PNCWA2026
Rising to the Moment: Advancing a Sustainable Water Future

Annual Conference & Exhibition
September 13–16, 2026
Spokane Convention Center
Spokane, WA

This CEU Packet Includes:

- PNCWA2026 Event Agenda
- Opening General Session Information
- Presentation Descriptions with Speaker Bios
- Conference Tour Information
- Mobile Sessions Information
- Ops Challenge Information

Determination of Max Conference Credit Amount

Max Credit	Times	Activity
Sunday, September 13		
0.2	10:00 AM-12:00 PM	Ops Challenge Practice
0.3	1:00-4:00 PM	Ops Challenge Orientation and Training
0.1	5:30-6:30 PM	Ops Challenge Competition
Monday, September 14		
0.15	8:30-10:00 AM	Opening General Session
0	10:00-10:15 AM	Break
0.2	10:15 AM-12:20 PM	Technical Sessions
0	12:25-1:25 PM	Lunch
0.1	1:30-2:30 PM	Technical Sessions
0	2:30-2:45 PM	Break
0.2	2:45-4:50 PM	Technical Sessions
Tuesday, September 15		
0.1	8:00-9:00 AM	Technical Sessions
0	9:00-9:30 AM	Break
0.2	9:30-11:35 AM	Technical Sessions
0	11:35 AM-1:00 PM	Lunch
0.1	1:05-2:05 PM	Technical Sessions
0	2:05-2:35 PM	Break
0.2	2:35-4:40P PM	Technical Sessions
Wednesday, September 16		
0.2	8:00-10:05 AM	Technical Sessions
0	10:05-10:25 AM	Break
0.2	10:25 AM-12:30 PM	Technical Sessions
Total Max Credit per Attendee: For Ops Challenge participants – **2.2 CEUs** (22 Contact Hours) For all other attendees – **1.6 CEUs** (16.5 Contact Hours)		

PNCWA2026: *Rising to the Moment*

Monday, September 14th Agenda

Time	Room 201	Room 202	Room 205	Room 206A	Room 206B	Room 206C	Room 206D	Room 207	Other Events
7:00AM - 8:00AM	**Ballroom 111: Breakfast (Open to All Attendees)**								
8:30AM - 10:00AM	**Ballroom 111: Opening General Session**								
10:00AM -10:15AM	**BREAK**								
10:15AM - 11:15AM	Wastewater Treatment Fundamentals, Session 1	Puget Sound Nutrients, Session 1	Optimization of Municipal Treatment Facility Operations, Session 1	Leadership & Development, Session 1	Climate Adaptation & Resilience, Session 1	Collection Systems and Distribution, Session 1	Water Reuse, Session 1	Municipal Treatment, Session 1	Stormwater Tour 10:15 AM - 12:20 PM
	Wastewater Treatment 101 *Hannah Thomascall*	Navigating Nutrient Regulation in Puget Sound *Eleanor Ott , Shawn McKone*	North Idaho Operator Panel Discussion: UltraLow Tertiary Phosphorus Removal *Kylie Cutler , Andrew Ruiz, Craig Borrenpohl*	People and Pixels: Leading and Managing in an Increasingly Virtual World *Dan Speicher*	Don't be the frog in the warming waters. Operations and climate change: a primer and a peer sourced set of vulnerabilities and solutions to prepare for a resilient water system today. *Tracy Lunsford, Beth Miller, Layne McWilliams*	Lessons Learned in Condition Assessment of the Inverness Force Main System *Heather Stephens, Brenda Sherwood*	Quantifying PFAS in Crops and Wetland Vegetation at Land Application Sites *Kimia Tabib*	Innovative Temporary Disinfection Strategy Saves Construction Time and Money *Patricia Tam*	
	MBR Treatment Facilities in Practice: Overview, Applicability, and Procurement *Kelsey Wagner,*	Nutrient Removal Performance to Inform Technology Based Effluent Limits *Charles Hammond*		Leading a Multigenerational Workforce Through AI Adoption *Mizan Rashid, Mark Poling*		FFRPP Force Main Rehabilitation – The New Standard in Pressure Pipe Lining Sysytems *Matthew Izzard*	Transforming Waste Into Value Through Advanced Water Reuse Technologies Murthy Kasi, Raj Chavan	Ultraviolet (UV) Disinfection Procurement Selection Process Aiding the Design Development of the 210 mgd Elliott West Wet Weather Treatment Facility *Michael Borrero, Meghna Prasad*	
11:20AM - 12:20PM	Wastewater Treatment Fundamentals, Session 2	Puget Sound Nutrients, Session 2	Project Delivery, Session 1	Leadership & Development, Session 2	Climate Adaptation & Resilience, Session 2	Collection Systems and Distribution, Session 2	Water Reuse, Session 2	Municipal Treatment, Session 2	
	Fundamental Concepts in Biological Nutrient Removal *Christine HengelProm*	Connecting Nutrient Management to Oxygen Available for Puget Sound Organisms *Stefano Mazzilli, Marielle Kanojia*	Market Pulse: How to Use Market Soundings to Improve Collaborative Delivery Procurement *Shelby Hodge, Laura Nolan*	First Time Supervisor? Don't Just Survive, Thrive! *Mark Poling, Jason Flowers*	From Risk toward Resilience: Climate Adaptation for King County's WW Infrastructure *Jennifer Belknap*	CIPP Lining the Unlineable *Bob Jacobsen*	Upgrading Clean Water Services' Temperature Compliance Strategy – A Holistic, Watershed and ValueBased Approach *Scott Mansell , Lauren Roof*	HighRate Clarification for Wet Weather Resilience: Actiflo BenchScale Study *Brent Robinson, Karstin Jacobson*	
	50 years of tertiary treatment. Leveraging tertiary filtration experiences of the past when designing for the future. *Danny Murphy*	An Evolving Regulatory Tide: Nutrient Compliance Changes for Puget Sound *Amanda McInnis, Natalie Monro*	Avoid Common CM/GC Pitfalls: Pursuing a WinWin without Giving Away the Farm *Michelle Green*		Climate Resilience in Action: Practical Frameworks from CoasttoCoast *Maithilee Das Lappin*	UltraViolet CuredinPlacePipe Lining of Center Street Trunk, a Large Diameter Eggshaped Brick Sewer in the Downtown area *Zach Swartzendruber,*		CFD Modeling Supports the 210 mgd Elliot West Wet Weather Treatment Facility Hydraulic Design *Ed Wicklein*	
12:25PM - 1:25PM	**Ballroom 111:** Awards Luncheon (Ticket Required)								
1:30PM - 2:30PM	WAVE PRESENTATIONS	Puget Sound Nutrients, Session 3	Optimization of Municipal Treatment Facility Operations, Session 2	Utility and Asset Management, Session 1	Emerging Contaminants, Session 1	Collection Systems and Distribution, Session 3	Biosolids, Session 1	Municipal Treatment, Session 3	
		Tracking Puget Sound Nutrient Loading Trends and Water Quality Response *David Clark, Joel Baker, Stefano Mazzilli*	Breaking the Cycle of Scaling: A Fresh Approach at Tri-City WRRF *Josh Miner,* Shubhashini Oza	Rising to the Moment Through Practical Shut Down Planning for Operational Facilities *Nicole Ream, Hana Kim , Christina Vanburen*	Avian Influenza A(HS) Surface Water Detection with eDNA Mobile Filtration *Bella Beha*	Finding the Path: When to Choose GC/CM or PDB for Linear Conveyance *Patrick Weber*	Biosolids Planning for Community Growth Under Uncertainty: A RoadmapBased Approach *Quinn Behnke, Bill Owen*	Implementation of a Major Wastewater Plant Expansion through the use of Progressive Design Build *Rick Kelly, Kelly Comstock*	
			Durham WRRF Tertiary Filter Performance Optimizations *Jana Otero, Matthew Christensen, Alex Crozes*	Risk, Reward and Reality – Structuring Your Project So That Contractors Want to Hard Bid *Chris Baersten*	Genomic techniques informing harmful algal bloom (HAB) management strategies *Rachel Golda*	Lessons from Supporting 10+ Miles of Large-Diameter Pipeline Construction *Jennifer Kersh, David Kelly*	Policy Shifts & Technology Transitions: Scaling Biosolids Thermal Drying for LongTerm Resilience *Jeremy Koch*	City of Lynden WWTP Biological Nutrient Removal Upgrade: Phased Conversion of Oxidation Ditches to MLE Within a FloodwayConstrained Site *Bita Nazyab*	
2:30PM - 2:45PM	**BREAK**								Spokane County Regional Water Reclamation Facility Tour 1:30 PM - 3:45 PM
2:45PM - 3:45PM	Project Delivery 101, Session 1	Puget Sound Nutrients, Session 4	Optimization of Municipal Treatment Facility Operations, Session 3	Utility and Asset Management, Session 2	Emerging Contaminants, Session 2	Collection Systems and Distribution, Session 4	Biosolids, Session 2	Municipal Treatment, Session 4	
	Critical Early Planning for Program Delivery: Keys to LongTerm Success *Petra Liskova, Anna James*	Evolving Puget Sound Nutrient Database to Support Broader Nutrient Program *Amanda McInnis*	Sweating the Assets Low Build Intensification for Total Inorganic Nitrogen Removal with the Mobile Organic Biofilm™ (MOB) Process Installation in Reno, Nevada *Graig Rosenberger*	Digital Dreams Meet Operational Reality: Curing the Shiny Object Syndrome *Scott Bash*	'Background' PFAS occurrence in groundwater and soil: influence of land use and urbanization *Rachel Golda, Ryan Dougherty*	Pipe Ramming for the Frogs *Brendan O'Sullivan , Brandon Falk*	A Solid Approach to Pasco's Growing City *Will Kirby*	State Point in Practice: Validating Assumptions and Making Daytoday Operational Decisions *Ornella Sasa-Hernandez, Erik Lorntson*	
	Rising to the Moment Through Interface Management in Complex Capital Programs *Nicole Ream, Gabe Solmer*	Post Point's Nutrient Reduction Evaluation Findings *Anne Conklin*	Aeration System Evaluation at Pocatello WPCF: Diffuser Replacement Restores Capacity and Avoids Near Term Blower Upgrade *Katerina Messologitis, Skyler Allen*	AI and Machine Learning in the Water Industry: RealWorld Applications for Enhanced Operations and Asset Management *Nandita Ahuja*	Beyond Nutrients: PilotScale Removal of Phosphorus, Toxicity, Metals, and PFAS *Nick Guho*	Strategic Selection of Sewer Installation and Rehabilitation Methods on a Complex Utility Project *Jacob Korsness*	Grease, Gas, and the Bottom Line: Twelve Years of FOG Facility Operations at the Durham WRRF *Kevin Wegener, Dan Garbely*	Improving CSO Metals Removal: Bench Scale Results and Treatment Pathways *Natalie Gustafson, Shannon Cavanaugh, John Carter*	
3:50PM - 4:50PM	Watershed 101, Session 1	Puget Sound Nutrients, Session 5	Optimization of Municipal Treatment Facility Operations, Session 4	Utility and Asset Management, Session 3	Emerging Contaminants, Session 3	Collection Systems and Distribution, Session 5	Biosolids, Session 3	Municipal Treatment, Session 5	
	Benefits of Stream Restoration and Habitat Enhancement to Improve Watershed Health, Drought Resilience, and Inform BasinWide Planning *Paul Beskow*	Balancing Uncertainty and Compliance King County's Nutrient Reduction Evaluation *Ian McKelvey, Anne Conklin, Ali Saperstein*	Leveraging MABR Intensification Technology to Remove Nitrogen within Existing Tankage *Michael Falk*	An Improved RFP/RFQ Process for Everyone's Benefit *Brian Murphy, Frank Dick*	DeRisking PFAS Compliance with RSSCTs and Machine Learning *Joe Downey, Raj Chavan*	From Aging to Amazing: Pump Station Retrofit Wins and the Moments That Made Us Smarter *Adam Crafts*	Reducing Risk and Improving Performance in Thermal Hydrolysis Systems *Tom Nangle*	Wastewater Surveillance Reveals Geographic and Sociodemographic Patterns of Antimicrobial Resistance *Matthew Latham*	Women of Water Networking Event 3:50 PM - 5:30 PM Roof Deck
	Water Quality Trading 101: Watershedbased Clean Water Act Compliance Strategies *Chris Thomas, Jessica Fox*		Optimizing SBR Aeration Through DataDriven Modeling *Thomas Maere*		From Data to Decision: PFAS Treatment Strategies for Landfill Leachate *Robert Rebodos*	Taking the Stink Out of Wet Well Maintenance *Sam Taaffe*		When Everything Changed Overnight: The Story of Lahaina WWTF Resilience *William Leaf*	
5:00PM - 7:00PM	**Exhibit Hall 100:** Exhibit Hall Opening Reception								
7:15PM - 8:30PM	**Film Showing in Conference Theater: *Unless Something Goes Terribly Wrong***								

PNCWA2026: *Rising to the Moment*

Tuesday, September 15th Agenda

Time	Room 201	Room 202	Room 205	Room 206A	Room 206B	Room 206C	Room 206D	Room 207	Exhibit Hall	Other Events
7:00AM - 8:00AM	**Ballroom 111C: Operator's Breakfast | Ballroom 111AB: Breakfast** (Open to All Attendees)									
8:00AM - 9:00AM	Conveyance 101, Session 1	Water Reuse, Session 3	Digital Solutions and Automation, Session 1	Public Communications and Outreach, Session 1	Storm, Surface Water, and Watershed Management, Session 1	Collection Systems and Distribution, Session 6	Municipal Treatment, Session 6	Biosolids, Session 4	Exhibit Hall, Session 1	
	Lift Station Design 101 *Curtis Butterfield, Julia Reese*	Advancing Water Reuse Through Regulatory Reform: A PNW Perspective *Amelia Luna, Erin Mackey, JJ Fenton*	Build, Buy or Hybrid: Pathways to Continuous Water Quality Monitoring *Jason Cook*	Going Together to Go Farther: Regional Collaboration for Better Outcomes *Elizabeth Lowell, Manon Fisher*	From Limits to Markets: Assessing the Feasibility of a San Francisco Bay Nutrient Water Quality Trading Program *Chris Thomas, Mike Falk*	Technologies for Climate Resiliency in Sewer System *Ann Quenzer*	Around the World in 40 Minutes: Global Lessons for Meeting Stricter Nitrogen Limits *Matt Noesen, Paul Steele*	Designing for Flexibility: PilotScale Digestion for LongTerm Solids Planning *Tyler Barber*	Influent to Effluent Wastewater Technologies Mobile Session	
	Digging into NoDig: Intro to Trenchless Technologies *Ross Varin*		Flowing Together: Spokane Turns RealTime Data into Action to Advance Stormwater Treatment and Protect the Spokane River *Adam Rhoades*		Wastewater Treatment for Watershed Protection: Understanding the Three Basin Rule *Peter Olsen, Pam Villarreal*	Optimizing the Benefits of I/I Reduction: Oregon City's Approach to Private Side Laterals *Dave Brokaw*		The Same…But Completely Different: Thermophilic Aerobic Digestion Overhaul(s) in the Pacific Northwest *Matthew Williams*		
9:00AM -9:30AM	**BREAK: Exhibitor Hall**									Upriver Dam Tour 9:00 AM - 11:40 AM
9:30AM - 10:30AM	Project Delivery 101, Session 2	Water Reuse, Session 4	Project Delivery, Session 2	Public Communications and Outreach, Session 2	Storm, Surface Water, and Watershed Management, Session 2	Collection Systems and Distribution, Session 7	Municipal Treatment, Session 7	Biosolids, Session 5	Exhibit Hall, Session 2	
	Delivering Differently Making Sense of Collaborative Delivery Options *Michelle Green, Kristen Jackson*	From Regional Discharge to Hillside Reuse: Designing Affordable Wastewater Solutions for Small Communities *Ashley Williams, Nathan Wright, Jon Groth*	From Cost to Impact: Reframing Water Investments for Value *Luke Pinto*	Building the Dream Team: Crafting Stories for Project Partnerships and Funding *Kelly Black, Erin Cox*	Beyond Opportunistic Retrofits: A Strategic Framework for WatershedScale Nature Based Solutions *Nikki Redden , John Phillips*	Rising to Coastal Risk – Relocating the 55th Street Pump Station *Travis Meyette, Shawn Spargo*	Navigating Complex Biological Nutrient Removal Process Selection Decisions in an Uncertain Regulatory Climate *Kathryn Gies, Johnny Leavy*	Digestion Without Indigestion: Adaptive Planning for Biosolids Resiliency and Risk Management in the face of Uncertainty *Jen Murphy, Heather McKenna*	Collections Systems Mobile Session	
		Source Water Characterization and Pilot Planning for Advancing Potable Reuse in the Pacific Northwest *Victoria Nystrom,* Stephen Taylor	From Episodic VE to Continuous Value Management: Lessons from Seattle's Mouth of Duwamish CSO Program *Tyler Brenton , Greg Brink*	Working Upstream: Advancing EquityInformed Actions in Wastewater Capital Projects *Anika Tabachnick, Keanna Dandridge, Lynsey Burgess*		Designing for Resilience: Delivering the Fry Creek Pump Station to Protect Aberdeen from Tidal and Storm Driven Flooding *Charlie Allaben, David Kuhns*	Operating Experience with DAS, ABAC, and Sidestream Nutrient Removal at the Boulder WRRF *Nathan Brown*			
10:35AM - 11:35AM	Utility Management 101, Session 1	Water Reuse, Session 5	Project Delivery, Session 3	Public Communications and Outreach, Session 3	Storm, Surface Water, and Watershed Management, Session 3	Collection Systems and Distribution, Session 8	Municipal Treatment, Session 8	Biosolids, Session 6	Exhibit Hall, Session 3	
	Stormwater Infrastructure Maintenance Overview *Becky Casey*	Water Reuse Projects: Where Innovation and Dreams Meets Operational Realities *Ken Windram*	Clear as Primary Effluent – A CMGC Delivery Story in Oregon *Rob Peacock , Josh Johnson , William Pense*	Building Trust Around the Tap: Engaging Communities to Address Chronic Groundwater Contamination *Isaac Estrada*	City of Spokane's Adaptive Management Approach to Facility Planning *Amanda McInnis, Lorena Croucher*	Microtunneling to Minimize Community and Environmental Impacts *Brendan O'Sullivan, Glen Wheeler*	Piloting MABR Nitrogen Removal Under RealWorld Operating Constraints *Nikita Kowal, Anne Conklin*	From Cake to Product: Transforming Class A Biosolids Through Biodrying *Todd Williams*	Wastewater Solids Handling Mobile Session	
	I/I CostEffectiveness 101: DataDriven Decisions for Wet Weather *Brent Robinson*	Demonstrating the ecological benefit of reuse water for wetland restoration using environmental DNA metabarcoding *Hannah Ferguson*		Down the Drain and in your Brain – How to get Wastewater Education to Stick *Hannah Thomascall, Elisabeth Murphy*	Balancing Water Quality & Cost: Adaptations to Nutrient Regulations in the West *Jessica Shepard, Geneva Bernsten, Madelynn Knab*	Emergency Repair and LongTerm Rehabilitation of Goedeck Trunk, RUSA's Primary Wastewater Conveyance Asset *Ryon Kershner, Clay Jordan, Rob Lee*	A UK first: The world's largest MABR combined with densification *Craig Duvall*	Beyond Dry: What Happens Next *Amy Hanna*		
11:40AM - 1:00PM	**Ballroom 111:** PNCWA Business Luncheon (Ticket Required)									
1:05PM - 2:05PM	Wastewater Treatment Fundamentals, Session 3	Water Reuse, Session 6	Digital Solutions and Automation, Session 2	Industrial Treatment, Session 1	Storm, Surface Water, and Watershed Management, Session 4	Leadership & Development, Session 3	Climate Change Adaptation, Greenhouse Gas Emissions, and Sustainability, Session 1	Municipal Treatment, Session 9	Exhibit Hall, Session 4	
	Nutrient Removal 101: From Conventional Activated Sludge to Advanced Technologies for Stringent Compliance *Murthy Kasi,* Austin Carnes, *Ron Gearhart*	When It Rains, It Pours: RiskBased Winter Reuse Management in a Groundwater Management Area *Lauryn Guerrissi, Joe Mitzel*	From GIS to GIIS: The Next Evolution of Utility Intelligence *Mike Van Doorn, Marty Anderson*	Beer For Drinking, Recycled Water for Data Center Cooling A Case Study *Ufuk Erdal*	Restoring Historic Drainages & Managing Risk with Regional Stormwater Facilities *Thomas Suesser, Kaitlin Vacca*	Equitable Workforce Development Models for Large Utilities *Margo Iniguez Dawes, Eli Weiss*	Operational Tradeoffs Between Nutrient Removal and N_2O Emissions in Aerobic Granular Sludge Systems *Bao Nguyen Quoc*	Biological Phosphorus Removal and Anaerobic Zone Sizing from a Carbon Perspective - Clarifying Return on Investment *Isabel Huggins*	Wastewater Reclamation Facility Emerging Technologies Mobile Session	
		Butte Montana Leading the Northwest in Wastewater Effluent Reuse *Garrett Pallo*	When do Digital Tools Actually Help Operators? *Chinmay Gaidhani*		Navigating Turbulence: Underground Stormwater Design in a Constrained Corridor *McKailee Beck, Bob Thayne*		Witchy Brew: New Empirical Insights into the Dark Art of Primary Sludge Fermentation *Jon Liberzon*	Nanobubble Pretreatment as an Intensification Strategy at the Budd Inlet Treatment Plant *Riley Murnane, Paul Jue, Stephen Taylor*		
2:05PM - 2:35PM	**BREAK: Exhibitor Hall**									
2:35PM - 3:35PM	Wastewater Treatment Fundamentals, Session 4	Water Reuse, Session 7	Project Delivery, Session 4	Industrial Treatment, Session 2	Storm, Surface Water, and Watershed Management, Session 5	Leadership & Development, Session 4	Municipal Treatment, Session 10	Municipal Treatment, Session 11	Exhibit Hall, Session 5	
	Centrifuge Processing 101 *Sean Tierney*	Quantitative Water Quality Risk Assessments *Topher Jones*	Getting Back on Track: Overcoming Schedule Challenges with Progressive DesignBuild *Brad Florentin*	Research and Regulation: Proactively and Reactively Investigating Industrial Sources of Nitrification Inhibition *Leila Barker, Cierah Alferness*	Shaving the Peaks in Battle Ground: A Case Study in Equalization *Travis Tormanen, Travis Meyette*	Learning how to juggle: Multidisciplinary project management 101 *Laura Nolan*	Integrating Partial Denitrification–Anammox and Biological SelectionDriven Densification in a FullScale ContinuousFlow Facility Under Stringent Nitrogen Limits *Yewei Sun*	The Next Generation of Biological Nutrient Removal: how the results from three Water Research Foundation projects will influence the future of nutrient removal design and operation *Leon Downing*	Wastewater Treatment Odor Control Mobile Session	City of Post Falls Water Reclamation Facility Tour 1:05 PM - 4:40 PM
	Tertiary Filtration 101 *Michael Bundy*	Artificial Intelligence and Machine Learning Can Make Potable Reuse Projects More Resilient than Ever *Ufuk Erdal*	Progressive Design Build Provides Lessons Learned from the Pandemic for Critical Infrastructure *Michael Fuss*	Utility as Connector: Building Regional Resilience Through Industrial Symbiosis *Jessica Shaw, Matt Noesen, Mike Hodgson*	West Point Treatment Plant Steady and Transient Hydraulic Modeling *Mahsa Ahmadpoor*	High Performing Teams That Deliver: Practical Lessons for Wastewater and Stormwater Projects *Keith Ward, Kerri Franklin*	Intense Intensification Modeling: Improved Sensitivity and Capacity Analyses of Densified Sludge *Luke Pinto*	Beyond Nitrification: SystemWide Considerations Associated with BNR Conversion *Majid Neyestani*		
3:40PM - 4:40PM	Wastewater Treatment Fundamentals, Session 5	Water Reuse, Session 8	Project Delivery, Session 5	Optimization of Municipal Treatment Facility Operations, Session 5	Storm, Surface Water, and Watershed Management, Session 6	Emerging Contaminants, Session 4	Municipal Treatment, Session 12	Biosolids, Session 7	Ops Challenge Session 1	
	Biosolids Land Application 101 *Jori Nelson*	PNW WateReuse: Water Right Considerations *Adam Gravley*	From Red Tape to Green Lights! How CM/GC Can Expedite Project Delivery and Bolster Owner Engagement *Jordan Parker, Justin Blickle*	Empowered Operators Deliver Energy Savings *Matt Smeraglio*	From Submittal to Decision: Strengthening Stormwater and Floodplain Development Review *Dan Gariépy, Kripa Chandran*	PFAS Mitigation at Water Reclamation Facilities Leveraging Existing Processes *Michael Cubas*	Designing Nanobubble Pilots That Deliver: Lessons from Previous Experimental Frameworks *Jon Liberzon, Stephen Taylor*	Making Digester Gas Work: Renewable Natural Gas Case Study *Karen Bill, Adam Behr*	Leadership Development Through Operations Challenge Kevin Wegener, Chris Carsner	
	Activated Carbon 101: Fundamentals, Performance, and Practical Applications in Water Treatment *Christopher Vizcaino*	We Can't Do it Alone: Building a Strategy for Community Partnerships *Natalie Monro*	OnTime and Under Pressure: Collaborative Upgrades to Nampa's Influent Systems *Michael Schulz, Shannon Johnson , Nick Miller*	Crawling Out of the Graveyard: Practical Learnings from Utilities Transitioning from 24/7 Staffing *Thomas Maere*	Counter the Scour! How Large Woody Material can be used to Protect Assets and how to Manage Risks *Paul Beskow*	Topic TBD Speaker TBD	Is Your Concrete QuietQuitting? Restoring Service Life for Critical Wastewater Facilities *Riley Walsh*	BioDrying for Small Municipalities Case Studies, Performance Data, and Economic Analyses Valentino Villa		
4:45PM - 6:45PM	**Exhibit Hall 100:** Exhibit Hall Closing Reception									
7:00PM - 10:00PM	**Block Party**									

