and construction support of sewer ventilation modification and treatment of foul air from the main inlet sewer (NSOOS) and the underground screening area at North Head WWTP. This \$100-million-dollar project involves improvement of the containment and extraction system from two main sources and treatment of the foul air through an innovative two stage biotrickling filter system. The biotrickling filter system will treat high strength foul air and is designed to achieve less than 1,000 ou on a 95th percentile basis without any further polishing. Directly responsible for all process design including odor specification and detailed design reviews, critical equipment selection.

Process Designer. Water Corporation, Perth. Subiaco WWTP Biosolids Load Out Design. Concept design ventilation and foul air treatment from the biosolids liming and truck loading areas.

QC Reviewer. NTWMD Rowlett Creek RWWTP Peak Flow Management Improvements and Lower Cottonwood Creek Lift Station Improvements, North Texas Municipal Water District, USA. The project provided engineering design for the Peak Flow Management Improvements Project. The recommended improvements will provide for treatment of peak 2-hour flow rates of up to 120 mgd, address identified dry-weather capacity deficiency issues for currently permitted annual average day flow, and provide phosphorus removal at the Rowlett Creek RWWTP. The project also included a new and enlarged Lower Cottonwood Creek Lift Station.

Process designer. PUB, Singapore. Jurong Water Resource Plant phase 4 upgrade. Concept design ventilation and odor control for Inlet Work Area and PSTs.

Detail design Engineer; Catoma WPCP upgrade project, Montgomery. USA. Responsible for the detail design of the odor control system including covers, ventilation, ductwork and odor treatment of the new Head Works and FOG storage facility.

Project Team Member. Orange County Sanitation District, Los Angeles, USA. Technical design and support for the development of an odor control master plan for the OCSD WWTPs.

Process Lead. Sydney Water Corporation, Sydney, Australia. NSOOS Scrubbers replacement at North Head. Optioneering of technology and plant lay-out integration, concept design and detail process design for the ventilation and control of foul air from the main inlet sewer (NSOOS) and the underground screening area at North Head WWTP.

Senior Consultant, NSOOS Odor Control Project, Sydney Water, Australia. The Northern Suburbs Ocean Outfall Sewer (NSOOS), is one of Sydney Water largest interceptors with a capacity of over 315 mgd. An extensive corrosion and odor management study undertaken using the research from the \$21 million SCORE project demonstrated the need for three large interceptor ventilation and odor treatment facilities. The facilities need to be in sensitive urban environments, so a high level of treatment efficiency and inconspicuous design is required. This project involves developing feasible designs that meet these objectives before moving into the implementation stage of the project. Selecting a treatment technology that can reliably achieve a low odor output with minimal operational requirements is critical for the success of this project.

Process Lead. Sydney Water Corporation, Sydney, Australia. Cronulla WWTP Odor Abatement Strategy. Concept design, detail design, construction and commissioning support for the containment, ventilation and biological treatment of odorous emissions at the Cronulla WWTP. This \$35-million-dollar project included all the planning, detailed design, including CALPUFF modelling for the site, extensive workshops with

operators to gain acceptance of the odor containment covers that provide ready access to critical equipment and the implementation of a new odor control system based on four biotrickling towers treating foul air. This project was completed by October 2014 and has effectively transformed what was previously one of the worst smelling facilities to one with no foul odor.

Consultant. Sydney Water Corporation, Sydney, Australia. Corrosion and Odor Strategy Program. Develop integrated corrosion and odor strategies and plans for all Sydney Water's wastewater systems to meet the SWC corrosion and odor objectives. Develop life cycle costing and modeling tools for long term planning and integrate R&D outcomes from the Australian National Research Program SCORE. Develop an integrated planning process for wastewater systems including hydraulics, quality, growth and process technology improvements.

Commissioning Manager. Gippsland Water Corporation, Maryvale, Australia. GWF Sludge Dewatering Building Upgrade. Commissioning and process proving of ventilation of the upgraded sludge dewatering area at Gippsland Water Factory.

Consultant. Sydney Water Corporation, Sydney, Australia. Malabar WTP Area 15 Biosolids Ventilation Audit and Upgrade. Perform audit of existing ventilation and foul air treatment facilities at the biosolids liming and sludge storage buildings. Instruct contractor and train operators for implementations of multiple improvements.

Process Designer. City West, Melbourne, Australia. Dockland Sewer Mining project. Design for treatment of odor emissions from a membrane bioreactor wastewater recycling plant.

Published Papers

Selection of Publications in scientific journals (peer reviewed):

Kraakman, N.J.R., A. F. Torres, B. Sampaio, S. Bordel, R. Lebrero, R. Muñoz (2026) Mini-review of Capillary Gas Treating Bioreactors – Opportunities and Challenges. Accepted for publication in **Frontiers in Environmental Engineering**.

Kraakman, N.J.R., Bordel, S., Lebrero, R., Muñoz, R., (2025). Biological Elimination of Dilute Methane through Multi-channel Taylor Flow Capillary Bioreactors. **Journal of Water Process Engineering**. 72, 107531.

Kraakman, N.J.R., Villarreal-Heras, L., González-Martín, J., Cantera, S., Muñoz, R., Lebrero, R. (2025). Enhancing Dilute Methane Treatment Through Liquid Phase Alteration in a Capillary Bioreactor. **Chemical Engineering Journal**. 510. 161383.

Kraakman, N.J.R., J. González-Martina, C. Sanchez Garcia, S. Cantera, R. Lebrero, R. Muñoz (2024) Multi-channel Capillary Bioreactor for Hydrophobic VOCs and CO₂ Abatement - Process Intensification Through Silicone Oil Addition. **J. of Environmental Chemical Engineering**.

López, L.R., P. Dessì, A. Cabrera-Codonya, L. Rocha-Melognoc, N.J.R. Kraakman, M.D. Balaguera, S. Puiga (2024) Indoor CO₂ Direct Air Capture and Utilization: key strategies towards carbon neutrality. **Cleaner Engineering and Technology**.

Bordel, S., Kraakman, N.J.R., Munoz, R. (2024) Theoretical analysis of gas-liquid mass transfer in Taylor Flow capillary reactors **Chemical Engineering Science**. 119949.

Kraakman, N.J.R., J. González-Martina, E. Rodriguez, R. Lebrero, M.A. Deshusses, R. Muñoz (2023) Hydrophobic Air Pollutants Removal at One Second Gas Contact in a Multi-channel Capillary Bioreactor. **J. of Environmental Chemical Engineering**, 11. 110502.

Kraakman, N.J.R., Diaz, I., Fdz-Polanco, M., Munoz, R. (2023) Large-scale Micro-aerobic Digestion Studies at Municipal Water Resource Recovery Facilities for Process-integrated biogas desulfurization. **J. of Water Process Engineering**. 53 103643.

López, L/R., P. Dessì, A. Cabrera-Codony, L. Rocha-Melognoc, N.J.R. Kraakman, V. Naddeo, M.D. Balaguer, S. Puig (2022) CO₂ in Indoor Environments: From Environmental and Health Risk to Potential Renewable Carbon Source. **Science of the Total Environment**, <https://doi.org/10.1016/j.scitotenv.2022.159088>

Kraakman, N.J.R., J. González-Martina, C. Pérez, R. Lebrero, R. Muñoz (2021) Recent Advances in Biological Systems for Improving Indoor Air Quality. **Reviews in Environmental Science and Bio/Technology**. <https://doi.org/10.1007/s11157-021-09569-x>.

González-Martín J, Kraakman N.J.R., Pérez C, et al (2020) A State-of-the-Art Review on Indoor Air Pollution and Strategies for Indoor Air Pollution Control. **Chemosphere** 262.

Kraakman, N.J.R., Joyce, J.R., Romero Flores, A. (2020) Biological Odor Control. In: Odor Emissions and Control for collection systems and water resource recovery facilities. **Manual of Practice No. 25. Second Edition. Water Environmental Federation**, Alexandria, VA. USA.

Estrada, J.M., N. J. R. Kraakman, R. Lebrero, R. Muñoz (2015). Integral Approaches to Wastewater Treatment Plant Upgrading for Odor Prevention: Activated Sludge and Oxidized Ammonium Recycling. **Bioresource Technology** 196: 685–693.

Kraakman, N.J.R., Cesca, J., Hamer, G., Aurisch, R. (2015) Containment of odours: Design and Implementation of Ventilation and Cover Systems while Maintaining Operability. **Water Journal**, August: 55-61.

Alfonsina, C., R. Lebrero, J.M. Estrada, R. Muñoz, N.J.R. Kraakman, G. Feijoo, M.T Moreira (2014) The use of Life Cycle Assessment as a criterion for the selection of odour removal technologies. **Journal of Environmental Management**.

Kraakman, N.J.R., Estrada, J.M., Lebrero, R., Cesca, J., Muñoz, R. (2014) Evaluating Odour Control Technologies using Reliability and Sustainability Criteria. **Water Science & Technology**. doi: 10.2166/wst.2014.036.

González J.E., N.J.R Kraakman, Y. Wang, L. Vorreiter, J. Cesca, T. Nguyen (2014) Sydney Water Corrosion and Odour Management Tool. **Water**, Volume 11. No. 4: 65-71.

Roche Rios, J.M., Kraakman, N.J.R., Kleerebezem, R. Revah, S., Kreutzer, M.T., van Loosdrecht, M.C.M. (2012) Bioreactors to increase methane transfer and consumption. **Chemical Engineering Journal**, 217: 91–98.

Kraakman N.J.R., Pol, A., Smeulders, M.J., Jetten, M.S.M., Op Den Camp, H.J.M. (2012) Extremely acidophilic sulfur-oxidizing bacteria applied in biotechnological processes for gas purification, Journal of Environmental Science and Health, Part A: **Toxic/Hazardous Substances and Environmental Engineering**, 47:7, 964-969.

Kraakman, N.J.R. and Cesca, J. (2012) Evaluating Odour Control Technologies using Reliability and Sustainability Criteria. **Water**. November issue 2012.

Estrada, J.M., Kraakman, N.J.R., Lebrero, R. Muñoz, R. (2012) A Sensitivity Analysis of Process Design Parameters, Commodity Prices and Robustness on the Economics of Odour Abatement Technologies. **Biotechnology Advances**.

Kraakman, N.J.R., Roche Rios, J., van Loosdrecht, M.C.M. (2011). Review of Mass Transfer Aspects for Biological Gas Treatment. **Appl. Microbiol. Biotechnol.** 91: 873-886.

Estrada, J.M., Kraakman, N.J.R., Muñoz, R., Lebrero, R. (2011) A comparison analysis of odour treatment technologies in wastewater treatment plants. **Environmental Science & Technology**. 45, 1100–1106.

Kraakman, N.J.R. (2009) Developments in Odour Control for the Wastewater Industry. **Water**. 11: 37-41.

Van Ras, N. et al. (2006) Biological air filter for air quality control. In: Microgravity Applications Programme: Successful teaming of science and industry. **ESA publication** SP-1290, Andrew Wilson (ed.), Noordwijk the Netherlands, pp. 270-280. ISBN 92-9092-971-5.

van Groenestijn, J.W. and Kraakman, N.J.R. (2005) Review. Recent Developments in Biological Waste Gas Purification in Europe. **Chemical Engineering Journal**, 113: 85-91.

Kraakman, N.J.R. (2003) Full-scale Biological Treatment of Industrial CS₂-Emissions at Extreme Conditions; the Robustness of a Biological System and its Risks to Waste Gas Purification. **Environ. Engineering**, 22(2): 79-86.

Woertz, J.R., van Heiningen, W.N.M., van Eekert, M.H.A., Kraakman, N.J.R., Kinney, K.A., and J.W. van Groenestijn (2002) Mite growth on fungus under various environmental conditions and its potential application in biofilters. **Experimental & Applied Acarology**, 27 (4): 265-276.

Woertz, J.R., Heiningen, W.N.M. van, Eekert, M.H.A. van, Kraakman, N.J.R., Kinney, K.A. and J.W. van Groenestijn (2002) Dynamic bioreactor operation: effects of packing material and mite predation on toluene removal from off-gas. **Applied Microbiology and Biotechnology**, 58: 690-694.

Groenestijn, J.W. van, Heiningen, W.N.H., van, and Kraakman, N.J.R. (2001). Biofilters based on the action of fungi. **Water Science and Technology**, Vol 44 No 9 227-232.

Boehm, J.M., Wu, T., Stone, A.G., Kraakman, N.J.R., Iannotti, D.A., Wilson, G.E., Madden, L.V., Hoitink, H.A.J., (1997) Cross-polarized magic-angle spinning 13C nuclear magnetic resonance spectroscopic characterization of soil organic matter relative to culturable bacterial species composition and sustained biological control of Pythium root rot. **Applied and Environmental Microbiology**. Vol. 63, No. 1. 162-168.

Middelhoven, M.J., Coenen, A., Kraakman, N.J.R., Sollewijn Gelpke, M.D. (1992) Degradation of some yeasts Candida parapsilosis and Arxula adenivorans: evidence for an operative gentisate pathway. **Antonie van Leeuwenhoek**. 62:181-187.

Book Chapters:

Kraakman, N.J.R. (2023). Odor and Air Emissions Management. In: WEF MOP8 Design of Water Resource Recovery Facilities. **Water Environmental Federation**. USA

Kraakman, N.J.R., J.R. Joyce, A. Romero Flores (2021) Biological Odor Control. In: WEF MOP25 Odor Emissions and Control for Collection Systems and Water Resource Recovery Facilities. **Water Environmental Federation**. USA

Estrada, J.M., Kraakman, N.J.R., Lebrero, R., Muñoz, R. (2014). Sewage Treatment Plants: Economic Evaluation of Innovative Technologies for Energy Efficiency. **IWA Publishing**, London.UK.

Estrada, J.M., Kraakman, N.J.R., Lebrero, R., Muñoz, R. (2013). Strategies for Odour Control. In: Odour Assessment Handbook. Edited by: V. Belgiorno, V. Naddeo and T. Zarra. **Wiley Publishing**, USA.

Kraakman, N.J.R. and K.J.A. de Waal (2006) Treatment of Carbon Disulfide from Industrial Wastegas Emissions: Air Pollutants Turned into Re-usable Sulfuric Acid. In: Waste gas treatment for resource recovery. Editors: Lens P.N.L., Kennes C., LeCloirec P. and Deshusses M. **IWA Publishing**, London. UK.

Kraakman, N.J.R. (2006) Reduction of Air Emissions (Dutch). In: Water in de Industrie. **tenHagenStam publishers**, The Netherlands.

Kraakman, N.J.R. (2005) Biotrickling and Bioscrubbers Applications to Control Odour and Air Pollutants: Developments, Implementation Issues and Case Studies. In: Biotechnology for Odour and Air Pollution Control: **Springer-Verlag**, Heidelberg, Germany. Edited by Shareefdeen, Z. and Singh, A.

Kraakman, N.J.R. (2001) New Bioreactor Systems for Treating Sulphur- or Nitrogen Compounds. In: Bioreactors for Waste Gas Treatment: **Kluwer Academic Publishers**, Edited by Kennes, C., Veiga, M.C.

Most Recent Presentations at International Conferences:

Title: *Micro-aerobic Digestion – A Face-lift to Traditional Anaerobic Digestion Processes with Minimum Plant Upgrading Cost.* International Conference on Wastewater Treatment Technologies. **Hong Kong.**

Organizer and Chair of a full-day technical workshop *Assessing Sewer Septicity – Tools to Save Money and Trouble.* WEFTEC 2024 - New Orleans, USA.

Title: *Addressing Today's Bioresources Challenges and Enabling our Circular Economy Future.* European Biosolids & Bioresources conference. November 2024. **Manchester, United Kingdom.**

Title: *Deep Sewerage Tunnel Ventilation & Odor Control Management and Operating Experiences in Hot Climate Conditions.* WEF Odor & Air Pollutants Conference, May 2023. **Charlotte, USA.**

Title: *An Odour Attribution Study to Determine the Relative Contribution from Three Facilities for the Development of Real-Time Odour Monitoring.* Aqua-Enviro Conference 15th September 2022r. **Leeds, United Kingdom.**

Title: *Full-scale Digester Micro-Aeration Studies to Improve Biogas Quality and Process Stability.* WEFTEC, 10-15 October 2022, **New Orleans, USA.**

Title: *Overcoming Bioavailability Limitations for the Treatment of Low Concentration Gases such as Odours and Indoor air Pollutants.* IWA 9th Odour & VOC/Air Emissions. 26-27 October 2021, **Bilbao, Spain.**

Title: *Using Olfactometry to Evaluate Odor Persistency from Sites Emitting Odor.* IWA 9th Odour & VOC/Air Emissions. 26-27 October 2021, **Bilbao, Spain.**

Title: *Preventing Odour Emissions by Process Integrated Methods using Readily Available Plant By-products.* Practical Experiences in Odour Management Conference, 30th September 2020, **Virtual, United Kingdom.**

Title: *High-rate Micro-aeration Digestion for Advanced Process Stability and Sulphide-free Biogas.* European Biosolids and Bioresources Conference. 24-25 November 2020. **Virtual, United Kingdom**

Title: *Advanced Sewer Process Modelling to Develop Odour and Corrosion Risk Profiles for Managing Sewer Assets.* Air and Odor Management Conference and Technology Showcase, September 19 - 20, 2019. **Toronto, Canada,**

Title: *Full-scale Digester Micro-Aeration Pilot Study to Improve Biogas Quality for Energy Recovery.* WEFTEC. 21-25 September 2019. **Chicago, USA**

Title: *Odour Control Master Planning using Innovative Integrated Approaches,* COC conference, December 2018, **Calgary, Canada.**

Title: *Quality Control of the Containment of Gases in Covered Processes.* WEF Odor & Air Pollutants Conference, March 2018. **Portland, USA.**

Title: *Food Waste Impact Study: Sewer Process Modelling for Future Options Assessment.* WEF Odor & Air Pollutants Conference, March 2018. **Portland, USA.**

Title: *Odor Control Master Planning using Integrated Approaches.* Odor Management Conference & Technology Showcase, November 2017. **Los Angeles, USA.**

Title: *Preventing Odor Emissions by Integrated Activated Sludge and Oxidized Ammonium Recycling.* WEFTEC. October 2017. **New Orleans, USA**

Title: *Design and Implementation of Air Extraction using the Odor Capture Performance for the Containment of Odors.* WEF specialty conference. March 2016. **Milwaukee, USA.**

Headshot and Model Release

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Insert Initials:	BK
Date:	January 1, 2026

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David F. Garcia, Jr., PE

President and Principal Planning/Optimization Engineer

Description

Over the course of his 18 years as a collection systems infrastructure planning engineer, David Garcia has gained diverse experience and mastery in hydraulic modeling, strategic master planning, flow analysis, asset management, and condition assessment.



