STUDENT DESIGN COMPETITION 2025

weftec®

Sept. 27 – Oct. 1, 2025

Chicago, Illinois

Water Environment Federation®
the water quality people®

STUDENTS & YOUNG PROFESSIONALS COMMUNITY
SYP

TABLE OF CONTENTS

KEY

Wastewater

Water Environment

Circular Water Economy

INTRODUCTION

The WEF Student Design Competition was designed to showcase top university students aspiring to become water quality professionals. It allows them to demonstrate their skills and enthusiasm while tackling real-world design challenges.

We encourage you to engage with students during breaks and at the **SYP Reception on September 27 at 7PM** (Chicago Hilton, RSVP required). Also, on September 29, a **Career Fair** will be held from 1PM - 4PM (Rooms S105, South Building). WEF and the Students and Young Professionals Committee thank *Black and Veatch*, *Grundfos*, *GHD*, *Tetra Tech*, and *Brown and Caldwell* for sponsoring the SDC; the judges for their time and expertise, and the WEF Board of Trustees for supporting the Students and Young Professionals programs. Thank you to the students and their advisors for their motivation and enthusiasm.

The Student Design Competition Sub-Committee supports design competitions at both the Member Association (MA) and national levels. MAs are encouraged to create their own prompts or allow student teams to devise their own problems. Winning teams from each MA can compete at WEFTEC and must follow the national competition guidelines. The Student Design Competition focuses on high-quality written and oral presentations, with scoring based on the design report, presentation skills, and responses during a Q&A session with judges.

Please contact the subcommittee if your MA is interested in holding a regional competition or sending a team to the SDC in the future!

FOR MORE INFORMATION, PLEASE CONTACT:

WEF SYPC Sub-Committee Co-Chair:

Seoyeong Lee Email: lees@bv.com

WEF SYPC Sub-Committee Co-Chair:

Megan Woodall Email: meganwoodall1219@yahoo.com

Coordinator, Workforce Development

Alison Hayden Email: ahayden@wef.org

WEF SYPC Sub-Committee Co-Vice Chair:

Cara Jung Email: cara.jung@tkda.com

WEF SYPC Sub-Committee Co-Vice Chair:

Jada Williams Email: williamsj6@bv.com

SYP COMMITTEE

The mission of the WEF Students and Young Professionals Committee (SYPC) is to encourage and facilitate student and young professional involvement in WEF and the Member Associations through professional development and leadership opportunities. One of WEF's strategic initiatives is to encourage the involvement of students and young professionals in the organization. The following programs have been developed to provide opportunities for students and young professionals:

- Student chapters in colleges and universities
- Reduced student and YP membership rates
- Free registration for WEF Student Members attending WEFTEC, WEF conferences, and webcasts
- WEFTEC Student and Young Professionals Career Fair, Student Lounge, Students & Young Professionals Meeting, Student Design Competition, WEF Community Service Project and Water Palooza
- YP Summit, a professional development event
- Midyear Springboard Program Technical Workshop
- Development opportunities
- Stockholm Junior Water Prize
- WEF Canham Graduate Studies Scholarship

The SYPC is made up of students, young professionals, academics, and water quality professionals. We welcome your participation in the WEF SYPC and/or on a student activities or young professional committee at your local member association.

The SYPC and WEF encourage you to take advantage of WEF membership benefits. For more information contact Alison Hayden, Coordinator, Workforce Development, at ahayden@wef.org.

PAST WINNERS

Year	Water Environment Competition	Wastewater Competition
2024	University of Florida	North Carolina State University
2023	Georgia Institute of Technology	Texas Tech University
2022	University of Waterloo	University of Texas - Austin
2021	California State Polytechnic University, Pomona	Clemson University
2020	University of Guelph	Colorado School of Mines
2019	University of British Columbia	University of Colorado - Boulder
2018	University of British Columbia	University of Colorado - Boulder
2017	University of Guelph	University of Colorado - Boulder
2016	University of Minnesota, Twin Cities	Southern Methodist University
2015	South Dakota State University	Southern Methodist University
2014	University of British Columbia and University of North British Columbia	University of South Florida
2013	University of British Columbia	University of South Florida
2012	University of South Florida	University of Colorado - Boulder
2011	University of Florida	University of Wyoming
2010	University of Florida	Southern Methodist University
2009	University of Florida	University of Colorado - Boulder

Year	Combined Competition
2008	University of Florida
2007	University of Florida and North Dakota State University
2006	University of Florida
2005	University of South Florida
2004	University of Washington
2003	University of Central Florida
2002	University of New York at Buffalo

COMPETITION SCHEDULE

Start Time	**Wastewater Competition** Room S102bc	**Water Environment** Room S103b	**Circular Water Economy** Room S103cd
7:30	Teams Arrive for Check-in and Breakfast		
8:00	Opening Welcome		
8:30	Virginia Polytechnic Institute and State University	George Mason University	Loyola University Chicago
9:00	Tecnológico de Costa Rica	University of British Columbia	Colorado School of Mines
9:30	Washington University in St. Louis	SUNY College of Environmental Science and Forestry	University of Cincinnati
10:00	Break	Break	Break
10:15	University of Connecticut	Polytechnic University of Puerto Rico	University of Waterloo
10:45	Abilene Christian University	Georgia Institute of Technology	University of South Alabama
11:15	University of Nevada, Las Vegas	University of California, Riverside	University of South Florida
11:45	Lunch (Room S104)		
12:20	Process Design Challenge (Room S104)		
13:00	Break	Break	Break
13:15	North Carolina State University	Carnegie Mellon University	Georgia Institute of Technology
13:45	Universidad Autónoma de Querétaro	University of South Florida	University of California, Riverside
14:15	Manhattan University	Washington University in St. Louis	Purdue University
14:45	Break	Break	Break
15:00	Northern Arizona University		
15:30	Wilkes University		
16:00	Networking Dessert Reception and Team Photos (Room S102bc)		
17:00	Awards Ceremony (Room S102bc)		

BRUSHY CREEK REGIONAL WASTEWATER FACILITY – EAST PLANT EXPANSION

WASTEWATER

ABILENE CHRISTIAN UNIVERSITY

TEAM

Lettie Jane Myers
Melanie Matute
Rhett Kahlden
Sofia Panter

ADVISOR

Timothy Kennedy, PhD, PE

MEMBER ASSOCIATION

Water Environment Association of Texas

Due to a rapidly growing population in the Austin area, the Brushy Creek Regional Wastewater Facility - East Plant requires an expansion to accommodate an annual average daily flow increase from 20 million gallons per day (MGD) to 30 MGD and a peak two hour flow increase from 60 MGD to 90 MGD. The proposed design will focus on increasing capacity and compliance with stricter Texas Pollutant Discharge Elimination System effluent permit limits. The existing facility infrastructure, capacity, and effluent quality are analyzed and discussed to identify weaknesses and provide a framework for the proposed design. Potential design solutions regarding expanding existing infrastructure, reliability, and performance are examined. Design matrices are performed on the viable options and a recommended design is formulated based on the results. The proposed design is then analyzed on its potential effluent limits, recommended sizing, and potential location. Additionally, an Opinion of Probable Cost, Operation and

(cont.) Maintenance Cost, and Construction Sequencing are provided to assess the feasibility of the proposed solution. The recommended design aligned with the Texas Commission on Environmental Quality requirements, considered operator familiarity, and cost, and focused on efficiency with future development in mind.

SAW MILL RUN URBAN FLOODING REMEDIATION

WATER ENVIRONMENT

CARNEGIE MELLON UNIVERSITY

TEAM

Nora Lane
Samhita Gudapati
Matteo Perillo
Jonathan Subramanian

ADVISOR

Joe Moore, PhD

MEMBER ASSOCIATION

Pennsylvania Water Environment Association

Saw Mill Run is an underserved portion of Pittsburgh which frequently floods, causing the displacement of local residents and businesses, and faces the ecological consequences of Acid Mine Drainage. Ansonia Place is a site along Saw Mill Run in which intervention would provide the largest benefits for the community as it lies between a rail line, busline, and highway and serves a large population. Several solutions addressing the water quantity and water quality issues at Ansonia Place were evaluated, including constructing detention ponds, implementing limestone pits, changing stream morphology, and creating urban wetlands. Each of these alternatives were then assessed on a number of factors, such as flood mitigation ability, expected improvements to water quality, and integration into the existing environment. Through a multi-criteria decision making analysis, it was determined that creating urban wetlands would be the best solution to revitalize Ansonia Place. Similar projects in the Pittsburgh area and research (cont.) regarding recent advancements in urban wetland construction were used to design a wetland suitable for Ansonia Place. The cost to implement the design was estimated based on local rates for plants, earthwork, infrastructure design, and general maintenance, as well as, previous estimates made for similar revitalization projects.