PNCWA2026: Rising to the Moment

Wednesday, September 16th Agenda

Time	Room 201	Room 202	Room 205	Room 206A	Room 206B	Room 206C	Room 206D	Room 207	Other Events
7:00AM - 8:00AM	**Ballroom 111: Breakfast** (available to all attendees)								
8:00AM - 9:00AM	Project Delivery 101 , Session 3	Biosolids, Session 8	Project Delivery, Session 6	Optimization of Municipal Treatment Facility Operations, Session 6	Storm, Surface Water, and Watershed Management, Session 7	Municipal Treatment, Session 13	Collection Systems and Distribution, Session 9	Climate Change Adaptation, Greenhouse Gas Emissions, and Sustainability, Session 2	
	Building Resilient Utilities: Creative Financing for Water and Wastewater *Stillman Norton , Pam Villarreal*	The Impacts of Heating Biosolids on the Fate of PFAS: Drying, Pyrolysis, and Gasification *Francesca Cecconi*	Beyond asbuilts: Asset onboarding that works *Chris Puccio*	Novel Aeration Control Delivers Energy Savings and Improved Nutrient Removal *Mark Gehring*	Modeling Aquifer Storage and Recovery for Thermal Mitigation on the Tualatin River, OR *Zoe Rodriguez del Rey , Jared Kinnear*	Study of a Montana Waterbody The Ashley Creek Use Attainability Analysis (UAA) *Rickey Schultz, Chad Wiseman*	Beyond Gravity: Developing a Risk Framework for Pressurized Sewer Infrastructure *Rob Lee, Vanessa Johnson, Melissa Moe*	GHGs for poop? We've got the scoop! There's new GHG guidance created specifically for the water sector. *Tracy Lunsford, Stephen Greenslade*	
	Constructability Review 101 – Fundamentals, Benefits, and Practical Examples *Adam Rector*	From Pilot to FullScale: Navigating the Integration of Advanced Thermal Technologies for PFAS Removal in Biosolids *Donald Song*	Designing with Intent: Constructability Driven SOE Designs for the Carolina Trunk Sewer Rehabilitation Project *Conner Bauman*	Modeling The Impacts of Calcium Carbonate Alkalinity Enhancement on Biological Nutrient Removal *Nick Popolizio, Benjamin Geyman*	When Water Quality Standards Can't Reasonably Be Attained: Clean Act Water Options and Precedents *Clifton Bell*		Beyond Compliance: Elevating Stormwater Management from Permit Tracking to Strategic Asset Stewardship *Michelle Perdue , Shawn Alire, Beth Schrayshuen*	A CostEffective Nature Based Approach to Effluent Thermal load Mitigation *Mike Montazeri, Pete Munoz*	
9:05AM - 10:05AM	Modeling 101, Session 1	Biosolids, Session 9	Project Delivery, Session 7	Digital Solutions and Automation, Session 3	Storm, Surface Water, and Watershed Management, Session 8	Municipal Treatment, Session 14	Collection Systems and Distribution, Session 10	Climate Change Adaptation, Greenhouse Gas Emissions, and Sustainability, Session 3	Airway Heights Water Reclamation Plant Tour 8:00 AM - 10:30 AM
	Biological Process Modeling 101 and Beyond *Katerina Messologitis, Vrunda Patel*	Unlocking Hidden Solids Capacity Through Holistic, DataDriven Planning and Optimization *Luke Thompson Pinto, Alli Hornak*	Navigating Friction Between Engineers and Manufacturers *Tanner Windom, Keith Beckman*	Beyond the Buzzwords: What Digital Technology Can Deliver Today for Water and Wastewater *Susan Howard*	Hydro Logic: Data Driven Decisions for Current and Future Facilities in Floodplains and Floodways *Dan Gariépy, Kripa Chandran*	Origin of a Species: The Evolution of the Modern Day Mechanically Cleaned Bar Screen *Gary M Lohse, Andrew McGuire*	Separating Out the Crap: How to Innovate in a Changing Industry *Sam Taaffe* , David Lane	Extension of BEAM tool for assessing PFAS emissions and sustainability metrics in biosolids thermal processes *Francesca Cecconi*	
	Introduction to Hydraulic Modeling Applications of Hydraulic Modeling in Water, Stormwater, and Wastewater Infrastructure Design *Mizan Rashid, Ashraful Islam*	Thermal Processes: Fundamentals and Next Steps *John Ross*	CMGC in Action: Construction Progress and Lessons Learned from the Carolina Sewer Trunk Rehabilitation *Sarah Lingley, Ainsworth Marshall, Ryan Carney, Chris Bottoms*	Reimagining Water Utility Automation: Lessons from the City of Conroe's SoftwareDefined Transformation *Aayush Patel*	Integrated MicroSorbent Adsorption and Pile Cloth Media Filtration for Advanced Removal of Organic Micropollutants and PFAS in Wastewater Effluents *John Dyson*	DataDriven Headworks Design *Tim Matheis*	How to plan for growth when working with overly optimistic developers *Brad Mercure, Austin Suing*	From Deterministic Design to RiskBased Sewer Planning Under Climate Uncertainty *Amin Mahdipour, Scott Mansell*	
10:05AM - 10:25AM	**BREAK**								
10:25AM - 11:25AM	Wastewater Treatment Fundamentals, Session 6	Biosolids, Session 10	Project Delivery, Session 8	Digital Solutions and Automation, Session 4	Optimization of Municipal Treatment Facility Operations, Session 7	Municipal Treatment, Session 15	Emerging Contaminants, Session 5	Utility and Asset Management, Session 4	
	The Good, the Bad, and the Plugged: A Beginner's Guide to Screening *Kylie Cutler*	Challenges in Startup of a Biological Class A Biosolids System *Scott Weirich*	You Bought It How Many Times? Lessons in MegaProject Operator Training *Kiersten Lee, Lindsey Rafter*	What' just happened? Why can't we have the right data when we need it? *Mario Benisch, Austin Carnes*	Biological Nutrient Removal Facility Process Controls for Operational Flexibility and Reduced Operating Costs *Francesca Cecconi, Tricia Sweeny, Johnny Leavy*	Combining Innovation and Funding to Meet Challenges in Rigby, Idaho *Eric Roundy*	Remote Lab: Rapid OnSite Detection of Candida auris in Wastewater *Ollie Cook*	From Stalemate to Solution: How Community Engagement Resolved a Four Decade Wastewater Challenge in Fall City *Brian Shuck, Jeff Wilson*	
	So you think you want an Actuator? *Chris Baersten*	Startup & Optimization of Pocatello's Biosolids Reuse and Recovery Process *Jared Richens, Justin Bloxham, Colter Hollingshead*	OperatorCentered and Multi Modal Training for Complex Projects Ship Canal Water Quality Project Storage Tunnel Training Program *Asa Chavez-Knight, Juliana Andrade*	Designing Smarter: How Digital Twins Reduce Construction Cost in Aeration Basin Upgrades *Bruce Johnson*		Big Funding, Big Challenges: The Twisp Story *Brent Deyo, Andrew Denham*	Stormwater 2.0: Managing Emerging Contaminants and Evolving Water Quality Rules *Jana Crawford, Dustin Atchison*	Risky Business: A Collaborative Approach to Risk and Vulnerability in Comprehensive Planning *Swati Maurya, Ryan Haller, Justin Phelps*	
11:30AM - 12:30PM	Optimization of Municipal Treatment Facility Operations, Session 9	Biosolids, Session 11	Project Delivery, Session 9	Digital Solutions and Automation, Session 5	Optimization of Municipal Treatment Facility Operations, Session 8	Municipal Treatment, Session 16	Municipal Treatment, Session 17	Leadership & Development, Session 5	
	Permits, Petitions, and Progress: Delivering Under the Three Basin Rule *Luke Jones, Tsigereda Woldegiorgis* , Pamela Villarreal	Inside the First Full-Scale Microbial Hydrolysis Facility *Cameron Clark*	Threading the Needle: King County Wastewater Treatment Division's Innovative Alternatives Evaluation to Solve CSO Challenges for the Mouth of the Duwamish River *Edith Hadler, Shelby Hodge*	Modernizing SCADA Communication with Private Cellular Networks *Jeffrey Kanyuch, Trevor Klatt, Andy Huffman*	Commissioning Starts on Day 1: Building a StartupReady Facility *Keith Beckman, Curtis Fenner*	Fixed Covers, Secure Future: A Digester Upgrade Strategy Focused on Safety, Simplicity, and Emissions *Hannah McLean, Karina Woodland*	Breathing new life into old bioreactors: innovative aeration strategies for the future *Vrunda Patel*	Mission Ready: Recruiting the Next Wave of Water Operators from the Military *Dotti Ramey, Becca Chapa*	
	Groundwater Changes and its Effects on Underground Electric Infrastructure *Lauren Koonce*	Changing Paradigm - Idaho Falls WWTP Biosolids Long Term Alternatives Evaluation *Nickolas Smith, Darrin Lords, Laura Swanberg*	Optimizing a Combined Sewer Overflow Long Term Control Plan Using Alternative Delivery Methods to Deliver CSO HighRate Treatment *Yan Duan, Tim Healy*		Who's afraid of Serial #1? First Installations of New Processes or Equipment. *Mario Benisch*	Membrane Disc Diffusers – Clean or Replace? *Jon Butt*	Bringing Aerobic Granular Sludge (AGS) to Continuous Flow Treatment Plants: A GameChanger for New Plants, Nutrient Removal and Increase to Plant Capacity *BettyAnn Curtis*	Cybersecurity Incident Induced Billing System Outage: A Case Study in Customer Communication and Operational Resilience *Alexa Morris, Erin Blue*	

PNCWA2026
Rising to the Moment: Advancing a Sustainable Water Future

Annual Conference & Exhibition
September 13-16, 2026
Spokane Convention Center
Spokane, WA

PNCWA2026 Opening General Session

Keynote Speakers:

Rebecca Stern | Producer, *Unless Something Goes Terribly Wrong*

Jeff Schmidt | PNCWA and Senior Project Manager at Jacobs

Presentation Description:

Wastewater professionals know the importance of their work. The public, however, rarely gets a glimpse inside the facilities, challenges, and people responsible for protecting public health and the environment every day. In this engaging keynote fireside chat, Association President Jeff Schmidt sits down with Rebecca Stern, the producer of *Unless Something Goes Terribly Wrong* to discuss what happened when an industry that largely operates out of sight was brought into the spotlight.

Approaching the subject as an outsider, the producer will share how their team's perception of wastewater changed over the course of filming and the surprising lessons learned from spending a year alongside plant operators, maintenance staff, and utility leaders. The conversation will explore the documentary's reception among public audiences, policymakers, educators, and industry professionals, and how the film has helped raise awareness of the critical infrastructure and dedicated workforce that communities depend on but seldom notice.

Together, they will examine the power of storytelling to bridge the gap between technical expertise and public understanding. Attendees will hear what aspects of the industry resonated most strongly with viewers, why authentic human stories can be more impactful than technical facts alone, and how wastewater professionals can become effective ambassadors for their utilities and their profession.

This keynote will offer practical insights into communicating the value of wastewater services, building public trust, inspiring the next generation of operators, and elevating the profile of an industry that is essential to every community. Through an honest conversation about perception, engagement, and advocacy, attendees will gain fresh ideas for telling their own stories and helping the public better understand the indispensable work they do every day.

Rebecca Stern Bio:

Rebecca Stern is an Emmy-nominated documentary producer and director living in Los Angeles, CA. She focuses on stories that shock, awe and encourage a giggle. With credits on HBO, AMC, ABC, HULU, STARZ, ITVS, and NETFLIX, she makes a lot of stuff with the people she loves. Specific projects include: Well Groomed (SXSW '19, Hot Docs '19, HBO Sports), Smugshot (AMC '25, '23), Level Playing Field (HBO Sports, '21), Dear Santa (ABC/HULU '23, '21), Deerfoot of the Diamond (Camden '23), Battleground (Starz, Tribeca '22), Snowy (Sundance '21), Tre Maison Dasan (Independent Lens '19), Netizens (Tribeca '18, HBO Max), and the bomb (Tribeca '16, Netflix). Rebecca is a 2023 DOCNYC 40 Under 40 honoree, a 2019 Impact Partners Fellow, a SXSW-mentor, a pga-accredited producer and a Documentary Producers Alliance board member.

Jeff Schmidt Bio:

Jeff is a Senior Project Manager and Engineer with 29 years of experience in civil, environmental, and water resources engineering. Project experience includes project management, planning studies, hydraulic and hydrologic analysis, detailed design, and construction administration for a wide variety of projects including combined sewer overflow mitigation, conveyance system rehabilitation and design, pump station design, stormwater quality improvements, stormwater flooding analysis, and infiltration/inflow studies.

PNCWA Technical Session Descriptions with Speaker Information

50 years of tertiary treatment. Leveraging tertiary filtration experiences of the past when designing for the future.

Description:

The Water Pollution Control Act Amendments of 1972 introduced major changes to legislation that formed the foundation for improvements to wastewater treatment in the United States. The act introduced concepts that seem fundamental today, such as technology-based standards and water quality criteria, and set aspirations for swimmable waters. It also provided huge federal grants for capital projects, which spurred a rush of tertiary filtration projects across the U.S.