David began his career in wastewater collection systems by performing condition assessment and flow monitoring. He brings the unique perspective of his field experience to strategic planning and alternatives development. This introduction to collection systems, together with specialist training from experts in Melbourne, Australia in 2007, has provided David with sound and practical understanding of hydraulic modeling.

David has been lead hydraulic modeler and project engineer for several large consent decree programs across the southern United States. During his employment with Black and Veatch and RJN Group, he acquired extensive experience calibrating models, evaluating alternatives, and developing Long Term Control Plans (LTCPs). By integrating asset management and condition assessment into the evaluation/planning process, David's teams developed unique solutions that eliminated sanitary sewer overflows while reducing the cost of planned improvements.

In addition to his professional engineering skills, David brings excellent communication skills and passion for the water industry. He strives to produce innovative, holistic, and robust solutions to provide clean, safe water for communities.

In 2017, David started Aguazé Solutions, specializing in hydraulic modeling, capital improvement planning, and optimization for water, wastewater, and stormwater systems.

Qualifications

Bachelor of Civil Engineering
Iowa State University
Graduated 2006

Professional Affiliations

Licensed Professional Engineer
NC, OR, TX, WA

Country Experience

United States
Australia
New Zealand
Samoa

Software Experience

Optimizer WCS
InfoWorks ICM
XP SWMM
PC SWMM
InfoSWMM
EPA SWMM
MapInfo
ArcGIS

Publications

WEFTEC 2012
WEFTEC 2013
WEF CS 2020
WEFTEC 2021
WEF CS 2022
WEF UMC 2022
WEFTEC 2022

Selected Project Experience

Aguazé Solutions, Principal Optimization Engineer, August 2017 – Present

- *Trinity River Authority, TX, USA* – TCWSP Distribution and Service Assessment – InfoWorks WS
- *Trinity River Authority, TX, USA* – CRWS Master Plan – InfoWorks ICM
- *Dallas Water Utilities, TX, USA* – Cedardale Improvements – InfoWater Pro
- *Dallas Water Utilities, TX, USA* – Regional Optimization – PowerBI
- *Trinity River Authority, TX, USA* – Linear Storage Optimization – InfoWorks ICM
- *San Antonio Water System, TX, USA* – Growth Master Plan – InfoWorks ICM
- *City of Fort Worth, TX, USA* – Master Plan Update – InfoWorks ICM
- *City of Houston, TX, USA* – Stormwater Master Plan Modeling – InfoWorks ICM
- *City of El Paso, TX, USA* – Doniphan Street Stormwater Analysis – InfoWorks ICM
- *City of Waco, TX, USA* – Hydraulic Model Calibration – InfoWorks ICM
- *Bethlehem Township, PA, USA* – PCSWMM 2D Model Conversion – PCSWMM/InfoWorks ICM
- *Marion County, FL, USA* – Water Hydraulic Model Update – InfoWater
- *Houston Public Works, TX, USA* – Sims Bayou Alternatives Analysis – InfoWorks ICM
- *Houston Public Works, TX, USA* – Hunting/Greens Bayou 2D Model – InfoWorks ICM
- *Minneapolis Metropolitan Council, MN, USA* – Minneapolis Interceptor Study – InfoWorks ICM
- *Houston Public Works, TX, USA* – Eddington PS and Wrightwood Optimization – InfoWorks ICM
- *Jefferson County, AL, USA* – Systemwide Optimization – InfoWorks ICM
- *City of Tulsa, OK, USA* – Northslope Basin Optimization – InfoWorks ICM
- *New York DEP, NYC, USA* – LTCP Optimization and Sensitivity Analysis – InfoWorks ICM
- *Bayonne, NJ, USA* – LTCP Optimization and Sensitivity Analyses – InfoWorks ICM
- *Queensland Urban Utilities, QLD, AUS* – S1 Capital Program Prioritization – InfoWorks ICM
- *Johnson County Wastewater, US* – Turkey Creek and Mission Main LTCP Optimization – PCSWMM
- *Kansas City, MO, USA* – Northern Basins LTCP Optimization and Sensitivity Analysis – PCSWMM
- *Kansas City, MO, USA* – Turkey Creek Basin LTCP Optimization – PCSWMM
- *Kansas City, MO, USA* – Brush Creek and Town Fork Creek Basins LTCP Optimization – PCSWMM

Black & Veatch, Infrastructure Planning Engineer, October 2013 – August 2017

- *Trinity River Authority, TX, USA* – Annual Update Service Area Master Plans and Flow Analysis – InfoWorks ICM
- *City of Shreveport, LA, USA* – Model Calibration and Consent Decree Master Plan – InfoWorks ICM
- *City of Raleigh, NC, USA* – Sanitary Sewer Capacity Study – InfoWorks ICM

RJN Group, Project Engineer, October 2006 – October 2013

- *Little Rock Wastewater, TX, USA* – Consent Decree System Evaluation – InfoWorks ICM
- *City of Hot Springs, AR, USA* – Consent Decree Master Plan – InfoWorks ICM
- *City of Fayetteville, AR, USA* – City-Wide Master Plan – InfoWorks ICM
- *City of Tulsa, OK, USA* – City-Wide SSES and Hydraulic Modeling Assessment – InfoWorks ICM
- *City of Ada, OK, USA* – City-Wide SSES studies and Master Plan – InfoWorks ICM
- *City of McKinney, TX, USA* – City-Wide SSES studies and Master Plan – InfoWorks ICM
- *City of Richardson, TX, USA* – City-Wide SSES studies and Master Plan – InfoWorks ICM
- *City of Plano, TX, USA* – City-Wide SSES studies – InfoWorks ICM

CONTACT

PHONE:

 (347) 777-9530

WEBSITE:

 [linkedin.com/in/graciela-miguel](https://www.linkedin.com/in/graciela-miguel)

EMAIL:

 gracielajubis@gmail.com

PROFILE

Innovative Civil Engineer with 10+ years of experience in Administration and Supervision of Construction Projects.

Proficient In: Project Management, Planning, Work Programming, Budgeting, Supervision of staff, Field Inspections, and Issuance of Technical Reports.

Organized and self-motivated. Excellent analytical skills. High attention to detail. Bilingual English/Spanish.

EDUCATION

B.S. CIVIL ENGINEERING

[2006]

Polytechnic University of El Salvador

UNDERGRADUATE THESIS

Stability Analysis and Recommendations for slopes with high risk of collapse.

CERTIFICATES

- 2023 Project Manager Professional PMP
- 2022 Lean Six Sigma White & Green Belt
- 2021 CIVIL 3D
- 2018 OSHA(10Hrs.)
- 2018 Excavation Safety Awareness
- 2008 Risk Assessment after Earthquakes
- 2004 Safety and Quality Control in the Construction Industry

SOFTWARES

Microsoft Office, AutoCAD, Autodesk Design Review, Civil 3D, Microsoft Project, Visio, Adobe Products, Knowledge of Primavera 6, ArcGIS, e-Gordian, CDS, FMS, SCORE, Benchmark.

GRACIELA MIGUEL

EXPERIENCE

NYC DEP GREEN INFRASTRUCTURE SENIOR PROJECT MANAGER

[2022–Present]

Manage large Green Infrastructure Design and Construction contracts up to \$38,000,000. Control and supervise contractors and consultants carrying out new design and construction. Review and approve contractors' and consultants' payments and requisitions. Manage the Green Infrastructure Program Support Contract (GIPS): Request, review, and approve Service Orders. Revise and approve staff curriculums, salary rates and hours of work for consultant or sub-consultant staff. Coordinate and attend kickoff and progress meetings. Review all submissions including design packages. Coordinate communications and derivable between Consultant and GI team. Review and approve budget proposals, control budget spending, review and approve invoices and payments under this contract. Make sure that all service orders are delivered on time as per approved schedule. Maintain monthly and yearly cashflows updated, prepare spending budget estimates for the duration of the contract. Attend hiring pools, Interview job applicants and interns. Supervise 3 project managers: assign, schedule, review office and field work, and training. Coordinate and prepare meetings with team, tasks reporting, follow-up work and check-ins, and annual performance evaluations. Prepare field schedule for the OGICDC unit. Prepare abstracts and presentations for Conferences. Manage 311 complaints and follow-up repairs.

NYC DDC – SAFETY & SITE SUPPORT REVIEWER

[2019–2022]

Conducted Technical review of the consultant's survey drawings and supporting documents for accuracy and completeness in accordance with the technical requirements outlined in the contract documents set forth by Site Engineering Unit.

NYC DDC – PUBLIC BUILDINGS PROJECT MANGER

[2018–2019]

Managed, controlled and Supervised Capital and Expense Contract Projects for the Job Order Contracting Unit (JOC). Coordinate activities between all stakeholders. Coordinated meetings, controlled budget, spending, schedules.

VANDERBURGH & CO, Inc PROJECT COORDINATOR

[2015–2018]

Coordinated the complete process from purchase to delivery worldwide. Supervised office personnel, warehouse staff and carriers. Revised and approved all documents.

CORPORACION DEL TROPICO PROJECT MANAGER

[2005–2009]

Supervised Construction Project of 25 residential properties. Average area of 2,200 sq. ft each. Assigned staff of 30 people with a project value of USD\$ 3,000,000. Responsible for construction permits, inspections, reports, budgets, contracts, estimating, procurement, schedules, and work programming.

VIA DEL MAR ADMINISTRATIVE ENGINEER

[2003–2005]

Responsible for budgets, invoices, payrolls, contracts, work programming, cash flow and budgets. Elaborated CAD drawings for Land registration. Participated in the Environmental Impact Study of Urbanization Via del Mar, El Salvador.

UNIVERSITY JOSE SIMEON CANAS, UCA SURVEY COORDINATOR

[2002–2003]

Coordinated Land surveying Project: Large properties located in the high parts of the mountains of Chalatenango, El Salvador. In charge of logistics, route, team supervision, survey review, calculations, and technical descriptions.



Education

B.S., Civil Engineering, Lehigh University

B.Arch., Architecture, Lehigh University

Professional Registration

MD Registered Professional Engineer #50330

OH Registered Professional Engineer #82682

PA Registered Professional Engineer #PE086607

FL Registered Professional Engineer #PE94172

DC Registered Professional Engineer #PE40001641

NCEES Record #16-823-99

Years of Experience: 20+

Certifications

(PACP/ MACP)

Contact Information

Phone: 484.201.5907

Address: 20 Halletts Point Apt 201, Astoria, NY 11102

Email: Mallory.Griffin@ghd.com

Awards / Recognition

ACEC/PA Diamond Award – 2021 PWSA Washout Manhole Evaluation Program

Trenchless Technology Magazine – 2022 Trenchless Project of the Year Honors

Mallory Griffin, PE

Northeast Water Market Leader / NYC Metro Leader

Ms. Griffin is a Registered Professional Engineer with a diverse background of 20 years of experience in the water engineering field. She has been involved in various EPA consent decree programs and design projects including water distribution/transmission design, wastewater pumping station replacements and rehabilitations, sewer/manhole rehabilitation projects, CSO elimination, sewer separation, water and wastewater treatment plant upgrades, and multiple engineering feasibility studies for various agencies throughout the Northeast, Mid-Atlantic and Midwest. She has a broad exposure resolving the engineering and organizational issues of water distribution and transmission systems, collections systems, sanitary and combined sewer interceptor systems, relief pipelines, pressure mains, and pumping systems, with the operational and sustainability goals of the downstream treatment and storage systems. Ms. Griffin prides herself in a having a passion for the water engineering field and having keen insight on what utility owners' best interest is for design and construction of infrastructure improvements. Her best skills are providing exceptional client service management with the goals of project delivery success to maintain existing clients, growth and market potential expansion, and developing lasting partnerships for strategic pursuits.

Work History:

GHD Inc. (GHD) 2022 – Present

Northeast Water Market Leader / NYC Metro (all market) Leader Associate – NY, NY 2025 - Present

- ❖ Responsible for water market business development, new client strategy, backlog and pipeline development
- ❖ Responsible for development of Metro NYC market including strategy, hiring, pipeline development and relationship management for NYC Clients.
- ❖ 20% YOY backlog growth achieved in Water for 4 years
- ❖ Leads accounts for NYCDEP, Pittsburgh Water, ALCOSAN, DC Water

Northeast Water Market Leader – Linear Infrastructure, Associate - Pittsburgh, PA 2022-2025

- ❖ Responsible for water market business development, new client strategy, backlog and pipeline development
- ❖ Regional growth from \$40M to \$60M Revenue in 2 years

Johnson, Mirmiran & Thompson, Inc. (JMT) 2015 – 2022

Water / Wastewater Section Head, Senior Associate - Pittsburgh, PA 2017 – 2021

Associate Vice President – Water Practice 2021 – present

- ❖ Responsible for water / wastewater group development, client services and marketing for the Western Pennsylvania and Ohio market.
- ❖ Developed a team of 10+ engineers from a team of zero, and provides a 38% profit margin on services out of the Pittsburgh Office.
- ❖ Lead Client Development for PA and OH: Proven Success
 - Pittsburgh Water and Sewer Authority – Primary client; first contract in 2017; Currently providing over \$20 million in revenue for water, wastewater, stormwater, construction management and inspection, and utility services; over 66 tasks / contracts since December 2017; extended through 2024.
 - ALCOSAN – 5 On-Call and design contracts for design services and construction management services inside and outside the fence.
 - Cleveland Water Department – new client contract in 2022 for water main replacement design services; upset 8-time incumbent consultant; 10th largest water utility in the Country.
 - PA American Water – new client development for water / wastewater services across Pennsylvania; currently providing SUE for sewer and force main design.
 - Duquesne Light – new client currently working on water main relocations with potential for utility management and relocation designs across Pittsburgh.
- ❖ Delivered Additional Client Growth for: NEORSD, Denver Water, Tampa Bay Water, DC Water, and Eastern Shore MD based on expertise and reputation.

Johnson, Mirmiran & Thompson, Inc. (JMT) 2015 – 2022 - Continued

Project Manager, Associate – Hunt Valley, Maryland 2015-2017

- ❖ Lead project manager for utility design: sewer rehabilitation, water main replacement and force main design; Managed a team of 20+ engineers
 - WSSC Client Services Lead for water main replacement – consultant quality control program; interacted with all senior water program managers on design and operational decisions; provided oversight of over 300 external consultant designs.
 - Baltimore County SRRR design lead; completed EPA consent order studies for 4 sewersheds including CCTV and flow monitoring analysis; designed sewer rehabilitation, pump station and force main replacements for \$10M in revenue projects.
 - Charles County – led team for sewer condition assessment reviews for county-wide CCTV inspections.
 - DC Water – provided quality oversight of sewer rehabilitation and facility design upgrade contracts.
 - MWAA – Reagan Airport; upgrade to two wastewater pumping stations.

George, Miles & Buhr, LLC

Civil Engineer / Municipal Engineer - Baltimore, Maryland 2007-2015

- ❖ Project Engineer providing design service for utility and facility designs; I&I studies, Consent-Order program management and oversight, private land development water / wastewater services.
 - City of Baltimore, MD; Led design of interceptor rehabilitation projects from 18-36" in diameter; provided comprehensive Sewershed assessment and rehabilitation design for consent decree programs.

- Baltimore County, MD; led Sewershed investigation services for flow monitoring, CCTV, and hydraulic modeling for consent decree programs; provided technical oversight of large diameter sewer rehabilitation designs.
- Charles County, MD; Designed two private development pump stations, and upgraded two county pump stations. Assisted with County reviews of developer plans for water main extensions and water tower installations.
- Howard County, MD; Led GIS analysis and hydraulic modeling programs for SSES programs and flooding scenarios; designed multiple large diameter interceptor CIPP rehabilitation projects.
- Cecil County, MD; Developed a nutrient credit trading program for the Chesapeake Bay Watershed specific to the northern bay; evaluated system expansion designs to eliminate septic systems and provide credit transfer to WWTP facilities; provided design for several treatment plant expansions and upgrades.
- New Castle Co. DE; Designed a 5 MGD pump station replacement inclusive of a new building, MEP design, site civil design, hydraulic modeling, and permitting.
- Anne Arundel County, MD; Frederick County MD; Carroll County, MD; Bowie, MD; designed various pump stations and wastewater treatment plant upgrades.