WASTEWATER EFFLUENT TEMPERATURE REDUCTION THROUGH HEAT RECOVERY AND REUSE AT J.D. PHILLIPS WATER RESOURCE RECOVERY FACILITY

CIRCULAR WATER ECONOMY

COLORADO SCHOOL OF MINES

TEAM

Ana Hopper
Grace Gallegos
Reed Gorner
Eduardo Ramirez

ADVISOR

Laura Crisman

MEMBER ASSOCIATION

Rocky Mountain Water Environment Association

J.D. Phillips Water Resource Recovery Facility (JDPWRRF) is seeking to introduce a system that reduces effluent temperature in accordance with anticipated changes to permit regulations. This facility treats a flow of 8.5 million gallons per day (MGD) at an average of 3oC above expected regulation standards. The recommended solution is a heat exchanger/heat pump system that can reduce the effluent temperature to meet standards along with recovering heat to be used for onsite heating. A fraction of the captured heat will be routed through an ethylene glycol loop to heat the UV disinfection and control buildings, and remaining recovered heat could be utilized for further on-site heating requirements, marketed to surrounding industry, or used for other reuse applications. The proposed temperature thresholds are only surpassed between December and February, indicating that the system will not operate year-round. Results of triple-bottom-line sustainability analysis yielded favorable outcomes,

(cont.) supporting the viability of the proposed system.

THE REHABILITATION OF THE KINGSTOWNE DAM

WATER ENVIRONMENT

GEORGE MASON UNIVERSITY

TEAM

Phillip Hunt
Samuel Hanny
Solomon Redo
Betsy Quimby
Charlotte Lunsford
Allyson Skahen
Daniel Cardona

ADVISOR

Matthew Doyle, PE

MEMBER ASSOCIATION

Virginia Water Environment Association

The Dam Rehabilitation Team at George Mason University is addressing the issue of downstream flooding and erosion by researching various, viable solutions that effectively rehabilitate the Kingstowne Dam to proper Dam Safety Standards. Four alternatives for the dam and three alternatives for the stream were considered by utilizing HEC-RAS models to determine the best solution for the project. The scope of the rehabilitation for the project involves connecting the two ponds and extending the existing dam across both ponds. The dam would be rehabilitated to remove vegetation, place fill in needed areas, and add better drainage systems. To alleviate concerns for flooding, a principal and emergency spillway were added for continuous stream flow. The new dam structure was then analyzed for slope stability, seepage, flow net calculations, flood extent analysis, and hydraulic design. Envision Sustainability analysis was conducted for the project. With an analysis of quality-of-life improvements, (cont.) resource allocation, and climate resiliency impacts, the project would receive a Bronze Level Envision award. Project costs and design were influenced by several successful dam projects to ensure proper sustainability and stormwater management practices, which are crucial in addressing proper flood control for the Kingstowne community.

WASTEWATER TREATMENT PLANT AND CAP DESIGN FOR BATON ROUGE EXIDE SUPERFUND SITE

CIRCULAR WATER ECONOMY

GEORGIA INSTITUTE OF TECHNOLOGY

TEAM

Joshua Guthrie
Earl Harris
Gavin Hurn
Aidan Jensen

ADVISOR

Sharon Just, PE, F.ASCE

MEMBER ASSOCIATION

Georgia Association of Water Professionals

The Exide Superfund site in Baton Rouge, Louisiana operated as a battery recycler from 1969 until closing in 2009, and was designated a Superfund site in 2023 following bankruptcy. The site's existing Wastewater Treatment Plant (WWTP) was installed in 1987 and is deteriorated and undersized. The WWTP is required to treat leachate collected from wells near site landfills, as well as the first inch of rainfall runoff from the site's concrete pad. The team compiled Discharge Monitoring Report data, reviewed historic information, conducted a site visit, interviewed operators, and prepared hydrological calculations. The calculations demonstrated that the existing WWTP has insufficient capacity, and confirmed that rain events force the operators to work unsustainable hours to clear the backlog. Three alternatives were designed and compared to mitigate this issue. Specifically, the use of an asphalt barrier to cap all, half, or none of the existing contaminated concrete was modeled, to allow clean runoff to be diverted from the (cont.) plant. A matching WWTP was then sized for each capping option. The costs of each approach were estimated using RS Means and vendor quotes for equipment. The option of a full cap, which resulted in the smallest treatment plant, was recommended for installation.

EROSION CONTROL AND WATERSHED IMPROVEMENTS AT POSTAL POND IN DECATUR, GEORGIA

WATER ENVIRONMENT

GEORGIA INSTITUTE OF TECHNOLOGY

TEAM

Harrison Baro
Caroline Fjeran
Martin Lachev
Alison Rooks

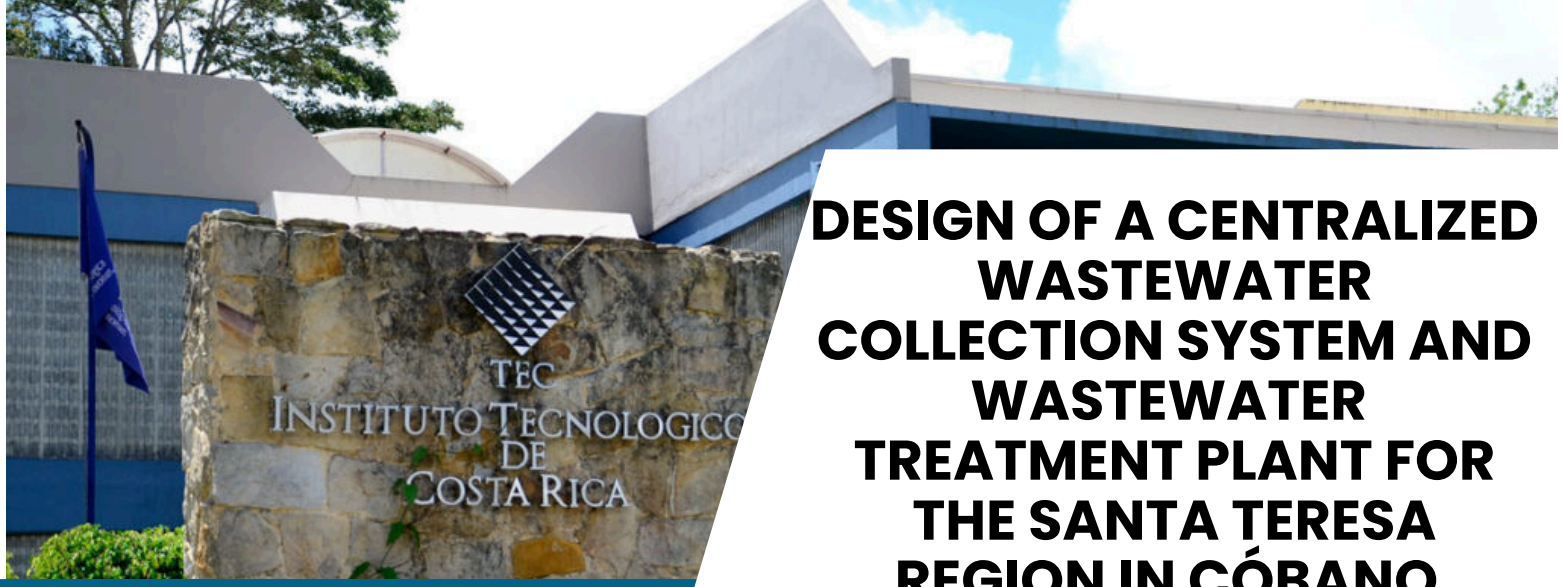
ADVISOR

Sharon Just, PE, F.ASCE

MEMBER ASSOCIATION

Georgia Association of Water Professionals

Postal Pond in Legacy Park in Decatur, Georgia is degraded due to upstream erosion, sedimentation, and a failing outlet structure. A design was prepared for the U.S. Army Corps of Engineers to improve the ecological function, hydrological safety, and recreational value of the pond. The design includes (i) a Step Pool Stormwater Conveyance (SPSC) system, (ii) live-staking and stream channelization, (iii) pond dredging, and (iv) a Cipolletti weir and pedestrian bridge. Four site visits were conducted in different weather conditions to identify flows, assess conditions, and complete measurements. Historic bathymetric data was secured to define dredging extents, and a HEC-RAS model was prepared to design an outlet weir to meet a 25-year storm event. Input from the City of Decatur was considered, resulting in preservation of beaver habitats at the site. Alternatives such as a sediment forebay were considered but discarded due to inadequate site conditions, while other options were rejected due to the City's emphasis on (cont.) maintaining the natural aesthetic of the park. A cost estimate was prepared using RS Means, vendor, and Army Corps data. This project will improve watershed resilience and quality, infrastructure reliability, and recreational access in Legacy Park while showcasing sustainable stormwater design practices.