The oldest tertiary filtration facilities are nearing 50 years of service. Most of these original installations have undergone multiple phases of expansion, a major rehabilitation or two, or, have been replaced entirely by a younger filtration model / technology. At the same time, and somewhat ironically, many treatment plants are still adding their first tertiary filtration facilities. So, what can we learn from those that have been doing it for decades?

This presentation will cover the following topics:

- The rise and fall of technologies: Different approaches to tertiary filtration over the years.
- Filter surveillance studies: Optimization is not just for drinking water filters! Understand what your tertiary filters are trying to tell you and how to get the most out of them.
- Major Rehabilitation: Common scope items, design considerations, planning for future flexibility.
- Pilot Testing: You might only get one shot, how to make it count.
- Facility Design: What makes a great tertiary filter?

Speaker(s):

Danny Murphy, dmurphy@carollo.com, Carollo Engineers, Boise, Idaho

Danny Murphy is Carollo's national lead for tertiary treatment. He spent the first half of his career as an Operations Engineer at a large wastewater treatment plant in Melbourne, Australia, focusing on a 185-mgd advanced tertiary treatment upgrade. Danny moved to the U.S. to join Carollo 10 years ago to further pursue his passion for tertiary treatment and potable reuse design.

A Cost Effective Nature Based Approach to Effluent Thermal load Mitigation

Description:

Small coastal wastewater treatment plants are challenged by stringent thermal load limits driven by climate change, sensitive receiving waters, and evolving regulatory frameworks. The City of Cannon Beach, Oregon, recently received a renewed NPDES permit that includes new excess thermal load (ETL) limits for discharge to Ecola Creek. Preliminary review of operational data indicated that compliance could be difficult during warm and shoulder seasons, prompting a comprehensive thermal load optimization study.

This study presents a full-scale, data-driven evaluation of thermal load sources, transport mechanisms, and mitigation strategies at a 1.0-MGD wastewater treatment plant. A distributed temperature monitoring network was deployed across the collection system influent, activated sludge process, lagoons, ultraviolet (UV) disinfection system, constructed wetlands, and receiving water. High-frequency temperature data were collected over multiple seasons and evaluated alongside flow, ambient air temperature, and solar radiation to characterize both internal process heat contributions and external environmental drivers.

Results indicate that influent wastewater temperature is the dominant driver of thermal load, consistently exceeding ambient creek temperatures by 5–10 °C during summer months. Internal plant processes, including biological treatment, aeration, pumping, and UV disinfection, contributed a relatively modest cumulative temperature increase of approximately 2–3 °C, with no single unit process identified as a dominant heat source. Lagoons exhibited clear solar-driven warming behavior, acting as thermal collectors rather than buffers during warm periods, while aeration basins largely mirrored influent temperature patterns.

Operational optimization strategies were evaluated with emphasis on low-cost, rapidly implementable measures. Constructed wetland performance was identified as the most effective thermal mitigation mechanism. Hydraulic modifications within existing wetland cells, implemented through simple adjustments to flow paths and water surface elevations, produced statistically significant additional cooling. These improvements translated to measurable reductions in calculated ETL and increased operational flexibility.

This case study demonstrates that small utilities can achieve meaningful thermal load reductions through targeted monitoring, operational optimization, and nature-based solutions. The findings provide a practical, transferable framework for utilities facing similar regulatory pressures, emphasizing that data-driven operations and adaptive use of existing assets can defer or reduce the need for costly capital improvements while protecting sensitive receiving waters.

Speaker(s):

Dr. Mike Montazeri, PE, mmontazeri@windsorengineers.com, Windsor Engineers, Vancouver, Washington

Dr. Mike Montazeri, P.Eng., PE, is an Engineer and Project Manager with 10 years of experience in planning, design, construction and operation of various engineering and research projects. His main focus is design and construction of major infrastructure projects and large scale municipal and industrial liquid and solid waste management systems. He is an expert in project execution, system optimization, and regulatory compliance.

Mike has played a pivotal role in upgrading, designing, and developing more than a dozen large-scale industrial and municipal wastewater and biosolids processing facilities. His expertise spans the process design of core systems, as well as the development of supporting infrastructure and building designs, ensuring comprehensive and efficient facility operations.

Pete Munoz, PE, pmunoz@biohabitats.com, , ,

Pete Muñoz is Senior Engineer and Practice Lead at Biohabitats. Based in the Cascadia Bioregion office in Portland, Oregon, he works around the globe helping to implement nature-based solutions that promote healthy communities, resilient infrastructure, & ecological complexity. Licensed in 21 states, Pete has almost three decades of water infrastructure experience with a special focus on natural wastewater treatment, water reuse, and resource recovery.

A Solid Approach to Pasco's Growing City

Description:

As one of the fastest growing cities in Washington, the City of Pasco had to take great steps to update its Wastewater Treatment Plant (WWTP). To support this effort, the City acquired State Revolving Fund (SRF) loan funding to provide improvements that would increase capacity of the WWTP. After the initiation of construction for the first stage of improvements (Pasco Phase 1), the design for the second phase of work commenced. This design stage had to be completed on an accelerated schedule to stay within funding timelines.

This presentation will focus on the project description, schematic, and process design decisions that were made on the solids handling portion of the WWTP's $18M, Phase 2A improvements in order to accommodate a short design schedule. We will highlight the construction phase of the project, as well as "lessons learned".

Additional Design Information: The solids handling portion of the Phase 2A improvements included the construction of a new Solids Handling Building containing Thickening and Dewatering Centrifuges. The facility was designed with operators in mind, providing for operational flexibility and maintenance ease. Additionally, the facility was designed to be expanded at least twice in the future and included support structures and lifting equipment sized for future equipment as well as space for at least one additional centrifuge for thickening and dewatering each. The design of the facility included a new Centrate building to provide conveyance of dewatering centrate. Other facilities such as the old Solids Handling Building, Intermediate Clarifier, and WAS pump station were upgraded to support the new Solids Handling Facilities.

Speaker(s):

Will Kirby, will.kirby@consoreng.com, Consor, Boise, Idaho

Will Kirby is a project engineer with over ten years experience in engineering of critical civil infrastructure projects. He has centered his career around the supply, treatment, and conveyance of water. Off the clock, Will spends his time with his family, mostly chasing a toddler who is inevitably getting into something she shouldn't be.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

A UK first: The world's largest MABR combined with densification

Description:

Wastewater treatment plants (WWTPs) in the Pacific Northwest face challenges from population growth, industrial expansion, and stricter environmental regulations, particularly the impending Total Nitrogen (TN) limit (WSDE, 2022). Biological process intensification offers a practical alternative to conventional solutions.

United Utilities (UU) provides water and wastewater services to approximately 7 million people in the North West of England. UU operates a wastewater treatment facility in the Northwest of England, which has an average daily flow of 150 MLD (40 MGD). The facility has primary treatment and an existing anoxic-oxic secondary treatment system that is 20% unaerated and 80% aerobic with surface aeration.

UU chose a Membrane Aerated Biofilm Reactor (MABR) upgrade to nitrify 800 kgNH4-N/d (1760 lbs-NH4-N/d) of influent load and hydrocyclones installed in the WAS line to achieve densification. The combination of the two technologies allowed the UU WWTP to meet the new impending effluent ammonia limit of 2 mgNH4-N/L and improve clarifier performance. An intensification solution was necessary as the facility has no room for expansion. The MABR was installed in the anoxic zone of the AO process.

MABR is a simple advanced biofilm technology that utilizes gas-permeable membranes to efficiently deliver oxygen directly to the biofilm it supports (Houweling et al., 2017). The benefits of the technology, which include: i) high nitrification rates, ii) simultaneous nitrification and denitrification (SND), and iii) seeding of nitrifier rich biofilm to the suspended growth.

Densification leverages a combination of biological selection and physical selection, by means of a hydrocyclone, to improve settleability of the sludge. The improvement in settleability of sludge unlocks capacity of the secondary clarifiers, unlocking treatment capacity within a secondary treatment process.

The MABR and densification upgrade was completed in 2025. The MABR removed over 900kgNH4-N/d, while the sludge volume index (SVI), reduced by 39%. The system was able to meet its regulatory limit consistently, and UU gained more resilience in clarifier operation.

The success of the UU WWTP upgrade provides a roadmap for WWTPs in the Pacific Northwest to achieve efficient treatment capabilities and limit expansion in the wake of impending strict nutrient limits.

Speaker(s):

Craig Duvall, craig.duvall@veolia.com, Veolia Water Tech, San Francisco, CA

Craig Duvall is an Industrial Process Engineer at Veolia Water Technologies & Solutions. He has 11 years of combined experience with biological process design for both municipal and industrial markets. Craig holds a Master of Applied Science in Environmental Engineering and a bachelor's degree in Biological Engineering both from the University of Guelph, and he is passionate about promoting water reuse, recovery, and environmental sustainability.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Activated Carbon 101: Fundamentals, Performance, and Practical Applications in Water Treatment

Description:

Activated carbon is a widely used yet often misunderstood treatment media in water applications. This introductory session provides a practical overview of activated carbon fundamentals, including how it is manufactured, the significance of pore structure, and the differences between powdered, granular, and extruded forms. Attendees will gain a clear understanding of adsorption mechanisms and how activated carbon removes common contaminants such as organics, taste and odor compounds, disinfection byproducts and PFAS.

The presentation will also address key performance factors, including contact time, loading rates, and media selection, as well as common misconceptions that can lead to improper system design or unrealistic expectations. Real-world examples will be used to illustrate where activated carbon excels, where its limitations exist, and how it fits within an overall treatment train.

Designed for operators, engineers, and water professionals, this "Activated Carbon 101" session emphasizes practical knowledge that can be immediately applied in the field. By the end of the presentation, attendees will be better equipped to evaluate when activated carbon is an appropriate solution, ask the right questions during system design, and operate carbon systems more effectively and confidently.

Speaker(s):

Christopher Vizcaino, chris.v@activatedcarbon.com, Carbon Activated Corp, Compton, California

Christopher Vizcaino is a water treatment and activated carbon specialist with more than 17 years of experience in adsorption technologies for municipal, industrial, and environmental applications. He holds a Master's degree in Physical Chemistry from the University of Colorado, bringing a strong technical foundation to the design, optimization, and implementation of activated carbon systems for the removal of VOCs, chloramines, PFAS, hydrogen sulfide, and other contaminants in both water and air treatment processes.

Throughout his career, Christopher has worked closely with utilities, engineers, and industrial clients to develop practical treatment solutions that balance performance, operational reliability, and cost efficiency. His technical expertise includes carbon media selection, adsorption kinetics, vessel design, pilot testing, and troubleshooting of full-scale treatment systems.

Advancing Water Reuse Through Regulatory Reform: A PNW Perspective

Description:

Water reuse is an important strategy for sustainable water management in the Pacific Northwest (PNW), offering communities a novel strategy to address regional growth, bolster strained infrastructure and localize water supplies. One critical consideration for the advancement of water reuse in the region is the reform of existing water reuse regulations that may be needed to meet specific use cases such as potable reuse.This session will provide an overview of the Pacific Northwest's water reuse regulatory landscape and offer a

regional perspective on opportunities and challenges for advancing reuse programs. It will highlight key findings from The State Water Reuse Regulatory Guide (Guide), which is slated to be released in May 2026. The Guide is a multi-partner project, funded through the WateReuse Association, AWWA, AMWA, WEF and NACWA, and is informed by extensive stakeholder engagement via workshops, interviews, and focus groups across many U.S. geographies including states in the PNW. The Guide outlines regulatory pathways, reflects insights from utilities, consultants, and regulators and outlines technical elements fundamental to effective regulatory language.

Across Washington, Oregon, and Idaho, legacy water reuse exists alongside emerging opportunities for the future growth of water reuse. As the region begins to invest in advanced treatment and infrastructure, water reuse will depend on clear, adaptive regulatory frameworks to ensure adequate water supply, sustain industry, and protect human health and ecosystems. This session will share lessons learned, key policy drivers, and collaborative approaches shaping a consistent and forward-looking regulatory environment for the PNW.

A 25-minute presentation about the Guide is proposed to be accompanied by a 25-minute panel discussion regarding the potential application of the guide to regulatory development in the PNW. The panel is anticipated to include regulators and utility/industry representatives who will respond to questions about how the Guide may be used to advance water reuse in the PNW. Panel participants will be determined upon acceptance of the proposed PNCWA abstract and availability of regulators to attend the conference.

Speaker(s):

Amelia Luna, aluna@hazenandsawyer.com, Hazen and Sawyer, Oakland, CA

Amelia Luna is a water and wastewater engineer at Hazen and Sawyer with 18 years of experience in treatment design, water reuse, and sustainability. She has led pilot studies, decision analyses, plant upgrades and new facility designs through startup and optimization. Her reuse work includes developing permitting pathways and designing onsite and stormwater reuse systems. As a project manager, she builds collaborative teams to deliver complex projects from concept through operations.

Erin Mackey, Emackey@BrwnCald.com, , ,

Dr. Erin Mackey is Brown and Caldwell's Western Regional Practice Leader for Reuse. She works out of their Walnut Creek, California office.

JJ Fenton, , Brown and Caldwell, Boise, ID

JJ Fenton is an Assoc. Environmental Engineer at Brown and Caldwell. He works out of their Boise, Idaho office.

Aeration System Evaluation at Pocatello WPCF: Diffuser Replacement Restores Capacity and Avoids Near Term Blower Upgrade

Description:

The City of Pocatello Water Pollution Control Facility (WPCF) is designed to treat a maximum month flow of 12.5 mgd for nitrogen and phosphorus removal using an A2O process. The 2021 Facility Plan evaluated process

capacity under current and projected flows and loads via process modeling (BioWin), which identified that the aeration system was nearing its capacity. The City noted operational challenges, such as the blowers operating near the design capacity and often surging, which led to the development of a blower replacement design project.

During the preliminary design and information review phase of the project, several limitations were identified that could impact the design of the new replacement blowers for the WPCF, such as the fouling condition of the aeration diffusers. An Aeration System Master Plan was completed to holistically evaluate the condition of the aeration piping, diffusers, and blowers for the Swing and Aerated zones. The City removed nine diffusers from service and shipped them to a third-party vendor for visual inspection and evaluation of the differential pressure across the diffuser at various airflows in their "as received" condition and after acid cleaning.

This evaluation identified that the existing diffuser headloss across the ceramic diffusers, whether acid cleaned or not, was inadequate to meet the current and future aeration demands. Therefore, a phased aeration system upgrades project was defined, where the first phase included replacement of the aeration diffusers and the second phase included blower replacement. The diffuser replacement project was completed in 2024, and the City observed a significant improvement in the overall aeration system capacity, including improved blower operational conditions (recovered blower capacity) allowing the City to defer the second phase of the project.

This presentation will provide lessons learned from the Aeration System Master Plan, highlighting the importance of understanding the fouling conditions of the diffuser system.

Speaker(s):

Katerina Messologitis, katerina.messologitis@stantec.com, Stantec, Portland, OR

Katerina has nine years of experience as a process engineer at Stantec. Her experience ranges from facility planning to full-scale plant design and operation. Katerina is well versed in wastewater process modelling, piloting, and treatment optimization studies.

Skyler Allen, , City of Pocatello, Pocatello, ID

AI and Machine Learning in the Water Industry: RealWorld Applications for Enhanced Operations and Asset Management

Description:

In recent years, artificial intelligence (AI) and machine learning (ML) tools are increasingly being applied throughout the water industry. This presentation highlights three real-world case studies demonstrating the practical use cases and benefits of AI and ML in operations, planning, risk management, and cost reduction.

Case Study 1: Flow Prediction and Wet Weather Management

Problem Statement: How can a 32-million-gallon wet-weather equalization basin be managed more effectively to prepare for wet weather events?

Solution: An ML model predicts influent flow 72 hours in advance.

By leveraging over six years of historical data including rainfall, streamflow, past influent flows, time-of-day patterns, and system improvements, a machine learning model was designed to forecast influent flow up to 72 hours ahead. This tool has improved wet weather management, reduced combined sewer overflows, and prevented the basin from exceeding capacity. As a result, Raleigh Water can proactively address storms and postpone expensive new storage projects, with this solution in place for over five years. The mean absolute error of peak hour flow predictions in deployment was measured in 2021, as 12 mgd when predicting 12-hours in advance, and the largest storms are approximately 150-200 mgd in magnitude.

Case Study 2: Predictive and Adaptive Asset Management

Problem Statement: How can sewer pipe inspections be prioritized, and how can inspection results be used to refine prioritization continually?

Solution: An ML model predicts pipe condition scores from 1-5 and updates weekly with new inspection data.

This approach, applied to a North Carolina utility's sewer system, uses an automated ML pipeline to retrain deterioration models weekly. The system ensures up-to-date predictions for uninspected pipes, helping utilities prioritize inspections and maintenance, reduce the risk of unexpected failures, and adopt an adaptive asset management strategy. This model has retained an accuracy metric of 86% or higher correctly classified pipes in deployment.

Case Study 3: Anomaly Detection and Operations Support

Problem Statement: Identify issues with 68 sewer flow meters and backfill meter errors.

The final example involves a utility in northwest United States, where an ML model forecasts wastewater flow one hour ahead and automatically flags anomalies in flow meter data. This system identifies several types of meter anomalies including: drift, low flow, high flow, stagnation, and abrupt changes; enabling quick responses to what are likely maintenance issues and improving billing accuracy. This project used an efficient one-size-fits-all modeling approach to consolidate all of the available data while predicting individual meter outcomes. A great deal of insight was also provided about each metered sewershed through SHAP plots, which explain what ML models are learning.

Collectively, these projects showcase the water sector's increasing ability to deploy AI and ML to enhance efficiency, resilience, and informed decision-making, making "AI on Tap" a practical reality.

Speaker(s):

Nandita Ahuja, nahuja@hazenandsawyer.com, Hazen and Sawyer, Vancouver, BC

Nandita Ahuja is an Associate with Hazen and Sawyer specializing in water and wastewater infrastructure planning and design. She has led master planning efforts for major utilities, with expertise in advanced process and hydraulic models that support long-term capital planning and operational optimization. Nandita is also passionate about applying data science tools to enhance traditional engineering outcomes.

An Evolving Regulatory Tide: Nutrient Compliance Changes for Puget Sound

Description:

The Washington Department of Ecology's Puget Sound Nutrient Reduction Plan and Advanced Restoration Plan are reshaping wastewater treatment requirements across the region. New and lower effluent limits—along with near-term loading caps based on historical performance—are driving significant operational and capital planning decisions. Many utilities must evaluate transitioning from conventional secondary treatment to advanced biological nutrient removal processes while also adopting data-driven operational strategies.

For utilities, particularly small and moderate-sized systems, these regulatory changes present substantial challenges. Infrastructure retrofits, process upgrades, refined monitoring programs, and updated capacity analyses require both financial investment and technical expertise. These challenges are magnified by the challenge of communicating with utility leadership, politicians, and the community at large. At the same time, the evolving framework creates opportunities to rethink long-term strategy, including water reuse, groundwater recharge, operational optimization, and potential nutrient credit trading mechanisms.

This presentation highlights how three small-to-moderate Puget Sound utilities have approached compliance through different pathways aligned with their constraints and priorities:

Coupeville is reducing direct discharge to Puget Sound by pursuing reuse and groundwater recharge strategies.

Stanwood is focusing on operational optimization and enhanced monitoring to better understand and improve nitrogen removal performance.

Anacortes has been proactively optimizing biological processes since 2021 and is refining plant performance while evaluating long-term loading scenarios.

