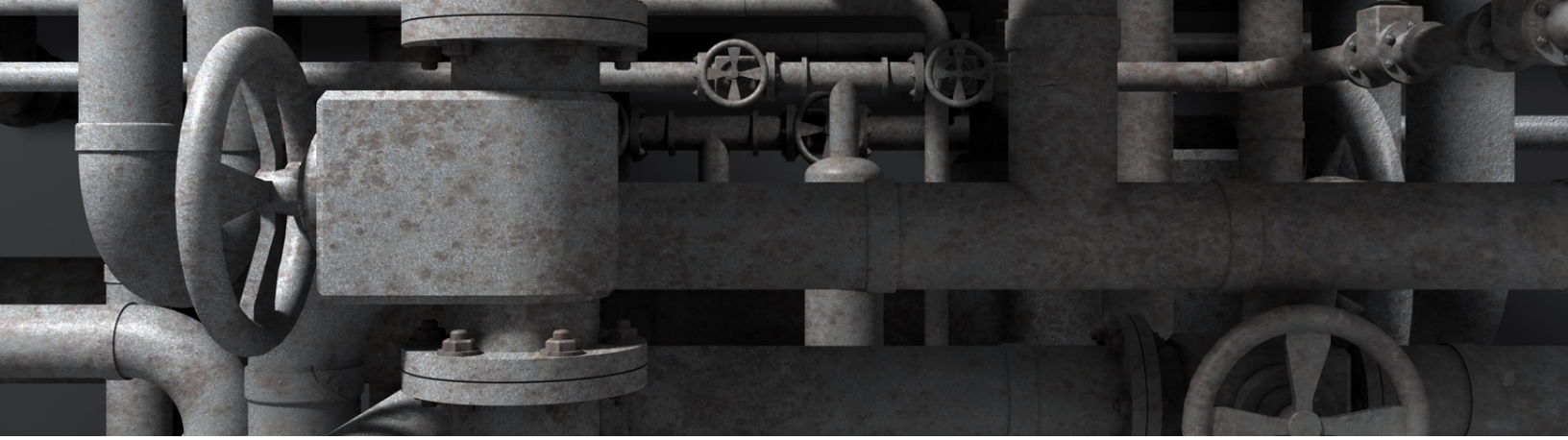
Clackamas Community College

ORWEF
Oregon Water Education Foundation

WATER ENVIRONMENT SCHOOL

PROGRAM

2023



WELCOME INSTRUCTIONS

We are glad you are here and ready to learn. Now, let's get you going to earn some CEUs! The next few pages are the campus map to get an idea of where your courses and activities will be, the schedule to get an idea of what you are about to learn, and your award sheet.

01

CAMPUS MAP

Please review the map to gather where your track will held, where the restrooms are, and lounge/networking spaces will be.

02

SCHEDULE

This schedule is a review of each track's program and speakers. There is a 10 minute break between each session. Lunch will be from 12:30-1:00 pm on Tues and Weds. On Thursday snacks will be available in the morning and afternoon between sessions. A 45 minute lunch will be served from 12:30-1:15 pm. Please feel free to explore the campus during those times and preview the building artwork. Catering is provided. Please look at the map for where the catering will be served.

03

CEU In-person Tracking Sheet

Please fill out your tracking sheet with your name, address, and email. This form is key for you to obtain your DEQ required CEUs. At the beginning of each instruction session please hand your CEU card to the moderator. The moderator will be verifying your attendance and at the end of the session you will need to pick up your stamped card. Do not lose your CEU card! This sheet will be proof of your in-person participation to be eligible to receive CEUs. At the end of the day, you will need to turn in this sheet to the registration desk (where you got this packet!).

LOCAL ACCOMODATIONS

Here is a list of local hotels if your home is too far from the school.

---

01 **Best Western Plus Rivershore Hotel**
1900 Clackamette Dr, Oregon City, OR 97045
(503) 655-7141

02 **Budget Inn Gladstone**
19240 SE McLoughlin Blvd, Gladstone, OR 97027
(503) 656-1955

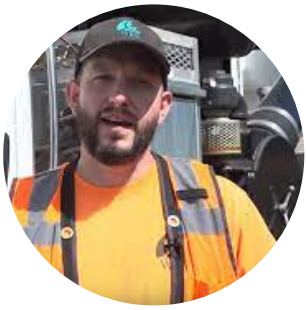
03 **Holiday Inn Express Portland SE Clackamas Area, an IHG Hotel**
75 82nd Dr, Gladstone, OR 97027
(503) 722-7777

LOCAL EATS

Here is a list of local eats that our faculty recommends:

Local Eateries (Fast Food)	Five Guys 19574 Molalla Ave, Oregon City, OR 97045
	Mod Pizza 19550 Molalla Ave Suite 145, Oregon City, OR 97045
	Panda Express 19526 Molalla Ave #137, Oregon City, OR 97045
Local Restaurants & Bars	Bugatti's Oregon City 334 Warner Milne Rd, Oregon City, OR 97045
	Lil' Cooperstown Bar & Grill 19352 Molalla Ave, Oregon City, OR 97045
	The Wild Hare Saloon 1656 S Beavercreek Rd, Oregon City, OR 97045
Oregon City Favorites	Corner 14 Foodcarts 508 14th St, Oregon City, OR 97045
	Coasters Crossing 1757 Washington St, Oregon City, OR 97045-1039

2023 WATER ENVIRONMENT SCHOOL LEADERSHIP



Matt Zak

ORWEF President/ Source Control Specialist,
Clackamas Water Environment Service.