DESIGN OF A CENTRALIZED WASTEWATER COLLECTION SYSTEM AND WASTEWATER TREATMENT PLANT FOR THE SANTA TERESA REGION IN CÓBANO, COSTA RICA

WASTEWATER

TECNOLÓGICO DE COSTA RICA

TEAM

Pablo Bravo
Daniela Moreno
Ángel Araya
Michelle Molina
Evald Chaves
Camila Picado
Evald Chaves
Valery Quesada

ADVISOR

Diana Alejandra Zambrano Piamba MSC

MEMBER ASSOCIATION

Central States Water Environment Association

The project proposes a centralized wastewater collection and treatment system for Santa Teresa, Carmen, and Hermosa, in Cóbano, Puntarenas. Currently, the use of inefficient septic tanks has caused pollution and environmental concerns among residents, tourism sectors, and local organizations. A gravity and pressure sewer network was designed with more than 22 km of pipes, 537 manholes, and 42 pumping stations, considering the projected population and tourist growth until 2069, based on INEC data and tourist occupancy trends. The selected treatment plant combines an equalization system using a structure that also acts as a sand trap, oxidation ditches, an artificial wetland with Eichhornia crassipes, and pretreatment with a screw conveyor. This configuration allows for the efficient removal of organic matter, nutrients, and solids, complying with national environmental regulations. In addition, a photovoltaic plant was proposed to cover approximately 20% of the plant's

(cont.) energy demand, with an estimated return on investment period of 4.1 years. The total estimated cost of the project is $24.4 million, while the annual operating and maintenance cost is around $2.4 million. The design prioritizes sustainability, operational efficiency, and minimal impact on the community, integrating solutions adapted to the coastal topography and climatic conditions of the area.

BROOKFIELD ZOO AUTOMATED GROUNDWATER CAPTURE, POLISHING, AND REUSE SYSTEM

CIRCULAR WATER ECONOMY

LOYOLA UNIVERSITY CHICAGO

TEAM

Jenna Andersen

Mairead Shannon

Paul Borrego

ADVISOR

Dr. Maryam Amouamouha

MEMBER ASSOCIATION

Illinois Water Environment Association

Brookfield Zoo's bear habitat currently faces challenges in efficiently utilizing the groundwater pumped by a lift station from the exhibit's moat system into Swan Lake. Previously, Brookfield staff had the idea to use the excess groundwater runoff to maintain the water level of the Wolf Woods Wetland, located within the Mexican Grey Wolf Habitat. Zoo staff ran a lay-flat hose from a tee at the Swan Lake discharge point to distribute the excess groundwater to fill the Wolf Woods Wetland. While this project was initially successful, this proof-of-concept system is now failing due to years of exposure to the harsh weather and animal interference. Additionally, the zoo's groundwater contains high levels of iron, which can negatively affect the health of the wolves. As a result, the zoo has recognized the need for a more permanent and sustainable solution. The project team's design replaces the lay-flat hose with an automated PVC pipe network that incorporates a groundwater retention, novel biochar filtration, and distribution system, along (cont.) with water level and quality sensors and automated valves for flexibility in routing the water. Out team's design will enhance water sustainability and efficiency at Brookfield Zoo.

SAW MILL RUN URBAN FLOODING REMEDIATION

MANHATTAN UNIVERSITY

WASTEWATER

TEAM

Mahnoor Sultan
Andrew Kurian
Jose Guzman
Jonross Euan Silva
Mohamed Ali
Camilo Mote-Londono
Rilind Bajraktari

ADVISOR

Joe Moore, PhD

MEMBER ASSOCIATION

Pennsylvania Water Environment Association

Struvite precipitation poses significant operational difficulties in water resource recovery facilities (WRRF). At the Yonkers Joint Wastewater Treatment Plant (WWTP) in New York, struvite accumulation was identified in centrate and secondary digester transfer lines. After evaluation of the conditions at the facility, sodium hexametaphosphate (SHMP) dosing and lamella plate settlers were selected as the optimal additions to the current treatment processes to mitigate the effects of struvite precipitation. The implementation of these treatment processes enables struvite recovery, thus providing the facility with an additional revenue stream to offset a portion of the upgrade cost. Through a comprehensive analysis including bench-scale lab testing of SHMP in Yonker's centrate, design based on the plant's available space and loads, and cost analysis based on projected annual benefits, this project poses a solution to struvite scaling while enabling phosphorus recovery and cost optimization.

LEXINGTON REGIONAL WASTEWATER TREATMENT PLANT BIOSOLIDS INFRASTRUCTURE EXPANSION AND IMPROVEMENTS

WASTEWATER

NORTH CAROLINA STATE UNIVERSITY

TEAM

Maisha Chowdhury
Makenna Miles
Graham Scherle
Rachel Spaulding

ADVISOR

Francis L. de los Reyes III, PhD.

MEMBER ASSOCIATION

North Carolina AWWA-WEA

The Lexington Regional Wastewater Treatment Plant (LRWWTP) requires upgrades to its biosolids handling systems to ensure plant functionality through 2045. The Howldraulics team visited the LRWWTP to assess current operations and gather feedback from plant operators. Operators expressed that several systems within the biosolids handling system are at the end of their useful life and require frequent maintenance. Following the visit, Howldraulics performed a comprehensive evaluation of the current biosolids thickening, dewatering, disposal, and hydraulic processes. Our assessment confirmed that existing systems cannot support flow projections for 2045. To determine the optimal biosolids upgrade design, we developed and analyzed three alternatives incorporating various combinations of thickening, dewatering, and disposal technologies alongside two hydraulic alternatives. These technologies include dissolved air flotation tanks, gravity belt thickeners (GBT), centrifuges, belt filter presses, sludge holding tanks, and thermal dryers. Using (cont.) a multi-criteria decision-making approach, incorporating ENVISION rankings, operator input, and weighted evaluations based on cost, operation, maintenance, and sustainability, we recommend that the optimal alternative should utilize a GBT, sludge holding tanks, a centrifuge, and a thermal belt dryer. Our proposed design ensures long-term reliability, produces Class A biosolids compliant with regulations, and includes a comprehensive site layout, constructability plan, and cost analysis.

EXPANSION OF THE SPECIAL PLANNING AREA 1 WATER RECLAMATION FACILITY FOR THE CITY OF SURPRISE, ARIZONA

WASTEWATER

NORTHERN ARIZONA UNIVERSITY

TEAM

Alec Layden

Andrew Shipley

Tyler Wade

ADVISOR

Jeffrey Heiderscheidt, PhD

MEMBER ASSOCIATION

AZ Water Association

The Special Planning Area (SPA) 1 Water Reclamation Facility (WRF), owned and operated by the City of Surprise, Arizona, needs to increase its treatment capacity from 12.8 to 16.3 million gallons per day (MGD). It is limited by its secondary treatment processes, comprised of five plants each with its own oxidation ditches and clarifier. The City requested the evaluation of three alternatives: two that handle the increased capacity by modifying how Plants 4 and 5 operate without changing their footprint, and one that adds a new Plant 6. Alternatives were developed and analyzed, and it is recommended to modify the existing Plant 4 and 5 oxidation ditches to operate with two half anaerobic/aerobic independent tanks to remove nitrogen and biochemical oxygen demand (BOD) and improve facility redundancy. The design team also analyzed each treatment process to look for areas to optimize or improve and ensure the facility operates jointly with proposed design changes to secondary treatment. It is also (cont.) recommended that to change preliminary treatment to incorporate band screens to mitigate damage to brush aerators. These upgrades will prepare the SPA 1 WRF facility to handle the increased flow that is expected, while leaving space for further expansion.

POWERING PREPAREDNESS: WERC'S FLOOD RESPONSE IMPROVEMENTS

WATER ENVIRONMENT

POLYTECHNIC UNIVERSITY OF PUERTO RICO

TEAM

Abigail Irizarry
Ricardo Huerta
Dash González
Yubiri Rivera
Karla Valentín
Angel Torres
Angelique Medina

ADVISOR

Prof. Ginger Rossy, EIT

MEMBER ASSOCIATION

Puerto Rico Water & Environment Association

The Water and Energy Resilience Collective (WERC) addresses persistent flood and landslide risks in Marin Bajo, a rural Puerto Rican community located in Patillas. The community also faces a particular vulnerability due to unreliable electricity and limited digital literacy among the older residents, despite access to tools like USGS Streamgage and the WaterAlert app. This project aims to enhance flood preparedness and resilience through reliable, low maintenance, and environmentally conscious solutions. Site visits, community engagement, field data collection, and research on existing technologies formed the foundation for the needs assessments and design of alternatives. Green infrastructure alternatives, such as vetiver-based riparian buffers, gabion walls, and a hybrid solution, were designed for flood mitigation. To enhance the existing streamgage system, micro-hydro turbines and hybrid solar-hydro systems were explored to power monitoring components, along with an early-warning flood alarm. These alternatives were developed using software tools such as

(cont.) AutoCAD and AutoCAD Electrical, HEC-RAS, QGIS, and GAWAC. They were evaluated based on technical feasibility, estimated costs, environmental impact, maintenance, and replicability. The most effective combination was selected to improve real-time alert capabilities and promote sustainable watershed management. This integrated, community-centered approach is designed for replication across other flood-prone regions in Puerto Rico.