Each utility is updating its Nutrient Reduction Evaluation and capacity analysis to understand the implications of near-term caps and projected long-term requirements under the Advanced Restoration Plan. This session will provide practical insight into alternative compliance pathways, lessons learned from early action, communications strategies, and considerations for balancing regulatory certainty, capital planning, operational performance, and community priorities. Attendees will gain a clearer understanding of how peer utilities are navigating uncertainty while preparing for long-term nutrient management in Puget Sound.

Speaker(s):

Amanda McInnis, Amanda.McInnis@jacobs.com, Jacobs, Billings, Montana

Amanda is an experienced principal project manager with a broad range of water, wastewater, effluent management and stormwater experience, including project management, planning, permit assistance, funding assistance, design, and construction. With over 26 years of experience, she has completed many facilities plans and is the technical lead on the City of Spokane Riverside Park Water Reclamation Facility Facilities Plan.

Natalie Monro, Natalie.Monro@jacobs.com, Jacobs, Bellingham, Wa

Natalie is an experienced project communicator with a strong background supporting recycled water, groundwater, and water supply programs requiring community education and public acceptance. She has over 10 years of experience, both as a consultant and working for local governments in the Idaho and Washington.

An Improved RFP/RFQ Process for Everyone's Benefit

Description:

Mr. Murphy and Mr. Dick will serve as co-moderators of the session. A total of six panelists will be selected to participate; three utility representatives and three consultant representatives all from different firms and utilities.

As a utility do you ask questions that don't provide any differentiation between proposers? As a consultant do you feel you are responding to generic requests that limit the space you have to get into the project's challenges and innovative solutions? In today's rapidly evolving utility landscape, outdated Request for Proposal (RFP) practices can hinder innovation, transparency, and fair competition. We live in a digital world, but RFPs remain the same as they did in the hard-copy world. Through presentations, panel dialogue, and audience Q&A, we'll explore how to craft RFPs that align with today's digital tools, for proposals viewed on screen and not in hard-copy, web links, embedded video, page layouts, etc. that balance detail with clarity, and the use of emerging technologies like AI in proposal preparation and review—while still meeting regulatory and audit requirements.

This 1.5-hour panel session will begin with brief presentations from the moderators on the perspectives of a utility and a consultant on the RFP/RFQ process. Through prepared questions posed by the moderators as well as questions posed by the audience participants will hear lessons learned and practices used from both sides about how to ask the right questions, receive better responses, and gain insights into how proposers interpret your requirements and why utilities are asking the questions they do. This session will provide actionable guidance for creating RFPs that yield stronger proposals, reduce ambiguity, allow and encourage innovative approaches from proposers, and make your selections more objective, equitable, and defensible.

Speaker(s):

Frank Dick, frank.dick@cityofvancouver.us, City od Vancouver, Vancouver, WA

Wastewater Treatment Engineering Manager, Department of Public Works

Frank Dick oversees wastewater treatment engineering functions for Vancouver, including planning, capital project management, O&M contract administration and Vancouver's fully delegated pretreatment program.

Prior to his 18 years at Vancouver, he spent 14 years at semiconductor and electronics manufacturing facilities in the Portland-Vancouver area, in consultant and staff positions for facilities engineering and environmental compliance.

Mr. Dick currently serves as the Co-Chair of the National Association of Clean Water Agencies' Pretreatment and Pollution Prevention Committee and is active Oregon ACWA and Pacific Northwest Clean Water Association. Mr. Dick earned his BS in Chemical Engineering from Washington State University.

Brian Murphy, murphybm@cdmsmith.com, CDM Smith, Portland, OR

Brian is a professional engineer with 33 years of experience, including 30 years as a consultant in the PNW and has led countless business development, proposal, and interview activities. Brian is currently the regional Client Service Leader CDM Smith. In that role his objective is client satisfaction which he believes is not limited to project delivery, but a continuous activity beginning with first contact.

Around the World in 40 Minutes: Global Lessons for Meeting Stricter Nitrogen Limits

Description:

Water resource recovery facilities across the Pacific Northwest are preparing for increasingly stringent nitrogen discharge limits. While regulatory drivers may be local, many utilities worldwide have already navigated this transition—providing valuable lessons on what works, what doesn't, and how performance compares to early expectations.

This presentation draws on case studies from North America, Europe, and Australia, highlighting utilities that have expanded or retrofitted existing facilities to comply with tighter nitrogen limits. Rather than focusing on any single technology, the session emphasizes decision-making, delivery, and performance outcomes that are directly applicable to utilities planning similar upgrades.

For each case study, the presentation addresses three key questions:

- Why was a specific nitrogen removal approach selected given site constraints and regulatory goals?
- What delivery model was used to implement the solution, and how did it influence schedule, risk, and cost?
- How has the operating facility performed relative to permit limits and planning-phase expectations?

A range of nitrogen removal strategies will be discussed, including stand-alone and integrated solutions such as four-stage Bardenpho, shortcut nitrogen removal, process intensification and densification, and advanced technologies including membrane aerated biofilm reactors (MABRs) and membrane bioreactors (MBRs). The presentation will compare how these approaches performed in real operating environments, including startup challenges, operational flexibility, and long-term reliability.

By synthesizing lessons across geographies and regulatory frameworks, this session provides a global perspective with local relevance. Attendees will gain practical insights to support informed decision-making as they evaluate nitrogen removal strategies, delivery models, and risk tradeoffs for facilities in the Pacific Northwest.

Speaker(s):

Matt Noesen, matt.noesen@jacobs.com, Jacobs, Vancouver, WA

Matt is a civil engineer with over 35 years of experience, specializing in planning, design, construction, and commissioning of water resource recovery facilities and currently leads Jacobs water resource recovery market solutions for the West U.S. Matt has provided engineering and management services for a range of projects associated with tightening nutrient regulations. He has designed, managed, or advised on over 100 wastewater projects/programs across the North America. Matt served as program advisor for the Puget Sound Nutrient Technical Assistance Regional Project for the Association of Washington Cities, WA where Jacobs conducted site visits of each plant to understand their treatment current operations, and discuss ideas for optimization and nutrient removal for 22 municipal wastewater utilities. Jacobs considered alternatives, evaluated environmental justice impacts, conducted an affordability analysis, and prepared a Regional Report summarizing the nutrient optimization plans (NOPs) and nutrient reduction evaluation (NREs) – if applicable - including costs and nitrogen mass reduction estimates. Matt presented this work at WEFTEC 2024 in New Orleans.

Matt has a BS in Electrical Engineering, an MS in Civil (Environmental) Engineering, holds a P.E. in four states and is a Project Management Professional (PMP).

Paul Steele, paul.steele@jacobs.com, , ,

Senior wastewater technologist with over 20 years of experience in selecting and implementing nitrogen removal solutions for municipal wastewater treatment facilities across North America.

Artificial Intelligence and Machine Learning Can Make Potable Reuse Projects More Resilient than Ever

Description:

Potable reuse has become an alternative water supply choice that is drought proof, locally controllable, sustainable, and in some cases more affordable than other water supply sources (e.g. sea water, brackish groundwater). In many potable reuse projects, we largely rely on traditional control logics along with the conservative set points to take a unit process or entire treatment train offline to prevent the public consumption of unsafe water. While it represents a safe solution, it does not necessarily reflect the best management strategy due to potential losses of revenue as well as operational and maintenance challenges due to intermittent operations resulting from advanced treatment trains going frequently offline. Artificial intelligence (AI) and machine learning (ML) have the ability to constantly and quickly adapt and process large amounts of data in real-time with great accuracy, it may be an ideal platform for supporting our decision for managing potable reuse projects and assets. AI is the capability of a machine to imitate intelligent human behavior. AI refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions. A subset of artificial intelligence is ML which refers to the concept that computer programs can automatically learn from and adapt to new data without being assisted by humans. Unfortunately, neither AI nor ML has been widely used in the water industry despite the huge potential. Recent work demonstrates that AI&ML can be successfully leveraged in potable reuse projects by using data obtained from an operating pilot scale potable reuse treatment train to predict:

- RO permeate TOC in a pilot-scale IPR train
- Nitrite nitrogen (NO2-N) concentration feeding to a pilot-scale IPR train

This presentation will provide detailed insights into the process of constructing artificial neural network (ANN) models, evaluating their predictive performance, and identifying their role in supporting decision-making. The application of these models helps maintain process performance without frequent flow diversion, maximizes revenue streams, reduces errors, and enhances both regulatory and public confidence. Ultimately, the integration of AI and ML makes direct potable reuse (DPR) projects more resilient than ever.

Speaker(s):

Ufuk Erdal, ErdalUG@bv.com, Black and Veatch, Irvine, California

Dr Erdal is serving as the Water Reuse Global Practice and Solutions Director at Black and Veatch with more than 30 years of diverse experience. He led or directly involved in municipal and industrial water reuse projects in United States, Australia, Argentina, Brazil, and Taiwan creating innovative and sustainable water management solutions. He holds a provisional patent (US 2024/0230176 A9) for evaporative cooling to reduce energy and water footprint of cooling. He got his master and PhD degrees from the Ohio State University and Virginia Tech, respectively. He likes ocean swimming, playing bridge and wine testing.

Avoid Common CM/GC Pitfalls: Pursuing a Win-Win without Giving Away the Farm

Description:

Many public agencies have turned to CM/GC (GC/CM in Washington) to address their toughest projects, looking to leverage benefits such as selecting their contractor based on qualifications and getting early constructability and cost input during the design phase. As agencies finish their first or first of several CM/GC projects, some are surprised at what they are getting or not getting out of the delivery process.

This presentation will first cover the contractual basis for the CM/GC model, including clarification on roles and contractual accountability for the Owner, Engineer and CM/GC Contractor. With this fundamental understanding, the presentation will discuss 2-3 common observations, based on real-world project examples (with names and projects withheld to protect the innocent!). These include:

- “We talked about this during design – why is this a change order?”
- “The Owner paid a lot for the CM/GC to participate in the preconstruction, but not sure I got much benefit out of it.”
- “Why does it seem like the Owner is carrying all the risk?”

We’ll then discuss root causes and strategies to manage the CM/GC process so that all parties: Owners, Designers and Engineers, have a clear contractual basis to move through the process with a common goal of a successful Project.

Speaker(s):

Michelle Green, Michelle.Green@jacobs.com, Jacobs, Portland, Oregon

Michelle is an industry leader in developing and promoting best practices for use in implementation of successful collaborative delivery projects. As Jacobs' Water Market Design-Build Lead in the Western US, Michelle leads PDB and DB build projects, design for CMGC projects, and serves as an Owner's Advisor for PDB and CMGC projects.

Background PFAS occurrence in groundwater and soil: influence of land use and urbanization

Description:

Per- and polyfluoroalkyl substances (PFAS) are a diverse class of persistent environmental contaminants with negative human health and ecosystem impacts. However, data in soil and groundwater is sparse outside of specific cleanup sites.

PFAS have been consistently detected in the soil and shallow groundwater of a restored urban wetland irrigated with Class A reuse by Clean Water Services (CWS). The temporal and spatial patterns over 3 years of study suggest that irrigation is not the source of PFAS. However, with no other obvious sources nearby and a lack of urban groundwater and soil data, it was not known if these concentrations were typical for an urban area or reflective of the complex history of the site. To address this question, we characterized PFAS concentrations in shallow groundwater and soil across 13 wells within the watershed covering a gradient of urbanization over both wet and dry season conditions to establish 'background' PFAS concentrations and compare them to the concentrations and composition profiles observed at the restored wetland.

With the potential implications and legalities of PFAS detections in private wells from well owners, Summit Water Resources was enlisted to select wells and assist in making the study a blinded assessment. Summit analyzed a large database of wells to find suitable candidate wells, conducted outreach and access agreements with well owners, conducted site visits and assessments, and collected all samples using CWS's SOP. CWS analyzed all samples in-house, but sample IDs were anonymized, CWS had no contact with well owners, and CWS was not aware of the exact locations or owners of the wells. This encouraged participation by private well owners and assuaged fears about repercussions of any PFAS detections.

In this talk, we will discuss the findings from this study in context of the other samples from the restored wetland, urban creeks, MS4, and WRRF effluent in the watershed. We will also describe the implications for PFAS in urban and rural environments, the 'urban signature' observed, the effects on the pilot reuse irrigation study, and the lessons learned in carrying out this complex blinded assessment.

Speaker(s):

Rachel Golda, goldar@cleanwaterservices.org, Clean Water Services, Hillsboro, OR

Rachel Golda is a researcher at Clean Water Services in Oregon, where she leads the Emerging Contaminants group. Her work focuses on real-world water challenges like PFAS, microplastics, and algal toxins, with the goal of improving water quality in the context of wastewater engineering.

She has over 15 years of applied research experience and holds M.S. and Ph.D. degrees in Environmental Science and Engineering from Oregon Health & Science University. She's also active in the water sector through organizations like Water Environment Federation and the Oregon Association of Clean Water Agencies.

Ryan Dougherty, rdougherty@summitwr.com, Summit Water Resources, Portland, OR

Ryan has 12 years of experience providing hydrogeologic and water resource management services in the Pacific Northwest. As both a hydrogeologist and water resources engineer, he applies a broad quantitative skillset to support groundwater supply studies, groundwater recharge projects, public water system planning and management efforts, source water protection studies, numerical groundwater modeling, and the design, construction, and operation of water supply wells.

Balancing Uncertainty and Compliance: King County's Nutrient Reduction Evaluation

Description:

The King County Wastewater Treatment Division (WTD) is conducting a system-wide Nutrient Reduction Evaluation (NRE) to meet near-term regulatory requirements from the Washington State Department of Ecology (Ecology) while safeguarding long-term environmental and financial sustainability.

WTD's system is unusual in that it includes three regional treatment plants subject to the regulatory requirement, each with unique circumstances and constraints. Navigating the individual circumstances for each treatment plant, the capabilities of WTD's system as a whole, and the delivery of ongoing investments to meet other needs and commitments required a planning process that considered a long-term approach to managing nutrients. At the same time, the near-term regulatory submittal carries significant implications for funding and implementation based on Ecology's envisioned timeline for nutrient reduction in Puget Sound.

This presentation will discuss the planning process used to balance WTD's long-term considerations (and their inherent uncertainty) with compliance on Ecology's near-term regulatory submittal. Topics will include how the multitude of potential alternatives were evaluated and managed, how consideration of system-wide opportunities and outcomes were developed, and how uncertainty inherent in a multi-decade planning period was communicated in the planning process. By describing the planning process used, audience members will hear lessons learned on how to manage complexity and uncertainty while meeting regulatory requirements. This may benefit agencies in other parts of the Pacific Northwest align their own regulatory responses with long-term needs and constraints.

Depending on the status of the regulatory submittal at the time of the presentation, results from the NRE may be presented as well. If results are not available at the time of the conference, big-picture conclusions will be provided instead.

Speaker(s):

Ian McKelvey, imckelvey@brwncald.com, Brown and Caldwell, Seattle, Washington

Ian McKelvey is a Director at Brown and Caldwell with 20 years of experience in the planning, design, and delivery of wastewater systems.

Anne Conklin, aconklin@carollo.com, Carollo, Seattle, Washington

Ali Saperstein, asaperstein@kingcounty.gov, King County Wastewater Treatment Division, Seattle, Washington

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Balancing Water Quality & Cost: Unique Adaptations to Strict Nutrient Regulations across the West

Description:

Over the past two decades, nutrient limits for municipal wastewater dischargers have become more stringent across Montana, Idaho, and Washington, driving billions in capital investment. Compliance schedules, escalating costs, and other Clean Water Act obligations heighten financial pressures on utilities and oftentimes disproportionately impact historically overburdened communities. This presentation communicates distinct strategies to navigate an evolving regulatory landscape.

In Montana, nutrient limits near the practical bounds of treatment technology were set statewide, raising affordability concerns. For nearly ten years, at least five Montanan facilities sampled ambient nutrient concentrations in receiving waters which informed data-driven models used to develop technically defensible and economically reasonable permit limits. A Nutrient Work Group, composed of over ten representatives across the state, strategized nutrient variances for over ten years. They supported the implementation of narrative criteria and adaptive permitting alternatives to make proposed requirements more reasonable and affordable.

In Idaho, a watershed TMDL established phosphorus limits to mitigate localized impairments. An Idahoan facility partnered with technical experts and a local advisory group to evaluate treatment alternatives and develop a fiscally responsible, multi-benefit compliance strategy aligned with community priorities. With the help of the highly engaged citizens advisory committee, the utility selected an innovative technology which recovers nutrients, supporting reuse of treated effluent. A long-term, multi-phase approach utilizing state revolving fund financing is estimated to have saved the utility tens of millions of dollars.

In Washington, the Salish Sea Model informs proposed Puget Sound nitrogen reductions in a permit which uniquely requires formal affordability and environmental justice analyses. A Washington utility is evaluating affordability with established and emerging approaches using refined spatial and demographic resolution to optimize project scope, compliance schedule, and affordability impacts. This analysis revealed a significant portion of households currently experience affordability challenges for sewer costs. When the same evaluation is applied across all water services, the number of households increases, stressing the importance of holistic affordability evaluations. The cost of proposed nutrient treatment improvements is anticipated to push

additional households over this “affordability edge” but an extended compliance schedule would likely decrease these affordability impacts.

While evolving nutrient regulations require significant investment to improve water quality, utilities demonstrate that thoughtful, data-driven approaches can balance regulatory compliance with socioeconomic realities. These case studies highlight defensible and replicable strategies that support environmental progress while mitigating disproportionate community impacts.

Speaker(s):

Madelynn Knab, Madelynn.Knab@hdrinc.com, HDR, Bellevue, Washington

Madelynn Knab is an engineer-in-training with three years of experience in the planning and design of water and wastewater infrastructure projects across the country. Her experience includes utility design, grading and drainage design, hydraulic calculations, condition assessments, alternatives analysis, and CAD-based modeling for projects ranging from water distribution systems to wastewater treatment facilities. With a degree in chemical and biological engineering, she supports multidisciplinary infrastructure projects through technical analysis, detailed design, and practical problem-solving, helping clients develop efficient and reliable water infrastructure solutions.

Geneva Bernsten, Geneva.Bernsten@hdrinc.com, HDR, Bellevue, Washington

Geneva Bernsten is an engineer-in-training with experience in planning, design, and services during construction for municipal wastewater facilities in the Pacific Northwest. Her technical contributions include integrated planning, facility upgrades, alternatives analysis, and process modeling related to wastewater treatment and solids handling systems. Beyond municipal wastewater, she ventured into the Water-Energy nexus with her master's research which tackled furthering the development of a novel technology to remove organic arsenic from landfill gas condensate. Geneva supports municipal wastewater projects with strong technical rigor and hands-on construction experience, helping clients advance efficient, research-informed treatment solutions from planning through commissioning.

Jessica Shepard, Jessica.Shepard@hdrinc.com, HDR, Bellevue, Washington

Jessica Shepard is a licensed Professional Engineer in the state of Washington with experience in water and wastewater conveyance and treatment design. She has supported the design of water and wastewater pipelines, drinking water storage facilities, stor

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Beer For Drinking, Recycled Water for Data Center Cooling A Case Study

Description:

Data center owners are increasingly setting ambitious environmental, sustainability, and governance (ESG) goals. Their objective is to achieve energy neutrality and become water positive by 2030. However, these targets are difficult to reach using traditional energy-intensive mechanical cooling or water-intensive evaporative cooling methods, especially without improving cloud compute efficiency and developing thermally

effective layouts. Across most regions of the United States, combining direct evaporative cooling with free air cooling offers the lowest energy and water consumption for data center cooling. In practice, this approach has resulted in water consumption ranging from 5.5 to 190 gallons per megawatt-hour (MWh) of cooling, achieved by maximizing heat rejection to dry coolers. This case study evaluated the feasibility of two cooling water supply strategies for evaporative cooling in a hyper-scale data center located in the Midwest region:

- Using entirely recycled water
- Employing a hybrid approach (blend of surface water and recycled water)

The data center owner provided specific water quality requirements with a target cycle of concentration (Cycle) of 6 for the adiabatic cooling system. Comprehensive heat and mass balance analyses were performed to:

- Estimate cooling tower flow rates and determine advanced treatment (reverse osmosis, RO) needs to meet water quality specifications.
- Assess whether blowdown streams could be returned to the head of the water reclamation facility (WRF) or blended with secondary effluent without affecting the WRF's process performance, operation, effluent quality, or NPDES discharge permit.