MZak@clackamas.us

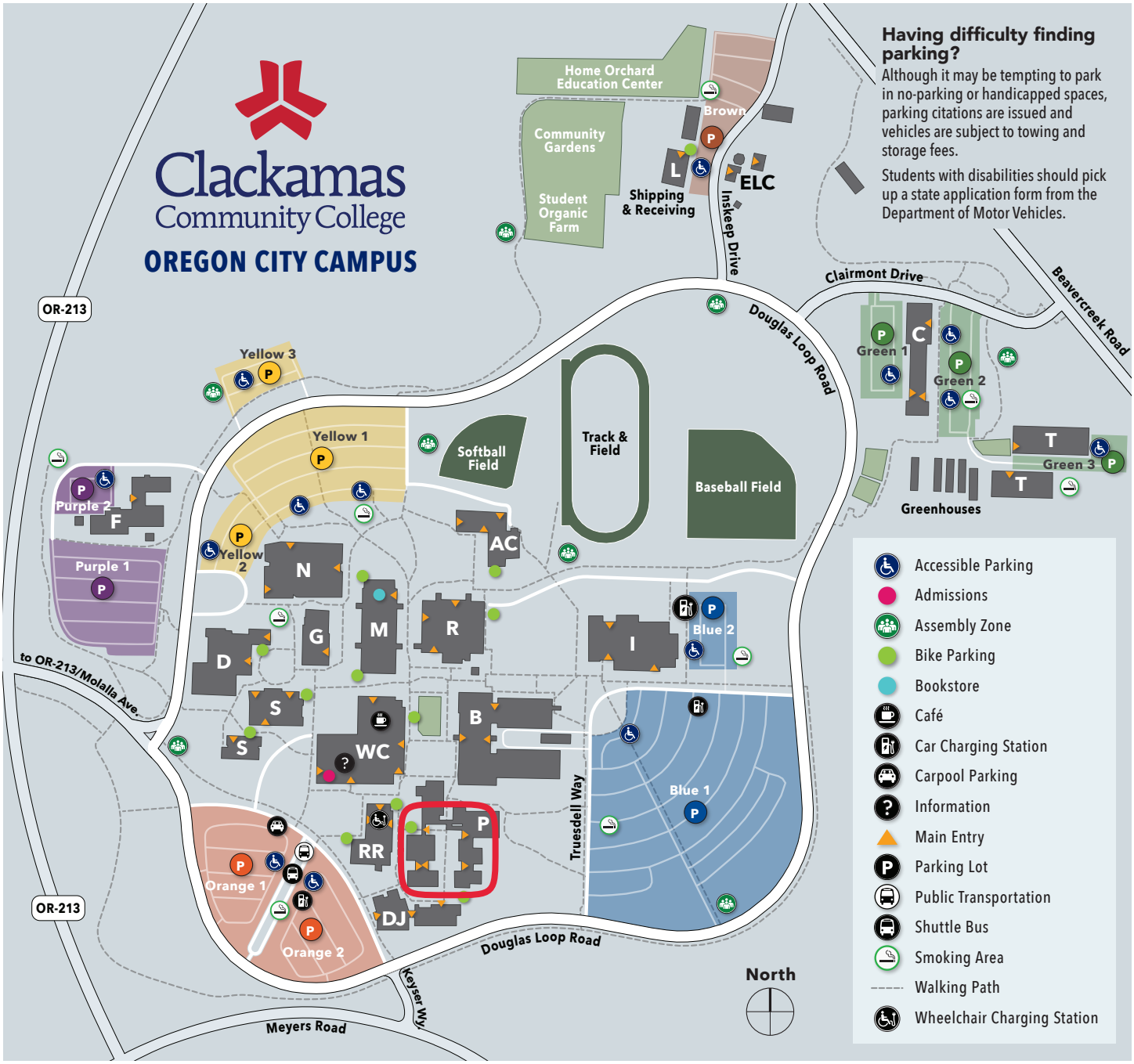
This is Matt Zak's second year as president of Oregon Water Education Foundation (ORWEF) and a vital part of the committee for over 10 years. He is a sanitary and storm water sewer technician and clean water defender for Clackamas county's Water Environment Services.
Our organization committee is always looking for speakers and people to volunteer their time to be a part of our committee. Please contact to help develop next year's program.

Dr. Matthew La Force, Ph.D

CCC Facilitator, Engineering Sciences Department Chair, WET Program Educator

laforce@clackamas.edu

Matthew LaForce is the CCC Engineering Department Chair and one of the lead instructors for the WET program. He has been a facilitator for ORWEF's Water Environment School for over 12 years. If you or someone you know is interested in learning about earning a degree with the WET program, please contact.



BUILDING CODES and SERVICES

Art Center (AC)

Barlow Hall (B)
- Foundation
- Human Resources
- President's Office

Clairmont Hall (C)
- Connections with Business and Industry

DeJardin Hall (DJ)

Dye Learning Resource Center (D)
- Academic Computer Lab
- Library
- Tutoring

Environmental Learning Center (ELC)

Family Resource Center (F)
- Child Development Center

Gregory Forum (G)

Holden Industrial Technology Center (I)

Lewelling (L)
- Campus Services
- Shipping & Receiving

McLoughlin Hall (M)
- Bookstore
- College Safety

Niemeyer Center (N)
- Alexander Art Gallery
- Osterman Theatre

Pauling Center (P)
- Workforce Services

Randall Hall (R)
- Athletics Center

Roger Rook Hall (RR)

Streeter Hall (S)

Training Center (T)

Wacheno Welcome Center (WC)
- Admissions Center
- Advising
- Career Services
- Cougar Café
- Disability Resource Center
- Education Partnerships
- Financial Aid
- Multicultural Center
- Registration/Records
- Student Accounts
- Student Government
- Testing Center
- VET Center