LEBANON WWTP PEAK ENERGY DEMAND ANALYSIS

CIRCULAR WATER ECONOMY

PURDUE UNIVERSITY

TEAM

Reagan VanDermark
Annette Winterland
Chris Dunlap
Jillian Hirsch

ADVISOR

Margaret Whelton, PE

MEMBER ASSOCIATION

Indiana Water Environment Association

The Lebanon Utilities Wastewater Treatment Plant (WWTP) has an average flow of 5 million gallons per day (MGD) and a peak flow of 15 MGD. The WWTP saw a reduction in energy consumption in 2018, due to the implementation of dissolved oxygen control in its oxidation ditches. However, the facility still has high peak demand energy charges: daily fees that are assessed based on the highest 15-minute period of energy consumption. The Lebanon WWTP currently spends roughly $19,300 a month on energy, with around $7,800 associated with charges for billing demand (peak demand charges). Reducing the peak demand energy charges at the Lebanon WWTP will lessen operational costs. The objective of this project is to evaluate the Lebanon WWTP and determine feasible, reliable, and cost-effective solutions for the facility with respect to reducing peak demand charges. Solutions will be evaluated based on costs, energy reduction, and operational ease.

AUBURN GREEN INFRASTRUCTURE STORMWATER TREATMENT SYSTEM

WATER ENVIRONMENT

SUNY COLLEGE OF ENVIRONMENTAL SCIENCE AND FORESTRY

TEAM

Sophia Jarosz
Mark Khreptyk
Caitlin McCarthy
Emma Skibinski
Erich Thompson

ADVISOR

Douglas Daley PE

MEMBER ASSOCIATION

New York Water Environment Association

Our team was tasked with designing stormwater filtration for the City of Auburn, New York, to minimize pollutant loading into the Owasco River. The city is separating its combined sewer system, and CDM Smith Incorporated has already updated four outfalls to discharge stormwater only. Our goal is to integrate stormwater treatment into these current plans. The design scope includes developing filtration and treatment infrastructure at outfall 017 off Miller Street. The client expressed interest in green infrastructure, while remaining open to other approaches. We established goals and constraints for the filtration and treatment system design, ensuring it adhered to the scope parameters defined in the previous CDM Smith project. The goals focused on creating a cost-effective method to filter and treat stormwater runoff, and our primary constraint was the limited

(cont.) space available. To determine the necessary water volume and discharge rates, we utilized HydroCAD software. Subsequently, we referenced the New York State Department of Environmental Conservation Stormwater Management Design Manual and the New York State Standards and Specifications for Erosion and Sediment Control to finalize our designs. Ultimately, we recommended a stormwater wetland alternative for its effective filtration and treatment capabilities.

BRUSHY CREEK REGIONAL WASTEWATER TREATMENT PLANT DESIGN REPORT

WASTEWATER

UNIVERSIDAD AUTÓNOMA DE QUERÉTARO

TEAM

Ana Arreguín
Erika Téllez
Arturo Cacho
José Luna
Kevin Martínez

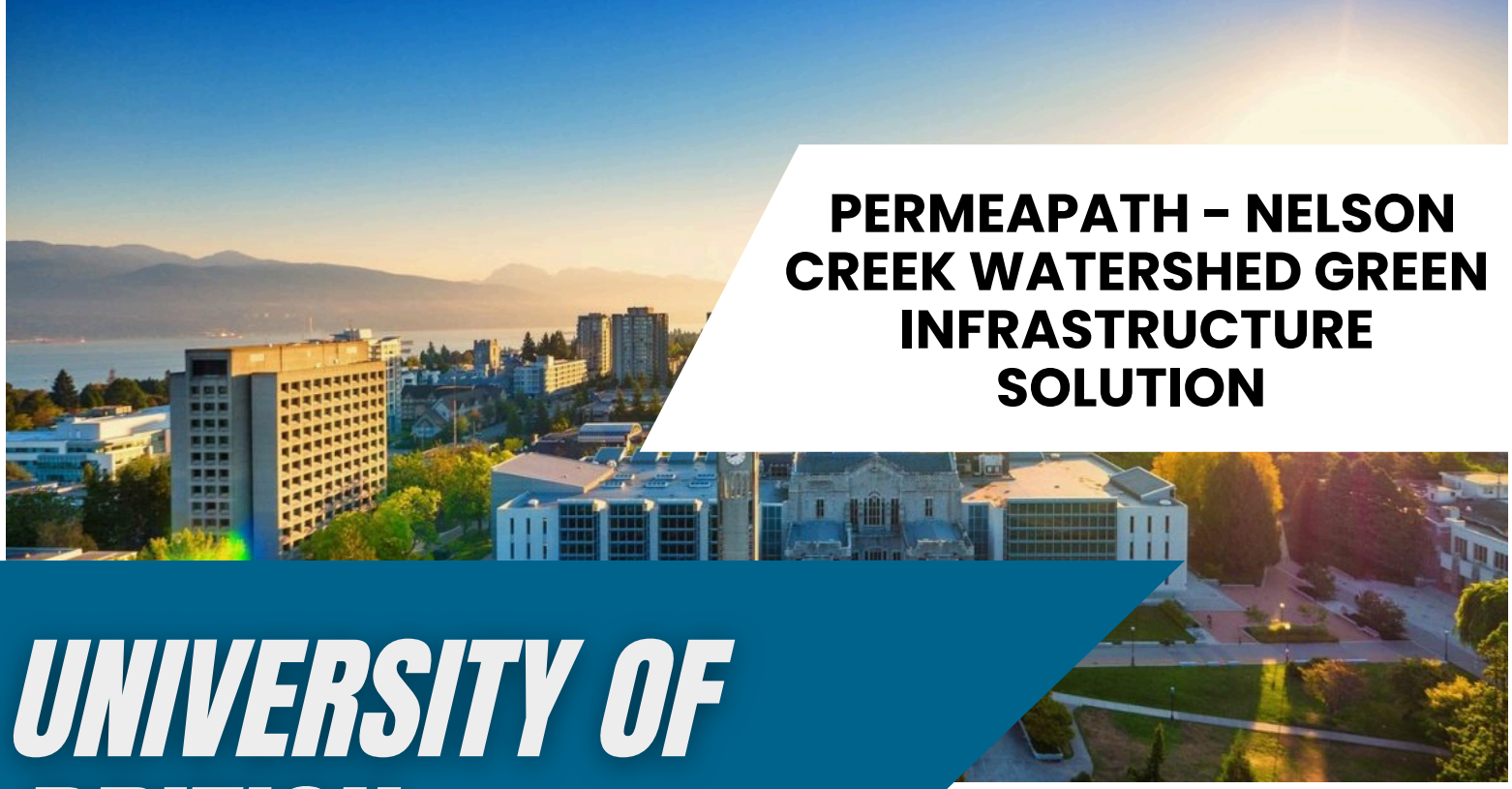
ADVISOR

José de Jesús Treviño Reséndez, PhD

MEMBER ASSOCIATION

Sociedad Mexicana de Aguas, A.C. (SMAAC)

Our team developed a design proposal for the expansion of the Brushy Creek Regional Wastewater Facility - East Plant (BCE) from 20 to 30 MGD (AADF) and 60 to 90 MGD (PH), in response to regional growth and updated TCEQ effluent limits. The scope included evaluating existing infrastructure, identifying units with limited capacity, and proposing upgrades to ensure compliance. To support this, a hydraulic profile was developed to assess head conditions and confirm gravity flow feasibility throughout the plant. We evaluated three biological nutrient removal alternatives - A2O, Modified Bardenpho, and UCT - and selected A2O based on sustainability, construction viability, regulatory performance, and lifecycle cost. The final design includes a new influent lift station, full replacement of the preliminary treatment unit, expanded aeration and clarification capacity, full-plant RoDisc filtration, sodium hypochlorite disinfection, and improved solids handling. For odor control, a compact modular biofilter system was (cont.) proposed, designed to treat up to 5,000 cfm of airflow with minimal maintenance. We also identified a PFAS sampling point within the reuse distribution network and proposed a GAC-IX treatment system for future implementation. Construction sequencing, quantity take-offs, and vendor consultation supported cost estimating and design validation, ensuring long-term operational resilience and regulatory compliance.



PERMEAPATH – NELSON CREEK WATERSHED GREEN INFRASTRUCTURE SOLUTION

WATER ENVIRONMENT

UNIVERSITY OF BRITISH COLUMBIA

TEAM

Cindy Chow
Jaden Gauw
Jaden Mah
Kajal Mishra
Megan Slot

ADVISOR

Zeina Baalbaki, Ph.D., P.Eng.