The study determined that a hybrid approach—using approximately 50% potable water and 50% recycled water—is the most suitable and cost-effective solution for the data center. The hybrid strategy offers several advantages:

- Eliminated the need for constructing a new raw water intake structure and costly expansions at the water treatment plant
- Significantly reduced RO treatment
- Substantially lowered capital operational expenditures for treatment
- Allowed easy disposal of RO concentrate by blending it with secondary effluent for NPDES discharge.

The results of this study provide valuable insights for public agencies, data center owners, and water practitioners. Those exploring recycled water options will find guidance for creating sustainable solutions for evaporative cooling in data centers, commercial, and industrial facilities.

Speaker(s):

Ufuk Erdal, ErdalUG@bv.com, Black & Veatch, Irvine, California

Dr. Erdal leads Black & Veatch's Global Water Reuse practice with over 30 years of experience in planning, facility design, technology validation, and commissioning advanced treatment facilities for water reuse. He developed a cooling patent to reduce carbon footprint and has delivered water reuse projects for major data center clients. Dr. Erdal earned his master's from the Ohio State University and his PhD from Virginia Tech. He enjoys ocean swimming, bridge, and wine tasting.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Benefits of Stream Restoration and Habitat Enhancement to Improve Watershed Health, Drought Resilience, and Inform Basin-Wide Planning

Description:

Engineers, agencies, and communities are facing ever growing concerns regarding sustainable watershed health in the face of urbanization, contaminants of concern from roadway runoff and municipal wastewater effluent, higher stormwater peak flows, increased stream temperature due to disappearing canopy cover, data centers, climate change and more frequent droughts. This session will explore how stream restoration, habitat enhancement, and surface water improvements can work together to provide the buildings blocks of a healthy watershed and offset impacts of development.

To level set for the entire audience, our presentation will first discuss the role streams play in watersheds, from urban environments, to agricultural lands, to industrial and commercial areas, to residential suburbs, as well as review typical water quality issues, such as nutrient loading, temperature and fecal coliform impairment, dams and fish barriers at roadway crossings, and loss of floodplains and wetlands.

We will then discuss how these impairments can be addressed, such as through culvert replacement, stream reconstruction, floodplain widening, wetland restoration, addition of vegetation canopy cover, dam removal, and stream realignment, as well as comparing design and construction costs and effort.

Finally, this session will conclude with a discussion of how agencies and watershed planners can evaluate what issues are facing a watershed and stream system, plan for sustainable watershed health, and decide which projects will provide the greatest impact.

Speaker(s):

Paul Beskow, pbeskow@geoengineers.com, GeoEngineers, Inc., Tacoma, WA

Paul is a civil and hydraulics professional engineer and project manager with over 13 years of experience on extensive and diverse public works, water resources, habitat, and parks projects for agencies throughout the Pacific NW. While his specialty is hydrologic and hydraulic engineering services for stream, lake, and bank restoration, he also brings experience in water/wastewater infrastructure, stormwater management, erosion and sediment control and environmental protection, parks and trails, dry utilities, roadways and sidewalks, pedestrian safety and ADA compliance, jurisdictional representation, public engagement, right-of-way (ROW) acquisition, rural and urban projects, bidding and award support, construction management, maintenance of traffic, and construction inspection services. He is experienced in seamlessly leading and managing interdisciplinary design teams while still engaging in the technical details of a project to reach streamlined, effective, and constructable deliverables for all types and sizes of projects, programs, and clients.

Beyond as builts: Asset onboarding that works

Description:

Accurate asset data generated during design, construction, and replacement of linear conveyance is foundational to long-term operations, maintenance, and asset management. Too often, however, onboarding

for pipelines, structures, and appurtenances is inconsistent, with incomplete attributes, scattered records, and unclear roles and responsibilities. This leaves utilities scrambling to understand and manage asset information at startup and during early operations. The result is a chaotic landscape of data spread across multiple applications and repositories, or, in some cases, not collected at all, hindering support for day-to-day operations and maintenance (O&M) activities of new assets and creating unnecessary long-term risks.

This presentation shares a practical, repeatable approach to asset onboarding for linear conveyance that reduces risk, accelerates readiness, and improves lifecycle outcomes. We will outline core elements of an effective onboarding program with a focus on linear assets, based on direct experience and lessons learned:

1. Foundational business process workflows and stage gates from 30% design through closeout.
2. Tools and technology enablement to standardize data capture and transfer.
3. Cross functional collaboration with clearly defined roles and responsibilities across engineering, capital projects, O&M, and asset management.
4. Leadership commitment and governance to sustain practices.
5. Organizational change management (training, job aids, adoption plans).

The presentation illustrates these practices with recent Pacific Northwest case snapshots, where program level tools built on the Microsoft Power Platform/Dataverse are used to collect standardized asset data from designers and contractors, support asset status tracking and monitoring through defined project lifecycle stages, provide visibility and transparency to cross functional teams, and develop structured handover packages (including e O&M content). Results include improved data completeness at cutover, faster computerized maintenance management system (CMMS) go live for new pipelines and structures, fewer duplicate assets, and clearer accountability across project phases.

You will be able to recognize the operational risks and business impacts of inadequate infrastructure onboarding practices and learn field tested best practices and innovative approaches developed by utilities actively working to improve their asset onboarding processes. This practical approach helps utilities reduce operational risk and improve long term performance of conveyance assets.

Speaker(s):

Chris Puccio, cpuccio@brwncald.com, Brown and Caldwell, Denver, Colorado

Chris is a technology executive and management consultant with over 35 years of experience leading technology strategy and system implementations, including nearly 20 years supporting water and wastewater utilities.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Beyond Compliance: Elevating Stormwater Management from Permit Tracking to Strategic Asset Stewardship

Description:

Many stormwater programs face a common challenge: comprehensive asset inventories that may track location and type, but provide no guidance on which assets matter most, how to prioritize limited resources, or when to act. Kitsap County's transformation from managing 8,000+ assets for basic MS4 compliance to strategic asset stewardship demonstrates a replicable pathway forward.

This presentation will share how developing a comprehensive risk-based asset management framework can transform reactive maintenance into proactive planning. Attendees will learn how to develop risk-based prioritization frameworks by applying consequence and probability of failure assessments to move from crisis management to strategic resource allocation. We'll demonstrate how we established risk profiles for each BMP type, calculated lifecycle costs and replacement values, and created maintenance protocols aligned with water quality goals—delivering individual Asset Management Plans for ponds, pipes, and stormwater parks with schedules tied directly to performance standards.

Participants will gain strategies for connecting asset management to water quality outcomes by integrating lifecycle planning, maintenance protocols, and monitoring programs with MS4 permit compliance and watershed protection goals. Our integrated Monitoring Plan connects water quality monitoring, facility effectiveness studies, and watershed assessments with asset management and capital priorities, enabling data-driven budget justification and objective decision-making.

The session will provide proven approaches for organizational transformation, including techniques for engaging cross-divisional teams and demonstrating ROI to secure funding and leadership support. As a grant-supported pilot project, our work has generated strong interest from both our funding agency and other Public Works divisions exploring how to replicate this framework—demonstrating its viability for resource-constrained municipal programs.

For stormwater professionals struggling to do more with less, this session offers practical tools and approaches to make the shift from reactive maintenance to strategic stewardship while sustaining water quality improvements.

Speaker(s):

Michelle Perdue, mperdue@kitsap.gov, Kitsap County, Port Orchard, WA

Michelle Perdue, Stormwater Program Manager, Kitsap County Public Works

Michelle has over 20 years of experience in municipal stormwater management and environmental outreach, with a focus on delivering critical community outcomes like flood protection, improved surface water quality, efficient regulation of development, well-planned watersheds, and effective and empathetic customer service.

Her work at Kitsap County, in harmony with the Clean Water Kitsap partnership, has included nationally-recognized projects and programs that reduce flooding, prevent pollution and restore fish habitat, ensuring that our shellfish beds, streams and waterbodies remain functional for the humans and wildlife that depend on them.

Prior to joining Kitsap County, Michelle was the Municipal NPDES Stormwater Permit Manager for the City of Moses Lake, Washington.

Shawn Alire, salire@kitsap.gov, Kitsap County, Port Orchard, WA

Shawn Alire, Stormwater Retrofit & Asset Manager, Kitsap County Public Works

Shawn brings more than 30 years of public service experience with the county, having worked across the Roads and Community Development departments before transitioning into Public Works. Throughout his career, he has played a key role in supporting infrastructure, community planning, and public service initiatives, bringing a deep understanding of county operations and a strong commitment to serving the community.

Beth Schrayshuen, bschrayshuen@eaest.com, EA Engineering, Science and Technology, Hunt Valley, MD

Beth Schrayshuen, Asset Management Program Manager, EA Engineering, Science, and Technology, Inc., PBC

Beth is a Professional Engineer, International Society of Arboriculture Certified Arborist, and Institute of Asset Management Certified professional. Sh

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Beyond Dry: What Happens Next

Description:

This paper examines the technical, operational, and planning considerations associated with upgrading existing thermal drying systems with advanced thermal processes (ATP) such as gasification and pyrolysis. As utilities seek to enhance resiliency, manage escalating biosolids disposal costs, and respond to evolving regulatory pressures including PFAS-related concerns, many are evaluating how next-generation thermal technologies can be integrated downstream of conventional dewatering and drying systems.

Across the United States, municipalities are facing reduced disposal outlets, increasing community opposition, and tightening regulations that have limited land application as a viable option. Thermal drying has become a common strategy to reduce volume and mass, improve landfill acceptance, and mitigate storage risks during unfavorable land application conditions. However, drying alone may not fully address long-term regulatory, cost, or sustainability objectives.

Advanced thermal processes are emerging as viable large-scale solutions, offering further mass and volume reduction and demonstrated destruction of PFAS in biosolids. Incorporating future ATP retrofits into existing treatment trains represents a critical evolution in solids management planning. Retrofitting ATP introduces unique challenges related to dewatered cake and dried product handling, feedstock blending, buffering capacity, operational continuity, and energy integration.

This paper presents a systems-level framework for evaluating retrofit readiness, focusing on key interfaces between dewatering, drying, and advanced thermal units. Topics include the role of upstream and downstream buffering to maintain operations during maintenance or process disruptions; flexibility in dried product handling to support multiple end uses such as pellets, biochar, or thermal feedstock; and opportunities for energy recovery to offset the high energy demands of thermal drying. Capturing waste heat from ATP units can

significantly reduce fossil fuel consumption and greenhouse gas emissions but requires careful attention to temperature profiles, condensate management, corrosion control, and dynamic load conditions.

Successful implementation also depends on coordinated controls, instrumentation upgrades, permitting strategies, emissions management, and adaptability to evolving PFAS guidance. Facilities that adopt a holistic approach will be best positioned to develop resilient, flexible, and future-proof biosolids management infrastructure.

Speaker(s):

Amy Hanna, , Hazen and Sawyer, Raleigh, North Carolina

Amy Hanna serves as Hazen's National Biosolids Practice Leader and is a senior associate in the Raleigh, NC office. Amy has 20 years of experience and specializes in the planning, design and commissioning of biosolids treatment processes. When she isn't engineering, Amy likes to knit.

Beyond Gravity: Developing a Risk Framework for Pressurized Sewer Infrastructure

Description:

Clark Regional Wastewater District (“District”) provides wastewater service to more than 109,000 people in southwestern Washington. The District maintains a comprehensive asset management program for its gravity conveyance system, pump stations, and treatment facilities. Following completion of a gravity sewer risk assessment, the District identified a gap in its framework: evaluating risk in continuously pressurized, largely inaccessible force mains. The District owns and operates 83 force mains ranging from 2 to 48 inches in diameter, totaling more than 686,000 linear feet of pipeline.

Force mains operate under fundamentally different conditions than gravity sewers. Failure mechanisms are driven by internal pressure, hydraulic transients, air management, and cyclic stress. Force mains can also be challenging to inspect, whereas risk in gravity sewers can often be assessed using visual inspections. Direct inspection opportunities are limited, condition data are often sparse, and the consequences of failure (COF) can be immediate and significant.

This presentation describes the District’s approach to the development of a force main risk model structured around primary failure mechanisms, including corrosion influenced by the soil environment, hydraulic velocity extremes, and pressure transients. The methodology adapts traditional likelihood and consequence scoring to reflect pressurized system behavior. Additionally, the presentation will highlight how the District addressed common data limitations while maintaining defensible technical rigor. The resulting scoring framework incorporates weighted factors and condition modifiers based on the relative influence of each parameter on overall force main health, producing a more representative evaluation of asset risk.

By aligning risk scoring with actual force main failure modes, the District expanded its asset management program to more effectively prioritize one of the most critical and least visible components of the collection system.

Speaker(s):

Rob Lee, PE, PMP, rob.lee@leewayengineeringsolutions.com, Leeway Engineering Solutions, Portland, Oregon

Rob Lee is a principal engineer with Leeway Engineering. He has 27 years of experience, is a licensed PE, and has supported asset management plans on sanitary gravity sewers, storm sewers, and force mains for several agencies in the Pacific Northwest.

Vanessa Johnson, PE, vjohnson@crwwd.com, Clark Regional Wastewater District, Vancouver, Washington

Vanessa is the Capital Program Manager with the Clark Regional Wastewater District in Clark County (WA). She is a licensed engineer with over 20 years of experience working on municipal wastewater projects here in the Pacific Northwest.

Melissa Moe, MA, PMP, mmoe@crwwd.com, Leeway Engineering Solutions, Portland, Oregon

Melissa is the Collection Systems Operations Manager for the Clark Regional Wastewater District. She has a MA in Project Management, has her Project Management Professional certification, and 15 years of work experience focused in the area of maintenance

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Beyond Nitrification: SystemWide Considerations Associated with BNR Conversion

Description:

The Washington Department of Ecology is planning to implement the Puget Sound Nutrient Reduction Plan, requiring wastewater treatment plants to significantly reduce nitrogen discharges to Puget Sound by 2050. To meet these objectives, many facilities will need to be designed to operate at longer solids retention times (SRTs), typically on the order of 7–8 days, compared to historical operation at 1–2 days, to reliably support nitrifier growth and stable nitrification.

While the effectiveness of longer SRTs in promoting nitrification is well established, increasing SRT alters activated sludge system behavior beyond nitrogen conversion alone. Operation at longer SRTs influences microbial community structure, TOrC fate, and contaminant partitioning—factors that are often secondary considerations during BNR planning and design.

Research has shown that the response of contaminants of emerging concern, including pharmaceuticals, to operation at longer SRTs can vary widely depending on compound-specific properties. Compounds with higher sorption affinity, such as triclosan and vancomycin, tend to preferentially associate with biomass and accumulate in WAS as SRT increases. In contrast, more hydrophilic compounds, including TCEP and trimethoprim, may persist in the aqueous phase or exhibit variable removal due to slower biodegradation kinetics. Conversely, bulk organic indicators such as TOC and soluble COD typically demonstrate improved removal at longer SRTs, reflecting increased microbial diversity.

Operation at longer secondary sludge SRTs also affects solids handling performance. As sludge age increases, greater endogenous decay and changes in extracellular polymeric substances characteristics may reduce

thickening and dewatering efficiency. Experimental and full-scale observations indicate that volatile solids destruction efficiency in anaerobic digestion may decrease from approximately 30% to 25% as secondary treatment SRT increases from 5 to 10 days, with further reductions observed at higher SRTs. These changes may result in higher polymer demand, lower achievable cake solids, and increased hauling costs, and should be considered alongside liquid-stream performance when planning BNR conversions.

The goal of this presentation is to highlight the suite of treatment and operational changes that accompany conversion to BNR systems operating at longer SRTs. By understanding these system-wide effects, utilities can better integrate nutrient reduction goals with broader treatment and resource recovery objectives.

Speaker(s):

Majid Neyestani, majid.neyestani@stantec.com, Stantec, Bellevue, Washigton

Dr. Majid Neyestani is a Senior Associate, Wastewater Engineer at Stantec, with 15 years of experience in municipal and industrial wastewater treatment. He holds a PhD in Civil and Environmental Engineering and is a licensed Professional Engineer in Washington, Nevada, and Hawaii.

His experience includes facility planning, process evaluations, detailed design, construction-phase support, pilot studies, and technology assessments for liquid stream treatment and solids handling facilities. Majid has supported projects across the U.S. West Coast and Hawaii, with a focus on practical, technically sound, and constructible solutions.

Beyond Nutrients: Pilot-Scale Removal of Phosphorus, Toxicity, Metals, and PFAS

Description:

Water resource recovery facilities (WRRFs) are often faced with needing to meet increasingly stringent treatment requirements for a variety of constituents, including nutrients, metals, and toxicity. Additionally, the U.S. EPA has adopted a multipronged strategy to address per- and polyfluoroalkyl substances (PFAS) contamination that includes reducing discharge to waterways which may lead to numerical limits in the future. Supplemental advanced treatment operations including ultrafiltration (UF), granular activated carbon (GAC), anion exchange, nanofiltration, and reverse osmosis are often needed to meet stringent effluent limits for metals, toxicity, and PFAS.

This study will present results from a seven-month-long pilot investigation of coagulation/flocculation (C/F), submerged membrane UF, followed by GAC in treating secondary effluent from a WRRF in the western United States. The primary objectives included characterizing the removal of PFAS, metals (aluminum, arsenic, chromium, copper), total phosphorus (TP), and whole effluent toxicity (WET). Performance monitoring involved analyzing composite and grab samples for phosphorus, total organic carbon, metals, WET, toxicity-associated compounds such as quaternary ammonium surfactants, and PFAS including perfluorooctanoic acid (PFOA).

Based on the first five months of operation, WET reduction was not conclusively demonstrated by WET testing. However, direct quantification of compounds associated with toxicity indicated substantial removal by the C/F+UF as well as GAC. C/F+UF removed 60-80% of quaternary ammonium surfactants, non-ionic and anionic surfactants, and biocides, suggesting a reduced treatment burden on downstream GAC. PFOA breakthrough

was observed between 3000 and 5000 bed volumes with a pilot influent PFOA concentration of 13 ng/L. Further characterization of C/F+UF PFAS removal is ongoing. Finally, C/F+UF also achieved significant metals removal, including approximately 80% for aluminum, and 80–100% for total recoverable arsenic and chromium.

This pilot study provides critical performance data for mainstream advanced treatment with C/F+UF and GAC for toxicity and PFAS removal. Removal of toxic compounds by C/F+UF helped lower removal demand at the GAC unit . Additionally, this study contributes pilot-scale PFAS removal performance data across C/F+UF and GAC. These data and findings support the design of full-scale tertiary treatment facilities for water reuse applications and assist in meeting evolving regulatory requirements for TP, WET, metals, and PFAS.

Speaker(s):

Nick Guho, nguho@carollo.com, Carollo Engineers, Boise, Idaho

Nick Guho is a lead technologist at Carollo with 15 years of experience in applied research and consulting. He specializes in wastewater process modeling, data analytics, process design, and BNR facility planning. He holds MS and PhD degrees in Civil Engineering from the University of Idaho.