CCC CAMPUS SITES

CCC at Harmony Community Campus
7738 SE Harmony Road
Milwaukie, OR 97222

CCC Oregon City
19600 Molalla Ave.
Oregon City, OR 97045

CCC Wilsonville Campus
29353 SW Town Center Loop E
Wilsonville, OR 97070

CCC OFF-CAMPUS SITES

Canby Applied Technology Center
721 SW Fourth St., Canby, OR 97013

Estacada High School
355 NE 6th, Estacada, OR 97023

Molalla Center
(behind Molalla Public Library)
201 East Fifth, Molalla, OR 97308

PAULING CENTER

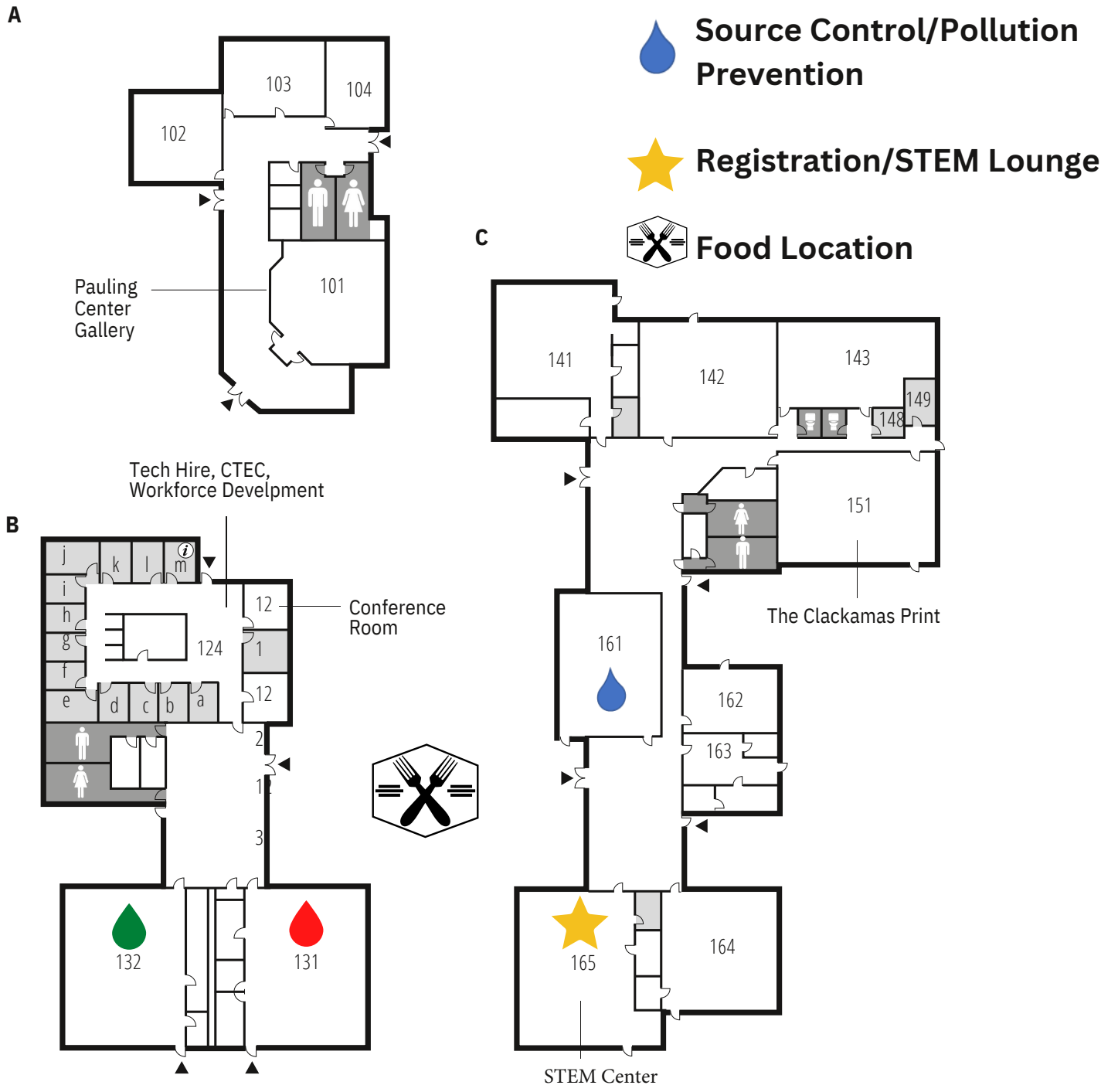
Collection Systems

Wastewater Operations

Source Control/Pollution Prevention

Registration/STEM Lounge

Food Location



restroom staff office classroom building entrance elevator

July 2021

PLANNING COMMITTEE

Our team below has worked tirelessly in making a relevant training program while keeping up with industry standards and emerging issues. When developing the program, these committee members strive to provide training that uphold the school's high standard for quality training while meeting the needs and interest of the attendees.
These committee members have volunteered their time to make this school a success.
Thank you!

Kasie Auger
Hunter Bennett-Daggett
Brent Carrar
Erin Duffy
Akiko Gates
Kimi Grzyb
Michael Hawkins
Lisa Hillyard
Ross Johnston
Stephanie Kerns
Matthew LaForce
Gabriela Medina
Victoria Mendez
John Nagy
Molly Nause-McCord
Monica Stone
Dustin Thorson
Matt Zak
Amber Steele
Rita Fallin

If you are interested in joining the ORWEF planning committee please contact ORWEF President, Matt Zak, MZak.clackamas.us

ORWEF

Water Environmental School

Schedule & Session Descriptions

		Day 1: Tuesday, June 27, 2023		
TIME	SESSION	**Track A** Collection Systems: Operations & Maintenance, Safety, Asset Management	**Track B** Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge	**Track C** Source Control/Pollution Prevention: Industrial Pretreatment, Stormwater, Reuse & Biosolids
7:00-7:45	*Event Opens: Q&A, Getting Started, Introductions*			
8:00-9:00	1	KEYNOTE SPEAKER Empowering Operators: Harnessing AI-Driven Tools Amid Challenges in Wastewater Treatment *Keaton Larson Lesnik, PhD* *Maia Analytica*		
9:10-10:10	2	**Update on the War on Wipes** *Frank Dick, PE* *City of Vancouver*	**Upgrading Wastewater Lagoons for Cold-Weather Ammonia Removal** *Brady O'Leary* *TriplePoint Environmental*	**Protecting our Waterways: How to Leverage Microbial Source Tracking for Fecal Contamination Management** *Scott Harding & Michael Waud* *LuminUltra Technologies*
10:20-11:20	3	**Empowering Your Staff - What does it really mean?** *Mark Poling and Hannah Thomascall* *Clean Water Management* *Spokane County*	**BNR Process Improvements at LOTT** *Jen Murphy,* *Parametrix Engineering*	**A City with a Drink(ing) Problem** *Leah Rohan* *Walla Walla*
11:30-12:30	4	**How to Put a Pipe Through a Nature Park: Partnership and Communication** *Jadene Stensland, PE* *Clean Water Services*	**NO SESSION**	**SCAP: A Public-Private Partnership for Catch Basin Maintenance** *Eric Lambert & Christa Britton* *Clark County; City of Gresham*
12:30-1:00		LUNCH BREAK		
1:00-2:00	5	**Implementation of Telemetered Water Quality Sensors in the Sanitary Collection System - 2023 Update** *Jason Cook* *Clean Water Services*	**Introduction to Controls Systems** *Jen Murphy* *Parametrix Engineering*	**Application of Analysis, Planning, and the Incident Command System to Support Emergency Response to Emerging Threats to Oregon's Waterways** *Don Pettit* *ODEQ*
2:10-3:10	6	**Why My Brand-New Equipment Shakes, Rattles, and Rolls** *John Koch, PE* *HDR, Inc.*	**Real-Time Process Control** *Jen Murphy* *Parametrix Engineering*	**Roadside Emergencies & Hazard Awareness** *Dustin Ross* *ODOT*
3:20-4:20	7	**Pipe Defect Evaluation and Trenchless Repairs** *Craig Christensen, PE* *David Evans and Associates, Inc.*	**Data, Analysis and the Future of I & C** *Jen Murphy* *Parametrix Engineering*	**Managing Wastewater& Stormwater Field Operations During Challenging Times** *Kyle Bean* *Field Operations Supv.* *Water Environment Services*

Day 2: Wednesday, June 28, 2023

TIME	SESSION	**Track A** Collection Systems: Operations & Maintenance, Safety, Asset Management	**Track B** Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge	**Track C** Source Control/Pollution Prevention: Industrial Pretreatment, Stormwater, Reuse & Biosolids
7:00-7:45	*Event Opens: Q&A, Getting Started, Introductions*			
8:00-9:00	8	KEYNOTE SPEAKER **Large Diameter Structural Pressure Pipe Rehabilitation: 30-inch Tight-fit HDPE Case Study** *Dan Buonadonna* *Jacobs Engineering Group Inc*		
9:10-10:10	9	**Don't Be a Stuck PIG!** *Molly Nause-McCord &* *Jacobs Eng* *City of Portland, BES*	**Your DEQ Online** *Jessica Lorenz* *DEQ*	**Stress Testing the Sandy Wastewater Treatment Plant** *Keith Scranton* *Veolia*
10:20-11:20	10	**Yikes! More Clogged Pipes? Using Social Marketing to Improve System Outcomes** *Rachel Garrett and Lynn Knapp* *Brown and Caldwell, Cascadia Consulting Group*	**DEQ Operator Certification Basics** *Kimi Grzyb* *DEQ*	**Full-scale Demonstration of Energy and Carbon-efficient BNR** *Dr. Pusker Regmi* *Brown and Caldwell*
11:30-12:30	11	**Pipeline Renewal & Replacement Targets Lower Risk and O&M Demands** *Rob Peacock, PE* *Kennedy Jenks*	**Pump Performance Assessment: A Panacea for Predictive Maintenance?** *Jen Murphy* *Parametrix Engineering*	**Novel Food Waste Pre-Processing and Systematic Co-Digestion to Enhance Biogas Production and Improve Solids Treatment** *Bhargavi Subramanian* *Kennedy and Jenks*
12:30-1:00		LUNCH BREAK		
1:00-2:00	12	**Utilizing Acoustics to Enable Condition Based Maintenance in Gravity Sewer Systems** *Gene Hallum* *InfoSense, Inc.*	**Pumping to Greater Heights- City of Portland Collaborative 3D BIM Driven Pump Station Upgrades** *Jen Murphy* *Parametrix Engineering*	**Advancing State-Level Reuse Policy with Grass Roots Efforts** *Terrance Romaine and Shelly Parini* *WES*
2:10-3:10	13	**Doing More with Less: Adaptable Tools for Prioritizing System Repairs** *Scott Duren, PE* *& Adam Donald, PE* *Water Systems Consulting*	**An Incident Investigation - at the City of Portland WWTP** *Lauren Wilcox* *HSSE Manager* *City of Portland, BES*	**Influent Pump Station Flow Equalization at the Rock Creek AWRRF** *Chris Maher* *Clean Water Services*
3:20-4:20	14	**Data, Analysis and the Future of I & C** *Jen Murphy* *Parametrix*	**Too Hot! NPDES Temperature Mitigation** *Jen Murphy* *Parametrix Engineering*	**Process Configurations for Biological Nutrient Removal** *Chris Maher* *Clean Water Services*