MEMBER ASSOCIATION

British Columbia Water and Waste Association

Increasing rainfall intensity and ongoing urban densification in the Nelson Creek Watershed of Coquitlam, British Columbia, have amplified the need for sustainable stormwater management. PermeaPath is a strategy aimed at improving stormwater quality, limiting runoff flow rates, reducing drawdown times and enhancing ecological resilience. The design utilizes low impact development (LID) technologies to address upstream, midstream and downstream locations of the watershed, each presenting different stormwater issues and urban contexts. Lebleu Street is a steep residential area with fast runoff, Edgar Avenue is a flat residential zone with limited infiltration and Mackin Park is a public green space with high community use and ponding concerns. Alternative technologies were evaluated and ranked based on economic feasibility, constructability, environmental performance, and community benefit. The final design includes bioswales with check dams on Lebleu Street, tree trenches and permeable pavers for Edgar Avenue, and a rain garden for (cont.) Mackin Park which also incorporates educational signage regarding Indigenous knowledge and stream health conservation. Conceptual cost estimates were derived from vendor quotes and comparable case studies, totaling approximately USD $240,000. PermeaPath offers a resilient and sustainable framework for managing stormwater challenges, while enhancing urban livability and strengthening the connection between community and environment.

JET FUEL REMEDIATION

WATER ENVIRONMENT

UNIVERSITY OF CALIFORNIA, RIVERSIDE

TEAM

Aiden Crayne

Hannah Does

Chris Solares

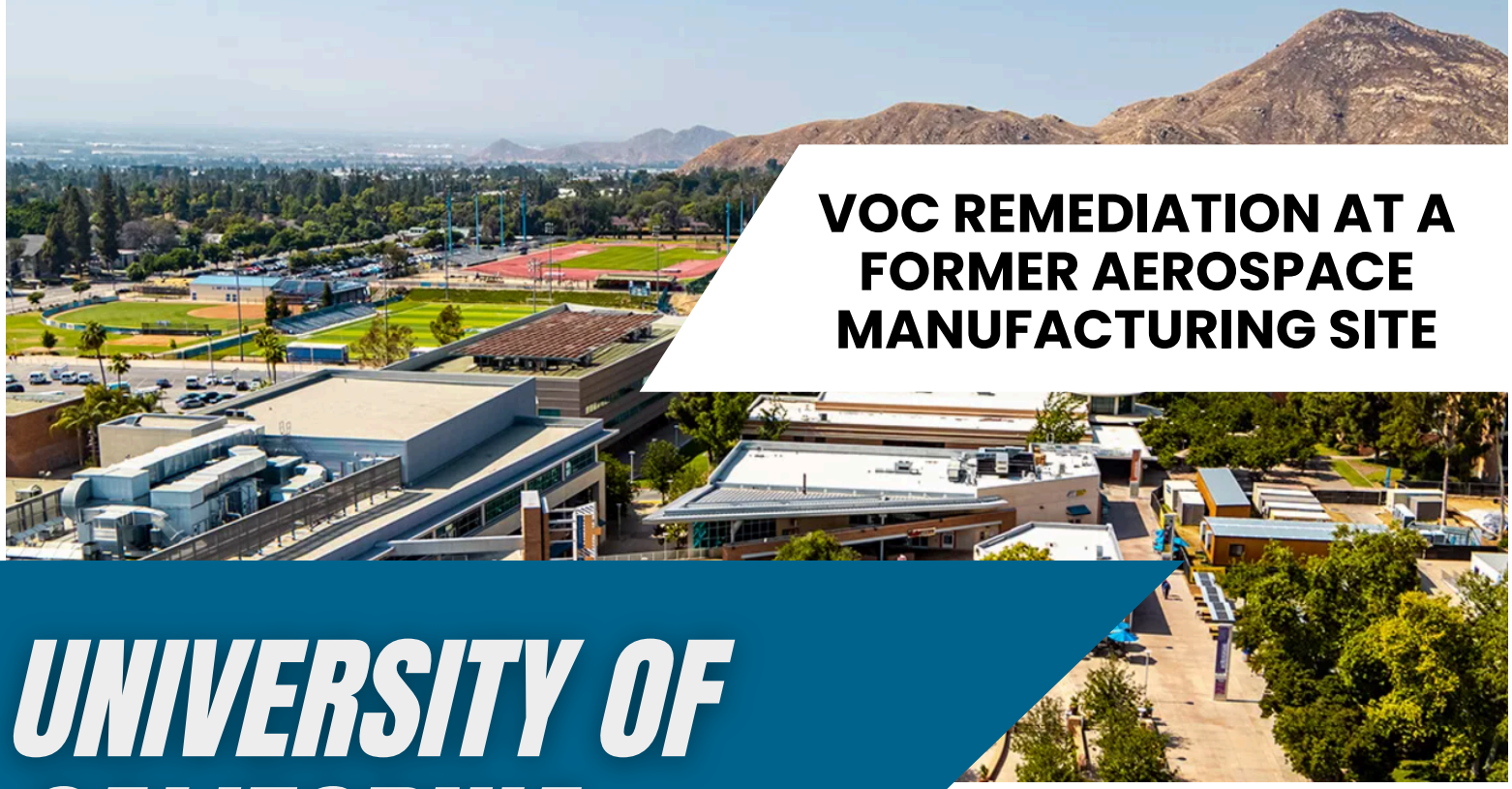
ADVISOR

Amanda Rupiper, PhD

MEMBER ASSOCIATION

California Water Environment Association

This report presents our team's design and evaluation of a steam-enhanced extraction system for the remediation of a jet fuel-contaminated site. The project integrates thermal, physical, and chemical treatment technologies to recover and treat subsurface petroleum hydrocarbons. Our approach combines steam injection with multiphase extraction, followed by a sequence of downstream units including a heat exchanger, knockout tank, dissolved air flotation system, granular activated carbon filters, and a catalytic thermal oxidizer. The design targets a former military fuel storage area with ~15,000 gallons of JP-8 contamination, requiring remediation to meet residential zoning standards within five years. Each component was designed and analyzed through engineering calculations, energy and mass balance modeling, and equipment performance evaluation. We also conducted an economic assessment to understand cost distribution and key financial sensitivities. Environmental impacts—such as air emissions, groundwater (cont.) protection, and soil disturbance—were identified, with proposed mitigation strategies. A risk and hazard analysis using HAZOP methodology was completed to improve operational safety and system resilience. This report outlines a technically integrated, environmentally conscious, and safety-focused remediation strategy tailored for complex hydrocarbon-impacted sites. Although not financially profitable, the project delivers long-term environmental and public health value critical for future land redevelopment.



VOC REMEDIATION AT A FORMER AEROSPACE MANUFACTURING SITE

CIRCULAR WATER ECONOMY

UNIVERSITY OF CALIFORNIA, RIVERSIDE

TEAM

Lori Castaneda
Melan Penglin
Alyssa Gomez
Lexi Srikureja
Helen Nguyen

ADVISOR

Amanda Rupiper, PhD

MEMBER ASSOCIATION

California Water Environment Association

At a 25-acre Brownfield site in Los Angeles, decades of industrial activity have led to significant concentrations of volatile organic compounds (VOCs), specifically tetrachloroethylene (PCE) and trichloroethylene (TCE), and total petroleum hydrocarbons in the diesel range (TPH-diesel) in soil, soil vapor, and groundwater. In order for this parcel of land to be sold, the site must undergo remediation to address the pervasive contamination. Our team has developed an integrated remediation and water reuse plan to address this contamination and enable circular water use at the site. The system incorporates air sparging and soil vapor extraction (SVE) with off-gas treatment via granular activated carbon (GAC), ensuring efficient contaminant removal. Solar panels have been implemented to mitigate our energy usage and reduce our environmental footprint. Treated groundwater will be repurposed for non-potable site use or recharged into the local aquifer, reducing dependence on imported supplies and closing the water loop. Achieving (cont.) regulatory compliance for the groundwater at this site will make the groundwater basin available for community use. By transforming a contaminated industrial site into a safe, reusable resource, our project promotes environmental justice, supports equitable land redevelopment, and contributes to sustainable water management in the face of climate change.

STORM WATER REUSE AT THE CINCINNATI ZOO AND BOTANICAL GARDEN

UNIVERSITY OF CINCINNATI

TEAM

Allison Reynolds

Lizzie Clingan

Kell Geisler

ADVISOR

Dr. Drew McAvoy

MEMBER ASSOCIATION

Ohio Water Environment Association

ZooRenew was assigned by the Cincinnati Zoo and Botanical Garden (CZBG) to work on achieving the net-zero non potable water usage goal at the zoo. This was done by designing a new storm water reuse system at the old elephant reserve portion of the Zoo. This project will decrease the Zoo's reliance on treated drinking water for non-potable uses. This project will also reduce the volume of storm water entering the downstream sewer system. This reduction in runoff volume from the Zoo's property will assist with sewer overflows that cause backups and flooding for their neighbors. The collected and treated storm water will be used for toilet flushing, habitat and holding spray down, moat filling, irrigation, and animal exhibits. ZooRenew conducted a thorough review of existing CZBG storm water reuse systems, as well as new technologies to be used for collection, prefiltration, preliminary storage, primary treatment, final storage, as well as addressing the leak at Swan Lake. An economic analysis (cont.) was completed of the recommended reuse system including the costs for each technology, overall project cost and a cost savings analysis.