Volunteer / Leadership Experience (Current and Past):

- ❖ **Engineers' Society of Western Pennsylvania – Board of Directors, Elected 2022; Currently serving as 2nd Vice President**
- ❖ **ACEC/NY – Emerging Leaders Committee 2025-2026**
- ❖ **ACEC/PA – Vice Chair of Energy, Environment and Water committee – 2021-2023**
- ❖ **Society of Women Environmental Professionals, Three Rivers Chapter**
 - Inaugural Secretary: August 2017 – February 2019
 - Vice Chair: February 2019 – February 2020
 - Chair: February 2020 – February 2021
- ❖ **Water Environment Federation (WEF) / Pennsylvania Water Environment Association –** PennTec conference committee for Women in Water Initiative Summit
- ❖ **WEF / OWLS – 2017 technical oversight technical white papers on force main inspection and condition assessment.**
- ❖ **Saw Mill Run Watershed / Watersheds of South Pittsburgh – Volunteer 2015 to 2023**
- ❖ **Herring Run Watershed Association / Blue Water Baltimore - Volunteer 2007-2015**

Additional Background / Ms. Griffin's engineering experience includes:

- ❖ Extensive design of sewer and manhole rehabilitation, over 1 million linear feet (LF) of rehabilitation designs, with over 250,000 LF of large diameter pipeline rehab. Ms. Griffin has specialized expertise on several types of pipeline and manhole rehabilitation.
- ❖ Large-scale CCTV and condition assessment program implementation, with over 5 million LF of sewer pipeline QA/QC reviewed across her career. Ms. Griffin has provided asset-management planning and design recommendations to several large urban cities to meet consent decree requirements and program goals.

- ❖ Water distribution and transmission main replacement programs for aging urban infrastructure. She has led teams to replace over 500,000 LF of small diameter water mains and thousands of lead service line replacements in the last 8 years. Additionally, she has run 3rd party design review contracts for over 300 consultant design plans representing 400 miles of water main replacement for major urban clients. Her current water transmission main designs are replacing over 100,000 LF of critical large diameter mains that supply drinking water to the City of Pittsburgh, and other major metropolitan areas.
- ❖ Wet Weather Programs – She has lead Inflow and Infiltration (I/I) reduction studies involving hundreds of flow meters, radar rainfall analysis, hydraulic modeling, sewer separation design, green infrastructure implementation, and flooding relief projects. Her SSO and CSO mitigation projects have provided water quality benefits to the Chesapeake Bay Watershed and Ohio River Watershed to meet TMDL program requirements.
- ❖ Water / Wastewater Pumping and Storage – Ms. Griffin has designed pumping systems from 100 GPM up to 480 MGD for private and publicly owned facilities. She has evaluated pressure main design and provided case study evaluations to major urban infrastructure clients on best practices for design, construction, and operation and maintenance of pressure main systems.

References available upon request.

Mrs. Crawford is a water resources engineer with over 7 years of experience specializing in the planning, design, and modeling of large-diameter water and wastewater conveyance infrastructure, as well as drainage and stormwater systems. She has supported the development of complex municipal systems through hydraulic and transient modeling, hydrologic analysis, route analyses, feasibility studies, and preliminary engineering reports, contributing to interconnected transmission systems spanning up to 40-miles with a focus on long-term performance, reliability, and future demand projections. Her experience includes managing the design of large-diameter waterlines and design-build delivery of regional wastewater facilities, including coordination of force main design and customization of lift station hydraulics to accommodate future residential growth. Ms. Crawford serves as Engineer of Record for a county-wide drainage program, overseeing technical reviews and guiding development to meet drainage criteria and stormwater regulations, and supports capital improvement program efforts through project development, prioritization, and program management. She has contributed to site development through drainage and civil design for public facilities and provides capital improvement planning, asset management, and management of GIS-based inventories that integrate spatial and hydraulic data for informed decision-making.

EXPERIENCE

Drinking Water

- *Southeast Transmission Line (SETL), City of Houston, TX. 2019-2023.** Graduate Engineer. Planning the design and construction of 13-miles of distribution water line along Highway 3, ranging from 12- to 42-inches. Performing cost sharing analyses between the City of Houston and co-participants. Performing surge analysis modeling to provide air valve location recommendations. Assisting with the management of design phase services, coordinating with engineers of record on the production of their plan sets, preparing project work plans for construction phase services, and providing quality control reviews on all work products.
- *NHCRWA Projects 7, 23, 31, 37 Transient Analyses, Harris County, TX. 2021-2024.** Project Engineer. Modeling proposed distribution water lines to be constructed in the North Authority's potable water system under pressure surge scenarios. Interpreting model results to recommend air valve placement and design along water lines from 12- to 66-inches along water line projects spanning beyond 41-miles.
- *City of Schertz 25-Year Water Master Plan, Schertz, TX. 2022-2023.** Project Engineer. Performing city-wide long-term planning projections such as land-use, population, water supply, and demand to generate conditions of the City's complex and rapid future growth. Modeling and calibrating existing hydraulic conditions of the system for average, minimum, maximum, and fire flow scenarios in an extended period simulation model. Modeling and iterating 5-, 10-, 25-year future conditions of the system to recommend improvements to the City's infrastructure. Creating a 25-year CIP based on the recommended improvements identified by the future conditions model.
- *San Jacinto River Authority (SJRA) Woodlands Division 25-Year CIP, The Woodlands, TX. 2023.** Project Engineer. Performing a desktop condition assessment of the SJRA Woodlands potable water assets including five water plants, 38 wells, and 121-miles of water line. Developing an asset database and interactive tool to determine asset conditions and performance. Using GIS and the above-mentioned tools to schedule and cost estimate a 25-year CIP targeting renewal and replacement of all necessary infrastructure.
- *Trinity River Authority (TRA) Huntsville 36-inch Water Line Replacement, Huntsville, TX. 2023.** Assistant Project Manager. Providing assistance in the management of the preliminary engineering and planning phase tasks for the replacement of 3-miles of 36-inch raw water line from its Trinity River intake point to its output at the High Service Pump Station and 10-miles of 36-inch treated water line from the Pump Station to the Center. Developing the basis of design and construction specifications, creating real estate acquisition needs and plans, coordinating environmental and survey services from subconsultants.
- *NHCRWA Projects 39 and 40 Route Analyses, Harris County, TX. 2024-2025.** Project Manager. Managing the development of alternative routes for a proposed 37-miles of potable water line ranging from 12- to 42-inches in diameter, which were planned to expand the Client's surface water transmission program. Developing and overseeing a GIS database

Education:

BS Biological and Agricultural Engineering, Texas A&M University, 2020

Registrations/Certifications:

Professional Engineer: Texas, No. 152304
Certified Planner, American Institute of Certified Planners: No. 37201

Professional Affiliations:

AWWA, Texas, Southeast Chapter
American Planning Association, Texas Chapter

Office Location:

Houston, Texas

Total Years of Experience:

(2019) 7

Years with Tetra Tech:

(06/2025) 1

to log alternative routes, easements, tunnels, interconnections, and water receiving facilities. Advising construction methods for all alternative routes within a highly developed urban corridor. Collaborating with the Client and respective EOR to ensure only feasible alignments were identified across the project corridors.

***City of Lake Jackson Water Master Plan, Lake Jackson, TX. 2024-2025.** Project Manager. Managing and developing City-wide long-term planning projections such as land-use, population, water supply, and demand to generate conditions of the City's declining future growth. Modeling and calibrating existing hydraulic conditions of the system in an extended period simulation model. Modeling and iterating 5-, 10-, 25-year future conditions of the system to recommend improvements to the City's infrastructure. Developing an asset database and interactive tool to determine asset conditions and performance. Using GIS and the above-mentioned tools to schedule and cost estimate a 25-year CIP targeting renewal and improvement of all necessary infrastructure.

goals.

Veterans Memorial 66-inch Water Line Design Build, City of Houston, TX. 2025-2026. Project Manager. Manage the preliminary and final design of 2,000 linear feet of 66-inch bar-wrapped steel waterline along a highly trafficked corridor in North Houston. Provide technical guidance, project scheduling, and design support, as well as coordination with subconsultants. Deliver project management services through the bid and construction phases, supporting the project through final completion.

Wastewater

***Cibolo West Gravity Main, Schertz, TX. 2025.** Project Manager. Managing the modeling and planning of a future 18-inch gravity main to service new residential developments in a rapidly growing rural area. Guiding future projection calculations, horizontal and vertical alignment, and the application of modeling parameters. Managing subconsultant environmental and geotechnical services. Collaborating with the Client and stakeholders to ensure the end product accomplished all goals.

Capital Renewal and Maintenance Program (CRMP), City of Houston, TX. 2026. Project Manager. Provide consulting services to the City of Houston in support of the Capital Renewal and Maintenance Program (CRMP), including project development, scope definition, and prioritization of infrastructure improvements. Coordinate with City stakeholders to evaluate system needs, develop project recommendations, and track progress across multiple workstreams. Support program management activities such as scheduling, budgeting, and reporting to ensure successful delivery of capital improvement projects.

La Frontera Regional Lift Station Design Build, City of Fort Worth, TX. 2025-2026. Project Manager. Managing design-build project delivery for the La Frontera 3-MGD regional lift station in Fort Worth, Texas, supporting a master-planned single-family residential development. Coordinate with the owner, contractor, and design team to advance design, control scope, and maintain schedule and budget. Provide technical oversight, including coordination of a new force main design and customization of lift station hydraulics to accommodate future residential growth. Oversee construction-phase activities and facilitate decision-making to ensure successful project execution and integration with the regional wastewater system.

Stormwater

***Hydraulics and Hydrology Analyst, Houston, TX. 2022-2023.** Project Engineer. Performing hydrologic and hydraulic modeling to identify existing and future conditions of a 50-acre site located adjacent to FEMA floodplain. Establishing detention and outfall requirements to show no adverse impact on the watershed. Recommending detention infrastructure to meet drainage requirements.

***Pulte Homes Single-Family Development, Liberty County, TX. 2023-2024.** Project Engineer. Performing hydrologic and hydraulic modeling to identify existing and future conditions of a 75-acre site identified in the FEMA floodplain. Developing a complex 1D-2D hydraulic model to establish the interaction of two separate creeks across the project site. Recommending detention infrastructure and civil site design to meet drainage requirements.

***ACME Warehouse Development, Houston, TX. 2024.** Project Engineer. Performing hydrologic and hydraulic modeling to identify existing and future conditions of a previously developed 17-acre urban site. Defining the urban watershed and developing a hydraulic model to establish the interaction of separate sewer sheds across the project site. Recommending detention infrastructure and civil site design to meet existing drainage requirements and show no adverse impact.



Drainage Engineer of Record, Chambers County, TX. 2025-2026. Program Manager. Managing the Chambers County drainage review program as Engineer of Record, overseeing technical reviews and approval of public and private development projects for compliance with County drainage criteria. Provide leadership and technical guidance to review staff, coordinate with developers and design teams, and support the County in implementing drainage policies and standards. Oversee project tracking, review timelines, and stakeholder communication to ensure consistent and efficient delivery of drainage infrastructure and flood mitigation solutions.

** Denotes experience prior to Tetra Tech*



Lauren Carter- Roth Venu, M.Sc.

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Honolulu, 96822
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+1 808-737-1512 (t)
lauren@rothecological.com

Lauren Roth Venu is an ecopreneur, a TEDx speaker and published author, who is committed to building innovative solutions for climate resiliency. In 2006, she formed Roth Ecological Design International to address the disparity between development practices and the preservation of ecological systems by offering water management strategies and the design of nature-based solutions to support the regeneration of water supplies and ecological services. Her continued passion in green infrastructure drove her to form 3Rwater that developed the Follow the Drop mobile app and data platform. Follow the Drop strives to democratize nature-based rainwater management solutions and help municipalities and water agencies collect data and measure impact of their stormwater management programs to inform water management goals, funding and policy development. She deeply believes in activating communities to build sustainable water management practices that support natural systems and accelerate climate adaptation.

EDUCATION

- M.Sc. University of Hawai'i at Manoa School of Earth, Science and Technology Department of Oceanography (2002-2005)
- B.A. University of Colorado at Boulder Major: Environmental Science; Specialization: Water Resources (1995-1999)

PROFESSIONAL DEVELOPMENT

- Hawaii Leadership Lab for Entrepreneurs, Business and Government Leaders (2025-2026)
- Google for Startups United Nations Sustainable Development Goals Program (2022-present)
- Blue Startups Cohort 12 (2020-2021)
- Purple Maia Purple Prize Program (2019)
- National Green Infrastructure Certification Program – Trainer (2018-Present)
- The Water Environmental Federation Leadership Program (2015)
- United Nations University / East- West Center's ProSPER.net Leadership Program (2013)

AWARDS

- Finalist for Entrepreneur of the Year in Clean Tech by HVCA (2021)
- (1) ASLA Award for the University of Hawaii West Oahu Campus Administrator and Allied Health Science Building (2021)
- (3) AIA Awards for the University of Hawaii West Oahu Campus Administrator and Allied Health Science Building (2019)
- Named *Top Forty Under 40 Business Leaders* by *Pacific Business News* (2014)
- U.S. Regional Environmental Protection Agency Award (2005).

COMMUNITY & CIVIC INVOLVEMENT

- World Bank Youth Innovation Challenge Water Solutions for a New Climate Reality- Founding Partner (2024-2025)
- Onsite Nonpotable Reuse Stakeholder Advisory Group (2020-present)
- The Hawaii Nature Center, Facilities Advisor (2020-present)
- Board of Directors Member for Ahahui Malama I ka Lokahi (2014-2025)
- State of Hawai'i Building Code Council, Co-Chair Green Codes Investigative Committee (2013-2018)
- Chair of the Advocacy Committee for the Hawai'i Chapter Green Building Council (2012-2018)
- State of Hawai'i Water Security Advisory Group (2017).
- Polynesian Voyaging Society, Crew Member (2012-2013)
- State of Hawai'i Department of Health Water Reuse Guidelines Advisory Committee (2013-2017)
- State of Hawai'i Commission of Water Resource Management's Water Conservation Advisory Group (2011-2013)
- Water and Wastewater Committee Chair for the Honolulu City and County Sustainable Building Task Force (2010-2011)
- Engineers Without Borders (2010-2012)

SELECTED INVITED SPEAKER/LECTURER

- *Water Environment Federation Stormwater Summit 2020, 2021, 2023*
- *American Water Works Association /Hawai'i Water Environment Association Conference: 2010-2012, 2015-2019, 2022, 2024-2026*
- *City and County of Honolulu Stormwater BMP Conference, 2022-2025*
- *NOAA Green Infrastructure Solutions for Coastal Communities Workshop: 2021*
- *Sakamaki Extraordinary Lecture Series, 2016*
- *TEDx Maui, 2013*
- *Sustainable Water Resource Management, Seminar for the Government of Jeju, Jeju Island, Korea, 2011*
- *Asia Pacific Clean Energy Summit, 2010*
- *Cornell University Sustainability Roundtable for Hotels and Hospitality, 2009*

SELECTED PUBLICATIONS

- *Follow the Drop - Curriculum.* 2020.
- Roth Venu, L. 2015. Ch 5. *Ecological Design. Thinking Like an Island: Navigating a Sustainable Future in Hawai'i, University of Hawai'i Press.*
- Roth Venu, et al. 2014. Ch. 4. *Stormwater Management the Natural Way: Low Impact Design & Development. Recycled Water for Reefs. Coral Reef Alliance.*
- Roth Venu, et al. 2014. Ch. 3. *Reef Stewardship Activities that Reduce Land-Based Pollution: Hawaii Hotel Reef Stewardship Guide. Coral Reef Alliance.*
- Roth Venu, L. 2010. *Ecological Design: Wetland Technologies. HonuGuide.*
- Jayanthi, S., Roth A., Kristal, M. and Venu LCR. 2009. *Dynamics of neo-operations strategy: an ecological perspective on strategy, survival, and the environment. Management Science.*
- Laws, E. and Roth, L. 2004. *Effects of Channelization on Waimanalo Stream, Oahu. Pacific Science. 58:2, 261-72.*

PROFESSIONAL AFFILIATIONS

- Green Infrastructure Leadership Exchange
- Water Environment Federation
- Hawaii Water Environment Association
- American Water Works Association
- Hawaii American Water Association
- U.S. Green Building Code Council
- International Water Association
- Hawaii Building Industry Association

WORK EXPERIENCE & SELECT PROJECTS

Roth Ecological Design Int. (2006-present)

Founding Principal and President. 1164 Bishop St, Suite 1208, Honolulu, HI. 96813. Tel:+ 1 808-737-1512, www.rothecological.com

Roth Ecological Design Int. (REDI) offers strategic water management planning and design of natural systems to treat and manage water onsite. REDI often serves as a bridge between landscape architecture and civil engineering by specializing in the design of regenerative systems to reduce the water footprints of new and redevelopment projects and (re)building of ecological systems.