Day 3: Thursday, June 29, 2023

TIME	SESSION	**Track A** Collection Systems	**Track B** Wastewater Operations	**Track C** Source Control/Pollution Prevention
7:00-7:45	*Event Opens: Q&A, Getting Started, Introductions*			
8:00-9:00	15	**How to Be Successful in the Wastewater Business** *Michelle Beason, PE* *National Plant Services*	**Condition Assessment 1, 2, 3** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team*	**Transformation through Innovation: Sedron's Varcor** *Tim Evenson* *Sedron*
9:10-10:10	16	**Siphon Cleaning and Inspection Tips and Tricks** *Michelle Beason, PE* *National Plant Services*	**Real Time Equipment Monitoring and Condition Assessment** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team*	**Compliance Pitfalls** *Johnny Leavy* *City of Medford*
10:20-11:20	17	**Package Lift Stations for FAST Retrofits** *Rich Owens* *Owens Pump*	**Leveraging Data for Reporting and Decision Making** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team*	**Control Loop Descriptions, Process and Instrumentation Drawings, and Programmable Logic Controllers usage in Wastewater Operations** *Joel Borchers* *Clean Water Services*
11:30-12:30	18	**Solutions for Pump Plugging** *Rich Owens* *Owens Pump*	**Optimizing Data Management through eRIS** *Tim Kruse* *SUEZ Smart & Environmental Solutions*	**Albany's WRF Dewatering and Compost Upgrade** *Brian Stevens* *City of Albany*
12:30-1:15		LUNCH BREAK		
1:30-2:30	19	**Energy Efficiency Optimization for Water and Wastewater Systems** *Kelson Redding* *Energy Trust of Oregon*	**3D Virtual Reality – Project Design** *Jen Murphy, Engineer* *Parametrix Engineering*	**The Biology of Nitrogen Removal in Wastewater** *Dotti Ramey* *City of Vancouver*
2:40-3:40	20	**Out of Boundary Contracts & Access Rights for Utilities** *Sarah Liljefelt* *Dunn Carney LLP*	**Foundations of Activated Sludge** *Mark Walter, Operations and Maint Specialist* *Water Dude Solutions*	**Struvite: Methods Of Prevention, Removal And Recovery** *Brett Laney* *Clean Water Services*
3:50-4:50	21	**The Sewer Whisperer: "Listen Carefully, Your Sewer is Talking to You"** *Brogan Quist* *Smart Cover Systems*	**Troubleshooting a Process Upset: City of Portland Columbia Boulevard WWTP** *Monica Stone, Process Control Supervisor* *City of Portland, BES*	**Lessons Learned From A Decade Of Phosphorus Recovery At Clean Water Services' WRRF** *Brett Laney* *Clean Water Services*

Session Descriptions: Track A Collection Systems: Operations & Maintenance, Safety, Asset Management		
DAY ONE		
8:00-9:00 AM	1	**Empowering Operators: Harnessing AI-Driven Tools Amid Challenges in Wastewater Treatment** *Keaton Larson Lesnik, PhD* *Maia Analytica* Integrating artificial intelligence (AI) into the water and wastewater treatment sector presents a unique opportunity to enhance outcomes, despite the numerous challenges associated with its implementation. This discussion explores the development and adoption of AI-powered tools tailored for operators, while acknowledging the inherent complexities in refining and incorporating these technologies into daily operations. The focus is on user-friendly systems designed to optimize processes and streamline tasks. Emphasis is placed on the crucial role operations staff play in capitalizing on the opportunities offered by these tools, propelling the water sector towards a more innovative and resilient future.
9:10-10:10 AM	2	**Update on the War on Wipes** *Frank Dick, PE* *City of Vancouver* This presentation will provide an update to last year's presentation on work by utility representatives and manufacturers to get state wipes labeling legislation passed. We will identify wastewater system issues with flushed wipes, and hear about working being done on the local, national and international level to address wipes through laws and policy.
10:20-11:20 PM	3	**Empowering Your Staff - What does it really mean?** *Mark Poling and Hannah Thomascall* *Clean Water Management; Spokane County* We'll explore empowering and enabling your team to act through fostering collaboration, creating a climate of trust, facilitating relationships, strengthening others, enhancing self-determination, developing competence and confidence, and organizing work to build competence and ownership. We will talk about how all these elements combine to create empowerment that not only delivers greater job satisfaction for you and your team, but they also deliver better business results.
11:30-12:30 PM	4	**How to Put a Pipe Through a Nature Park: Partnership and Communication** *Jadene Stensland, PE* *Clean Water Services* In early 2021, Clean Water Services began a two-year utility construction project to replace the 40-year-old sanitary pipe which runs through the popular Tualatin Hills Nature Park, a 220-acre "crown jewel" nature and wildlife reserve. The project will also enhance the environment and wildlife habitat around Cedar Mill Creek. Ultimately, the project team created a 360-degree Virtual REality tool to allow the public to experience changes in vegetation growth during and after construction.
1:00- 2:00 PM	5	**Implementation of Telemetered Water Quality Sensors in the Sanitary Collection System - 2023 Update** *Jason Cook* *Clean Water Services* Clean Water Services has been developing telemetered, continuous water quality sensing network for the sanitary collection system in order to help protect the WRRF from harmful discharges. The challenges of developing such a network in such a difficult environment are considerable, but over the last 5 years CWS has been working to develop the technology, methods, and practices to overcome them. CWS is now moving out of the pilot phase into the full implementation phase and has already been successful in tracking down and eliminating two long-standing sources of upsets to the WRRFs. In this talk, CWS will discuss their path to the current state and their vision for the near and long-term future.
2:10-3:10 PM	6	**Why My Brand-New Equipment Shakes, Rattles, and Rolls** *John Koch, PE* *HDR, Inc.* Condition assessments have brought to the forefront many long term and ongoing issues with mechanical equipment. Finite element analysis (FEA), modal and vibration analysis has been employed during Level 3 and 4 stages of condition assessment to determine natural frequencies of the equipment, vibration frequencies and amplitudes as well as how to increase equipment natural frequency to reduce vibration. Many of the vibration issues encountered during condition assessments can be attributed to equipment installation and anchoring. Equipment is not as "stout" as it was 40 and

		50 years ago which means its stiffness and mass is less. The reduction in materials allow manufacturers to be cost effective in this very competitive world. The old name brand manufacturers have been swallowed up by big corporations where the name of the game seems to be making money as their first priority. Quality, reliability, and longevity is on the third or fourth rung of their precedence. This overall philosophy has resulted in equipment that is more susceptible and prone to vibration.
3:20-4:20 PM	7	**Pipe Defect Evaluation and Trenchless Repairs** *Craig Christensen, PE* *David Evans and Associates, Inc.* This presentation will focus on the evaluation of pipe defects in a wide variety of pipe types and materials and the wide range of "trenchless" construction repair methods to match those defects, including cured-in place pipe (CIPP) lining, pipebursting, sliplining, and others. The bulk of the • presentation will focus on storm and sewer projects done for the city of Bellevue Washington but the presentation will also include several Watermain replacement projects done via pipe bursting for King County Water District No. 90 in Renton, Washington.