OPTIMIZATION OF NITROGEN REMOVAL FOR YORK MAINE

UNIVERSITY OF CONNECTICUT

WASTEWATER

TEAM

Ethan Esposito

Julia Horlitz

Jeffrey Valentine

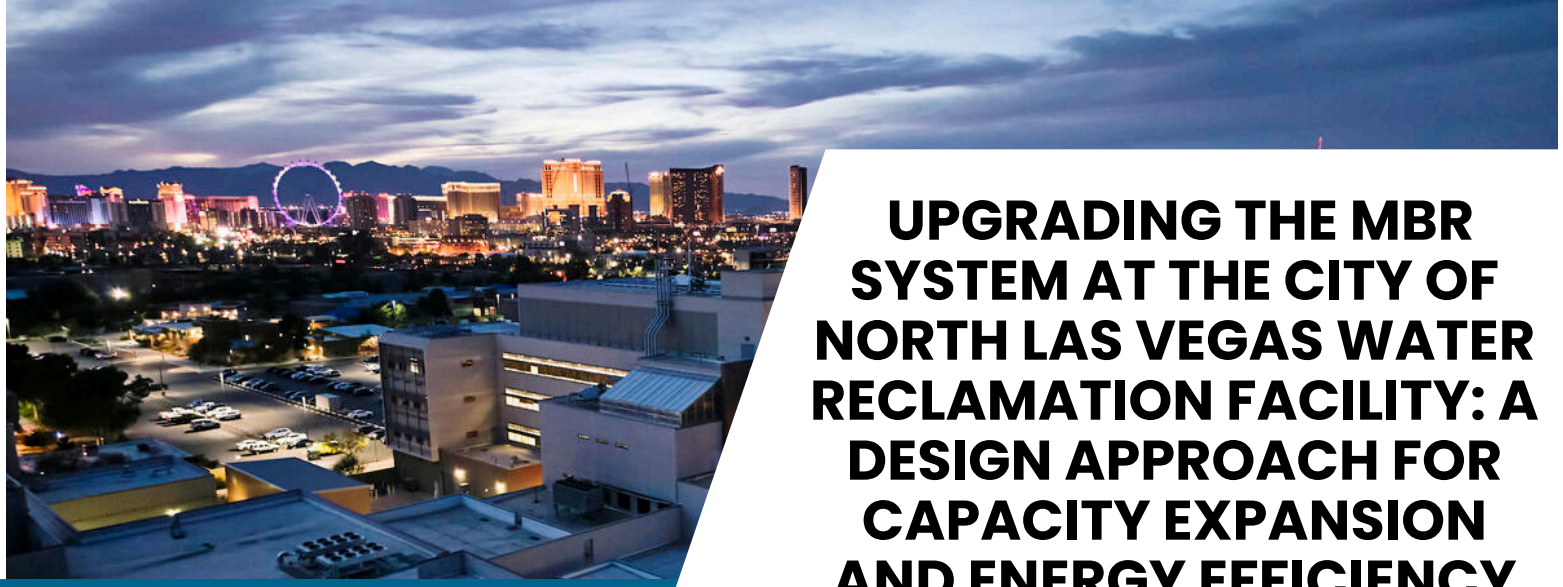
ADVISOR

Udayarka Karra PE, PhD

MEMBER ASSOCIATION

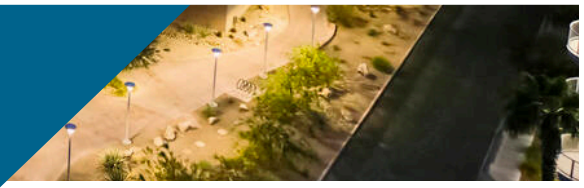
New England Water Environment Association

A retrofit of the aeration basins at the York Wastewater Treatment Plant in Maine was completed with the goal of optimizing nitrogen removal. The purpose of optimizing nitrogen removal is to meet anticipated NPDES nitrogen discharge limits, and to preserve the health of the Casco Bay. The aeration basins were modified to take advantage of the MLE process. Two potential designs were identified for the six tanks. The first is two serpentine trains consisting of three tanks in each and the second design runs with 6 individual parallel tanks. The aeration tanks were designed to contain two oxic zones as well as swing zones which will primarily serve as anoxic zones facilitating nitrogen removal. The sizing of these zones was done using the "desktop approach" in Wastewater Engineering: Treatment and Resource Recovery by Metcalf & Eddy. Once the sizing was completed the AOR and SOR were calculated. This information was used to identify potential blowers and diffusers for the tanks. Further variables were calculated and (cont.) provided to vendors for the additional equipment necessary for the system. A cost comparison was used to select the optimal design. Potential tertiary treatment was researched to identify possible solutions to strict future nitrogen limits.



UPGRADING THE MBR SYSTEM AT THE CITY OF NORTH LAS VEGAS WATER RECLAMATION FACILITY: A DESIGN APPROACH FOR CAPACITY EXPANSION AND ENERGY EFFICIENCY

WASTEWATER



UNIVERSITY OF NEVADA, LAS VEGAS

TEAM

Ahmadreza Khatamgooya
Morteza Nazaripour
Setareh Cheshmekhezr
Isma'il Abdulraheem

ADVISOR

Eakalak Khan, Ph.D., P.E., BCEE F.IWA, F.WEF

MEMBER ASSOCIATION

Nevada Water Environment Association

The City of North Las Vegas is expanding its Water Reclamation Facility to increase treatment capacity from 25 MGD to 50 MGD due to anticipated growth in residential, commercial, and industrial developments, particularly in the Apex Industrial Park. In support of this real-world infrastructure project, our team developed a design proposal to upgrade the existing membrane bioreactor (MBR) system, originally constructed in 2011, to meet future capacity, performance, and effluent quality goals, modernizing the plant while maintaining cost-effectiveness. Our design focused on evaluating membrane technologies based on surface area, treatment efficiency, and operational flexibility. In addition, we conducted an alternatives analysis of aeration strategies, comparing conventional air-based systems with direct oxygen injection. This comparison considered oxygen transfer efficiency, energy demand, and operational costs to identify the most effective solution. Process modeling was used to develop and (cont.) optimize the treatment train and evaluate system performance under a range of loading scenarios. Capital and operations and maintenance (O&M) costs were estimated using vendor quotes and regional construction data. Furthermore, to support sustainability, the project incorporates solar photovoltaic systems to reduce dependency on grid power and lower carbon emissions.

EXPLORING STRATEGIES TO ENHANCE WASTEWATER MANAGEMENT IN UNIONTOWN, ALABAMA

UNIVERSITY OF SOUTH ALABAMA

TEAM

Barsha Pudasaini
Rachel Chai
Saxon Saxon
Raihan Un Nabi Sakib
Travis Abshear
Usam Pudasaini