- **Waimea 400 Master Plan:** Led the technical planning and concept design of a 120+ acre stormwater wetland to mitigate flooding on newly acquired 400 acres by the County of Kauai for affordable housing and agricultural development.
- **City of Sacramento Onsite Reuse Program Development:** Supporting the city in the development of an Onsite Water Reuse Program that will offer a regulatory framework for new and redevelopments to use recycled water for indoor reuse.
- **State of Hawaii Department of Land and Natural Resources, Hāena State Park:** Flood mitigation design following the 2018 disaster. Design of large-scale green infrastructure as part of a flood mitigation strategy for the park and cultural resources.
- **City and County of Honolulu, Neal Blaisdell Center Redevelopment:** Integrated water master planning including the design of onsite water reuse, rainwater harvesting and green stormwater infrastructure.
- **Honolulu Board of Water Supply:** One-water planning / onsite reuse for master planned Transit Oriented Development communities .

- **State of Hawaii Commission of Water Resource Management:** Inventory of Statewide State and County Facilities to Implement Recycled Water.
- **Office of Hawaiian Affairs, Kūkaniloko Water Master Plan:** Development of a water portfolio for water supply. Planning and concept design of green infrastructure design to support, stormwater capture, onsite water reuse and future agriculture.
- **Kamehameha Schools, Kapālama, Maui & Hawaii Island Campuses:** Onsite water reuse and green infrastructure assessments for all of KS Schools island-wide to support 'āina-based education and return on investment for the facilities.
- **Kamehameha Schools, Kahalu'u Mai Kai Redevelopment Cultural Education Center:** Onsite wastewater treatment (blackwater and greywater) and reuse and green stormwater infrastructure design.
- **University of Hawaii West Oahu Campus Administration and Allied Health Building (LEED Gold):** Onsite greywater treatment and reuse, rainwater harvesting and green stormwater infrastructure design, permitting and post-construction support.
- **University of Hawaii West Hawaii (Palamanui) Campus (LEED Platinum):** Onsite wastewater treatment using constructed wetland technology and reuse and landscape design.
- **City and County of Honolulu Department of Facility and Maintenance:** Led National Green Stormwater Infrastructure Certification (ngicp.org) trainings for City and County of Honolulu staff and contractors.

3Rwater, Inc. (2019-present)

Founder and CEO, P.O. Box 11081, Honolulu, HI 96828. Tel: 1 808-781-7583, www.3r-water.com

3Rwater developed the Follow the Drop mobile app and data platform to serve as an all-in-one green infrastructure planning, management, and community engagement tool. Follow the Drop was designed to increase access to stormwater capture solutions for private properties and help water agencies collect metrics, track projects and build transparency in their stormwater programs.

- **City and County of Honolulu (2020-present):** Led baseline stormwater modeling using 3Rwater's Follow the Drop app in priority watersheds. In partnership with Malama Maunaloa, Hawaii Green Growth and Hui o Ko'olaupoko, supporting community rainwater assessments with private property owners using the app. Collecting data and providing data management and analytics to support the development of the City's Direct-Install GSI [incentive program](#).
- **Malama Maunaloa, NFWF & NOAA Grant partnership, Flood Mitigation Plan (2022-present):** Community engagement, identification of green stormwater infrastructure retrofit opportunities, and providing data collection and stormwater metrics using the Follow the Drop app in East Honolulu with residents, schools and businesses.
- **Malama Maunaloa, City and County of Honolulu, HCF Freshwater Initiative Grant partnership (2024-2025):** Partner organization for development of a Pilot Green Stormwater Infrastructure Incentive Program for residents of Oahu. Includes identifying community partners to help shape the program, data collection and metrics with Follow the Drop and updating Follow the Drop to provide program administration.
- **Hawaii Green Growth, NFWF & HCF Freshwater Initiative Grant partnership (2024-2025):** Supporting HGG in community rainwater assessments and leading baseline stormwater data collection and assessments using the Follow the Drop app for Ala Wai Watershed.
- **Auckland Council Healthy Waters, New Zealand (2022-2024)** Customized Follow the Drop to support Council's drought mitigation program and encourage rainwater harvesting on private properties. Included working with Council's Māori Outcomes team to develop a Te reo Māori language version of app.
- **Kupu, Water Security Advisory Fund, State of Hawaii & HCF (2017-2019):** Developed the Follow the Drop mobile app to help meet the goals of the Hawaii Freshwater Initiative. Beta-tested in schools and co-developed the Follow the Drop curriculum.

Ocean Arks International (1999-2002)

Operations Manager, 10 Shanks Pond Rd. Falmouth, MA 02540. www.oceanarks.org

Ocean Arks International (OAI) is a 501c3 founded and led by the internationally acclaimed Bioneers, John and Nancy Todd. The mission of OAI is to spread ideas and practices of ecological sustainability throughout the world with a particular focus on the protection and restoration of the world's waters. John Todd is also the inventor of the Living Machine, a nature-based water/wastewater treatment system that has been deployed globally. With funding from the late Senator Inouye and PICHTER, the Living Machine technology was brought to Hawaii in 2000, serving as an innovative approach to treat polluted water akin to traditional Hawaii water management practices.

Served as the Operations Manager for the Living Machine project in Hawaii:

- Led the operations of the Living Machine program and facility
- Led research on native Hawaiian plants to be used in the system
- Community and school group education

Zachary Monge, P.E.

**Senior Project Manager
Upstate NY Water Group Operations and Sales Leader
Syracuse, NY Office Operations Leader**

Education

M.S., Environmental Engineering, University of Massachusetts – Amherst, 2011
B.S., Environmental Engineering, University of Connecticut – Storrs, 2009

Professional Registrations

Professional Engineer: NY

Distinguishing Qualifications

Zach is the Water Group Leader for Upstate New York, overseeing all of Jacobs' water market projects from Buffalo to Albany and Poughkeepsie to the Canadian border. Zach is currently the Project Manager for Onondaga County's award-winning CSO Abatement and CMOM Programs. Zach has extensive combined sewer system experience, including design and construction of green infrastructure, sewer separation, CSO regulator modification, and sewer rehabilitation projects. Zach also has extensive experience with wastewater and drinking water infrastructure projects in a variety of municipal settings. Zach is active in NYWEA and WEF and NYSAWWA, a member of the WEF Collection Systems Committee and a frequent presenter at various conferences in New York and nationally. Zach is:

- Experienced in stormwater management, green infrastructure, natural treatment and water resource management applications for CSO abatement and stormwater management
- Experienced in project management and delivery, including design management, construction engineering, and construction management
- Experienced in a variety of applications for wastewater and drinking water conveyance, distribution, and treatment
- Experienced in various aspects of groundwater treatment
- Experienced with FEMA-funded disaster repair work
- Experienced in ultraviolet treatment and chlorine disinfection for drinking water treatment
- Advanced research in ultraviolet advanced oxidation processes utilizing hydrogen peroxide and its solid forms

Representative Projects

Stormwater Manager/Green Infrastructure/CSO Abatement

Program/Project Manager; CMOM Program Management, Onondaga County, NY; Ongoing. As Program/Project Manager for Onondaga County's CMOM Program, Mr. Monge leads the delivery of a multi-faceted Program. Work includes sewer capacity model development, O&M plan overhauls for wet weather facilities, CCTV program development, SSES studies, and I/I elimination strategies. Mr. Monge oversees a large, multi-disciplinary team delivering the work, and coordinates with the client daily.

Program/Project Manager; CSO Program Management, Onondaga County, NY; Ongoing. As Program/Project Manager for Onondaga County's CSO abatement program, Mr. Monge has completed numerous tasks, including Long-Term Control Plan development, financial capability assessment development, regulatory reporting, Use Attainability Analysis planning, oversight and direction of the program in its interaction with numerous stakeholders, program budget analyses, SWMM modeling oversight and review, subcontractor invoice review and approval, technical memorandum writing, development of project fact sheets, daily client interaction, and internal contract amendment and budget tracking.

SWMM Modeling Oversight; CSO and CMOM Program Management, Onondaga County, NY; Ongoing. Under role as Program Manager of both programs, oversaw significant SWMM modeling, including recalibration of the CSO model, which required flow monitoring program development, development of sewer system capacity models for sanitary districts, also requiring flow monitoring program development, SSES model development, and individual project SWMM modeling.

Design Manager, CSO Program Management, Onondaga County, NY; Ongoing. In the design manager role, coordinated the design of over 85 GI projects over a 12-year period. Work included developing project ideas with the Green Planning Committee, client coordination and communication, comment adjudication and design deliverable scheduling and review. Prepared agendas and chaired bi-weekly review meetings with the client in this role. Attended and presented projects at public education and outreach meetings. Also led the proper state and local permitting process for each project.

Project Manager, CSO 066 Regulator Modification, Onondaga County, NY; Ongoing. Oversaw the design of this \$5M construction project to reconfigure and upsize the CSO regulator piping from a frequently overflowing CSO outfall in Syracuse, NY. Design included coordination with structural and geotechnical engineers due to 25'+ depth of sewers being replaced. Also required close coordination with the City of Syracuse for work within the right-of-way, and along the streambanks of Onondaga Creek. During design, coordinated design reviews internally and externally, including comment resolution and public education and outreach.

Task Leader, Stormwater Management Plan Development, Hunts Point Produce Market, NYC Economic Development Corporation; Ongoing. Led team in the development of the stormwater management plans for this \$700M construction project. Work included review of stormwater BMP and pipe sizing calculations, outfall analysis for existing outfalls, assessment of climate change impacts, coordination with environmental permitting, and Engineering Basis of Design Report writing.

Senior Project Engineer, St. George Esplanade, NYC Economic Development Corporation; Ongoing. Provided engineering design review for this stormwater management/green infrastructure development project to redevelop the St. George Esplanade from the formerly abandoned Staten Island "Wheel" project. Work included close coordination with the client and stakeholder representatives, BMP sizing calculation review, and environmental permitting coordination. Also included technical specification development, cost estimating review, and assisting Project Management with overall delivery of project.

Construction Engineer/Inspector/Manager, CSO Program Management, Onondaga County, NY; Ongoing. Oversaw the construction of over 100 CSO abatement projects as the lead construction engineer/manager/inspector. His work has included reviewing construction submittals, chairing pre-construction and construction progress meetings, preparing meeting minutes and contract addenda, responding to contractor requests for information, completing construction inspections, issuing field orders and required corrective work actions, reviewing contractor claims and issuing contract modifications to the client. In

this role, he has worked closely with the construction manager, field inspector and client to ensure that the construction of each project is successful.

Design Engineer, CSO Program Management, Onondaga County, NY; Ongoing. Led the design of over 40 CSO abatement projects over a 12-year period. Zach designed the CSO 005 reconfiguration project featuring the re-plumbing of an existing combined sewer to connect to the Harbor Brook Interceptor Sewer upstream of the existing overflow structure. By making this modification, the volume of CSO reduction by 1 million gallons and activation frequency by 6 events. Other projects have included a variety of BMPs, including porous pavements, bioretention areas, underground infiltration trenches, stormwater wetlands, natural treatment wetlands, and green roofs. Also includes sewer separations, regulator modifications, and sewer lining. In this role he has completed drainage area delineations, sizing calculations, cost estimates, technical specification development, client comment resolution, and project modeling in HydroCAD and other software.

Project Manager, I-81 Renovation Project/CSO Program Management, Onondaga County, NY; Ongoing. In support of Onondaga County, completed the preliminary planning to assess the impacts of the I-81 renovation project on the County's sewer system and assets. Work includes review of technical design documents developed by NYSDOT, development of alternatives for replacement of large diameter combined sewers, cost estimating, SWMM analyses to project impacts to the County's combined sewer system as a result of the work, and development of preliminary design plans to replace two floatables control facilities and associated large diameter combined trunk sewers with a single combined trunk sewer and single floatables control facility, relocated large diameter trunk sewers, and stormwater management. Also included development of multiple Engineering Basis of Design Reports for each individual project.

Design and Construction Engineer/Inspector; CSO Program Management, Green Innovation Grant Program (GIGP), Onondaga County, NY; Ongoing. Mr. Monge has overseen the development of successful grant applications and implementation of six GIGP projects funded through NYS EFC. These projects include the War Memorial Cistern System where rainwater is captured, treated and used for ice making, the I-690 Downspout Disconnections project where rainwater is redirected from downspouts from I-690 to green infrastructure practices, the Washington Street Green Corridor project featuring innovative interconnected porous paving blocks and bioswales, and the South Salina Street Green Corridor, Butternut Street Green Corridor, and Prospect Hill Green Streets projects featuring enhanced stormwater street tree systems with Silva Cells, porous pavers, bioswales, and underground infiltration trenches. Mr. Monge developed the grant applications for these projects. During the design phase, Mr. Monge led or co-led the design of each of these projects and coordinated extremely closely with NYS EFC staff to address their design comments and concerns. During the construction phase, Mr. Monge acted as construction engineer and inspector for each project, overseeing the construction and ensuring that the GI was installed per the plans and specifications. Post-construction, Mr. Monge coordinated with NYS EFC regarding closeout and grant reimbursement for the County.

Project Manager, Harbor Brook CSO 018 Constructed Wetlands Storage and Treatment Facility, CSO Program Management, Green Infrastructure, Onondaga County, NY; Ongoing. Mr. Monge oversees the operations and monitoring of this landmark project. Mr. Monge authored long term monitoring and sampling plans in accordance with the NYSDEC State Pollution Discharge Elimination Permit and has been overseeing the monitoring program for the facility for over 6 years. In this role, Mr. Monge works with sampling staff to coordinate sampling and preparing quarterly performance reports and semi-annual groundwater reports for submission to the NYSDEC. Prior to this role, Mr. Monge led construction engineering efforts on this project.

Design Manager; LID Pilot Projects, Green Infrastructure, Ottawa, ON; 2021-2022. Mr. Monge is the design manager for the design of two LID pilot projects in the City of Ottawa featuring enhanced street tree trenches

designed with soil cells (Silva Cells®). As design manager, Mr. Monge has been responsible for the QA/QC of the LID design on Bank Street and Glebe Avenue through the preliminary design phase.

Senior Technical Engineer; Stewart Street LID Rehabilitation, Green Infrastructure, Ottawa, ON; 2024-2025.

Provided senior technical quality review for the rehabilitation of the bioretention areas along Stewart Street in Ottawa, ON. Growth and functionality of the bioretention areas had waned and the client desired rehabilitating the project site to return to desired conditions. Work included review of the technical memorandum with proposed rehabilitation measures and review of the contract documents for implementation.

Senior Technical Engineer; LID Guidelines Development, Green Infrastructure, Ottawa, ON; Ongoing.

Provided senior technical quality review for the development of LID standard guidelines for the City of Ottawa, ON. Included were the development of standard procedures, sizing requirements, standard details, and specifications.

Senior Technical Engineer; Armstrong CSO Green Infrastructure Project; Winnipeg, MB; Ongoing.

Provided senior technical quality review for the development of CSO abatement projects via green infrastructure in the Armstrong CSO area of Winnipeg. Work included concept development and review, review of basis of design, and review of detailed design plans.

Senior Technical Engineer; Traverse City Stormwater Management Plan Delivery, Traverse City, MI; Ongoing.

Developed and presented materials on Jacobs' stormwater and green infrastructure planning and management capabilities for Innovation Workshop with City staff in March 2024. Work included close coordination with City staff to understand their stormwater management challenges and experiences, and ways that their processes could be refined and improved in the future.

Project Engineer. ALCOSAN CSO Tunnel and Green Infrastructure Program Management, Pittsburgh, PA; Ongoing.

Supported and oversaw the value engineering and design reviews, and other support services to ensure the successful delivery of the green infrastructure program. Provided analysis of long-term sewer main flow data to evaluate the impact of GSI/SC projects at the sewershed level. Supported the development of ALCOSAN's 2019 GSI guidance manual and the development of ALCOSAN's regional stormwater plan that evaluated GSI potential throughout the Pittsburgh region.

Senior Technical Advisor, Water Quality Modeling Program, Peterborough, ON; 2022.

Provided senior technical review and guidance of water quality modeling work to assess system flooding and water quality impacts of current and future climate-change enhanced rainfall in the City of Peterborough. Work included review of model results and recommendations memo, including cost estimates.

Design Engineer; Lancaster Green Plan, Green Infrastructure, Lancaster, PA; 2014-2016.

As design engineer, Mr. Monge has completed the design of one comprehensive green street project on West Liberty Street. This project included curb extensions, underground infiltration trenches, downspout disconnections, and roadway improvements. In his role as Design Engineer, Mr. Monge has completed design calculations, set system elevations and resolved client comments. Mr. Monge is currently designing another comprehensive green street project on Hershey Ave. utilizing a curb extension, bioretention, underground infiltration and a Filterra® unit.

Design Engineer; PWD Green Streets, Green Infrastructure, Philadelphia, PA; 2015-2016.

As design engineer on this project, Mr. Monge has co-developed a 90% design submission to the client. GI included in this project includes underground infiltration areas, curb extensions, and bioswales. In this role, Mr. Monge completed

detailed GI sizing calculations, detailed designs, client comment resolution, and coordination with other design team members.

Project Engineer; DC Water GI Challenge, District of Columbia Water; 2015. Mr. Monge led the development of numerous front end and technical specifications for the 90% submittal for this important project with a new client. Mr. Monge coordinated closely with the client and design team for the specification development. In addition, Mr. Monge completed the detailed cost estimate for the project.