Session Descriptions: Track A Collection Systems: Operations & Maintenance, Safety, Asset Management		
DAY TWO		
8:00-9:00 AM	8	**Large Diameter Structural Pressure Pipe Rehabilitation: 30-inch Tight-fit HDPE Case Study** *Daniel Buonadonna* *Jacobs Engineering Group Inc.* Case study for 1.5 miles of 30-inch and 27-inch diameter concrete pipe rehabilitated with tight-fit HDPE lining. Challenges included pressures in excess of 100 psi, steep slopes greater than 40 percent through a valley, and wide gaps between pulled joints.
9:10-10:10 AM	9	**Don't Be a Stuck PIG!** *Molly Nause-McCord and Jacobs Eng (potential partner)* *City of Portland, BES* Have you ever wondered, what's UP with my wastewater pressure pipes? Well, BES in the City of Portland is working on just this. Since 2017 Molly has been working with millwrights, consultants, and aging infrastructure to get this information.
10:20-11:20 PM	10	**Yikes! More Clogged Pipes? Using Social Marketing to Improve System Outcomes** *Rachel Garrett and Lynn Knapp* *Brown and Caldwell, Cascadia Consulting Group* "Utilities are overwhelmed with competing needs, from system maintenance to capital projects. To compound the issue, system users often contribute to existing problems through detrimental behaviors such as rinsing FOG down drains and flushing wipes and trash. How can utilities not only increase awareness around problematic behaviors, but motivate behavior change? In this session, Rachel Garrett of Brown and Caldwell and Lynn Knapp of Cascadia Consulting Group will explore how applying a Community-Based Social Marketing (CBSM) framework can help motivate behavior change. CBSM can be a useful tool in many scenarios that utilities commonly face."
11:30-12:30 PM	11	**Pipeline Renewal & Replacement Targets Lower Risk and O&M Demands** *Rob Peacock, PE* *Kennedy Jenks* The City of Tigard has a goal to replace all water system pipe every 100 years. In 2022 the City used History and GIS to develop an algorithm to assess risk and rank pipeline replacement priority, then aligned with human intelligence to develop a 15-year plan to replace 44 miles of pipe, including the majority of the City's aging cast iron pipe. This presentation reviews the intersection of Council goals, Staff anecdotes, and data analysis in development of an ongoing Capital Improvement Plan.
1:00- 2:00 PM	12	**Utilizing Acoustics to Enable Condition Based Maintenance in Gravity Sewer Systems** *Gene Hallum* *InfoSense, Inc.* This presentation provides an overview of using transmissive acoustics to rapidly screen small diameter gravity-sewer lines before deploying cleaning resources. The technology is called Sewer Line Rapid Assessment Tool, or SL-RAT, and used sound waves to quickly assess for blockages. The SL-RAT can provide an assessment in three minutes or less, meaning a two-person crew can inspect 10-20,000 feet per day.
2:10-3:10 PM	13	**Doing More with Less: Adaptable Tools for Prioritizing System Repairs** *Scott Duren, PE and Adam Donald, PE* *Water Systems Consulting* Ongoing inspections and system data collection tools are rendering static master plans inadequate for utility planning. Additionally, inadequate historical spending in infrastructure has left a rising need for investment with limited budgets. Living toolsets that are continuously updated are necessary to meet the evolving needs. This presentation will showcase a range of prioritization tools, from simple GIS-based systems to more complex quantified risk comparisons to augment traditional master planning with tools sets that automatically adapt to updates in condition data.
3:20-4:20 PM	14	**Data, Analysis and the Future of I & C** *Jen Murphy* *Parametrix*

Session Descriptions: Track A Collection Systems: Operations & Maintenance, Safety, Asset Management		
DAY THREE		
8:00-9:00 AM	15	**How to Be Successful in the Wastewater Business** *Michelle Beason, PE* *National Plant Services* The water/wastewater industry is big and growing, and has many opportunities for both veteran professionals and newcomers, but it can be challenging to find your place. Michelle Beason will discuss her career in the industry, the changes she has seen, and the lessons she has learned about developing her own skills and helping to grow her company's business.
9:10-10:10 AM	16	**Siphon Cleaning and Inspection Tips and Tricks** *Michelle Beason, PE* *National Plant Services* Sanitary sewer siphons are the most challenging assets to inspect as they are designed to be continuously full of water, they have little to no redundancy, and with typically very high flow volumes. They are also located deep underground as they are designed to carry wastewater under roadways, channels, and water bodies, so dewatering and cleaning can be difficult. The construction and operation of inverted siphons will be explained, then an in-depth explanation of the strategies and troubleshooting.
10:20-11:20 PM	17	**Package Lift Stations for FAST Retrofits** *Rich Owens* *Owens Pump* *How to upgrade your lift station with minimal downtime and retrofit. What kind of equipment is available, and will it fit your specific station for quick retrofit and upgrade*
11:30-12:30 PM	18	**Solutions for Pump Plugging** *Rich Owens* *Owens Pump* How to prevent plugging in wastewater collections. What are the options in equipment, or how to keep your pump from plugging. Equipment features and advantages and disadvantages.
1:30- 2:30 PM	19	**Energy Efficiency Optimization for Water and Wastewater Systems.** *Kelson Redding* *Energy Trust of Oregon* Do the best you can with what you have, then upgrade where it is most beneficial and cost effective. The best approach to optimizing energy efficiency is to first consider how can we maximize the performance of the existing systems; only after these options are understood can we begin to consider capital efficiency improvements. This presentation, brought to you by Energy Trust of Oregon, will consider the most common opportunities to optimize water and wastewater facility energy use with both operations and maintenance practices and capital equipment upgrades. Additionally, we will cover resources that you can tap into to help in the process and attain incentive dollars for improvements.
2:40-3:40 PM	20	**Out of Boundary Contracts & Access Rights for Utilities** Sarah Liljefelt Dunn Carney LLP Learn best practices for out of boundary contracts and easements to avoid legal disputes.
3:50-4:50 PM	21	**The Sewer Whisperer: "Listen Carefully, Your Sewer is Talking to You"** *Brogan Quist* *Smart Cover Systems* This presentation reviews how customers can adopt unique and patented monitoring technology, which gives them data in the field that they did not have before. The monitors mount directly on the manhole covers - thereby eliminating the need for a confined space entry - and use ultrasonic sensors to monitor water levels. The remote monitors send data to a secure customer website, as well as sending out alarms, advisories, and maintenance alerts directly to the customer.