Beyond Opportunistic Retrofits: A Strategic Framework for WatershedScale Nature Based Solutions

Description:

Transportation-dominated urban watersheds are major sources of untreated stormwater pollution in Puget Sound, posing significant threats to aquatic ecosystems. Notably, contaminants from roadway runoff have been linked to increased salmon mortality, highlighting the urgent need for innovative solutions to safeguard water quality and protect vulnerable species. To address these challenges and pave the way toward a sustainable water future, The Nature Conservancy (TNC), in collaboration with Parametrix, implemented a replicable, data-driven siting framework in the Lower Green River Subwatershed within WRIA 9. This initiative aims to normalize and scale high-impact green stormwater infrastructure (GSI), transforming stormwater management from reactive measures to proactive, strategic investments.

The project showcases the power of integrated watershed analytics to identify priority basins and generate implementation-ready retrofit concepts that maximize water quality, ecological health, and community well-being. Leveraging TNC's Stormwater Heatmap—which combines high-resolution landcover mapping, continuous hydrologic modeling, and Bayesian pollutant loading estimates—the team systematically evaluated basins based on total suspended sediment loads and the extent of pollution-generating impervious surfaces. To ensure a holistic approach, the framework incorporated biological health indicators (such as B-IBI scores and salmon habitat use), environmental justice metrics (Combined Equity Index), and regulatory factors (including 303(d) listings and TMDLs) into a weighted scoring system. This methodology guarantees that pollutant reduction, ecological restoration, and human health are considered equally, reinforcing the commitment to a sustainable and equitable water future.

Through this comprehensive analysis, Basin 9048 (Mill Creek) emerged as the highest-priority site for intervention. The team conducted detailed catchment delineation, runoff ownership mapping, and land cover

analysis to accurately quantify stormwater volumes and sediment loads. Climate projections—anticipating increased rainfall intensity and flood frequency—were integrated to ensure that proposed facilities are resilient and future-proof. Conceptual nature-based retrofit strategies were then evaluated, focusing on local soil conditions, infiltration capacity, alignment with capital improvement plans, and partnership readiness, all critical elements in fostering long-term sustainability.

This case study demonstrates how watershed characterization, equity screening, and infrastructure feasibility can be combined into a transparent prioritization process that municipalities across Puget Sound can replicate. By advancing stormwater planning from opportunistic retrofits to strategically sited, high-impact investments, the framework contributes to a sustainable water future—treating the most severe pollutant loads, supporting salmon recovery, and providing co-benefits such as increased greenspace access and community revitalization. This integrated approach not only improves water quality but also enhances ecological resilience and social equity.

For utilities grappling with regulatory demands, climate uncertainty, and constrained budgets, this pragmatic roadmap offers a scalable solution for green infrastructure deployment where it is most needed. By prioritizing sustainability and resilience, communities can secure a healthier, more vibrant water future for generations to come

Speaker(s):

Nikki Redden, nredden@parametrix.com, Parametrix, Seattle, WA

Nikki is an environmental engineer with proven environmental and hydraulic modeling and design skills. She has a strong passion for stream restoration and stormwater management. Nikki's project experiment includes stream restoration, fish passage, stormwater management action plans, and hydrologic and hydraulic modeling.

John Phillips, jmphillips@parametrix.com, Parametrix, Seattle, WA

John is the Parametrix Director of Integrated Watershed Management an approach to natural resources and infrastructure development in watershed planning, management, restoration, and climate change adaptation. Prior to Parametrix John worked for King County managing major capital improvement programs for wastewater and climate adaptation. His climate work has been referenced in both the IPCC and National Climate Assessment reports.

Beyond the Buzzwords: What Digital Technology Can Deliver Today for Water and Wastewater

Description:

Delivering new technology is a people-first challenge that requires informed decision making at multiple levels. Leadership in many water and wastewater agencies often consists of individuals who are more comfortable with older methods. At the same time, technology is evolving rapidly as part of Industry 4.0. This creates a significant gap between the pace of technological advancement and the rate at which people adapt to change.

This gap presents a challenge when introducing new digital tools like digital twins, analytic modeling applications, and artificial intelligence and machine learning (AI/ML) solutions for the water and wastewater industry.

The message that will be delivered is that with a thoughtful, human-centered approach, one that's empathetic and strategic, even the most traditional-minded industry stakeholders can successfully accept the promise of new technologies.

Demystifying the terms and explaining the origins of these technologies is the first crucial step in increasing comfort levels with the technologies currently being marketed to our water and wastewater industry. The presenter will illustrate real life examples of successful technology adoptions providing significant return on investment and value to the water and wastewater sector. In contrast, over-hyped technologies will also be presented with clarity revealing why some digital solutions are clearly not yet ready for prime time.

In summary, the presenter, a water industry veteran, will rate 5 existing digital solutions and provide a recommendation to "Buy" or "Hold" for each technology based on return on investment calculations, ease of adoption ratings and other useful key performance indicators.

Speaker(s):

Susan Howard, susan.howard@mbakerintl.com, Michael Baker International, Portland, Oregon

Susan began her career in the United States Air Force as a cryptographic maintenance specialist. She holds a B.S. in quantitative analysis and computer engineering and an M.S. in telecommunications engineering from the University of Colorado Boulder.

She has spent over 20 years as a SCADA and cybersecurity specialist serving water, electric, and rail infrastructure.

She has provided SCADA and cybersecurity consulting for Hatch Engineering, Jacobs Engineering, and currently with Michael Baker International. She has delivered more than a dozen SCADA master plans, designs, and cybersecurity assessments for water and wastewater treatment plants across the country. Susan currently leads the Industrial Control Systems and Operational Technology practice at Michael Baker International.

Big Funding, Big Challenges: The Twisp Story

Description:

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

In 2024, the small and remote Washington community of Twisp secured the largest Washington State Department of Ecology grant award to date to renovate its aging wastewater treatment system. While the funding and design story was a major victory, the construction phase proved far more complex. As work progressed, the project encountered challenges common to remote locations: limited contractor availability, logistical hurdles, and interpretations of contract requirements that introduced schedule pressures, cost impacts, and several pivotal decision points for the team.

Small communities face steep obstacles when maintaining aging wastewater infrastructure—restricted budgets, limited staff, constrained contractor markets, and a project environment where the scale of available funding can create expectations that don't align with local realities. With an experienced Public Works Director—an operator with more than 30 years of hands-on wastewater treatment expertise—serving as a core design partner, the project team developed a tailored design that blended innovation with familiarity. The upgraded system centers on repurposing an existing oxidation ditch into multiple selector zones to enhance process stability and nutrient removal. New aerobic basins were introduced to expand treatment capacity and provide operational flexibility, while targeted equipment upgrades throughout the plant improved reliability and reduced long term maintenance needs. The design sought to honor the operator's deep understanding of the facility while maximizing the impact of the unprecedented funding package.

This presentation tells the full arc: what went right, what went wrong, and the lessons that emerged. We will discuss how the funding package was assembled, the operational considerations that shaped design decisions, and the construction phase insights that helped keep the project moving during contractual friction. These experiences highlight key considerations for agencies planning upgrades in constrained environments.

Attendees will gain insights into:

- crafting competitive funding applications
- tailoring design to operator vision and legacy systems
- maximizing funding impact
- anticipating remote site construction challenges
- contract strategies that reduce risk
- maintaining alignment between engineers, owners, operators, and contractors

This case study offers an honest look at delivering a complex renovation under unique geographic, operational, and funding conditions—while keeping the community's needs at the center.

Speaker(s):

Brent Deyo, bdeyo@ardurra.com, Ardurra, Coeur d'Alene, Idaho

Brent Deyo is a project manager at Ardurra, a consulting engineering firm specializing in infrastructure solutions. He brings diverse experience across water and wastewater systems, from collection and distribution through treatment. His work spans all project phases, from concept and planning to design, construction, and commissioning. Brent primarily serves municipalities, helping communities develop resilient and effective utility systems. Based in Coeur d'Alene, Idaho, he enjoys taking advantage of the area's outstanding outdoor recreation.

Andrew Denham, publicworks@townoftwisp.com, Town of Twisp, Twisp, Washington

Andrew Denham brings over 35 years of experience in wastewater, water, and public works. He is a certified Class IV operator in both wastewater and water and has extensive expertise in operations, regulatory compliance, and infrastructure management, offering a strong practical perspective on system planning and performance.

BioDrying for Small Municipalities Case Studies, Performance Data, and Economic Analyses

Description:

As biosolids management costs continue to rise, the fastest path to affordability in regards to tipping fees is volume reduction. Oftentimes, drying systems come with a large energy footprint and high throughput, leaving small municipalities with limited budgets and production with little options for a pathway to affordability through drying.

In 2024 and 2026, Bioforcetech installed and commissioned two BioDryer facilities at WWTP's under 3 MGD in the PNW; Scappoose, Oregon (1 BioDryer) and Yelm, Washington (2 BioDryers). These installations have given the two municipalities a low energy option to bring unstabilized dewatered sludge to 25% of the original mass and achieve up to Class A solids.

This presentation will bring together the viewpoints of the technology provider (Bioforcetech, BFT) and the city of Scappoose to discuss the unique challenges and opportunities associated with drying for small utilities. BFT will take the audience through the overall project, sharing the design process, ancillary equipment details, and taking a deep dive into direct performance data of the equipment installed. The performance data will include energy demand, cycles per year, overall throughput, and any challenges encountered during the years running.

Next, Kevin Turner, Superintendent of Wastewater at the City of Scappoose, will share the reasoning behind the implementation of their BioDryer, and the real experience of the system after 2+ years continuous operation. As smaller plants are uniquely positioned to carry large amounts of responsibility and processing on a small staff and budget, Kevin will focus on operations, maintenance, and requirements for the system based on the city’s experience as compared to the sludge management burden before installation and commissioning.

Finally, BFT and The City of Scappoose will take the audience through economic modeling of the life cycle costs of the BioDryer in comparison to land application in the PNW with the goal of developing an understanding of the pathway to affordability for these small utilities. While each municipality has unique drivers, the goal of the model is to give plants a baseline to work around where they could envision a pathway to affordable volume reduction if they fit.

Speaker(s):

Valentino Villa, v.villa@bioforcetech.com, Bioforcetech Corporation, South San Francisco, CA

Valentino Villa is the Co-Founder and SVP of Sales at Bioforcetech Corporation. Since Co-founding Bioforcetech, Valentino and his team have been rethinking every step of biosolids management to prepare for a carbon free

future. Valentino believes that Bioforcetech's biochar, OurCarbon®, is a resource, which is why he and his team have developed the applications for biochar far beyond soil amendment. Valentino lives in California with his wife and two sons.

Biological Nutrient Removal Facility Process Controls for Operational Flexibility and Reduced Operating Costs

Description:

The City of Medford is in the process of upgrading its Regional Water Reclamation Facility (RWRF) to meet recently prescribed effluent nutrient limits of 3.2 mg/L TN and 0.6 mg/L TP. The RWRF, like many wastewater treatment facilities in Oregon, was originally designed for conventional pollutants (BOD/TSS) and ammonia removal only. Therefore, significant upgrades are required.

The City has elected to construct a 5-stage Bardenpho Biological Nutrient Removal (BNR) secondary treatment process followed by a tertiary filtration process as the preferred treatment strategy for meeting the nutrient removal requirements. For this system, process controls and equipment selection are critical for optimizing nutrient removal, maximizing operational flexibility, and reducing operating and maintenance (O&M) costs.

This presentation will discuss the following recommended process control strategies for the new BNR system:

I. Dissolved Oxygen (DO)-based aeration control and ammonia-based aeration control (ABAC),

II. TSS sensors in the mixed liquor and in the WAS line to allow for real-time monitoring of solids retention time (SRT),

III. pH probes to monitor alkalinity adjustment needs, and

IV. ORP probes and phosphate analyzers to monitor biological phosphorus removal.

The discussion of these strategies will provide details on how each strategy will be implemented at the RWRF, what benefits are expected to be realized, and potential future process control additions to provide further enhancements.

The presentation will also address evaluation and selection of the aeration system blowers and diffusers for optimizing performance of the BNR Facility, with a focus on providing flexibility to operate at higher and lower DO setpoints. High-speed air-bearing turbo blowers, high-speed magnetic bearing turbo blowers, and hybrid screw blowers were considered and evaluated based on life cycle costs, turn-down capabilities to allow for both DO-based control and ABAC, and non-economic factors such as installation history, noise, physical size, and the ability to perform maintenance activities in-house.

Speaker(s):

Francesca Cecconi, cecconif@bv.com, Black & Veatch, Concord, California

Francesca is a process engineer with 9 years' experience in wastewater treatment working at Black & Veatch. She holds bachelor and master degrees from the University of Florence, Italy in Environment Engineering and a

PhD from UC Irvine. At Black & Veatch, she specializes in nutrient removal design and research, process optimization, energy and cost analysis, and carbon accounting.

Tricia Sweeny, tsweeny@westyost.com, West Yost, Sacramento, California

Tricia is a design engineer at West Yost with four years of experience in wastewater treatment. She holds a bachelor's degree in civil and environmental engineering from San José State University and a master's degree in environmental engineering from the University of California, Berkeley. Driven by a passion for water, she has built her career delivering high-quality engineering services across all project stages, with experience in liquid and solids treatment.

Johnny Leavy, Johnny.Leavy@cityofmedford.org, City of Medford, Medford, Oregon

Johnny Leavy is the Water Reclamation Division Manager for the City of Medford's Regional Water Reclamation Facility, where he leads wastewater operations, regulatory compliance, safety, and capital improvement efforts for a 25-person team.

Biological Phosphorus Removal and Anaerobic Zone Sizing from a Carbon Perspective – Clarifying Return on Investment

Description:

Water resource recovery facilities (WRRFs) are increasingly faced with the need for system renovations as influent flowrates increase and/or additional limits on effluent quality are established. As system upgrades are designed, frequently using the existing facility acreage, there is an earnest need to balance wastewater treatment capacity with the renovation footprint, as well as operational complexity and process sustainability. For facilities faced with effluent phosphorus limits, biological phosphorus removal (BPR) has proven to be a sustainable nutrient removal process. Critical to successful BPR is the anaerobic zone. Under anaerobic conditions, the organisms responsible for BPR (referred to as phosphorus accumulating organisms, PAOs) accumulate organic carbon from influent wastewater and stockpile it intracellularly as polyhydroxyalkanoate (PHA) for use anoxically and aerobically to achieve phosphorus removal. Design guidance regarding the time necessary for maximizing PHA accumulation and, subsequently, the volume of the anaerobic zone, is poorly defined; moreover, anaerobic zones for BPR systems have been chronically undersized. A major component in this uncertainty is the highly varying nature of influent carbon characteristics. Influent wastewater rich in volatile fatty acids (VFAs) or readily biodegradable COD (rbCOD) provides a more immediate carbon source for PHA synthesis under anaerobic conditions. For influent with low concentrations of these components, longer anaerobic detention times can leverage the hydrolysis and fermentation of slowly biodegradable COD (sbCOD) to further PHA accrual. Maximizing anaerobic PHA accumulation ultimately enhances BPR stability while also providing opportunities to minimize external carbon addition for nitrate removal.

As part of an ongoing Water Research Foundation research project, investigations have been undertaken at the University of Idaho to gain new insight into BPR, with a focus on anaerobic zone sizing, anaerobic PHA accumulation, and anoxic/aerobic PHA utilization. A potential "maximum" end anaerobic PHA concentration was explored using metabolic modeling coupled with data from bench-scale, pilot-scale, and full-scale BPR

treatment systems, including two bench-scale sequencing batch reactors (SBRs) designed specifically to inform this question. The SBRs received contrasting influent rbCOD/sbCOD fractions and were operated at varying anaerobic and aerobic detention times. The pilot-scale WRRF is a post-anoxic BPR configuration, while the full-scale WRRF is a pre-anoxic BPR configuration. The return on investment of increasing anaerobic detention time was investigated. Observations and results from data analysis and testing will be presented and discussed, incorporating trends in VFAs, intracellular carbon (including PHA and glycogen), potential anaerobic zone fermentation, and soluble phosphorus. Results from molecular interrogation will be incorporated into the presentation; the relative fraction of PAOs (including denitrifying PAOs) have been determined using qPCR targeting 14 different PAO clades.

Speaker(s):

Isabel Huggins, hugg1620@vandals.uidaho.edu, University of Idaho, Moscow, Idaho

Erik Coats, ecoats@uidaho.edu, University of Idaho, Moscow, Idaho

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Biological Process Modeling 101 and Beyond

Description:

Process modeling is an invaluable tool widely used across the wastewater industry for planning, design, and treatment optimization applications. Process models can also be used for training new staff to better understand full-plant operation, specifically simulating the impacts of varying operational conditions without risking treatment performance. Most recently, innovative applications of process modeling include digital twin capability to provide staff real-time process optimization opportunities. The level of complexity and time required to develop a process model can vary depending on the overall modeling scope and objectives of the end-user. This presentation will provide the audience with an overview of what process modeling is, types of modeling software available (i.e. BioWin, SUMO, SIMBA#), data requirements, and specific project examples, including:

1. City of Pocatello WPCF. Process modeling was used for facility planning (capacity evaluation) and later used for operator training. Current and projected flows and loads were used to evaluate process capacity across the planning horizon. A special sampling campaign for influent wastewater characterization was completed to supplement historical plant data. The process model provided valuable information to identify process bottlenecks (i.e. aeration system capacity) and inform the 20-year capital improvement plan.

2. Spanish Fork & Mapleton (SF/M) WRF. Process modeling was used to support a greenfield wastewater treatment plant design, specifically bioreactor sizing and configuration, aeration demand, and chemical dosing locations. The model was also used to evaluate future design capacity at higher loading conditions. The model provided confirmation of design assumptions and insights into operational flexibility.

3. City of North Las Vegas (CNLV) WRF. Process modeling was used to identify and evaluate process optimization opportunities for improving the stability of biological phosphorus removal at the CNLV WRF while an influent equalization basin was being constructed. Results were used to shortlist scenarios to test at full-

scale without impacting process performance. The viable process optimization alternatives were applied to full-scale and successfully improved stability biological performance.

Overall, the goal of this presentation is to help the audience understand when to use process modeling, what tool to apply, and how to best use the results.

Speaker(s):

Katerina Messologitis, katerina.messologitis@stantec.com, Stantec, Portland, OR

Katerina is a wastewater engineer at Stantec with 9 years of experience focused on all things process engineering from facility planning to full-scale plant design and operation. Katerina is well versed in wastewater process modelling, piloting, and treatment optimization studies.

Vrunda Patel, vrunda.Patel@stantec.com, Stantec, Bellevue, WA

Vrunda Patel is a wastewater engineer with over seven years of experience in municipal treatment systems, focusing on aeration design, process modeling, and energy optimization. Her work centers on applying simulation tools to improve system performance, control strategies, and operational reliability.

Biosolids Land Application 101

Description:

Biosolids are nutrient rich organic materials produced during the wastewater treatment process; after treatment, biosolids must be managed. Land application remains the predominant method of biosolids management that many utilities rely on. Land applied biosolids can provide valuable agronomic, environmental, and economic benefits which ultimately make it the most sustainable and cost effective option available for these utilities. This presentation introduces the foundational concepts of biosolids, their production within wastewater treatment processes, and historical use. Additionally, a deeper dive into this topic will explore the benefits and challenges associated with land application including the implications of state-level restrictions and potential alternative management strategies. Together, these topics highlight the complex intersection of environmental stewardship, regulatory compliance, and sustainable biosolids management in an evolving landscape.