Design Engineer; Radnor Township Stormwater Management; Radnor Township, PA; 2015. In this role, Mr. Monge has assisted senior technical staff in the development of stormwater management concepts in areas of poor drainage and severe flooding in Radnor Township. Mr. Monge has used drainage areas delineated by the SWMM modeling team to complete sizing calculations for GI concepts. Using the developed concepts, Mr. Monge developed cost estimates for the client to consider when deciding if they will proceed with the project.

Project Engineer; Clean Water Partnership, Green Infrastructure, Prince George's County, MD/Corvias; 2015. In his role as project engineer, Mr. Monge led the design of more than 10 stormwater management projects within Prince George's County, MD. These projects included bioretention areas, submerged gravel wetlands, and sand filters. Mr. Monge completed drainage area delineations, detailed sizing calculations, technical specification development, permit applications, and stormwater modeling utilizing HydroCAD. In addition, Mr. Monge led the screening process and eventual design of over 60 high flow media filter (Filterra/Focal Point) projects. The detailed screening process considered a number of factors, including existing grade, utility conflicts, available space, etc.

Project Engineer; Green Infrastructure Concept Development, Buffalo-Niagara Riverkeeper; 2015. As a project engineer on this project, Mr. Monge led the development of 2 green infrastructure concepts for future development by the Buffalo-Niagara Riverkeeper and Buffalo Sewer Authority. In this role, Mr. Monge completed drainage area delineations, detailed sizing calculations, cost estimations and client comment resolution.

Project Engineer; CSO Program Management, Green Infrastructure, Newport, RI; 2014. Mr. Monge developed a detailed technical memorandum for the development of GI conceptual designs at two sites. Included in the TM was a GI technology alternative analysis, GI project concepts, estimates of expected performance, preliminary cost estimates, and conclusions, recommendations and next steps.

Site-Civil Engineering

Senior QA/QC Engineer, Sludge Drying Bed Project, CSX Railroad, Selkirk, NY; Ongoing. Provided Senior QA/QC review of the 30%, 90%, and final design for the sludge drying bed project. Work included review of design plans and technical specifications and coordination with internal design delivery team on comment resolution.

Project Manager, Reimagining Freedom Plaza, NYS Office of Parks, Recreation, and Historic Preservation, Niagara Falls, NY; Ongoing. Under a subcontract with Rhodeside Harwell, provided preliminary design for the site civil and environmental permitting portions of this project. Included coordination with NYS Parks, NY Power Authority, and the City of Niagara Falls as stakeholders.

Project Manager, Tully Mudboils Mitigation Peer Review, Onondaga County, New York State Department of Environmental Conservation; Ongoing. Project Manager leading the peer review of a feasibility study analysis for the mitigation of the mudboils from Onondaga Creek in Onondaga County. Work included review of the

initial alternatives analysis for mitigation and review of the Feasibility Study for each of the alternatives to further the design of the project.

Senior Quality Reviewer, SWPPP Development, Equinor/South Brooklyn Marine Terminal; Ongoing.

Completed quality review of the development SWPPP document and accompanying drawings for this project for the construction of buildings and infrastructure related to the offshore wind power development project. Overall work area requiring SWPPP measures was greater than 100 acres. Work includes client comment resolution and final SWPP preparation.

Senior Quality Reviewer, SWPPP Development, Confidential Client; 2024-2025. Completed quality review of the development SWPPP document and accompanying drawings for this confidential client's project to rehabilitate existing infrastructure. Overall work area requiring SWPPP measures was greater than 50 acres. Work includes client comment resolution and final SWPP preparation.

Project Manager/Lead Designer/Construction Engineer, Civic Strip Improvements, City of Syracuse, Syracuse University, NY; 2014-2016. As lead designer for this project, Mr. Monge has completed the design of 2 public facility streetscape entrances and a pedestrian wayfinding signage system. The design of the public facility streetscape entrances includes the installation of new sidewalk, decorative brick pavers, and interactive kiosk bases. The pedestrian wayfinding system includes 60 signs in downtown Syracuse to direct pedestrians to various public facilities. His work further includes the development of technical specifications, cost estimates, and close coordination with the client. Mr. Monge lead construction engineering efforts for these projects, chairing meetings and preparing minutes, reviewing submittals, completing construction inspections and coordinating with the contractor and client on a day-to-day basis. As Project Manager, Mr. Monge is delivering this project under budget and on schedule, and consistently keeping the internal financial system updated.

Project Manager/Project Engineer; Hogansburg Dam Decommissioning and Removal, St. Regis Mohawk Tribe; 2014-2017. As a project engineer on this project, Mr. Monge finalized the design and specification development for this dam removal project. Mr. Monge has designed detailed construction sequencing plans and demolition plans and assisted with the effort for designing the stream-bank stabilization methods. Mr. Monge has led the development of detailed front end and technical specifications in close coordination with client tribal requirements. Mr. Monge was lead construction engineer for this project, chairing progress meetings and preparing minutes, reviewing submittals, coordinating with the contractor, responding to RFIs, change order requests, etc., reviewing payment applications, and assembling punch lists for the Contractor to complete prior to contract close out. As Project Manager, Mr. Monge took over the project when it was severely over-budget and has since delivered the project under-budget, lessening the internal cost impacts.

Project Engineer; 2016 Water Treatment Plant, Site-Civil Engineering, Oak Creek Water and Sewer Utility, 2015. As a project engineer, Mr. Monge developed detailed site plans for on-site stormwater management. In this role, Mr. Monge used previously completed stormwater calculations to design two dry basins to manage stormwater at the site of the water treatment plant. Mr. Monge developed underdrain, orifice and overflow designs for this site.

Project Engineer; Rondout-West Branch Tunnel Bypass Project, Site-Civil Engineering, NYCDEP Water for the Future Program, 2014. As lead design engineer, Mr. Monge developed detailed site plans through 70% design for tunnel waste settling basins and water treatment. In this role, Mr. Monge co-wrote the basis of design for the project, designed various site aspects in conjunction with senior engineering staff (settling basins, stormwater and erosion and sediment control), and developed/edited detailed specifications. Mr. Monge attended regular progress check-in calls with the client and contributed to weekly internal discussions with the design team.

Wastewater Conveyance and Treatment

Senior Project Engineer, Kirkpatrick Street Pump Station Rehabilitation, Onondaga County; Ongoing. Project engineer supporting the civil and process design portions of this pump station rehabilitation project. Supported project management and junior engineering staff with the development of site civil and process design elements during the design and construction phases of the project.

Project Manager, Marcellus DOT Facility Sanitary Sewer Connection Project, Onondaga County; Ongoing. Supported engineering design staff with the design of a new 8" sanitary sewer from the existing maintenance facility to the Town of Marcellus wastewater conveyance and treatment system. Work included review of sizing calculations, coordination of client and town comment resolution, cost estimating, and construction contractor oversight.

Senior Project Engineer, Pump Station Manlift Elevator Replacements, Buffalo Sewer Authority; 2024-2025. Assisted with design review and construction coordination for the replacement of three manlift elevators at three different sanitary sewer pump stations. Completed design QA/QC reviews at each design phase and assisted with shop drawing review and contractor coordination during construction.

Project Manager, Asset Management Plan Development Program, New York State Environmental Facilities Corporation and Department of Environmental Conservation; Ongoing. Project Manager for the development of asset management plans for the Village of Lima, City of Little Falls, Village of LeRoy, and Village of Arcade. Work included coordination with subcontractors for asset identification and condition assessments, capital improvement plan development, sewer rate analyses, and development of final asset management plans. Led coordination efforts of project team with NYSEFC/DEC and with the Program Advisor.

Project Manager, Midland Avenue Regional Treatment Facility Operational Improvements, Onondaga County; Ongoing. Project Manager overseeing the technical analysis, basis of design, detailed design, and construction of the \$2.2M project which included replacement of two submersible wet well pumps, one chopper pump, installation of a new monorail crane, and associated electrical and SCADA interconnection work. Work includes review of each of the design deliverables and construction oversight.

Project Manager/Construction Engineer, Eastside WWTP Asset Management Improvements, City of Oswego, NY; 2020-2023. As project manager and construction engineer for this project, Mr. Monge has overseen the \$6.9M electrical, SCADA, and HVAC upgrades to the Eastside WWTP. Mr. Monge chaired bi-weekly construction meetings, completed all construction administration work, and coordinated construction inspection actions internally and with subcontractors. Work also included supporting the start-up and commissioning of the new equipment.

Project Engineer, Sanitary Sewer System Evaluation, City of Oswego; 2016.

Supported the field assessment, data collection, and report development for the SSES of the Harbor Brook sewershed for compliance with the Consent Order between the City and NYSDEC. Completed smoke and dye testing for sanitary sewers and illicit discharge identification in the storm sewer system.

Groundwater Management and Treatment

Project Engineer, FEMA BRIC Application Development, Buffalo Sewer Authority; 2024-2025. Assisted with developing the FEMA BRIC Application for a project to install cutoff walls around the Bird Island WWTP to

prevent the movement of water beneath the Island that has negatively impacted WWTP infrastructure. Wrote multiple pieces of the application and assisted with developing the project plans and alternatives analysis. Further assisted with development of cost estimates compliant with FEMA requirements.

Project Engineer, Seepage and Subsidence Investigations, Buffalo Sewer Authority; 2023-2024. Supported project management with the collection and analysis of field data from seven monitoring wells around the Bird Island WWTP facility. Data was used to analyze the effects of changing groundwater elevations on seepage and subsidence issues through the facility. Work included summary report development with recommended actions, detailed design plan development for pilot repairs to seepage and crack repairs throughout the facility, and bidding and design services during construction.

Design Engineer/Construction Engineer, Confidential Client; 2016-2017. As a design engineer for this project, Mr. Monge has worked closely with senior design staff researching various alternatives for treating contaminated groundwater at the project site. To date, Mr. Monge has completed research for oil/water separators, clarifiers, sump pumps, and flow meters. In his role, Mr. Monge has discussed each treatment aspect with various vendors and manufacturers, and has developed detailed technical memoranda included with the basis of design report for the project. Mr. Monge completed the design of a \$2.5 million dollar vertical and horizontal contact bed system for treating groundwater to remove various contaminants. Mr. Monge primarily completed the design himself, with the support of senior technologists and structural and geotechnical engineers. This project is currently under construction and Mr. Monge has served as the construction engineer responding to contractor questions, reviewing submittals, and coordinating with on-site staff for the successful completion of this project.

Project Engineer, Water Planning, Study, and Design, Groundwater Treatment, Confidential Client; 2014-2015. Mr. Monge completed a basis of design report for the water planning, study, and design of a groundwater treatment project for a confidential client in Upstate New York. Working with project management, Mr. Monge co-authored the basis of design report. The document included a comprehensive history of the client's water usage, trends and maximum allowable purchase. Mr. Monge helped develop conclusions and recommendations for the client to utilize in planning their future growth. The client is currently reviewing the document and additional follow-on work is anticipated during 2015.

Drinking Water Distribution and Treatment

Senior Engineer, Corrosion Control Study for the City of Syracuse; US EPA Water Technical Assistance Program; Ongoing. Provided leadership and QA/QC review to junior engineering staff for the completion of a corrosion control study related to lead water service replacements in the City of Syracuse. Work included coordination with the City for lead pipe harvesting, water quality sampling, and summary report review.

Project Manager and Design/Construction Engineer, FEMA Damage Repairs, Mohawk Valley Water Authority, Ongoing. Led the development of detailed designs for the repair, relocation, or armoring of 11 different water mains or related infrastructure throughout the MVWA distribution system that were damaged by a 100-year storm in October 2019. Work included detailed design and specification development, cost estimates, client comment resolution, bidding support, and construction engineering during the construction phase. Also included close coordination with the client to ensure compliance with FEMA funding requirements.

Project Manager and Design Engineer, Water Main Reinforcement, Mohawk Valley Water Authority; 2021. Mr. Monge is leading his team's effort to support the MVWA with the re-armoring of a 36" water main at the toe of a reservoir holding dam. The existing armoring failed during a heavy rain event and is in need of replacing. Mr. Monge has developed the initial design and FEMA Damage Assessment report.

Project Engineer, UV Disinfection Improvements, City of Syracuse, NY; 2011-2012. Under the direction of project management, Mr. Monge completed a number of tasks, including parts of the design of the UV and chlorine disinfection processes, building HVAC design, water supply piping and yard piping. He also assisted in the writing of a number of technical specifications and submittal review during construction. Pre-construction, Mr. Monge supported project management with the development of the UV equipment pre-selection contract documents.

Research Assistant, UV AOP and Solid Forms of Hydrogen Peroxide; UMass Amherst; 2010-2011. As a research assistant, Mr. Monge completed numerous analyses on the use of solid forms of hydrogen peroxide (sodium percarbonate and perborate) as an alternative to liquid hydrogen peroxide. His research found that the solid forms of hydrogen peroxide were as effective as the liquid form in terms of disinfection potential, while providing the opportunity for increased cost and carbon footprint savings to the disinfection facility.

Geospatial Information Systems

Project Engineer; CSO/CMOM Program Management, GIS System Updates, Newport, RI; 2015. As a project engineer, Mr. Monge updated an existing GIS model of the City of Newport, RI with various storm and sanitary sewer updates compiled by field staff. In this role, Mr. Monge used information provided by field staff to update the master GIS model so that future planning work can be completed accurately.

Mentorship

Mentor, Senior Capstone Designs at SUNY ESF; 2018-Current. Mentor to Senior collegiate students at SUNY ESF for various senior capstone design projects on an annual basis. Completed peer reviews of studies and design alternative analyses and provided feedback on final group presentations to at a University Forum.

Membership in Professional Organizations

- New York State American Water Works (NYS AWWA) – Member
- New York Water Environment Association (NYWEA) – Member
 - Central Chapter Scholarship Committee Co-Chair: 2024 – Current
- American Public Works Association (APWA) – Member
 - Central Chapter Board Director: 2022 – Current
- Construction Management Association of America (CMAA), NY/NJ Chapter – Member

Training

- OSHA 10 Hour Construction
- Jacobs Fundamentals of Project Management
- Jacobs Construction Inspection
- Jacobs Construction Management
- Jacobs Site Safety Coordinator

Professional Articles

- Harnessing the Power of Artificial Intelligence and Machine Learning in Wastewater Collection Systems, *NYWEA Clear Waters Magazine*, Winter 2024 Edition. With David Barnes, Mark Wisbey, and Jennifer Baldwin/Jacobs.

Presentations

- O&M-Centered Digital Support Tools, *NYWEA Spring Meeting*, June 2023.
- Onondaga County CSO Abatement Program, *Jacobs East Region Program Management CoP*, May 2025.
- I-81 Viaduct Project – Combined Sewer System Master Planning, *Jacobs NY/NJ PDH Webinar*, November 2024. With Madeline Eggenberger/Jacobs.
- Using AI and Machine Learning for Asset Management Guidance, *NYWEA Spring Meeting*, Buffalo, NY, June 2024.
- Integrating Community Benefits into Project Designs, Workforce Development, and Capacity Building, *NYSAWWA Annual Water Event*, Saratoga Springs, NY, April 2024. With Leticia Solaun/Jacobs.
- Smart CSO Management with AquaDNA, *NYWEA Annual Meeting 2024*, New York, NY, February 2024.
- Onondaga County's 30-Year Project: Closure of the Amended Consent Judgement and Next Steps, *NYWEA Annual Meeting 2023*, New York, NY, February 2023. With Lauren Livermore/Onondaga County.
- Save the Rain: 230 Completed GI Projects in 10 Years – O&M Lessons Learned and Success Stories, *Georgia Association of Water Professionals Technical Conference*, December 2022.
- Onondaga County's 30-Year Project: Closure of the Amended Consent Judgement and Next Steps, *Three Rivers Wet Weather Conference*, Pittsburgh, PA, November 2022. With Andrew Potts/Jacobs.
- Investigating Seepage and Subsidence at the Bird Island Wastewater Treatment Plant, *Western NY Chapter NYWEA Luncheon*, Buffalo, NY, November 2022. With Tim Blake/Buffalo Sewer Authority.
- Onondaga County's CSO Program: Getting to the Finish Line (?), *WEFTEC 2022*, New Orleans, LA, October 2022.
- Investigating Seepage and Subsidence at the Bird Island WWTP, *NYWEA Spring Meeting*, Syracuse, NY, June 2022. With Tim Blake/Buffalo Sewer Authority.
- Onondaga County's Resilient Combined Sewer System: Using Green and Gray to Reduce CSOs and Increase Resiliency, *WEF Collection Systems Conference*, Detroit, MI, April 2022.
- When the Presumptive Approach Doesn't Meet Water Quality Targets: An Onondaga County Case Study, *NYWEA Annual Meeting 2022*, New York, NY, February 2022. With Adam Woodburn/Onondaga County.
- Affordability: A Driver for Consent Order Driven CSO Abatement, *NEWEA Fall Conference*, Portsmouth, NH, September 2021.
- Small Holes, Big Wins: Onondaga County's CSO Abatement Program's Approach to Optimizing CSO Regulator Performance, *NEWEA Spring Meeting*, Virtual, June 2021. With Adam Woodburn/Onondaga County.