Session Descriptions: Track B Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge		
DAY ONE		
8:00-9:00 AM	1	**Empowering Operators: Harnessing AI-Driven Tools Amid Challenges in Wastewater Treatment** *Keaton Larson Lesnik, PhD* *Maia Analytica* Integrating artificial intelligence (AI) into the water and wastewater treatment sector presents a unique opportunity to enhance outcomes, despite the numerous challenges associated with its implementation. This discussion explores the development and adoption of AI-powered tools tailored for operators, while acknowledging the inherent complexities in refining and incorporating these technologies into daily operations. The focus is on user-friendly systems designed to optimize processes and streamline tasks. Emphasis is placed on the crucial role operations staff play in capitalizing on the opportunities offered by these tools, propelling the water sector towards a more innovative and resilient future.
9:10-10:10 AM	2	**Upgrading wastewater lagoons for cold-weather ammonia removal** *Brady O'Leary* *Triplepoint Environmental* Wastewater lagoons were generally not designed for efficient or effective ammonia removal. With new and stringent ammonia regulations coming into enforcement around the country, many lagoon system operators are finding themselves out of compliance. This presentation will discuss why lagoon systems fail to nitrify, what can be done to improve nitrification in a lagoon, and will compare technologies to guarantee treatment that can meet even the strictest of limits: Non-detect down to water temperatures of 1C.
10:20-11:20 PM	3	**BNR Process Improvements at LOTT** *Jen Murphy, Engineer* *Parametrix Engineering* LOTT Clean Water Alliance provides wastewater treatment and water reclamation for 120,000 residents in Washington and has been performing nutrient removal since 1994. This is a presentation of the 2020 upgrade project to to design a second generation/large scale system to increase reliability and to enhance flexibility.
11:30-12:30 PM	4	**NO SESSION** Please attend one of the other track opportunities to obtain CEUs for this time-frame.
1:00- 2:00 PM	5	**Introduction to Controls Systems** *Jen Murphy, Engineer* *Parametrix Engineering* Using automated controls and remote monitoring to ensure operators can meet the challenges and keep systems running smoothly. An overview of system options, sensors, transmitters and software.
2:10-3:10 PM	6	**Real Time Process Control** *Jen Murphy, Engineer* *Parametrix Engineering* An overview of on the design, implementation and real-time operation of advanced process monitoring techniques for wastewater treatment plants. A software platform allows the real-time execution of advanced process monitoring techniques that are used for fault and process upset detection and identification. The statistical methods are part of a supervisory control level that allows for integration of the different facets of process monitoring and control, including fault detection, knowledge extraction and controller action.
3:20-4:20 PM	7	**Data, Analysis and the Future of I & C** *Jen Murphy, Engineer* *Parametrix Engineering* Operating increasingly sophisticated treatment processes in a cost-effective and energy-efficient way requires expanding capabilities for rapid, accurate real-time quantification of a broadened range of wastewater constituents as well as envisioning novel feedback control strategies based on these signals. Improvements in nutrient removal, adoption of instrumentation and process upgrades at operating wastewater treatment facilities and proof-of-concept research results focus on leveraging real-time sensing of wastewater chemistry for process monitoring and control.

Session Descriptions: Track B Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge		
DAY TWO		
8:00-9:00 AM	8	**Large Diameter Structural Pressure Pipe Rehabilitation: 30-inch Tight-fit HDPE Case Study** *Daniel Buonadonna* *Jacobs Engineering Group Inc.* Case study for 1.5 miles of 30-inch and 27-inch diameter concrete pipe rehabilitated with tight-fit HDPE lining. Challenges included pressures in excess of 100 psi, steep slopes greater than 40 percent through a valley, and wide gaps between pulled joints.
9:10-10:10 AM	9	**Your DEQ Online** *Jessica Lorenz* *DEQ* The Wastewater Operator Certification program transitioned in early March 2023 to a new cloud-based system called Your DEQ Online. This tutorial will provide a demonstration of how to register and set up an account in Your DEQ Online.
10:20-11:20 PM	10	**DEQ Operator Certification Basics** *Kimi Grzyb* *DEQ* Content will cover how to get and stay certified, reciprocity, and opportunity for program feedback/questions.
11:30-12:30 PM	11	**Pump Performance Assessment: A Panacea for Predictive Maintenance?** *Jen Murphy, Engineer* *Parametrix Engineering* Avoid down-time and increase up-time while reducing unnecessary preventative and corrective maintenance costs. An innovative approach to pump performance assessments and overcoming challenges with a systematic and holistic approach to design and implementation.
1:00- 2:00 PM	12	**Pumping to Greater Heights- City of Portland Collaborative 3D BIM Driven Pump Station Upgrades** *Jen Murphy, Engineer* *Parametrix Engineering* A presentation about a City of Portland pump station upgrade project that benefited from 3D modeling to make design decisions.
2:10-3:10 PM	13	**An Incident Investigation - at the City of Portland WWTP** *Lauren Wilcox, HSSE Manager* *City of Portland, BES* Review of a near miss LOTO safety incident, to include a root cause analysis and corrective action plan as it relates to construction and operations.
3:20-4:20 PM	14	**Too Hot! NPDES Temperature Mitigation** *Jen Murphy, Engineer* *Parametrix Engineering* Thresholds for temperature are a concern in meeting NPDES requirements. Finding solutions to mitigate these impacts by an alternative's analysis can be a consideration. This presentation will cover some mitigation options and evaluation options, as well as cost factors.

Session Descriptions: Track B Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge		
DAY THREE		
8:00-9:00 AM	15	**Condition Assessment 1, 2, 3** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team* How the City of Portland Columbia Boulevard WWTP has developed their Condition Assessment Program.
9:10-10:10 AM	16	**Real Time Equipment Monitoring and Condition Assessment** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team* Hands on demonstration of equipment monitoring connected to condition assessment (may need space outside).
10:20-11:20 PM	17	**Leveraging Data for Reporting and Decision Making** *Mia Sabonavic, Brittany Downing, Ricky Davis* *City of Portland, BES Condition Assessment Team* From data collection and information obtained through condition assessment, learn how to create reports to support asset management decision making.
11:30-12:30 PM	18	**Optimizing Data Management through eRIS** *Tim Kruse* *SUEZ Smart & Environmental Solutions* A tool that can help pull data from multiple systems and provide information that can be easily analyzed and utilized to make operational decisions.
1:30- 2:30 PM	19	**3D Virtual Reality - Project Design** *Jen Murphy, Engineer* *Parametrix Engineering* A hands-on demonstration of 3D modeling to visualize, build and manage projects building a true virtual reality experience.
2:40-3:40 PM	20	**Foundations of Activated Sludge** *Mark Walter, Operations and Maint Specialist* *Water Dude Solutions* Will present process control testing and analysis best practices for activated sludge operation. Identify key parameters and expected ranges. Discuss operational response options to out of range parameters. utilize case studies and data analysis to illustrate how tests are interpreted.
3:50-4:50 PM	21	**Troubleshooting a Process Upset: City of Portland Columbia Boulevard WWTP** *Monica Stone, Process Control Supervisor* *City of Portland, BES* An overview of the Columbia Boulevard WWTP, high rate secondary process and a recounting of a process upset during construction and a chemical supply shortage. The presentation will cover contributing factors, corrective actions and lessons learned.