Speaker(s):

Jori Nelson, jori.nelson@hdrinc.com, HDR, Everett, Washington

Jori Nelson is a Utility Management Consultant with HDR based in Everett, Washington. Jori has experience across the water industry, including 7 years in the utility space. Prior to joining HDR, Jori oversaw the biosolids compliance program at Metro Water Recovery, a large utility in Colorado. As a part of her Professional Science Master's program, Jori assessed the implications of PFAS regulations for water reclamation facilities, highlighting the importance of sustainable biosolids management options.

Biosolids Planning for Community Growth Under Uncertainty: A Roadmap Based Approach

Description:

Wastewater utilities across the Pacific Northwest are facing increasing uncertainty around the long-term viability of biosolids land application, while simultaneously needing to plan for community growth. The Discovery Clean Water Alliance serves approximately 150,000 people, about 25% of the population of Clark County, Washington. Recent trends indicate that up to 50% of regional growth is expected to occur within the Salmon Creek Wastewater Treatment Plant service area, requiring multiple expansions in the next 20 years. With the potential loss of land application sites and increased pressures around affordability, this biosolids planning effort rose to the moment to balance growing uncertainty with core service delivery. Effective planning in this environment requires an adaptive approach to minimize risk of stranded asset investments, provide flexibility, and outline resilient process solutions while meeting near-term growth demands.

Class B biosolids land application has long been a go-to solids management strategy in the region. However, evolving regulations in other parts of the country, legislative pressure at the state level, and growing concerns from local farmers and food processors have created substantial uncertainty around the future of this outlet. As a result, utilities are challenged to make near-term investment decisions without knowing whether current practices will remain viable long term.

This presentation describes a roadmap-based biosolids planning process developed by the Discovery Clean Water Alliance that addresses these uncertainties while meeting immediate capacity needs. The planning effort began with a community values survey to identify priorities and inform evaluation criteria. Solids processing alternatives were then assessed using decision-support tools to quantify impacts to solids management, water use, and energy consumption. Future scenarios were mapped to evaluate how different regulatory and operational outcomes could affect solids processing strategies and to identify opportunities for phased investments and implementation. The team applied an adaptive planning lens at the end to develop the final recommendations that staged improvements over time.

The results of this process informed the selection of near-term projects that support a range of plausible future scenarios, minimize the risk of stranded assets, and preserve flexibility for expanded solids treatment or resource recovery. This presentation will share key lessons learned and demonstrate how utilities can develop actionable recommendations despite deep uncertainty, using a structured, values-driven planning framework that balances growth, resilience, and adaptability.

Speaker(s):

Quinn Behnke, qbehnke@brwcald.com, Brown and Caldwell, Redmond, Oregon

Quinn Behnke, P.E.

Quinn has over 13 years of experience as a mechanical engineer and is located in Redmond, Oregon. He specializes in wastewater solids and digester gas projects, including planning, evaluations, and detailed design for clients across the Pacific Northwest.

Bill Owen, bowen@crwwd.com, Clark Regional Wastewater District, Vancouver, Washington

Bill Owen, P.E., PMP

Bill is the principal engineer for transmission and treatment at Clark Regional Wastewater District in Vancouver, WA.

Breaking the Cycle of Scaling: A Fresh Approach at Tri City WRRF

Description:

Inorganic and mineral scaling has become an increasingly common and challenging issue at water resource recovery facilities (WRRFs) employing secondary treatment. The primary scaling com-pounds—typically phosphate-based salts such as struvite (magnesium ammonium phosphate) and brushite (calcium phosphate)—precipitate within pipe bends, valves, and other critical infrastructure. These deposits reduce treatment capacity and lead to unnecessary operation and maintenance burdens for WRRF operators. However, these precipitated minerals can also be harvested from sludge as a renewable agricultural resource, supporting circular economy principles.

Similar to many WRRFs, the Tri-City facility experienced significant scaling that required periodic removal and cleaning of pipe sections. To address this challenge, the facility undertook comprehensive site-wide sampling and conducted detailed chemical modeling. Rather than relying solely on bulk water quality metrics (e.g., total phosphorus, total nitrogen), the sampling program targeted a robust set of chemical parameters, including major cations (calcium, magnesium, sodium, potassium, iron, aluminum, manganese) and anions (chloride, sulfate, nitrate, acetate, phosphate). This approach provided deeper insights into site-specific scaling drivers such as pH, and ionic strength.

The chemical model was validated using scale sample characterization through X-ray diffraction and scanning electron microscopy. Once validated, the model was used to estimate the dosage and effectiveness of five different chemicals for scaling prevention, along with corresponding cost analyses. This study presents the methodology and findings of this integrated sampling and modeling effort and discusses why sidestream treatment is not always a viable solution for addressing scaling challenges.

Speaker(s):

Josh Miner, jminer@clackamas.us, Clackamas Water Environment Services, Clackamas, OR

Josh Miner, Senior Civil Engineer with Clackamas Water Environment Services. I have 13 years of experience working in the water and wastewater industry.

Shubhashini Oza, PhD, PE, SOza@BrwnCald.com, Brown and Caldwell, Charlotte, NC

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Breathing new life into old bioreactors: innovative aeration strategies for the future

Description:

The Gold Bar Wastewater Treatment Plant (GBWWTP) is an advanced nutrient removal facility treating wastewater from approximately 1.1 million population equivalents. EPCOR partnered with Stantec to evaluate the secondary aeration system to address declining reliability associated with a leaking main header (without redundancy), a constrained and inefficient tunnel configuration that limits maintenance; and long term secondary treatment expansion goals focused on improving energy efficiency and reducing emissions.

An integrated process–aeration–control model was developed in SIMBA#, calibrated to an existing BioWin model, and expanded to represent ten operating bioreactors with the full aeration distribution network. Modeling of current (2024) and projected future (2045) peak-week conditions revealed system limitations, including uneven dissolved oxygen (DO) distribution, improperly sized control valves, inconsistent basin header configurations, and air losses from aging main header couplings. These deficiencies increase energy consumption, reduce process flexibility, and limit system responsiveness during peak loading events, emphasizing the need for advanced aeration control strategies and long-term upgrades.

Future-year modeling evaluated three aeration control strategies to meet current and anticipated permit limits: existing DO control, optimized DO control, and advanced Ammonia versus Nitrate (AvN) control. The most significant gains were achieved with AvN control, which builds on piping and valve improvements required under optimized DO control while incorporating NHx and NOx monitoring in the final aerated zone. This enhancement enables real-time adjustment of DO setpoints based on measured NHx/NOx ratios, allowing precise balancing of nitrification and denitrification as loading conditions change. Compared to optimized DO control, AvN reduced total airflow requirements by 23–27 percent while maintaining compliance with potential future effluent nutrient limits by improving DO distribution, minimizing over aeration and strengthening overall process stability.

A parallel condition assessment identified significant reliability risks associated with aging aeration infrastructure. Following evaluation of alternatives, a new overhead redundant main header was selected to restore reliable system isolation, avoid disruptive tunnel excavation, and support phased modernization. A six-phase, 16-year implementation plan was developed with a total capital investment of CAD $44.2 million (Class 5). The study provides a data-driven roadmap for improving aeration reliability, reducing long-term energy demand, and positioning GBWWTP to meet objectives.

Speaker(s):

Vrunda Patel, vrunda.patel@stantec.com, Stantec Consulting, Bellevue, Washington

Vrunda Patel is a wastewater engineer with over seven years of experience in municipal treatment systems, focusing on aeration design, process modeling, and energy optimization. Her work centers on applying simulation tools to improve system performance, control strategies, and operational reliability.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Bringing Aerobic Granular Sludge (AGS) to Continuous Flow Treatment Plants: A Game Changer for New Plants, Nutrient Removal and Increase to Plant Capacity

Description:

Aerobic Granular Sludge (AGS) has already proven its value in Sequencing Batch Reactors (SBRs) by forming dense, fast-settling granules that enhance nutrient removal, reduce tank volumes, lower capital costs, and simplify expansions. Until now, AGS has been limited to SBRs—but that's changing. AGS is now a viable option for Continuous Flow (CF) treatment plants. This is significant since 80 to 90% of all wastewater treatment plants in the United States are continuous flow plants and now most all of these plants can consider the benefits of using AGS for their treatment needs.

For new plants, mixed liquor suspended solids can be designed at 6,000 to 8,000 mg/l because of the dense, fast settling granular sludge particles, thus saving significant construction costs due to smaller treatment tankage. For existing plants, flow capacity increases up to 2 times original flow can be treated within the treatment tankage by converting to AGS and increasing the mixed liquor to twice the original design levels. And if lower effluent nitrogen and/or phosphorus levels are needed, granular sludge can achieve the lower limits because of the elevated mixed liquor concentration and the simultaneous metabolic reactions occurring withing the granular particle.

This breakthrough is powered by a strategic combination of metabolic and physical selection techniques. This paper will review the necessary design features and selection techniques that allow granular particles to form and how the distribution of particles size within the plant can be controlled using a unique surface wasting scheme.

Most plant configurations can be designed or converted into an AGS plant with the benefits of lower construction costs, plant capacity increase or enhanced nutrient removal. A variety of plant layouts will be shown, along with microscopic photographs demonstrating optimum particle size distribution. Performance data, including Sludge Volume Index results from operating plants will also be presented.

Speaker(s):

Betty-Ann Curtis, bacurtis@parkson.com, Parkson Corporation, Castle Valley, Utah

Betty-Ann Curtis has worked in municipal wastewater for over 40 years, specializing in biological nutrient removal design, start-up and operation. She has worked for Ovivo (formerly EIMCO) and Xylem (formerly Evoqua, Siemens and USFilter) starting as a process engineer and completing her career as national director of sales (Evoqua). Her interest in aerobic granular sludge (AGS) for enhanced treatment performance enticed her out of retirement to work for Parkson Corporation with their ability to provide AGS process designs for both batch and continuous flow systems.

Build, Buy or Hybrid: Pathways to Continuous Water Quality Monitoring

Description:

Wastewater utilities increasingly need continuous flow, level, water quality, and other data to support operations, demonstrate and ensure compliance with permits, make data-driven decisions on investments and capital projects, and provide insights into the efficacy of different treatment or restoration efforts. However, there are often many options to provide this data. Some vendors offer turn-key services and systems that offer ease, reliability, accuracy, and support in return for higher costs for equipment, subscriptions, and data hosting services, and they are often difficult to pivot away from once invested in them. On the other hand, 'Open source', custom in-house, or less established systems can offer significant savings in equipment and subscription costs, but require significant investments in upfront labor costs to build and test the systems. They also frequently offer limited support, lower reliability, and less user-friendliness. Which option makes the most sense depends on the needs of the utility, but there is often very little data to make that decision.

Clean Water Services uses a number of vendors for continuous sensing needs and for nearly 10 years has also been working on developing custom in-house and open-source solutions to meet our needs with decreased cost. In 2026, due to some shifts in technology, availability of hardware, and other reasons, we are at a crossroads of continuing to invest in open-source solutions in-house, relying on proprietary vendor-based systems, or doing a hybrid. To make this decision, we developed several scenarios looking at total present value over the next 10 years accounting not only for cost but also the efficacy, resiliency, and sensibility of the systems under varying conditions and constraints.

Rather than prescribing a universal best option, we present multiple scenario-based solutions to choose from and compare the many pros/cons of open-source technologies as they compare to prebuilt established systems and methods that are more common industry-wide. For each explored scenario, we will share selection criteria, lessons learned, and some of the hybrid design methods that can help reduce risk while preserving flexibility.

Speaker(s):

Jason Cook, cookj@cleanwaterservices.org, Clean Water Services, Hillsboro, Oregon

Jason Cook, 8 years working with wastewater and specializing in novel monitoring and sampling techniques

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Building Resilient Utilities: Creative Financing for Water and Wastewater

Description:

Securing funding for municipal water and wastewater projects can be both challenging and complex, but the right strategy can turn critical infrastructure needs into reality. For many communities, obtaining affordable funding to keep the overall cost down is one of the most crucial factors in a project's ability to move forward. This presentation will explore real-world case studies of four communities that successfully assembled funding for their water and wastewater projects. Through these examples, we will examine the key funding sources available, including state and federal grants, low-interest loan programs, and local funding mechanisms. We will also highlight considerations for Build America, Buy America (BABA) compliance and approaches to securing funding for projects involving sensitive or emerging regulatory issues, such as PFAS treatment or lead service line replacement.

The presenters will provide insights into the funding application process, common pitfalls to avoid, and strategies for maximizing available resources. Whether you are planning a major system upgrade or addressing regulatory compliance, this session will provide practical guidance on navigating the financial landscape to move projects forward.

Speaker(s):

Stillman Norton, stillman@Kellerassociates.com, Keller Associates, Inc., Clarkston, Washington

Stillman manages Keller Associates' Clarkston, WA office and has managed and worked on a variety of water and wastewater system projects over the past 22 years. This includes master planning, modeling and calibration, pipeline replacement and new construction, pumping stations, storage reservoirs, and treatment plants. He has managed numerous wastewater treatment planning and design projects including improvements at activated sludge, membrane bioreactor, and lagoon treatment facilities. Stillman has managed and led the design of numerous booster stations, wells, storage tanks (elevated and ground level), and water distribution piping. Booster station designs have included completely new facilities and retrofitting existing facilities with new equipment, electrical, and controls. He recently led efforts to procure $12.2 million in funding for one of his clients, of which 94% was grant funding. He is licensed in Washington, Oregon, and Idaho.

Pam Villarreal, pvillarreal@kellerassociates.com, Keller Associates, Inc., Beaverton, Oregon

Pamela has 14 years of experience with various aspects of environmental remediation, stormwater, water, and wastewater treatment from the preliminary planning and development stages through design and construction management. She holds a bachelor’s degree in civil engineering from the University of California Los Angeles and is a licensed Professional Engineer. Pamela has lived and worked in California, New York, Idaho, and Oregon.

Building the Dream Team: Crafting Stories for Project Partnerships and Funding

Description:

Building the Dream Team: Crafting Stories for Project Partnerships and Funding

In an era of escalating water challenges, achieving a sustainable water future demands more than innovative engineering—it requires robust partnerships that bridge public and private sectors. This presentation explores "Building the Dream Team," a discussion about taking innovative water projects from concept to reality through not only technical expertise, but also collaboration, storytelling, and strategic funding.

At the heart of successful initiatives lies the power of storytelling. By crafting compelling narratives that highlight shared goals, environmental imperatives, and community benefits, we can rally diverse stakeholders—from government agencies and universities to corporations and nonprofits. We'll delve into a real-world example of how key partners, including regulatory and government agencies, a corporation, foundation, and nonprofits, helped the City of Nampa fund and build the Nampa Water Garden.

The Nampa Water Garden is an innovative, engineered wetland along Indian Creek that removes contaminants of emerging concern before the water reaches the Boise, Snake, and Columbia Rivers. The project is primarily funded through grants, corporate contributions, and foundation donations—with partners attracted by its water quality goals, corporate social responsibility, and community impact.

Part of what makes this story compelling is the project's innovation: advanced polishing cells harnessing zeolite, biochar, and activated carbon to target elusive contaminants of emerging concern, including pesticides, 6PPD-quinone, PFAS/PFOA, PCBs, and flame retardants. The wetland's dynamic design—featuring two parallel flow paths and sixteen strategic sampling points—unlocks discoveries on optimal treatment combinations, advancing the science of water purification in real-time ways that captivate funders, collaborators and the public.

The Nampa Water Garden was designed with the community in mind. A public parking area and trails woven throughout the park will encourage community engagement with the wetland and provide educational exhibits about water quality and conservation efforts. This multi-benefit space enhances environmental health while enriching Nampa's daily life, making it an attractive investment for donors seeking tangible, innovative ways to support water resiliency and local well-being.

Join us to gain insight into crafting your own stories, forging partnerships and securing funding, that turns vision into resilient realities. Ideal for communicators, project managers, planners, engineers, policymakers, and funders, this session will inspire actionable steps to build your dream team.

Speaker(s):

Kelly Black, blackk@cityofnampa.us, City of Nampa, Nampa, Idaho

With over 20 years of experience in government, corporate, and non-profit communication roles and an M.A. in Journalism, Kelly Black specializes in strategic storytelling, cross-agency collaboration, and translating complex technical information into compelling public messaging. As the Public Works Communication Manager for the City of Nampa, she is passionate about enhancing public understanding of water issues and advocates for innovative solutions that contribute to the health of regional water systems.

Erin Cox, Erin.cox@jacobs.com, Jacobs, Boise, Idaho

Erin Day Cox is a Water Resources Expert and Environmental Engineer who currently serves as the Northwest Water Resources Strategic Growth Leader and Idaho Client Account Manager at Jacobs. Erin has a B.S. in Biology, a M.S in Water Resources and Environmental Engineering, and she is a PhD candidate in Biological Design. Her areas of expertise include water quality, water resources, reuse, stormwater, and engineering with nature. Erin's professional career started in Newport Beach, CA working on complex water challenges at McGuire Environmental Consultants and then she worked as a Project Manager and in Business Development at CH2M HILL/Jacobs throughout the country for over 13 years. After a 10-year hiatus as an author and professor teaching environmental and water-related courses in Oregon Tech’s Civil Engineering program, she rejoined the consulting world in 2021. Her passion is protecting, improving, and sustaining water resources for future generations, and making the world a better place for everyone. She loves spending time reading, traveling, hiking, and exploring with her three kids.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Building Trust Around the Tap: Engaging Communities to Address Chronic Groundwater Contamination

Description:

Morrow and Umatilla Counties in Eastern Oregon face a decades-long problem with elevated nitrate levels in groundwater. Spanning 550 square miles, the region was designated special attention as the Lower Umatilla Groundwater Basin Management Area (LUBGMWA) in 1990 due to chronic contamination.

Now, efforts are underway to bring long-term sustainable solutions that safeguard the future of LUBGWMA's groundwater and communities.

With over 3,000 private wells serving some 8,000 residents, many households are vulnerable. The communities are largely rural and agricultural, with low population density, a large Spanish-speaking community, and a lingering distrust from decades of perceived inaction.

Studies pinpoint the main causes of nitrates: agricultural fertilizer, manure from dairy and cattle farms, and on-site septic systems. A smaller source is wastewater from food processing operations that is treated and reused for irrigation.

In response, the Drinking Water Roadmap project was initiated by EPA in 2024 to find long-term solutions. This project was a collective effort of both counties assisted by a consultant team to explore options for private domestic well owners.

This multi-stage effort was conducted over 2 ½ years to:

- Compile and analyze data from earlier studies
- Sample private wells
- Define focus areas for in-depth study and piloting
- Engage with well owners to work collaboratively on feasible solutions
- Evaluate the potential for service from in-home treatment, public water utilities, and neighborhood-scale systems.

Effective solutions depend on involvement from private well owners. To build awareness and trust, the project team launched a comprehensive engagement and education strategy grounded in transparency. Outreach included partnerships with community leaders and a stakeholder advisory committee; bilingual print and digital materials; a project website; public meetings; surveys; and targeted door-to-door outreach.

Recognizing there was no one-size-fits-all approach, outreach centered on addressing residents' concerns: cost, system maintenance, and neighbor coordination to support conceptual design development.

This session will explore how a decades-long, groundwater problem was advanced through adaptive outreach strategies. It will provide practical lessons for building community buy-in for solutions toward a clean water future.

Speaker(s):

Isaac Estrada, isaac.estrada@consoreng.com, Consor Engineers, Portland, Oregon

Isaac Estrada is a communications and community engagement specialist who supports municipalities and public agencies across the Pacific Northwest on infrastructure and utility projects. With a background in marketing and strategic communications, he helps agencies build public trust and engage communities around complex issues, particularly related to water infrastructure and groundwater contamination. His work focuses on transparent, culturally responsive outreach that strengthens relationships with diverse and historically underrepresented communities.