- GI Complementing Traditional Gray Infrastructure, *NYWEA Spring Meeting*, Syracuse, NY, June 2021. With Adam Woodburn/Onondaga County.
- Green Infrastructure for Healthy Communities. *Jacobs In the kNOW Webinar Series*, December 2021. With Andrew Potts and Paul Hargreaves/Jacobs and Adam Woodburn/Onondaga County.
- Onondaga County's GIGP Approach, *2021 NYWEA Annual Meeting*, Virtual, February 2021. With Jeanine Thompson/NYSEFC.
- Onondaga County, NY Save the Rain: 200 Completed Green Infrastructure Projects in 10 Years, Lessons Learned and Success Stories, *CNY NYWEA Chapter Virtual Technical Meeting*, October 2020.
- Onondaga County, NY Save the Rain: 200 Completed Green Infrastructure Projects in 10 Years, Lessons Learned and Success Stories, *TRIECA 2020*, Virtual, July 2020. With Adam Woodburn/Onondaga County.
- Onondaga County's Save the Rain CSO Abatement Program Accomplishments Under the Amended Consent Judgment and Path Forward Under the CSO LTCP, *2020 NYWEA Annual Meeting*, New York, NY, February 2020. With Adam Woodburn/Onondaga County
- Save the Rain: Lessons Learned in Innovative Stormwater Management, *NYWEA Stormwater Specialty Summit*, Syracuse, NY, November 2019. With Adam Woodburn/Onondaga County.
- Onondaga County Save the Rain: 200 Completed Projects in 10 Years Lessons Learned and Success Stories, *StormCON 2018*, Denver, CO, August 2018.
- Porous Pavements: Considering Options, What Works, What Doesn't, Pros, Cons, and Lessons Learned, *NYAPPA Drive-In Workshop*, Morrisville, NY, March 2018.
- The Green Planning Committee: Taking Onondaga County Save the Rain to the Next Level, *StormCon 2017*, Bellevue, WA, August 30, 2017.
- Treating CSOs Naturally: Onondaga County's CSO 018 Constructed Wetlands Pilot Treatment System, *WETPOL*, Big Sky Resort, MT, August 23, 2017.
- Treating CSOs Naturally: Onondaga County's CSO 018 Constructed Wetlands Pilot Treatment System, *NYWEA Annual Meeting*, New York, NY, February 7, 2017.
- Hogansburg Dam Removal, *NYS American Fisheries Society Annual Meeting*, Buffalo, NY, February 3, 2017.
- Co-Benefits of Green Infrastructure: An Environmental Analysis of the Save the Rain Program, *NYSAWWA/NYWEA Joint Energy Conference*, Albany, NY, November 16, 2016.
- Stormwater Management Approaches in an Urban Environment, *Syracuse University Urban Stormwater Management Undergraduate Course*, Syracuse, NY, September 21, 2016.

- Onondaga County CSO 018 Constructed Wetlands Pilot Treatment System, *CH2M Natural Treatment System Community*, Webinar, September 7, 2016.
- Onondaga County Save the Rain Program: Harbor Brook CSO 018 Constructed Wetlands Site Tour and Discussion, *Upstate NY ASLA Conference*, Syracuse, NY, September 25, 2015.
- Onondaga County Save the Rain Program: Harbor Brook CSO 018 Constructed Wetlands and Rosamond Gifford Zoo Stormwater Wetland and Cistern Site Tour and Discussion, *NYS Floodplain Conference*, Syracuse, NY, April 28, 2015.
- Natural Treatment: A Unique Approach to Urban Stormwater Management, *Syracuse University Urban Stormwater Class*, Syracuse, NY, January 27, 2015.
- Onondaga County Save the Rain Program: Harbor Brook CSO 018 Constructed Wetlands Site Tour and Discussion. *Sustainable Use of Renewable Energy Conference*, Syracuse, NY, October 3, 2014.
- Onondaga County Save the Rain Program: GI Construction and Technology Choices. *StormCon 2014*, Portland, OR, August 5, 2014.
- Onondaga County Save the Rain Program: GI Construction and Technology Choices. *New England Water Environment Association Integrated Wet Weather Issues Specialty Seminar*, Providence, RI, with Sean Skehan, October 24, 2013.
- Green Infrastructure Tour with New York State Soil & Water Conservation Districts. Syracuse, NY, with Sean Skehan, September 27, 2013.
- Rosamond Gifford Zoo Green Infrastructure Tour. *Central New York Air and Waste Management Association*, Syracuse, NY May 21, 2013.
- Rosamond Gifford Zoo Green Infrastructure Tour. *Central New York Water Environment Association*, Syracuse, NY, April 26, 2013.
- Green Infrastructure Maintenance Training. *Syracuse University Center of Excellence Maintenance Seminar*, Syracuse, NY, with Sean Skehan, October 12, 2012.
- Advanced Oxidation of Drinking Water Using Ultraviolet Light and Alternative Solid Forms of Hydrogen Peroxide. *2011 International Ultraviolet Association/International Ozone Association North American Conference*, Toronto, ON, September 19, 2011.

Languages

- English, Basic Spanish

Employee Update: 8/2025

RELEVANT EXPERIENCE

Clean Water Act Specialist – Michael Baker International, Virginia Beach, VA. 2023-present

I serve as a subject matter expert for water quality and NPDES issues for our federal, municipal and industrial clients.

Director, Point Source Program Development – RES, LLC, Richmond, VA. 2022-2023

I provided regulatory and policy support for projects related to NPDES compliance for a range of clients in the public and private sector. I also support business development by providing analysis of regulatory requirements.

Deputy Director, Senior - City of Richmond, VA, Department of Public Utilities. 2020-2022.

I served as the Deputy Director, Senior of the Collection Systems and Regulatory Affairs Division. The Division is responsible for operation and maintenance of the city's sanitary, combined and storm sewer systems and includes management of the Stormwater Utility; city floodwall system; the Water Resources Program; Pretreatment Program; the water and wastewater laboratories; and regulatory compliance for water-based utilities.

National Stormwater Practice Lead – RES, LLC, Richmond, VA. 2018-2020

I provided regulatory and policy support for projects related to stormwater compliance for a range of clients in the public and private sector. I also supported business development by providing analysis of regulatory requirements.

Senior Policy Advisor - City of Richmond, VA, Office of the Deputy Chief Administrative Officer for Operations. 2015-2018.

My primary area of focus was managing compliance and providing regulatory support to the water related utilities (stormwater, drinking water, and wastewater, including pretreatment program) and Department of Public Works.

Senior Scientist - LimnoTech, Inc., Washington, DC. 2008-2015.

I led the company's regulatory compliance services. My work generally included review and assessment of state and federal policy and regulations to develop strategies to help clients maintain a high level of compliance. Much of my work focused on watershed-based solutions for municipal and industrial clients.

Assistant Branch Chief - United States Environmental Protection Agency, Dallas, TX, and Washington, DC. 1988-1992; 1995-2008.

Prior to leaving EPA in 2008, I served as the Assistant Chief of the State and Regional Branch. Other positions I held at EPA included, Municipal Permits Program Coordinator, Acting Chief of the Municipal Branch, Acting Chief of the Industrial Branch, the National Pretreatment Program Coordinator, National Expert for NPDES Permit Program, senior staff member of the water quality criteria development team, NPDES permit writer, and regional pretreatment program manager. This experience provided me extensive insight of all aspects of NPDES permit development, negotiation, and issuance; with water quality criteria and standards; with industrial and municipal wastewater facility inspections; and contract management.

Environmental Protection Specialist - Department of Navy, Naval Facilities Engineering Command, Atlantic Division, Norfolk, VA, 1992-1995.

Managed the Command's water quality assessment program, NPDES permits program, and pretreatment permit program. Notable projects included: development of a coalition of Naval facilities to present a unified position on specific regulations in the southeastern Virginia area; management of a water effect ratio and water quality modeling study of the Elizabeth River; development of an industrial wastewater management program (modelled after Pretreatment Program) for Naval Base Norfolk, Naval Amphibious Base Little Creek and Marine Corps Base Camp Lejeune; management of a study to determine the toxicity and treatability of various fire fighting foams; and conducted numerous multi-media self-audits at Naval and Marine Corps facilities.

Environmental Researcher - Environmental Health Associates, P.A., Edison, NJ, 1987-1988.

Developed Health Risk Assessments and Environmental Impact Statements for a variety of clients.

Research Ecologist - The University of Texas at Arlington, 1984-1987.

Through a research grant and fellowship from Texas Utilities, studied the effect of strip mining and reclamation processes on herpetofaunal communities.

EDUCATION

M.S. BIOLOGY. The University of Texas at Arlington (1987).

B.S. BIOLOGY. State University College at Plattsburgh, NY (1984). Minors: Chemistry & Psychology.
Virginia Tech Wastewater Operators Short School. Blacksburg, VA (2017)

Office of Personnel Management, Growing Leaders for the 21st Century. Washington, DC. (2001)

Office of Personnel Management, Management Development Seminar. Shepherdstown, WV (2000).

US EPA Water Quality Standards Academy. Atlanta, GA (1994).

Water Quality Modeling and Modeling with WASP 5.0. University of Texas at Austin (1993).

A/E Contract Management Course. Naval Facilities Engineering Command. Norfolk, VA (1993).

US EPA Regulation Development Course. US EPA Headquarters, Washington, DC (1991).

Treatment of Metal Wastestreams, Self Study Course. California State University, Sacramento (1989).

Municipal Wastewater Treatment Training Workshop. University of Texas at Arlington (1989).

Pretreatment Facility Inspection, Self Study Course. California State University, Sacramento (1989).

Water Pollution Control: Biological Wastewater Treatment. University of Texas at Austin (1988).

AWARDS, RESEARCH GRANTS & FELLOWSHIPS

Award from the National Partnership for Reinventing Government from the Office of the Vice-President (Hammer Award), June 2000 and October 1998.

U.S. EPA Office of Policy Special Award for “Excellence in Leadership” for Project XL. September 1998

Letter of Appreciation, Major General Bowdon, Commanding General, Camp Pendleton. February 2003.

U.S. EPA Office of Enforcement and Compliance Assurance Bronze Medal. Environmental Justice Programmatic Reviews. September 2008

U.S. EPA Office of Water Bronze Medal. Environmental Justice. June 2008

U.S. EPA Office of Water Bronze Medal. Priority Permits Initiative. May 2006

U.S. EPA Office of Water Bronze Medal. Watershed-based Permitting. June 2003

U.S. EPA Office of Water Bronze Medal. 303(d) Regulations. July 2001

U.S. EPA Office of Water Bronze Medal. Permit Application Regulation. June 2000

U.S. EPA Office of Water Bronze Medal. Stormwater Report to Congress. June 2000

U.S. EPA Office of Water Bronze Medal. Pretreatment Program Training. June 1999

U.S. EPA Office of Water Bronze Medal. NPDES Permit Writers Training. June 1999

U.S. EPA Office of Policy Bronze Medal. Metal Finishing Strategic Goals Program. May 1998

U.S. EPA Office of Water Bronze Medal. Framework for Watershed-Based Trading. May 1997

U.S. EPA Office of Water Bronze Medal. Common Sense Initiative. May 1997

Letter of Appreciation, Admiral Schriefer, Office of Chief of Naval Operations. November 1996.

Letter of Appreciation, Admiral Moses, Commander Naval Base Norfolk. May 1995.

Letter of Appreciation, Captain Walsh, Engineering Field Activity Northwest. April 1995.

Letter of Appreciation, Admiral Schriefer, Office of Chief of Naval Operations. December 1994.

Graduate Research Fellowship and Grant. Texas Utilities Electric Services. Research the effects of strip mining and reclamation processes in Fairfield, Texas. 1985-1987.

Grant-in-Aid of Research. Sigma Xi, The Scientific Research Society. 1985-1988.

PROFESSIONAL MEMBERSHIPS

Water Environment Federation - Virginia Water Environment Association

RECENT PUBLICATIONS (Partial List of Recent Publications)

Bradley, P. and M. Brock. 2025. The Clean Water Act, Water Quality, Water Quantity and Stormwater. Proceedings of the Water Environment Federation. WEAT/WEF Collections Systems and Stormwater Conference 2025.

Bradley, P. and P. Calamita. 2025. A Question of Authority - U.S. Supreme Court reinforces need for fair notice and due process in Clean Water Act permitting. Water Environment & Technology. June 2025, Vol. 37, No.6. pp. 15-16.

Bradley, P. and C. McKenzie. 2024. Wet Weather and Water Quality: The Regulatory Puzzle Keeps Getting More Complicated. Proceedings of the Water Environment Federation, WEFTEC 2024

Bradley, P. and M. Stahman. 2023. How Lessons Learned from Compensatory Mitigation Can Help Water Quality Trading. Proceedings of the Water Environment Federation, WEFTEC 2023

Bradley, P, G. LeRose, A. Harrison, A. Savineau, M. Pugh, & K. Flis. 2022. Integrated Watershed Management – Better Data Mean Better Decisions. Proceedings of the Water Environment Federation, WEFTEC 2022

Bradley, P and P. Fanning. 2018. Wet Weather and Water Quality - 30 Years Later and All the Same Questions Remain. Proceedings of the Water Environment Federation, WEFTEC 2018

LeRose, G.; J. Hatchett, H. Bourne and P. Bradley. 2018. Richmond's RVA Clean Water Plan: How to Transition from Integrated Planning to Implementation. Proceedings of the Water Environment Federation, WEFTEC 2018.

Bradley, P.; A. Wortzel and B. Smith. 2015. What is it about November and EPA Memos: A Look at EPA's 2002, 2010 and 2014 Memos on Stormwater, TMDLs and NPDES Limits. Proceedings of the Water Environment Federation, WEFTEC 2015; pg 627-639.

LeRose, G.; R. Steidel, P. Bradley, H. Bourne, C. Blanchard and S. Mitchell. 2015. The Crucial Importance of Stakeholder Communication in Integrated Planning: Lessons from Richmond. Proceedings of the Water Environment Federation, WEFTEC 2015; pg 3325-3335.

Steidel, R.; G. LeRose, H. Bourne and P. Bradley. 2014. Watershed-Based Permitting and Integrated Planning: Bringing It All Together in Richmond. Proceedings of the Water Environment Federation, WEFTEC 2014: Session 321.

Baumgartner, R. and P.J. Bradley. 2014. Watershed Health, Ecosystem Services, and Integrated Permitting: Making It All Work Together. Water Environment & Technology. January 2014, Vol. 26, No.1. pp. 29-30

Bradley, P and D. Kocarek. 2014. Overall Design Considerations. Chapter 2 of Wet Weather Design and Operation in Water Resource Recovery Facilities. MOP 8. Water Environment Federation.

Baumgartner, R and P. Bradley. 2013. Watershed Health, Ecosystem Services and Integrated Planning/Permitting: Making It All Work Together. Proceedings of the Water Environment Federation, WEFTEC 2013: Session 318.

Bradley, P; Ott, D; Sandino, J; Fitzpatrick, J; Gellner, J and Tabor, C. 2012. Urban Wet Weather and Integrated Planning/Permitting: Past, Present And Future. Proceedings of the Water Environment Federation, WEFTEC 2012: Session 106.

Presentations (partial list of recent presentations):

WEAT/WEF Collections Systems and Stormwater Conference. 2025. The Clean Water Act, Water Quality, Water Quantity and Stormwater.

VWEA Industrial Waste Conference. 2025. Why for Pretreatment You Also Need to Watch Out for RCRA, CERCLA and the Dormant Commerce Clause of the Constitution

South Carolina Environmental Conference. 2025. Pretreatment, RCRA, CERCLA and the Dormant Commerce Clause of the Constitution (and other potential impacts)

WEFTEC Annual Conference. 2024. Wet Weather and Water Quality: The Regulatory Puzzle Keeps Getting More Complicated.

South Carolina Environmental Conference. 2024. Will All of These Stormwater Puzzle Pieces Fit Together? (One Water, Integrated Planning, Nature-based Solutions and MEP)

Virginia Water Environment Association/Water Works Joint Annual Meeting (Water JAM). 2024. Pretreatment, RCRA, CERCLA and the Dormant Commerce Clause of the Constitution

National Association of Clean Water Agencies (NACWA) Legal Conference. 2023. Between a Rock and a Hard Place: How the Dormant Commerce Clause and Pretreatment Regulations Can Force Utilities Into the Political Hotseat.

WEFTEC Annual Conference. 2023. How Lessons Learned from Compensatory Mitigation Can Help Water Quality Trading.

Southeast Stormwater Association (SESWA) Annual Conference. 2023. Maximum Extent Practicable and Nature-based Solutions: Synergy or Conflict?

Southeast Stormwater Association (SESWA) Annual Conference. 2023. Stormwater, Water Quality, Water Quantity and Lessons Learned from Compensatory Mitigation.

WEFTEC Annual Conference. 2022. Integrated Watershed Management – Better Data Mean Better Decisions. National Association of Clean Water Agencies. 2016-2019. Annual Pretreatment Conference. Pretreatment Training Course.