Session Descriptions: Track C Source Control/Pollution Prevention: Industrial Pretreatment, Stormwater, Reuse & Biosolids		
DAY ONE		
8:00-9:00 AM	1	**Empowering Operators: Harnessing AI-Driven Tools Amid Challenges in Wastewater Treatment** *Keaton Larson Lesnik, PhD* *Maia Analytica* Integrating artificial intelligence (AI) into the water and wastewater treatment sector presents a unique opportunity to enhance outcomes, despite the numerous challenges associated with its implementation. This discussion explores the development and adoption of AI-powered tools tailored for operators, while acknowledging the inherent complexities in refining and incorporating these technologies into daily operations. The focus is on user-friendly systems designed to optimize processes and streamline tasks. Emphasis is placed on the crucial role operations staff play in capitalizing on the opportunities offered by these tools, propelling the water sector towards a more innovative and resilient future.
9:10-10:10 AM	2	**Protecting our Waterways: How to Leverage Microbial Source Tracking for Fecal Contamination Management** *Scott Harding & Michael Waud* *LuminUltra Technologies* Fecal contamination can wreak havoc on your waterways, resulting in fines, health risks, economic losses, and reputational damage. Identifying the source of contamination through Microbial Source Tracking (MST) can help reduce remediation times and costs, and allows you to take proactive measures to prevent future contamination. We discuss understand how MST works, when you should consider MST testing, and how to build an MST testing plan.
10:20-11:20 PM	3	**A City with a Drink(ing) Problem** *Leah Rohan* *Walla Walla* The City of Walla Walla is facing capacity issues at its wastewater treatment plant, requiring a multi-pronged approach. This presentation will take you through the multi-year enforcement of a juice processor and the decision to create a high-strength rate to ensure winemaking facilities, breweries, and distilleries pay for their share of the upgrades.
11:30-12:30 PM	4	**SCAP: A Public-Private Partnerhsip for Catch Basin Maintenance** *Eric Lambert; Christa Britton* *Clark County; City of Gresham* Private catch basins are one of the first lines of defense in preventing pollutants from reaching MS4s and local waterbodies. They require regular maintenance to remove accumulated sediment, but dramatic cost variabilities and the time needed to find and research companies can be barriers for businesses. The Stormdrain Cleaning Assistance Program (SCAP) overcomes these barriers by partnering with a vendor to offer a low set price and creating a simple form where businesses can sign up for maintenance. SCAP is a public-private partnership model with minimal costs to jurisdictions who benefit from getting data on catch basins cleaned and having a valuable tool to offer for getting maintenance done.
1:00- 2:00 PM	5	**Application of Analysis, Planning, and the Incident Command System to Support Emergency Response to Emerging Threats to Oregon's Waterways** *Don Pettit* *ODEQ* Oregon's waters and waterways, long threatened by typical hazardous substances (petroleum fuels, solvents, metals, etc.), are now being threatened by new products moved to and/or through the state. As Oregon has attempted to better understand the risks due to the volume of transport, storage and use of these products, the very nature of the Incident Command structure used in the PNW for over 25 years is being challenged. These threats and

		challenges come at a time when Oregon is also trying to plan for and mitigate risks from a Cascadia Subduction Zone earthquake. This presentation will cover the full range of new and newly identified risks to Oregon's lands, skies and waters from incidental hazardous material releases, and what Oregon Emergency Response Planners are doing to address these new challenges. Case studies will be used to highlight how planning leads to better response outcomes, and where additional effort is needed.
2:10-3:10 PM	6	**Roadside Emergencies & Hazard Awareness** *Dustin Ross* *ODOT* Public Workers are on the roads all day, it's just a matter of time before you could be first on scene with one of these hazards, will you know what to do? This session will cover the awareness of the many unexpected hazards you could come across while working on our roadways; motor vehicle crashes, Haz-mat spills, suspicious persons, crime scenes, etc.
3:20-4:20 PM	7	**Managing Wastewater& Stormwater Field Operations During Challenging Times** *Kyle Bean, Field Operations Supv.* *Water Environment Services* Senior staff turnover, upgrading GIS inventories and the Maintenance Management System, Covid-19 shutdowns, wildfires and severe weather have posed significant challenges to wastewater and stormwater field operations. Learn how Clackamas Water Environment Services rose to the occasion to maintain service to our customers.

Session Descriptions: Track C Source Control/Pollution Prevention: Industrial Pretreatment, Stormwater, Reuse & Biosolids		
DAY TWO		
8:00-9:00 AM	8	**Large Diameter Structural Pressure Pipe Rehabilitation: 30-inch Tight-fit HDPE Case Study** *Daniel Buonadonna* *Jacobs Engineering Group Inc.* Case study for 1.5 miles of 30-inch and 27-inch diameter concrete pipe rehabilitated with tight-fit HDPE lining. Challenges included pressures in excess of 100 psi, steep slopes greater than 40 percent through a valley, and wide gaps between pulled joints.
9:10-10:10 AM	9	**Stress Testing the Sandy Wastewater Treatment Plant** *Keith Scranton* *Veolia* Keith Scranton is a graduate of the Water & Environmental Technology program at Clackamas Community College and has a B.S. in Biochemistry from Portland State University. He began working with Veolia at the City of Sandy Wastewater and Drinking Water Systems in November of 2020 as an Operations and Maintenance Technician. Since then, he has operated the systems through the planning and construction phases of the CM/GC upgrade project, and he is regularly involved in the discussions between the city, construction crew, and engineering team. Currently, he is the Lead Operations and Maintenance Technician with a team of two other operators at full staff.
10:20-11:20 PM	10	**Full-scale Demonstration of Energy and Carbon-efficient BNR** *Dr. Pusker Regmi* *Brown and Caldwell* The 26 mgd Seneca WRRF employs a 4-stage Bardenpho process, secondary clarifiers, and filters to meet stringent nutrient limits (total N of 4 mgN/L, total P of 0.27 mgP/L). One of the five process trains was converted to a test train that included the following changes:1) pumping of mixed liquor recycle (MLR) reduced from 400% to 200% of the influent flow; 2) ammonia-based aeration control (ABAC) to maintain dissolved oxygen (DO) levels in all aerated zones based on real-time ammonia probe readings; and 3) methanol addition discontinued. The ABAC operation uses real-time DO and ammonia measurements to adjust blower turndown and valve positioning to meet the setpoints for the system. Real-time DO, ammonia, and nitrate data were tracked. In addition, weekly profiles of key N, P, and carbon compounds were measured throughout the biological test and control trains to document the complex reactions occurring throughout the process. Batch activity testing was also conducted to quantify the health of the microorganism activity for the key N and P removal pathways. Based on weekly profiles, the average test train effluent ammonia was less than 0.2 mgN/L, TIN was 1.9 mgN/L, and orthophosphate was less than 0.2 mgP/L. SND and post-anoxic denitrification were responsible for enhanced nitrogen removal in the test train. A high degree of P uptake occurred even at low DO conditions, resulting in very low effluent P. The low DO operation (~0.3 mg/L) achieved by ABAC resulted in SND and significant aeration savings compared to the other trains operated at higher constant DO (~1.5 mg/L). The test train removed > 4 mgN/L via denitrification in the post-anoxic zones without supplemental carbon and achieved similar effluent nitrate concentrations compared to the other trains, which do require supplemental carbon.
11:30-12:30 PM	11	**"Novel Food Waste Pre-Processing and Systematic Co-Digestion to Enhance Biogas Production and Improve Solids Treatment"** *Bhargavi Subramanian* *Kennedy and Jenks* "Dr. Bhargavi (Gavi) Subramanian is a Staff Scientist in the Applied Research Group based out of the San Francisco Bay Area offices of Kennedy/Jenks Consultants. Her focus areas include co-digestion of organic wastes, digestion operations optimization, digester foaming guidance, pilot and full-scale wastewater studies. Gavi regularly works with wastewater utilities on optimization of digester operations. She has nearly 5 years of experience in research and technology development of wastewater treatment. Gavi earned her Ph.D. in Environmental Engineering from Illinois Institute of Technology, Chicago."