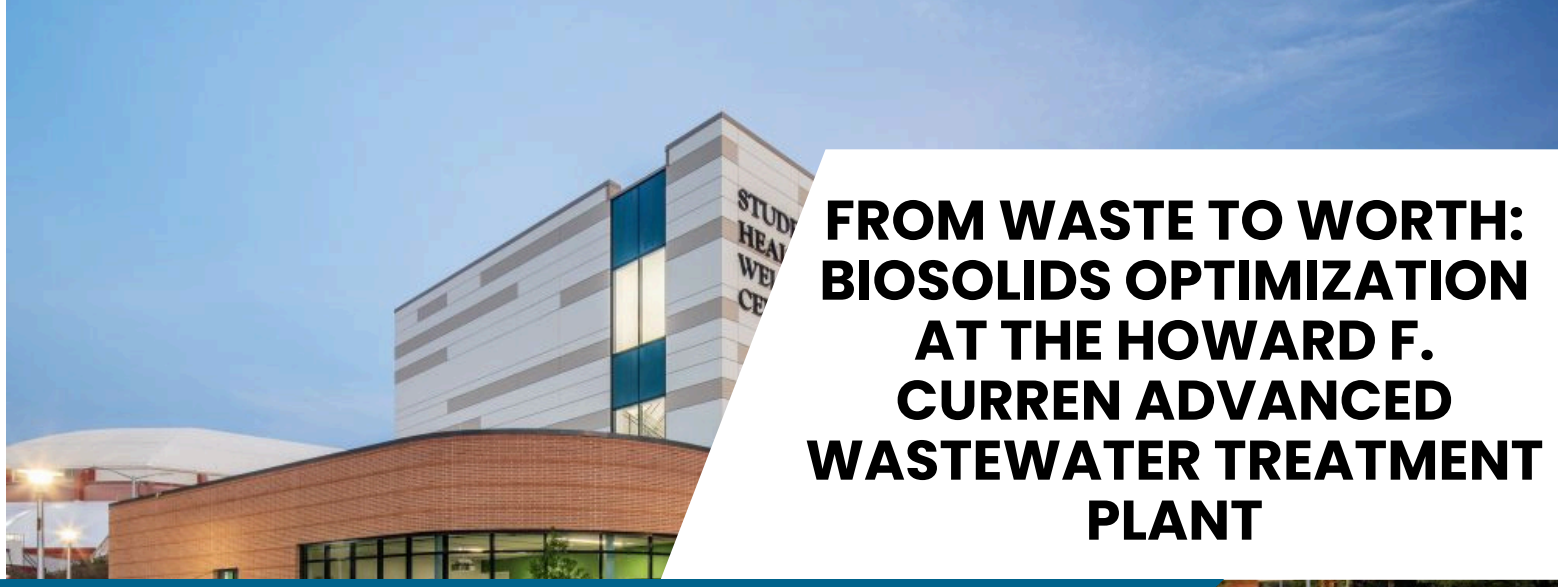
ADVISOR

Kaushik Venkiteshwaran, PhD

MEMBER ASSOCIATION

Alabama's Water Environment Association

Uniontown has been plagued by a crumbling economy and wastewater infrastructure that is beyond its service life and design capacity, which has resulted in disgruntled residents and environmental and public health hazards. In 2018, USDA funded $23M in upgrades that redirected the city's wastewater to a treatment facility via pipeline 18 miles away in Demopolis, Alabama. However, the Demopolis facility is now operating beyond its design capacity due to the additional wastewater load. Despite multiple interventions from local and state-level organizations, the lack of a sustainable solution to the wastewater issues persists today. Uniontown is struggling economically, has a lower tax base, and a high population density of a historically marginalized demographic, which makes it challenging to construct a traditional wastewater treatment plant. In response, we propose repurposing the original Uniontown treatment site to install a package treatment system and the existing lagoon to serve as an equalization basin. This new system will reduce (cont.) the waste load on the Demopolis facility and allow wastewater to be managed by the Waterworks and Sewer Board of the City of Uniontown. These improvements will increase treatment resiliency, reduce the risks to public health, and ensure that revenues generated are retained within Uniontown's economy.



FROM WASTE TO WORTH: BIOSOLIDS OPTIMIZATION AT THE HOWARD F. CURREN ADVANCED WASTEWATER TREATMENT PLANT

CIRCULAR WATER ECONOMY

UNIVERSITY OF SOUTH FLORIDA

TEAM

Adriana Mayr
Isabella Guzaldo
Ochithya Fernando
Schuyler Jones
Isaac Washington

ADVISOR

Sarina Ergas, PE, PhD

MEMBER ASSOCIATION

Florida Water Environment Association

The University of South Florida Wastewater team, SustainaCore, conducted an evaluation of biosolids treatment and end-use alternatives for the Howard F. Curren Advanced Wastewater Treatment Plant (HFC AWTP) in response to tightening regulatory requirements. HFC AWTP currently generates Class B biosolids via mesophilic anaerobic digestion, followed by dewatering through centrifuges or sludge drying beds, with final disposal through land application. Anticipated changes in Florida regulations and limitations on land application prompted prioritizing technologies that produce Class A or Class AA biosolids products to enable broader beneficial reuse and minimize environmental risks. The team assessed multiple technologies based on footprint, proven technology, ease of operation, capital and 25-yr O&M cost, and sustainability. Seven alternatives—current operations, landfill disposal, heat drying, acid-gas phased anaerobic digestion, gamma irradiation, lime stabilization, pyrolysis—were deemed nonviable due to technical, economic, or regulatory (cont.) constraints. A weighted sum model identified composting, solar thermal pasteurization (STP), and temperature-phased anaerobic digestion (TPAD) as the top-performing options. SustainaCore recommended STP for its ease of integration with existing operations, ability to produce a marketable Class AA fertilizer, demonstrated success in Florida, and large-scale operation capacity. A regional biosolids facility in partnership with Hillsborough County was proposed to enhance cost-effectiveness and resource recovery at scale.

DAVID L. TIPPIN WATER TREATMENT FACILITY SLUDGE PROCESSING REDESIGN

WATER ENVIRONMENT

UNIVERSITY OF SOUTH FLORIDA

TEAM

Santosh Jagan
Chase Royall
Regina Demechko
Garrett Rolle
Nicholas Moran

ADVISOR

Sarina Ergas, PE, PhD

MEMBER ASSOCIATION

Florida Water Environment Association

This report outlines the proposed redesign of the sludge processing system at the David L. Tippin Water Treatment Facility (DLTWTF) in Tampa, Florida. The project was driven by three key objectives: (1) relocate the existing sludge processing facility adjacent to the main treatment campus, (2) redesign Rogers Park Golf Course (RPGC) on the newly acquired land, and (3) consolidate the City of Tampa's water department offices. To address these goals, the team conducted laboratory testing to characterize the sludge, evaluated dewatering technologies, and completed preliminary and final designs, integrating feedback from city officials. Five dewatering systems—belt filter press, centrifuge, screw press, drainage bed, and a hybrid system—were analyzed using a weighted evaluation matrix based on performance, operational and capital cost, maintenance, and spatial footprint. Analyses included site constraints, vendor input, and economic modeling. The recommended hybrid system integrates decanter centrifuges with (cont.) covered solar-assisted drainage beds. This design offers a high total solids (TS) output of 50%, reducing hauling volume and cost while maximizing sustainability and flexibility. With the lowest operational cost and scalable, automated features, the system supports future growth in Tampa's water needs. The final site design also includes an office building, stormwater systems, and golf course reconfiguration.