VWEA Workshop. 2022. VWEA Workshop. 2022. The Gambles Mill Eco-Corridor Stream Restoration Project - A collaborative stream restoration project in Richmond, VA

AquaTech Amsterdam. 2021. “Turning on the Lights” in Richmond, Virginia: Using RT-DSS to Optimize Existing Infrastructure, Better Understand our Collection System and Reduce Combined Sewer Overflows

Mid-Atlantic Utility Conference Chesapeake Section of AWWA. 2021. City of Richmond: RVAH2O, Watersheds, Integrated Planning and CSOs

WEFTEC Annual Conference. 2018. Wet Weather and Water Quality - 30 Years Later and All the Same Questions Remain

National Association of Clean Water Agencies. 2017. Annual Enforcement Conference. How to Review and Negotiate Permits.

SHADRACK AMPOMAH

5115 Chatsworth St, Detroit, 48224 Mi | (330) 503-9709 | shadrackampomah2014@gmail.com

Objective

Results-driven manager seeking a challenging leadership role where I can leverage my strategic vision and operational expertise to drive business growth and success.

Professional Experience

Manager-CSO Facilities

July 2024-Present

Great Lakes Water Authority

- Oversee, manage and direct the day-to-day activities for Great Lakes Water Authority's (9) CSO Facilities.
- Responsible for ensuring compliance with federal, state, and local regulatory requirements, reporting and development of financial planning.
- Responsible for performance measurement while monitoring key performance indicators for successful operations and maintenance of Nine (9) CSO Facilities

Manager

May 2023-July 2024

Northeast Ohio Regional Sewer District-Westerly-Trickling Filter

- Responsible for planning, organizing, directing, and administering the operation and maintenance of the Westerly Wastewater Treatment Plant.
- Supervised and coordinated the work of subordinate staff to ensure compliance with federal, state, and local requirements for wastewater treatment and air emissions from plant processes.
- Planned, directed, scheduled, and supervised employees in the operation and maintenance of the wastewater treatment plant.
- Assigned and delegated work to meet performance objectives and provided guidance to assist staff; evaluate performance; and administer discipline, when appropriate.
- Served as Backup Professional Operator in the absence of the plant Superintendent and Assistant Superintendent.

Supervisor

May 2022-May 2023

Northeast Ohio Regional Sewer District-Southerly-Two Stage Aeration

- Supervised the efficient and safe operation of a wastewater treatment plant during an operating shift.
- Provided technical guidance to Operators, Supervisors and other Managers on operational procedures and problems. Demonstrates continuous effort to improve operations. Oversaw the monitoring of plant equipment operation and treatment processes.
- Responsible for ensuring employee safety, leading safety procedures, and writing incident reports.
- Identified malfunctions and potential process upsets.
- Performed other duties of a similar nature as may be required to accomplish departmental and company objectives and goals.
- Performed other duties of a similar nature as may be required.

Wastewater Treatment Plant Operator

Feb 2020-May 2022

Northeast Ohio Regional Sewer District- Easterly-Conventional

- Operated units by controlling and monitoring equipment and processes manually and using control systems, such as computers, programmable controllers, etc. Operated or monitored more than one unit in each shift.
- Recorded operating data. Maintains written and/or digital operating logbooks and records.
- Inspected equipment to ensure proper operation and operating efficiency of equipment.
- Monitored, interpreted, and recorded gauges, charts, and meter readings. Initiated changes as determined through operating conditions, process variables, calculations, test results and interpretation of data.
- Made necessary changes and adjusted controls to maintain proper operating conditions and achieve specified operational objectives.
- I wrote maintenance work requests and assisted in repairs.

Wastewater Analyst-Analytical Services

July 2019-Feb 2020

Northeast Ohio Regional Sewer District

- Picked up wastewater samples and prepared samples for analyses.
- Inspected instrumentation, calibration curves, and quality control criteria to verify reliability and accuracy of data.
- Checked information for quality, accuracy and completeness on reports, computer printouts, and calculations

while keeping detailed records of work undertaken.

- Prepared samples for Phosphorus, Ammonia, metals, and Mercury analyses.
- Identified faults in equipment, reports malfunctions and anomalies, and assists in diagnosing problems in processes.
- Properly preserved and aliquots wastewater samples for analysis.
- Followed standard laboratory operating procedures to perform a wide range of quantitative chemical and biological analysis utilizing EPA methods.

Environmental Projects Team Leader

May 2017- Aug 2017

Youth Opportunities Unlimited (Mayor Frank G. Jackson SYEP)

- Oversaw ninety-seven (97) employees on the daily operations of multiple environmental projects including Brownfield Site Assessments, City-wide Fire Hydrant Painting, GIS Related Projects, Illegal Dumping/Underpass Clean-ups & College Credit Plus Program.
- Ensured that each task met basic quality standards as outlined by Youth Opportunities Unlimited, the City of Cleveland, and other partner agencies.
- Researched and wrote a winning proposal for Retail Spaces Cleveland Project
- Instructed field labs that supported the various projects the youth were executing.
-

Quality Control Personnel/Water Treatment Operator

Sept 2014-Jul 2015

Blow Chem Industries, Tema-Ghana, West Africa

- Administered and documented approximately 3,650 physicochemical/biological tests on all water samples.
- Operated and sustained pretreatment and treatment systems to effectively treat water for consumers.
- Shouldered about 5000 sampling procedures to ensure adequate functioning of all treatment processes.
- Wrote ten (10) monthly reports for the Quality Control Department
- Managed 12-hour night shift production line that generated about \$50000 worth of products nightly.
- Proficiently brought changes to taste of bottled water through research endeavors to expand our market.

Skills/Certification

- | | |
|---|--|
| • Environmental Professional Intern | • Water Reclamation Professional Operator in Ohio 1, 2 & 3 |
| • GIS 1&2 (Vector & Raster data analysis) | • Soil and Water Analysis Tools (SWAT) |
| • Certified Associate in Project Management | • Class A, B, C & D Operator License in Michigan |
| • PMP: From Concept to Planning- CWRU | • Communicating with Impact- CWRU |

Social interest/Achievements

- | | |
|---|--------------------------|
| • Owner of \$54M Hubbell Southfield and \$60M Leib/Oakwood CSO upgrades | Current |
| • Project Manager/Owner for Overhead Crane Construction Conner CSO; DTE Municipal Lighting Upgrades for Puritan Fenkell CSO, Hatch and Lighting upgrades Conner CSO | Current |
| • Owner SCADA and I&C Upgrades for 7-Mile, Leib, St. Aubin and Belle CSOs | Current |
| • Manager for Wastewater Best Practices EGLE Mandated Meetings for Southeast Michigan | Aug 2024- Present |
| • Team Award for Extreme Rain Event Management | Aug 2023 |
| • Spirit Award at Northeast Ohio Regional Sewer District | May 2019 |
| • Presented research at the "2018 Ecological Society of America Annual Meeting" held in New Orleans, Louisiana | Aug 6,2018 |
| • Best Poster Research at the "10 th Annual Student Symposium on Environment" at Westminster College | Dec 7, 2017 |
| • Programs Chair for National Society of Black Engineers Club, YSU | Sep 2016-May 2017 |

Education

Youngstown State University, Youngstown, Ohio

July 2022

- Masters in Business Administration (Leadership)
 - GPA 4.0

Youngstown State University, Youngstown, Ohio

Dec 2017

- Master of Science in Environmental Science
 - GPA 4.0

KASHMIRA PATEL, PE, PMP

18994 Harrison Ave.
Livonia, Michigan 48152

Mobile: 248.679.6195
Email: kashpatel7@gmail.com

CAREER PROFILE

Project Management Professional (PMP) and licensed Professional Engineer (PE) with 25+ years leading multimillion-dollar capital improvement projects. Experienced in full project lifecycle management, cost and schedule control, risk mitigation, and stakeholder communication. Proven ability to deliver complex infrastructure projects on time and within scope by coordinating cross-functional teams and contractors, managing clear communication channels, and navigating regulatory requirements for critical wastewater facilities.

CORE PROJECT MANAGEMENT SKILLS

Project Planning & Execution
Budget & Schedule Management
Risk & Change Control
Stakeholder Engagement

Cost Negotiation
Team Leadership

PROFESSIONAL EXPERIENCE

Great Lakes Water Authority ► Detroit, Michigan **01.2016 to Present** **Engineer 4 | Lifecycle Project Manager**

- Lead full lifecycle management for CIP projects ranging from \$1M–\$104M.
- Establish cost and schedule baselines; monitor performance using detailed cost breakdowns and schedule updates.
- Review, negotiate, and process change requests while maintaining project milestones and preventing scope creep.
- Develop Power BI dashboards to communicate project changes, risks, and schedule impacts.
- Facilitate communication with internal leadership, engineering teams, and external contractors.
- Participate in contract negotiations, RFP evaluations, and interview presentations.

Detroit Water and Sewerage Department ► Detroit, Michigan **10.1999 to 12.2015** **Engineer 4**

- Managed construction projects valued \$5M–\$38M, ensuring alignment with scope, cost, and schedule.
- Led monthly progress meetings and monitored critical path activities to maintain project timelines.
- Negotiated and processed change requests and contractor claims, achieving win-win outcomes.
- Maintained comprehensive change request logs to support lessons learned and continuous improvement.
- Collaborated with plant operations, engineering teams, and designers to resolve issues and maintain project schedule.
- Completed project close-out activities, ensuring documentation and compliance requirements were met.

EDUCATION

Bachelor of Science in Mechanical Engineering

KASHMIRA PATEL, PE, PMP

PROFESSIONAL LICENSE and Certifications

- Professional Engineer (State of Michigan)
- Project Management Professional (PMP)
- Certified Reliability Leader (CRL)

PROFESSIONAL AFFILIATIONS

- Project Management Institute (PMI)
- Institute of Asset Management (IAM)

Steve Hitch, P.E., CSM

Redmond, WA | steve@hitchwre.com | 424-444-2490 | [linkedin.com/in/steve-hitch-pe](https://www.linkedin.com/in/steve-hitch-pe)

PROFESSIONAL PROFILE

Accomplished Civil Engineer and APWA Certified Stormwater Manager with over 30 years of experience directing complex public infrastructure, municipal utilities, and regional stormwater management programs. Proven expertise in watershed management, regulatory compliance, and multi-million dollar capital project delivery across both public and private sectors. Recognized expert in navigating complex inter-agency frameworks and engineering sustainable water resource solutions.

CORE CREDENTIALS

- **Licensed Professional Engineer (P.E.)** – Civil Engineering
- **Certified Stormwater Manager (CSM)** – American Public Works Association (APWA)
- **Education:**
 - Master of Science in Construction Management
 - Bachelor of Science in Civil Engineering (ABET Accredited Degree)

PROFESSIONAL EXPERIENCE

Principal Engineer

Hitch Water Resources Engineering, PLLC | *June 2026 – Present*

- **Specialized Technical Advisory:** Provide senior peer-review, independent technical review, and strategic program planning for municipal stormwater infrastructure, climate-resilient water quality facilities, and urban utility separation initiatives.

Senior Project Manager / Senior Engineer

HDR | *December 2023 – June 2026*

- **Capital Project Delivery:** Served as Project Manager for complex capital water resource and regional stormwater infrastructure projects, including the City of Everett Lenora Regional Stormwater Facility and King County's Cemetery Pond Restoration.
- **Design & Hydraulic Engineering:** Directed engineering lifecycles, detailed hydraulic/hydrologic modeling oversight, environmental permitting, and stakeholder coordination for major public infrastructure assets.
- **Grant & Agency Consulting:** Assisted municipal clients with complex grant negotiations, documentation compliance, and strategic funding administration (including Washington State Department of Ecology SFAP programs) to protect capital project eligibility.

- **Team Stabilization Leadership:** Supervised workload allocation, technical quality control, and executive mentorship for a regional engineering team delivering comprehensive utility planning, design, and asset management.

Utilities Engineering & Planning Manager

City of Redmond – Redmond, WA | *January 2023 – December 2023*

- **CIP Portfolio Management:** Served as a core member of the Public Works Leadership Team, directing comprehensive utility planning, engineering design, and capital delivery across a fully coordinated, multi-disciplinary Capital Investment Program (CIP) for water, sewer, and surface water systems.
- **City Engineer Proxy:** Acted as designated backup to the City Engineer, holding full operational accountability to evaluate private development proposals, authorize capital project progressions, and render final decisions on municipal engineering standards.
- **Process Optimization:** Partnered across divisions with planning, streets, and field operations to align rapid urban growth with long-term public asset management, ensuring new infrastructure met strict operational needs.

Engineering Supervisor

City of Redmond – Redmond, WA | *May 2019 – January 2023*

- **Interim Division Management:** Selected to step into an extended 8-month assignment directing the 27-person division, representing utilities, solid waste, and environmental services on the department's executive Leadership Team.
- **Asset Risk Mitigation:** Diagnosed systemic capital risks across the municipality's 23 wastewater lift stations, successfully shifting the utility from an unsustainable replacement mandate to a data-driven asset model.
- **Regional Diplomacy:** Chaired the Metropolitan Water Pollution Abatement Advisory Committee (MWPAAC) Engineering and Planning Subcommittee, driving regional consensus on infrastructure and planning across 34 local jurisdictions.
- **Interjurisdictional Negotiations:** Partnered with Sound Transit and WSDOT on complex corridor developments, successfully securing agreements governing active construction and long-term maintenance frameworks for regional stormwater infrastructure.

Senior Engineer

City of Redmond – Redmond, WA | *January 2003 – May 2019*

- **Programmatic Innovation:** Conceived, authored, and served as lead technical architect for Redmond's pioneering Regional Stormwater Facilities Program, establishing an innovative fee-in-lieu structure to leverage private investment to build resilient public infrastructure while securing full regulatory support from the Department of Ecology.
- **Public Works Contract Administration:** Managed full-lifecycle capital project delivery, consultant selection, and contract compliance for a major suite of regional stormwater facilities.

- **Innovative Capital Funding:** Successfully secured highly competitive infrastructure funding from federal, state, county, flood control district, and Community Facilities District sources to augment utility capital programs.
- **Interim Supervision:** Served a 15-month assignment as Interim Supervisor of Utilities Engineering, leading engineers and planners across utility engineering, maintenance, and construction support operations.

TECHNICAL PRESENTATIONS & REGIONAL LEADERSHIP

Panel Moderator & Speaker, APWA Washington Fall Conference | 2024 and 2025

Topic: Navigating the 6PPD-quinone World. Assembled and led expert panels featuring WSDOT Local Programs, Washington State Department of Ecology, King County, and regional stakeholders to address 6PPD-quinone impacts and establish resilient models for public project delivery.

Tanner Adair, PE

Water/Wastewater Engineer III

Years of experience
8

Years of experience with AECOM
8

Education
B.S. Civil Engineering, Ohio University, 2016
M.S. Water Resources, Cleveland State University, 2021

Registrations/Certifications
Professional Engineer - Ohio

Professional affiliations
Ohio Water and Environmental Association
Engineers Without Borders

Training
NASSCO PACP, MACP, LACP
Confined Space Certification



An analytically minded engineer with a solid background in all aspects of a project timeline including planning, design, bidding, construction, and post construction evaluation.

Professional history

Mr. Adair is a water/wastewater engineer within the Water Resource group of the AECOM Cleveland office and has 8 years of experience in civil engineering. He has extensive knowledge with water/wastewater modeling, preliminary and final sewer design, wet weather planning, construction management, condition assessment, sewer replacement and rehabilitation, as well as capital planning. His design experience includes several residential and interceptor sewer improvement projects.