1:00- 2:00 PM	12	**Advancing State-Level Reuse Policy with Grass Roots Efforts** *Terrance Romaine and Shelly Parini WES* *"Building Support for a Clean Water Future"* The WateReuse-PNW section advocates for a thorough and planned approach to recycled water implementationð an approach that is both sustainable and iterative. By choosing to actively advance water recycling now, communities can avert future water supply issues and choices that will be forced upon them in the future. As a result of a series of advancing water-reuse workshops, Oregon members were called to action: now is the time for water agency leaders to come together to summon the political will, innovate around technical and financial approaches, educate our communities, and champion our aspirational vision. The Oregon Committee for Legislative & Regulatory Affairs was formed to address this charge, and has set forth the following action plan: ÅSupport improvements to regulatory frameworks and processes through partnership and collaboration with DEQ and other clean water associations, such as ACWA. ÅDevelop informational and outreach materials for state legislators, key policymakers, and other state leaders. ÅMonitor emerging legislation and regulatory activity that impacts water reuse programs. ÅProvide a conduit for networking, information sharing, and support for challenging issues such as grant application development, public perception issues, permitting approaches, and more. This presentation will share the results of our discovery efforts, providing a summary of the õState of Reuse in Oregonòforms the basis of our collaborative action plan. The discussion will provide context for specific challenges, highlight the opportunities for positive change, and share the results of our progress. We invite engaged attendees to join our mission of establishing strong frameworks for innovative and community-centric water reuse and to be part of our next steps in advancing reuse in Oregon.
2:10-3:10 PM	13	**Influent Pump Station Flow Equalization at the Rock Creek AWRRF** *Chris Maher* *Clean Water Services* "Lesson covers the development and implementation of influent flow equalization, including data analytics, programming, and plant benefits such as energy efficiency, equipment runtime, process stability. and monitoring of collection system conditions."
3:20-4:20 PM	14	**Process Configurations for Biological Nutrient Removal** *Chris Maher* *Clean Water Services* "Lesson covers the fundamental biology of biological nutrient removal (phosphorus, ammonia, nitrate) and steps through the history and development of process flow diagrams and what they are meant to accomplish, in BNR. (i.e. MLE, A/O, A2O, Bardenpho, West Bank, SSEBPR etc.)"

Session Descriptions: Track B Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge		
DAY THREE		
8:00-9:00 AM	15	**Transformation through Innovation: Sedron's Varcor** *Tim Evenson* Sedron creates disruptive technologies that are fundamentally shifting the world from waste disposal to resource recovery. The Varcor is a liquid waste handling system that creates pathogen-free byproducts: clean water, class A(EQ) dry solids, and aqueous ammonia. Multiple Varcors are running across the country processing different waste steams including septage, biosolids, manure, and stillage. This energy efficient technology takes up a much smaller footprint than other waste processing methods and can be incorporated into WWTPs.
9:10-10:10 AM	16	**Compliance Pitfalls** *Johnny Leavy* *City of Medford* How to avoid pitfalls of commonly overlooked NPDES permit requirements.
10:20-11:20 PM	17	**Control Loop Descriptions, Process and Instrumentation Drawings, and Programmable Logic Controllers usage in Wastewater Operations** Joel Borchers Clean Water Services Control Loop Descriptions and Process and Instrumentations are two types of drawings that assist in building treatment systems in wastewater treatment plants. Their usefulness however continues log after construction is finished and Operations begins. This presentation focuses on what Control Loop Descriptions are, and how they can be used into the future. We then cover the functions of Programmable Logic Controllers (PLCs) and where they sit in the control of equipment in the treatment plant."
11:30-12:30 PM	18	**Albany's WRF Dewatering and Compost Upgrade** *Brian Stevens* *City of Albany* This lesson will chronicle the history behind the need for a composting project, compost facility construction, facility start up, and composting basics.
1:30- 2:30 PM	19	**The Biology of Nitrogen Removal in Wastewater** *Dotti Ramey* *City of Vancouver* The presentation will provide an introduction into the biology behind nitrogen removal in wastewater, focusing on the similarities and difference between the biological communities we need to reliably remove nitrogen. We'll focus on general needs of the bacterial communities and introduce the concepts and terms that engineers and designers use to design and troubleshoot biological nitrogen removal systems.
2:40-3:40 PM	20	**Struvite: Methods of Prevention, Removal and Recovery** *Brett Laney* *Clean Water Services* This presentation will cover why and where struvite forms, and common strategies for prevention, removal and recovery
3:50-4:50 PM	21	**Lessons Learned from A Decade of Phosphorus Recovery at Clean Water Services' WRRF** *Brett Laney* *Clean Water Services* This session will cover initial assumptions about Ostara's technology vs 10 years of operating performance, the unexpected challenges, and how we've addressed them.

Day 3: Thursday, June 29, 2023

TIME	SESSION	**BONUS WORKSHOP** **Adult CPR/AED via the American Red Cross for Wastewater Operators facilitated by Lisa Hillyard $30 Certificate Cost (Cash of Venmo) onsite**
7:00-7:45		*Event Opens: Q&A, Getting Started, Introductions*
8:00-9:00	15	**Adult CPR/AED via the American Red Cross for Wastewater Operators facilitated by Lisa Hillyard Part 1** Lisa Hillyard is an Authorized Outreach OSHA Trainer in both General Industry and Construction. She has been teaching Industrial Safety for over 15 years. Lisa has been employed with Clackamas Community College since 2014. During the first years of the COVID pandemic, Lisa completed a degree in Environmental Health and Safety and became interested in wastewater treatment facilities and their operations. Lisa is offering an opportunity for participants to become certified in adult AED/CPR for $30, which is the cost of the certificate from American Red Cross. Please bring cash or venmo onsite. Lisa Hillyard has taught CPR/AED since 2008.
9:10-10:10	16	**Adult CPR/AED via the American Red Cross for Wastewater Operators facilitated by Lisa Hillyard Part 2**
10:20-11:20	17	**Adult CPR/AED via the American Red Cross for Wastewater Operators facilitated by Lisa Hillyard Part 3**
11:30-12:30	18	**Adult CPR/AED via the American Red Cross for Wastewater Operators facilitated by Lisa Hillyard Part 4 (Final Section)**
12:30-1:30		LUNCH BREAK
1:30-2:30	19	
2:40-3:40	20	
3:50-4:50	21	

NAME:				
MAILING ADDRESS:				
	STREET	CITY	STATE	ZIP CODE
E-MAIL:		Date of Birth:		
			MM/DD/YYYY	

Track Descriptions

Collection Systems: Operations & Maintenance, Safety, Asset Management

Wastewater Operations: Basics & Beyond, Safety, Asset Management/ Technology/ Activated Sludge

Source Control/Pollution Prevention: Industrial Pretreatment, Stormwater, Reuse & Biosolids

THURSDAY, JUNE 29, 2023

	TRACK	Collection Systems	Wastewater Operations	Source Control/ Pollution Prevention
1	8:00-9:00 AM			
2	9:10-10:10 AM			
3	10:20-11:20 AM			
4	11:30-12:30 PM			
5	1:30-2:30 PM			
6	2:40-3:40 PM			
7	3:50-4:50 PM			

NEXT STEPS

Remember to turn in your CEU card at the registration desk before you leave. We will be emailing out your certificates at the end of the conference on Thursday June 29, 2023. ORWEF.wes@gmail.com will be sending electronic certificates to the email you specified in the registration process.

Thank you!

amber.steele@clackamas.edu
www.clackamas.edu/WET