NEXT-GEN WWTF: TURNING BARRIE'S WASTE INTO ENERGY AND NUTRIENTS

CIRCULAR WATER ECONOMY

UNIVERSITY OF WATERLOO

TEAM

Rosa Maria Castillo
Maryory Ocana
Joseph Wortman
Jinxuan Zhang

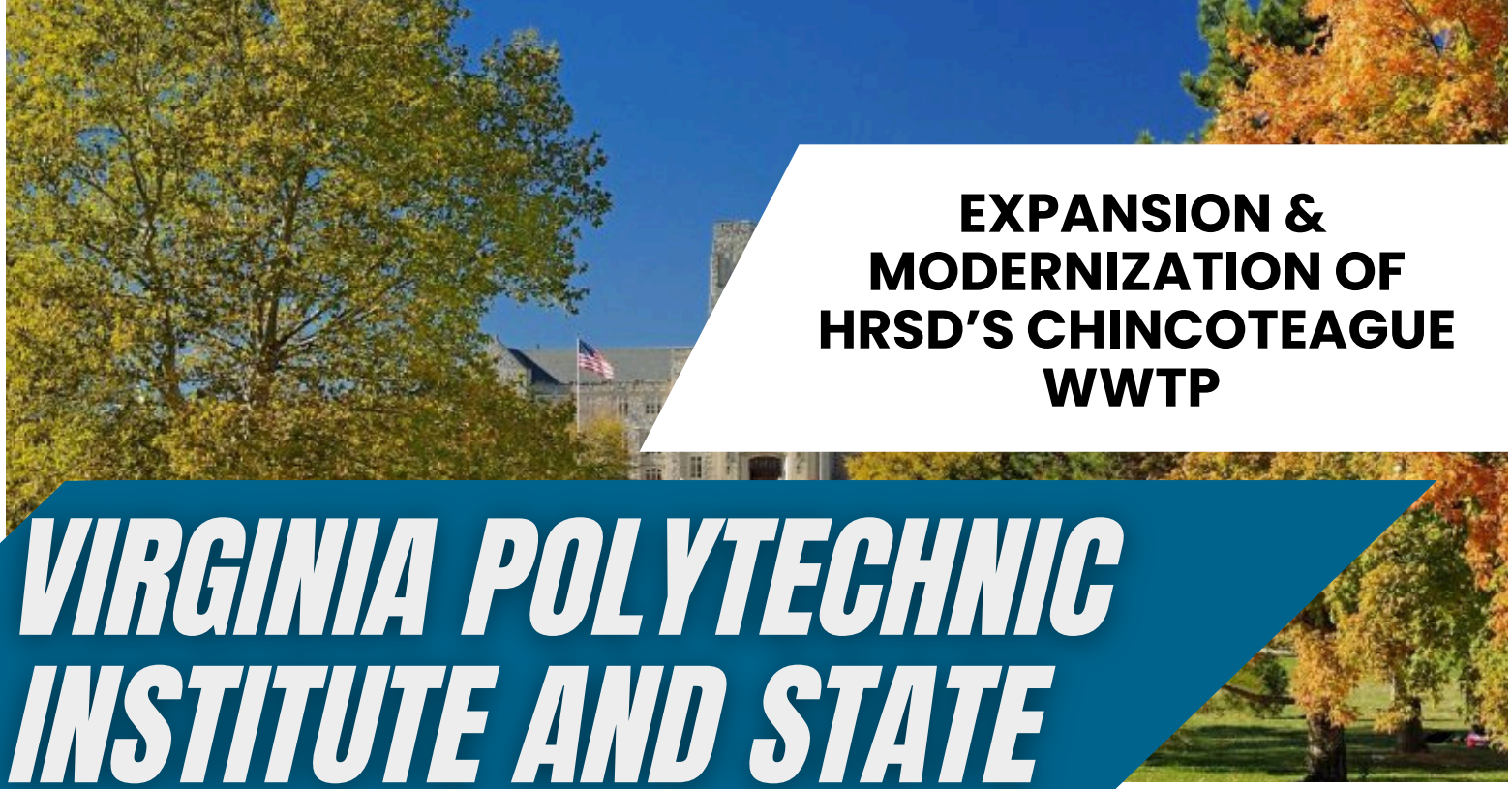
ADVISOR

Sarah Meunier

MEMBER ASSOCIATION

Water Environment Association of Ontario

This project proposes an enhanced design of the Barrie Wastewater Treatment Facility to advance a circular water economy through process recycling, resource recovery, and climate-resilient infrastructure. While not affiliated with the City of Barrie, the design is based on a publicly documented infrastructure need. The objective is to address projected population growth, meet stricter regulatory standards, and improve long-term sustainability within a constrained site. The scope includes advanced nutrient extraction, increased capacity, and integration of energy-efficient technologies. Cost estimates were developed using industry-standard unit rates and vendor quotes, accounting for both capital and O&M expenses. A rigorous alternatives analysis, guided by a weighted decision matrix, assessed technical, environmental, and economic criteria. The selected two-phase strategy begins with food waste co-digestion and repurposing of the secondary digester, achieving over 65% VSS destruction. Phase two (cont.) incorporates centrifuge dewatering, reducing biosolids volume by 87%, and enables nutrient recovery through struvite precipitation. These measures significantly enhance biogas production and reduce energy costs by 52%. The design aligns with WEF's circular water economy goals by maximizing value for people, nature, and businesses while promoting equitable, sustainable, and climate-resilient water services for future generations.



EXPANSION & MODERNIZATION OF HRSD'S CHINCOTEAGUE WWTP

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

WASTEWATER

TEAM

Cyrus Li
Will Dawson
Yitao Li
Mingxi Wang
Francis Robinson
Zhangtong Liao
Xueyao Zhang

ADVISOR

Dr. Zhiwu (Drew) Wang, PhD, P.E.

MEMBER ASSOCIATION

Virginia Water Environment Association

This report details a real-world design project for upgrading the Chincoteague Wastewater Treatment Plant (WWTP), addressing increasing peak summer flows driven by growing tourism. The existing 28,000 GPD facility cannot accommodate this demand, prompting the need for a new 130,000 GPD plant to also connect with the nearby U.S. Coast Guard WWTP. Following VDPES permit requirements and HRSD standards, a decision matrix evaluated four treatment options—conventional activated sludge, sequencing batch reactor, moving bed bioreactor, and membrane bioreactor (MBR)—based on capital and operational costs, footprint, effluent quality, operational flexibility, community impact, and compatibility with HRSD facilities. MBR was selected for its compact footprint, superior effluent quality, and operational flexibility. The proposed design includes an upstream equalization tank, two MBR trains, UV disinfection, an upgraded outfall system, and a comprehensive five-phase implementation plan that maintains uninterrupted service during (cont.) construction and allows for future expansions. The facility also incorporates a streamlined maintenance plan for a 4-hour operator schedule and uses corrosion-resistant materials suited for the coastal environment. The new plant, with a capital cost of $9,400,000 and an annual operational cost of $740,000, will sustainably meet Chincoteague's growing wastewater needs while protecting the surrounding environment and community.

BIOGAS TO BIOMETHANE: MICROBIAL ELECTROSYNTHESIS FOR RENEWABLE NATURAL GAS

WASTEWATER

WASHINGTON UNIVERSITY IN ST. LOUIS

TEAM

Grace Duong
Paloma Santiago
Soyoung Park
Kate Martin
Sally Carrington

ADVISOR

Dr. Zhen (Jason) He, Ph.D.

MEMBER ASSOCIATION

Missouri Water Environment Association

The efficiency of biogas produced from the anaerobic digestion (AD) of sewage sludge is often compromised by impurities such as hydrogen sulfide (H_2S) and carbon dioxide (CO_2), which reduce its energy content and increase purification costs. High concentrations of H_2S not only lower methane yields but also introduce toxicity and acidification, creating an unfavorable AD environment that can lead to system failure. To ensure that biomethane meets the same quality standards as natural gas, upgrading processes are essential to enhance methane purity and remove contaminants. This study investigates the application of microbial electrosynthesis (MES) in an ex-situ configuration. The MES-AD system employs two separate reactors: an MES reactor and an AD reactor. With the bioelectrochemical post-treatment, the system facilitates CO_2-to-CH_4 conversion while simultaneously reducing H_2S concentrations, improving overall biogas quality. This approach offers a sustainable and cost-effective alternative for biogas

(cont.) purification, contributing to the advancement of cleaner energy solutions.

RADIOACTIVE REMEDIATION: TREATING LEGACY URANIUM CONTAMINATION IN COLDWATER CREEK

WATER ENVIRONMENT

WASHINGTON UNIVERSITY IN ST. LOUIS

TEAM

Grace Duong
Lindsey Feeley
Naomika Raveendran
Alexa Wienhoff

ADVISOR

Dr. Zhen (Jason) He, Ph.D.

MEMBER ASSOCIATION

Missouri Water Environment Association

In the 1940s, Mallinckrodt Chemical Works, a chemical company operating in St. Louis, was chosen to process uranium for the Manhattan Project, leaving over 130,000 tons of radioactive waste exposed in the North County site. This led to contamination of Coldwater Creek, a nearby tributary of the Missouri River. From 1970 to 2014, Uranium-238 concentrations in the soil and sediment of Coldwater Creek have both decreased; however, surface water concentrations have stagnated at 5 µg/L. Uranium exposure is traced to numerous health effects and poverty rate within a one-mile radius of Coldwater Creek is 1.5x the rest of St. Louis County, posing environmental justice concerns. This study aims to define effective, economical methods to mitigate aqueous uranium contamination in the Coldwater Creek area. Biosorption, lime softening, and activated carbon adsorption systems were designed and analyzed. Because the techniques explored, individually, do not meet the strict ATSDR requirements, a dual-step method is necessary.

(cont.) A cost-benefit analysis finds lime softening, followed by biosorption can effectively decrease the existing contamination while adhering to budgets set by USEPA grants. These recommendations will protect the people and environment of North St. Louis from nuclear radiation by ensuring that the uranium contamination is mitigated.

BOOSTING AERATION FOR AN EXISTING OXIDATION DITCH

WILKES UNIVERSITY

TEAM

Benjamin Campbell

Ethan Parfitt

Gabrielle Vogel

ADVISOR

Prahlad Murthy PhD, PE, BCEE

MEMBER ASSOCIATION

Pennsylvania Water Environment Association

Most of the municipal wastewater treatment plants across the world utilize biological processes, along with physical and chemical processes, and contain a series of treatment units that require aerobic conditions in the wastewater. Aerobic conditions are attained by supplying pure oxygen through diffused aeration where either oxygen gas or liquid oxygen is pumped through a network of pipes that possess orifices. The other option is to use surface aerators that allow wastewater to make contact with the atmosphere for natural oxygen transfer to occur. Our group will be designing and evaluating the feasibility of these alternative systems for an oxidation ditch that is in New Britain Township, PA. This plant has a design capacity of 4.625 MGD and incorporates physical, chemical and biological unit processes to meet effluent quality standards as established by Federal and State regulators. Designing of the aeration systems meets the engineering design requirements as defined by ABET, the engineering accreditation (cont.) body in the U.S.A. and incorporate constraints such as time, cost, regulations, sustainability and site conditions. In addition, we will have the opportunity to communicate with industry professionals, especially those who are involved with the wastewater treatment plant mentioned above.

THANK YOU TO OUR SDC SPONSORS!

THANK YOU!

Judges:

We would like to thank our judges for volunteering their time. We are grateful for their presence and knowledge during the competition.

Mason Ericson
Eli Tilen
Clinton McAdams
Nadia Mugisha
Laura Gray
Aby Sabzwari
Janelle Armstrong
Adrian Romero
Amanda Smokoff
Molly Klausen
Jason Wiser
Kaitie Zusy
Nadiia Nichoha

Volunteers:

Thank you for your time and ideas shared during our monthly SDC calls and for your presence during the competition.

Kiran Udayakumar
Kshitiz Uprety
Shirley Smith
Jada Williams
Sarah Vander Meulen
Udayarka Karra
Luis Cifuentes
Ashley Goddard
Sydney Gard
Jenny Warren
Ya-chi Tsao
Cara Jung
Aparna Dwara
Md Komol Hassan
Stephen Moy
Steven Jackson
Mohamed Mohamed
Stephen Moy
Harry Zhang
Tim Ware
Sarah Vander Meulen