Selected Project Experience

Grandview and Pine Avenue Relief, City of Warren, OH (Project Engineer)

This project involved the evaluation of the southeast portions of the City which have experienced significant basement flooding reports over the past 20 years. The evaluation involved approximately 20% of the sanitary sewer system and included various flow splits, previously combined sewers, and 24 historic overflow locations. The proposed solutions included multiple relief sewers, sewer replacements, rehabilitation, and future I&I removal projects. The project utilized the City's hydraulic model to analyze historic, current, and baseline conditions. **Date:** 2024 **Value:** \$1,000,000

Sediment Removal and Condition Assessment, City of Warren, OH (Project Engineer and Construction Manager)

This project involved the selection and oversight of cleaning and inspection for approximately 120,000 LF of sewer ranging from 8-to-78 inches in diameter. The project was split into 3 contracts and awarded to 3 different contractors. It involved traditional cleaning and CCTV of small diameter sewers, focusing on hard to access locations such as backyard lines, and inspection of the City's main interceptors. The oldest assets (which were 120+ year old egg shape brick sewers) and a section of segmental block sewers were analyzed using multi-sensor technology. This evaluation was concluded with a rehabilitation recommendations report. **Date:** 2023-2024 **Value:** \$346,000

Eastern Heights Sanitary Sewer Evaluation Study, City of Elyria, OH (Project Engineer and Hydraulic Modeler)

The project area included 75,000 LF of sanitary sewer and 15 sanitary sewer overflows, which are under a consent decree by the Ohio EPA to be evaluated through PACP, MACP, and LACP inspections, mainline dye testing, and residential dye testing to locate potential sources of inflow and infiltration. This area was monitored by 47 flow monitors over 7 years and the data was analyzed and used to create a hydraulic model. The model was used to locate hydraulic restrictions and to identify and coordinate sanitary sewer relief alternatives, including a multi-phase large diameter relief sewer also required by the EPA. **Date:** 2022 **Value:** \$500,000

Perkins Park Parallel Relief Sewer, City of Warren, OH (Project Engineer and Construction Manager)

The 36-inch sewer was designed to relief the downtown area of Warren during heavy rain events and to prevent basement flooding. This sewer was connected to an existing 48-inch sanitary sewer through a specially designed junction chamber and relieves flow from an existing 150-year-old egg-shaped brick sewer. The relief sewer is approximately 2,500 linear feet. The project was divided into five tasks: flow monitoring, hydraulic modeling, basis of design, design, and construction management. **Date:** 2020 **Value:** \$458,000

Comprehensive SSO Sewer Study, City of Warren, Ohio (Project Engineer and Hydraulic Modeler)

The City hired AECOM for a multi-year program of flow monitoring, comprehensive sewer modeling of the City's collection system (where none existed before), providing alternative analysis and recommendations to deal with wet weather problems, and design for early action items to address these issues. The project's main goal was to successfully eliminate a permitted sanitary sewer overflow, which was required to be closed by EPA. There were also numerous issues throughout the City's collection system that cause basement flooding and manhole surcharges which needed to be evaluated. All issues were related to the City's former status as a combined sewer community. **Date:** 2017 **Value:** \$1,000,000

Additional Project Experience

Project	Owner	Year	Project Cost
Warren SSO Comprehensive Sewer Study	City of Warren	2017	\$ 1,000,000
Parma Heights Storm Sewer Modeling Phase 1 and 2	City of Parma Heights	2017/2019	\$ 25,000
Star Allotment Design/CA	City of Warren	2018	\$ 123,000
GIS Implementation	City of Warren	2018	\$ 105,000
GIS Management (Annual)	City of Warren	2018-2024	\$ 100,000
I&I Pilot Study	City of Warren	2019	\$ 96,000
North-South Interceptor Analysis	City of Warren	2019	\$ 10,000
St. Jude SSES	City of Elyria	2019/2022	\$ 325,000
Tiffin CSO Reporting	City of Tiffin	2019-2023	\$ 360,000
Grohl Alley Rehabilitation	City of Warren	2020	\$ 50,000
Perkins Park Parallel Relief Sewer Design/CA	City of Warren	2020	\$ 458,000
Dry Weather Overflow Sewer Design/CA	City of Warren	2020	\$ 174,000
Overbrook Pump Station Study	City of Elyria	2020	\$ 50,000
Expanded I&I Study	City of Warren	2021	\$ 597,000
Champion Meter Pit Study	City of Warren	2021	\$ 50,000
Bayberry Sewer Rehabilitation CA	City of Seven Hills	2022	\$ 18,000
Cheryl Ann Culvert Replacement CA	City of Seven Hills	2022	\$ 19,500
Packard Park Splash Pad Sewer Design/CA	City of Warren	2022	\$ 30,000
BRLE Assessment	Ottawa County	2022	\$ 75,000
Eastern Heights SSES	City of Elyria	2022	\$ 500,000
Hydraulic Modeling Update	City of Warren	2022-2023	\$ 157,000
Niles Road Sewer Reconfiguration Design/CA	City of Warren	2023	\$ 353,000
2023 Sewer Cleaning and Inspection Design/CA	City of Warren	2023	\$ 346,000
Maplewood Park Sanitary Sewer Study	Trumbull County	2023	\$ 228,000
Champion Meter Pit Rehabilitation Design/CA	City of Warren	2023	\$ 80,000
Storm Flow Monitoring (Multi-Year Program)	City of Warren	2023-2024	\$ 90,000
Pine Avenue Flooding Evaluation	City of Warren	2023-2024	\$ -
Grandview and Pine Avenue Relief Design	City of Warren	2023	\$ 1,000,000

Corinne Wiesner-Friedman, PhD

Associate Water Resources Engineer / Data Scientist

Personal Details

Length of service in the profession: 9

Year joined Jacobs: 2025

Jacob's office location: 2 Crowne Point Court, Suite 100, Cincinnati, USA 45241

Summary Biography

Dr. Corinne Wiesner-Friedman is a Water Resources Engineer, Data Scientist, and Innovator with expertise in hydrological, hydraulic, and water quality modeling, environmental data science, geospatial analysis, and advanced statistical learning. Her work integrates physically based modeling, GIS, Bayesian and geostatistical methods, machine learning, and network-based analytics to support stormwater and wastewater systems planning, resilient infrastructure, digital water solutions, and environmental with expertise in advanced geospatial analysis, hydrological, hydraulic, and water quality modeling, and environmental decision making.

Corinne's current work emphasizes model development, uncertainty quantification, calibration automation, and spatiotemporal prediction for complex water systems. She has particular expertise in combining domain knowledge with modern computational methods, including Bayesian Maximum Entropy, Gaussian Processes, hidden Markov Models, graph-based methods, and machine learning approaches for environmental forecasting and monitoring. She is also actively engaged with work integrating large language models (LLMs), retrieval-augmented generation (RAG), and knowledge graph systems to develop AI-assisted tool for engineering and environmental modeling workflows, technical knowledge management, and decision support.

Prior to joining Jacob's in 2025, Corinne served as a Physical Scientist at the US EPA, where she managed EPA's National Stormwater Calculator and supported management of EPA SWMM development, maintenance, and technical support. She led research touching upon geostatistics, machine-learning, hydrological modeling, microbial water quality modeling, microbial risk assessment, developing privacy preserving methods for wastewater-based surveillance and environmental health data.

Key Skills and Areas of Expertise

- Hydrological, hydraulic, and water quality modeling for stormwater and wastewater systems
- Model calibration, uncertainty quantification, and scenario analysis
- Spatial, spatiotemporal, and network-based statistical modeling
- Bayesian methods, geostatistics, and Bayesian Maximum Entropy (creator of pyBME)
- Environmental machine learning and hybrid physics-informed /data-driven modeling
- Digital water, decision support tools, and automation for modeling workflows
- GIS and geospatial analytics: ArcGIS Pro, QGIS, GDAL, GeoPandas
- Programming: Python, R, SQL, JavaScript, HTML/CSS, Matlab, C/C++
- Python libraries and frameworks: Pandas, NumPy, SciPy, scikit-learn, PyTorch, TensorFlow, GeoPandas, PySAL, NetworkX, FastAPI
- R packages and workflows for statistical and spatial analysis
- Development and application of large language model (LLM) workflows for technical analysis and tool development
- Retrieval-augmented generation (RAG) systems for structured knowledge retrieval and decision support, knowledge graph development and graph databases (Neo4j, Cypher)
- Use of local LLM infrastructure and model orchestration tools (e.g., Ollama) for private AI workflows
- Web and software development: Docker, Shiny, Leaflet, AWS, REST APIs

Education and Qualifications

- PhD, Environmental Sciences and Engineering, University of North Carolina at Chapel Hill, 2021

- BA, Economics, Beloit College, 2014
- BA, Theatre, Dance, and Media Studies, Beloit College, 2014

Achievements and Awards

- Beyondlf Innovation Grant, 2026, Jacob's Engineering
- America's Innovation Grant Program, 2026, Jacob's Engineering
- Performance Award, 2024, EPA
- Pathfinders Innovation Award, 2024, EPA
- Performance Award, 2023, EPA
- NIEHS Trainee, 2017-2021, NIH
- Gillings Merit Scholar, 2016, UNC-Chapel Hill

Languages

- English (mother tongue)
- French (mother tongue)
- Spanish (advanced)
- Portuguese (intermediate)

Employment History

- August 2023- July 2025, US EPA, Physical Scientist
- August 2021- January 2023, US EPA, ORISE Researcher
- August 2016- August 2021, UNC-Chapel Hill, Research Assistant
- August 2015-July 2016, AmeriCorps Community HealthCorps, Environmental Health Member

Project Experience

HRSD, Suffolk, Virginia

Used automated RTK calibration leveraging machine learning to model RDII for inflows directly upstream from pumps. Included data QA/QC and preprocessing.

City of Omaha, Nebraska

Built a three-part sewer intelligence and real-time control workflow for Omaha spanning rainfall nowcasting, machine-learning feature engineering, and hydraulic model automation. Developed radar-to-forecast pipelines and sewer forecasting models to support lead-time-sensitive operational decisions. Built a Python bridge to InfoWorks ICM that automated cloud scenario creation, RTC rule editing, simulation execution, results export, and end-to-end optimization of sewer control settings through parameter sweeps and multi-optimizer comparisons.

ALCOSAN

Built a Python-based spatial causal analysis pipeline to quantify how distributed sewer rehabilitation and green infrastructure projects affected dry-weather flow across the ALCOSAN collection system. Developed network-based exposure mapping to isolate dry-weather flow, link upstream GROW project doses to downstream monitors, and estimate treatment effects with regression, sensitivity, and permutation-test frameworks. Also produced decision-support outputs including monitor-selection analyses, engineering-based systemwide flow-reduction bounds, and publication-ready figures for communicating results to engineering and program stakeholders.

Onondaga, NY

Refined an automated SWMM calibration and WAPUG compliance workflow for the Onondaga collection system, integrating multi-objective calibration logic, model-output validation, and figure-generation tools to

assess flow, peak flow, and depth performance across monitored events. Built Python and R utilities to extract binary SWMM results, generate per-meter and combined PDF reporting, crosswalk modeled results against reference calibration tables, and resolve unit conversion, timestep, and depth-mapping issues to improve the reliability of calibration QA/QC outputs.

EPA for Gowanes Canal, NYC

Used previously developed automated precipitation event detection and characterization using high-resolution rainfall data from multiple NOAA weather stations across New York City. Applied NOAA Atlas IDF curves to estimate storm return periods and produced hyetographs and other visualizations to support stormwater management reporting. Implemented a combined sewer overflow (CSO) sampling decision tool that evaluates antecedent dry-weather conditions, holiday blackout periods, and site-specific rainfall intensity and depth thresholds to identify which storm events warrant water quality field sampling.

City of Lawton, Oklahoma

Developed a network-based hydrologic analysis system to quantify and prioritize infiltration and inflow (I/I) sources across a municipal combined sewer network using Python. Implemented a novel discrete RDII calculation methodology leveraging directed network topology to separate locally generated I/I from upstream flow pass-through, a key limitation of traditional approaches. Built a fully automated pipeline covering multi-gauge rainfall event detection, adaptive event tail recovery, and TDRM-based dry weather flow baselines, with mass balance validation at network confluences. Results were used to support infrastructure investment prioritization by identifying which catchment areas contribute most to system peak loading during storm events.

MSDGC Hydraulic Modeling Calibration

Hydraulic modeling calibration with MSDGC tool

MSDGC, East Ohio River Watershed

Reviewing previous reports and design documents to identify stormwater alternatives that may still be viable, but were not previously pursued prior to beginning new efforts in the same locality

Stafford, Virginia, Data Center Reuse Design

Pipe calculations and verification of being designed to standards.

Software Development

Jacob's System Optimizer

Supported a proxy or optimization review effort focused on improving system performance under dry- or wet-weather conditions. Contributed technical evaluation materials that helped assess optimization opportunities and communicate recommendations.

Jacob's AutoCal Projects

Worked on automated SWMM calibration and scenario testing across multiple client projects, with calibrated model files, reports, and related analysis outputs organized by effort. Contributed to improving calibration efficiency and consistency by combining model runs, review outputs, and supporting tooling into a repeatable workflow.

Jacob's Flood Products AI Calibrate

Developed roadmap materials for applying AI to hydraulic and hydrologic model calibration workflows. Helped translate technical modeling pain points into a staged product strategy, including implementation sequencing, adoption planning, and internal alignment.

Publications

- Wiesner-Friedman, C. PyBME (Version 0.5.0) [Computer software]
- Laiveling A, Wiesner-Friedman C, Jahne M. Evaluating pathogen modeling approaches for microbial risk assessment of stormwater in recreational and reuse contexts. *Sci Total Environ.* 2026 Mar 6;1024:181630. doi: 10.1016/j.scitotenv.2026.181630. Epub ahead of print. PMID: 41795514.
- Wiesner-Friedman, C., C., Laiveling, A., Buahin, C., et al., Defining geoprivacy on sewer networks and addressing ethical concerns in wastewater-based testing. (Manuscript in preparation, expected 2025: Water Research)
- Wiesner-Friedman, C., Laiveling, A., Jahne, et al., Franklin, A. et al. High-resolution monitoring of antimicrobial resistant bacteria in a mixed-use watershed: insights from a NARMS study in the East Fork Little Miami River, Ohio, USA. (Manuscript in preparation, expected 2025: Target Science of the Total Environment)
- Wiesner-Friedman, C., Brinkman, N., Wheaton, E., Nagarkar, M., Hart, C., Keely, S., Varughese, E., Garland, J., Klaver, P., Turner, C., Barton, J., Serre, M., Jahne, M., Characterizing spatial information loss for wastewater-based surveillance using crAssphage: effect of decay, temperature, and population mobility. *Environmental Science & Technology*, 57(49), 20802-20812, 2023
- Wiesner-Friedman, C., Beattie, R., Stewart, J., Hristova, K., Serre, M., Identifying sources contributing to antibiotic resistance genes in riverbed sediment and surface water using the microbial FIT framework. *Frontiers in Microbiology*, 14, 1223876, 2023
- Wiesner-Friedman, C., Beattie, R., Stewart, J., Hristova, K., Serre, M., Characterizing differences in sources and contributions to fecal contamination of sediment and surface water with the microbial FIT framework. *Environmental Science & Technology*, 56(7), 4231-4240, 2022
- Coffman, V.R., Hall, D.J., Pisanic, N., Wiesner-Friedman, C., Rogers, S., Rule, A., McCormack, M., Diener-West, M., Davis, M.F., Heaney, C.D., Assessing residential exposure to microbes from industrial hog operations in rural North Carolina: Lessons learned. *Journal: Progress in Community Health Partnerships: Research Education and Action*, 16(1), 61-72, 2022
- Wiesner-Friedman, C., Beattie, R., Stewart, J., Hristova, K., Serre, M., The microbial Find, Inform, and Test (FIT) model for identifying spatially distributed contamination sources: Framework foundation, application to ruminant Bacteroides in river sediment from Wisconsin, *Environmental Science & Technology*, 55(15), 10451-10461, 2021

Other Information

Select Presentations

- C. Wiesner-Friedman, V. Maybruck, Children's Health, Wastewater-Based, Epidemiology, and Data Privacy, Children's Hospital Division of Biostatistics & Epidemiology, Cincinnati, Ohio, 09/10/2025
- C. Wiesner-Friedman, C. Buahin, et al., EPA Stormwater Management Model and Stormwater Calculator Workshop. ASCE EWRI 2025 World Environmental and Water Resources Congress, Anchorage, AK, USA, 05/18/2025 - 05/21/2025.
- C. Wiesner-Friedman, A. Laiveling, C. Buahin, et al., Privacy in the pipes: contextualizing privacy methods for wastewater-based testing research. ASCE EWRI 2025 World Environmental and Water Resources Congress, Anchorage, AK, USA, 05/18/2025 - 05/21/2025.
- C. Wiesner-Friedman, D. Holcomb, D. Weller, C. Buahin, A. Laiveling, J. Yang, S. Keely, N. Brinkman, M. Jahne, J. Garland, and A. Franklin. Understanding Fecal Contamination and Antimicrobial Resistance in a mixed-use watershed: The Role of Precipitation and Hydrological Conditions. ASCE EWRI 2025 World Environmental and Water Resources Congress, Anchorage, AK, USA, 05/18/2025-05/21/2025.
- C. Wiesner-Friedman, A. Laiveling, C. Buahin, A. Mikelonis, M. Tryby, B. Davis, C. Mansfeldt, Unlocking Ethical Wastewater-Based Epidemiology: A Path to Secure Public Health Insights, US EPA Office of Wastewater Management, Water Infrastructure Division and Water Permitting Division, Virtual, 05/30/2025.
- C. Wiesner-Friedman, C. Buahin, The National Stormwater Calculator and EPA's Stormwater Management Model: Introduction, Demonstration, and Discussion, Presentation to Campus

RainWorks Challenge Students, March 2025

- Buahin, C., and Wiesner-Friedman, C.. Hydraulic Routing in Stormwater Collection Systems Using Physics-Informed Graph Neural Networks - ASCE EWRI World Environmental and Water Resources Congress, oral presentation, 5/19/2024.
- Wiesner-Friedman, C., and C. Buahin. The U.S. EPA ' s National Stormwater Calculator. Presented at Stormwater Management Public Education and Training Committee, Tampa Bay, FL, USA, 10/17/2023.
- Wiesner-Friedman, C. The U.S. EPA's National Stormwater Calculator - Achieving LEED BD+C V4 Homes and New Construction Sustainable Sites Rain Water Management. Presented at Green Home Institute, Virtual (Online) presentation, MI, USA, 04/26/2023.
- Buahin, C., and C. Wiesner-Friedman. Recent Updates to the Stormwater Management Model 5.1-5.2. Presented at 2023 World Environmental and Water Resources Congress, Henderson, NV, USA, May 21 -25, 2023.
- C. Wiesner-Friedman and C. Buahin, The National Stormwater Calculator - Introduction and recent updates. EWRI Congress, Henderson, NV, May 21 - 25, 2023.
- C Wiesner-Friedman, N Brinkman, S Keely, M Jahne. Estimating census population contributions to crAssphage measured at wastewater treatment plants in Ohio, International Conference on Water Management Modeling 2022. March 2-3, Virtual Conference, abstract accepted for oral presentation.

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