Butte Montana Leading the Northwest in Wastewater Effluent Reuse

Description:

The City-County of Butte-Silver Bow (BSB) has one of the most advanced wastewater treatment plants in Montana, if not within the Northwest. They treat millions of gallons of sewage daily using advanced membrane bioreactors followed by UV disinfection. The high-quality effluent rivals drinking water quality and has historically been discharged to a local creek. Like many communities, BSB is growing and struggling to keep up with the demands of potable water which they produce from a variety of ground and surface water sources. During the summer months, much of their potable water use is required for irrigation purposes. To address these needs, BSB has developed a system to reuse nearly all of their high-quality wastewater effluent to provide irrigation water through a "purple pipe" distribution network. Initially, BSB focused on providing water to a large cemetery, a city park and sports complex, a large municipal golf course, and a soccer field complex. Eventually, BSB plans to extend their purple pipe distribution system to additional areas and uses including using reuse water for street cleaning, dust control for construction sites, and for supplying water for rural and wildland fire fighting. By developing an effluent reuse system, BSB has reduced the pressures and demands placed upon their potable water supplies and gained a beneficial second-use of their potable water resources. Furthermore, the reuse of effluent reduces deleterious impacts on the receiving stream during the summer months when fish and aquatic species are most vulnerable. The reuse water is also currently being made available at no cost to the end users which reduces operational costs for the facilities that previously were using potable water for irrigation of landscaping. The recently completed project was paid for with an ARPA grant allowing BSB to set up and construct this first phase of their reuse water (purple pipe) distribution system. In this presentation, I will share information on how the BSB system operates, the regulatory challenges we faced in setting it up, and how BSB plans to expand the system for additional reuse opportunities.

Speaker(s):

Garrett Pallo, garrett.pallo@gmail.com, HDR Engineering, Missoula, Montana

More than 30 years of experience in the municipal water/wastewater industry. Former founder of Civil West Engineering in Oregon, now working with HDR out of Missoula MT.

Centrifuge Processing 101

Description:

This introductory course provides a practical overview of centrifuge operation for municipal and industrial water and wastewater treatment applications. Designed for operators, maintenance personnel, and plant support staff, the class explains the purpose of centrifuges in solids separation and how proper operation affects performance, reliability, and operating cost.

Topics include basic centrifuge components and terminology, principles of centrifugal force, feed characteristics, polymer basics, cake dryness, and centrate quality. Participants will also learn how key operating parameters — such as differential speed, pond depth, torque, and feed rate — influence dewatering results and overall process stability.

The course introduces essential safety considerations, start-up and shutdown fundamentals, and common operational challenges seen in real plant environments. Instruction is focused on practical understanding rather than advanced theory, making it ideal for personnel new to centrifuges or those looking to strengthen their foundational knowledge.

By the end of the session, attendees will understand how a decanter centrifuge works, what adjustments matter most, and how to support consistent, efficient operation. No prior centrifuge experience is required.

Speaker(s):

Sean Tierney, seant@frznbrg.com, Franzenburg Centrifuge, Des Moines, Iowa

Sean Tierney is a wastewater treatment and centrifuge process specialist with more than 20 years of experience in municipal and industrial dewatering applications. He currently serves as Business Development Manager and Process Specialist for Franzenburg Centrifuge, specializing in centrifuge optimization, aftermarket support, and process improvement solutions for municipal and industrial clients across the United States.

CFD Modeling Supports the 210 mgd Elliot West Wet Weather Treatment Facility Hydraulic Design

Description:

The Elliott West Wet Weather Treatment Station (EWWTS), a King County Wastewater Treatment Division (WTD) asset, brought online in 2005 to treat excess combined sewage from very old CSO basins. EWWTS current includes pumping, screening, chorine disinfection, then discharge to Puget Sound. Upgrades are being added to enhance treatment for flows between 25 mgd and up to 210 mgd through addition of improved screening, ballasted sedimentation, and UV disinfection. One key design challenge is retrofitting the new processes into the maximum 13.3-feet of available hydraulic grade between pump discharge structure and outfall, particularly considering this will be reduced by potential sea level rise and outfall changes. The

maximum tide level in Puget Sound has been rising and is projected to continue rising through the facility design life.

To address the complex retrofit hydraulics and to optimize flow conditions, a three-dimensional (3D) computation fluid dynamics (CFD) model was developed of the whole facility upgrade. The whole plant CFD model includes the existing pump discharge structure through the new screen structure, followed by ballasted sedimentation tanks, then through 8 parallel UV channels, back to a drop structure connecting everything to the existing outfall piping.

The model is free surface and includes all key equipment modeled in detail down to a one half inch accuracy to correctly simulate flow conditions. Key modeling benefits have included:

- Refined transitions and piping to new screen facility that lowered the upstream HGL by approximately 3.5 feet during preliminary modeling
- Optimized screening influent area to verify the balanced flows between channels and promote uniform flow distribution
- Developed a flow baffling system to balance flows between the UV channels for a range of operations to minimize head loss
- Improved the UV channel inlet configuration to facilitate uniform flow conditions approaching the UV lamps promoting optimal disinfection

The full plant model provided an ideal platform to reduce head losses, balance flows, and verify good flow distribution to optimize operations.

Speaker(s):

Ed Wicklein, ewicklein@carollo.com, Carollo Engineers, Seattle, Washington

Ed Wicklein is a hydraulic engineer with a focused on numerical modeling. He has nearly three decades of experience applying computational fluid dynamics (CFD) modeling to support design and operation of municipal and industrial water and wastewater facilities. He has additional experience with collection and distribution system modeling, physical modeling, and field data collection for physical and numerical model calibration. He is actively involved in both the IWA Working Group on CFD Modeling and the Hydraulic Intitule Pump Intake Committees.

Challenges in Startup of a Biological Class A Biosolids System

Description:

Biosolids treatment and handling continues to be an area of significant growth and development, especially production of Class A biosolids. The City of Yelm recently replaced their existing gravity belt press with a centrifuge and biodryer system. This presentation will discuss the lessons learned during startup of the new system to aid designers and operators in planning for the challenges faced.

Challenges encountered during startup of the new system include accounting for the time and difficulty of starting a biological process, disposal of off-specification cake, and operations challenges converting from a mostly continuous process to a batch process.

Unlike many other class A biosolids production processes, such as belt dryers, the biodryer is a partly biological process akin to composting, although in a much more compact footprint. It works by tumbling the biosolids, along with a seed solids amount, allowing the microorganisms to generate heat to dry the solids. Once it becomes too dry for the microorganisms to continue functioning effectively, boilers take over to provide the remaining drying. Establishment of the seed solids is a key component of startup that takes several weeks, and this must be planned for in the schedule and in startup of the other solids handling equipment.

During startup, any cake produced from the dewatering equipment, like the centrifuge used in this installation, must be collected and disposed of or recycled back into the facility. Because the off-spec cake produced in this case was not treated enough to qualify as class B solids, but too dry for other facilities to accept, handling was a challenge. It was recycled back into the solids storage tanks of the facility, but the polymer content of the cake had to be considered when future reprocessing took place. This complicated equipment operation and startup.

Finally, operations staff were comfortable operating a belt filter press which could run as much as needed. Conversion to the batch process used in the biodryer required a change in mindset to ensure batches were started on a reasonable schedule without requiring changes to staff working hours.

Speaker(s):

Scott Weirich, sweirich@parametrix.com, Parametrix, Puyallup, WA

Scott is a wastewater operator and engineer, focused on construction support, startup and pilot testing, and energy conservation. He has worked as an operator for the City of Boulder, CO and the City of Everett, WA. Since 2018, he has worked at Parametrix as an engineer where he has supported construction and startup of numerous projects including secondary treatment upgrades, peracetic acid disinfection, and solids handling.

Changing Paradigm – Idaho Falls WWTP Biosolids Long-Term Alternatives Evaluation

Description:

The City of Idaho Falls (City) originally identified solids handling capacity limitations in their 2024 Wastewater Facilities Planning Study and has also recently converted from lagoon storage and liquid biosolid land application to mechanical dewatering and dewatered biosolids land application. Due to the ongoing and increasing biosolids disposal challenges from development of local agricultural fields, higher landfill costs and other considerations, the City has decided to rethink its long term solids handling direction. This decision drove the City to undergo an evaluation (completed in spring of 2026) as a first step in potentially selecting a long-term enhanced and sustainable biosolids option. To perform this, the City undertook a study to evaluate and compare alternate WAS treatment technology with further solids treatment and drying options including composting, thermal drying and dehumidification. The City identified and weighed various factors such as life

cycle cost, odor, footprint, operability, safety and reliability, and PFAS considerations. These factors were quantified during the process and scored to help select the most feasible and favorable future direction for the biosolids management for the WWTP. This presentation will walk through biosolids evaluation drivers, how assessment criteria were established, findings and the decisions to date. Other topics will include conceptual layout, site visits to comparable facilities, flows and loads analysis, life cycle cost comparisons and the decision making process.

Speaker(s):

Nickolas Smith, nickolas.smith@stantec.com, Stantec, Boise, Idaho

Mr. Nick Smith is a licenced principal engineer out of the Boise, ID Stantec office. His 23 years of experience includes planning, designing, managing and performing construction management services for water treatment and water conveyance systems throughout the western United States and especially Idaho. Mr. Smith focuses on managing wastewater treatment and alternative delivery projects. Nick's dual education path included a finance degree with University of Oregon followed by an Environmental Engineering degree from Oregon State University. Nick enjoys outdoor activities including hunting, cycling, tennis and spending time with family and friends.

CIPP Lining the Unlineable

Description:

Seattle Public Utilities (SPU) faced an impending disaster with a failing stream culvert underneath an important roadway, but an emergency cured-in-place pipe (CIPP) lining project saved the day! The Fauntleroy Creek culvert underneath California Avenue SW in West Seattle is scheduled for full replacement in the next 5 years, including daylighting of the stream. However, after a routine internal inspection in 2024, the 400-foot-long mix of 24-inch-diameter corrugated metal pipe (CMP) and 30-inch-diameter reinforced concrete pipe (RCP) culvert had significantly more broken pipe and ovality (greater than 20 percent) than previous inspections indicated. Based on this degradation rate, confidence was low that the culvert would last a few more years, let alone 5 years.

SPU decided that emergency stabilization of the culvert had to be implemented as quickly as possible. After looking at alternatives, such as sliplining, pipe bursting, and trenchlessly installing a new pipe, CIPP lining was chosen as the preferred rehabilitation method. Because the culvert conveys a stream, styrene-free resins had to be used. The pipe's degraded state prompted concerns with having the pipe withstand several pressurizations associated with an ultraviolet (UV) cure. So a pull-in-place liner with epoxy resins and a steam cure was selected. SPU completed outreach to its normal list of CIPP contractors and the answer was the same: this line is too degraded to be CIPP-lined—the risk is too high for us to do this work. Undeterred, the design team persisted and found one CIPP installer willing (crazy?) enough to say, yes we can do this!

In October 2025, the contractor used a crane to lower equipment and the liner down a 30-foot-deep ravine to initiate work. It took several days to create a pumped stream bypass and lightly clean the line. After several stressful hours, including an emergency trip to a hardware store to repair broken equipment, the liner was

pulled into place and cured. Post-installation television inspection showed that the lining had successfully stabilized the pipe for at least the next 5 years until the full replacement can occur. Crisis averted!

Speaker(s):

Bob Jacobsen, bob.jacobsen@hdrinc.com, HDR, Seattle, WA

Bob Jacobsen has 25 years of experience in public utility collection/distribution arena with a focus in trenchless rehabilitation. He has his undergraduate degree from Virginia Tech and his master's degree from Johns Hopkins University.

City of Lynden WWTP Biological Nutrient Removal Upgrade: Phased Conversion of Oxidation Ditches to MLE Within a Floodway Constrained Site

Description:

The City of Lynden, Washington operates a secondary wastewater treatment facility utilizing extended aeration oxidation ditches followed by filtration and ultraviolet (UV) disinfection. With influent flows and loadings approaching facility capacity and anticipated future nitrogen limits in the Puget Sound basin, the City initiated a phased retrofit to increase treatment capacity and improve nitrogen removal capability. Implementing the improvements within an active treatment facility required a deliberate phasing and construction sequencing strategy to ensure uninterrupted plant operations throughout the retrofit.

This presentation summarizes the constraints and design approach for converting the City's existing oxidation ditches to a Modified Ludzack-Ettinger (MLE) biological nutrient removal process within the existing plant footprint. The facility is surrounded by regulated floodway, making expansion beyond current boundaries infeasible and requiring a net zero change in total structure square footage. The retrofit includes demolition of eight 25-foot rotor aerators and a mothballed 55'x 55'x25' trickling filter biotower constructed over one basin; conversion of the racetrack configuration to a single-pass pre-anoxic zone with tapered aeration and internal recycle; raising basin walls to increase process volume, solids retention time, and oxygen transfer efficiency; and construction of a new clarifier splitter box to support future expansion and improved flow distribution. The project also replaces an existing 1970s maintenance building with a new blower and electrical building housing process aeration equipment and associated electrical equipment.

This presentation will highlight key design decisions, the unique phasing strategy and project delivery approach used to implement the retrofit within an active treatment facility, and practical considerations for utilities planning nitrogen reduction retrofits within existing footprints.

Speaker(s):

Bita Nazyab, Bita.Nazyab@bhcconsultants.com, BHC Consultants, Seattle, Washington

Bita Nazyab, project engineer with 8 years of experience in wastewater treatment design

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Clear as Primary Effluent – A CMGC Delivery Story in Oregon

Description:

Clean Water Services (CWS) Forest Grove Water Resource Recovery Facility is a 30 MGD (peak) plant that receives wastewater primarily from the Cities of Forest Grove, Cornelius, and Gaston. In 2021, CWS completed a planning effort to select a preferred treatment alternative for copper removal ahead of the upcoming permit cycle to accommodate a growing residential and industrial customer base. Prior to this project, the plant did not have a primary clarification step. The preferred treatment alternative included Chemically Enhanced Primary Treatment (CEPT) using alum. This process addition would be required to remove copper and improve effectiveness of primary treatment and was intended to mitigate the need for a copper limit in the next NPDES Permit renewal.

At 30% design, the schedule crunch was becoming clear, and Clean Water Services goal to complete construction on schedule was in jeopardy. CWS determined CMGC delivery would be required to accelerate the schedule and deliver the project within the window that would allow testing prior to establishing the new permit limits.

The collaborative delivery team, consisting of Clean Water Services, Kennedy Jenks Consultants, and Slayden Construction, embarked on this ambitious project in November 2022. The project consisted of two, one-hundred-foot diameter circular clarifiers, a two-story primary sludge and scum pumping building, an alum building, lime silo, and flow control structure were to be constructed within an area less than 1-acre.

Several pieces of equipment required came with lead times greater than 52 weeks. It would be critical to advance design quickly and start procuring long lead equipment to produce early designs for construction, including a complete earthwork and foundation package ready for permitting, and to start the clock early on installation of 231 schedule-chewing auger cast piles.

Structural challenges included the design of a pump gallery sandwiched between the clarifiers, that will be isolated from sloshing seismic forces by means of expansion joints, while also sharing a common wall with clarifiers to maximize access.

This presentation will highlight the collaboration required to overcome procurement and delivery challenges through CMGC and bring the new processes online for Clean Water Services.

Speaker(s):

Rob Peacock, PE, robertpeacock@kennedyjenks.com, Kennedy/Jenks Consultants, Portland, Oregon

Rob Peacock is a Project Manager with Kennedy/Jenks in Portland and the Project Manager for the consultant design team for the Forest Grove Primary Treatment Project.

Josh Johnson, PE, johnsonj@cleanwaterservices.org, Clean Water Services, Portland, Oregon

Josh Johnson is the Principal Engineer for the Forest Grove Water Reclamation Facility and Clean Water Services Project Manager for the Forest Grove Primary Treatment Project.

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William Pense, william.pense@mwhconstructors.com, Slayden Construction, Inc., Salem, Oregon

Will Pense is an Assistant Project Manager for Slayden Construction and led much of the Construction Team for the Forest Grove Primary Treatment Project.

Climate Resilience in Action: Practical Frameworks from Coast to Coast

Description:

Across the United States, utilities are confronting intensifying climate impacts—from extreme heat and drought in the Southwest to flooding, severe storms, and infrastructure stress in the Northeast. While hazard profiles differ, the core challenge is shared: how can water and wastewater utilities embed resilience into everyday planning, capital programs, and funding strategies?

This session presents implementation-focused lessons from geographically distinct yet structurally similar resilience initiatives, including the City of Tempe, Arizona, and Monroe County, New York. These case studies demonstrate how utilities can translate climate risk assessments into actionable programs that align with capital improvement planning, regulatory frameworks, and community priorities.

In Tempe, Arizona, extreme heat is the dominant climate stressor. The City's 25-year Rain to Roots Master Plan integrates green stormwater infrastructure (GSI), low-impact development (LID), nature-based solutions (NBS), and urban forestry into traditional capital programs. Rather than treating resilience as a standalone initiative, Tempe embeds heat mitigation, water conservation, and neighborhood-scale improvements directly into infrastructure investment decisions.

In Monroe County, New York the Climate Adaptation and Resiliency Plan (CARP) builds on a comprehensive vulnerability assessment to evaluate physical, social, and economic risks. The effort extends beyond county operations to interconnected systems such as housing and transportation, while aligning with state standards and positioning projects for implementation funding.

The session will also provide updates on grant and financing strategies that recognize resilience as both system-scale infrastructure investment and property-level action.

Attendees will gain practical guidance on:

Launching a resilience program within an existing utility structure

Establishing measurable, defensible goals

Evaluating costs, co-benefits, and equity impacts

Integrating environmental justice principles into capital planning

Leveraging funding to accelerate implementation

Participants will leave with replicable frameworks and funding approaches applicable to Pacific Northwest utilities facing heat, wildfire-related impacts, flooding, and aging infrastructure challenges.

Speaker(s):

Maithilee Das Lappin, maithilee.daslappin@tylin.com, TYLin, Indianapolis, Indiana

With a decade of experience in the industry, Ms. Maithilee Das Lappin (she/her) has gained expertise in planning, design and construction services for water and wastewater infrastructure systems, including serving as Project Manager for combined sewer overflow facilities (CSO) storage and conveyance facilities and wastewater treatment plant (WWTP) upgrade and expansions. With her distinctive passion for sustainability and resiliency, Ms. Das Lappin recently led the development of Indiana's first regional Climate Action Plan in Greater Lafayette. She is currently assisting communities on both US coasts with their climate action and resiliency journeys. Ms. Das Lappin is also avidly passionate about volunteerism and participates on several committees and boards in her professional and personal community. Ms. Das Lappin is the current Secretary Treasurer on the Board of Directors for the Indiana Water Environment Association (IWEA), a member association of Water Environment Federation (WEF). She co-chairs IWEA's Editorial, Public Communication and Outreach Committee and serves on WEF's Service Project Committee. In 2022, Ms. Das Lappin was recognized as a Top 20 in their Twenties in Indiana by the Indianapolis Business Journal. She is a Purdue Engineering alumna, a registered Professional Engineer in Indiana and an Envision Certified Sustainability Professional.

CMGC in Action: Construction Progress and Lessons Learned from the Carolina Sewer Trunk Rehabilitation

Description:

At the 2025 PNCWA Conference, the City of Portland Bureau of Environmental Services (BES) presented the Carolina Sewer Trunk Rehabilitation Project as an example of using the Construction Manager/General Contractor (CMGC) delivery method to address a complex aging sewer pipeline in an urban area with steep slopes and mixed face geology. Now over a year into construction, this 2026 follow up presentation provides an update on how early CMGC assumptions and decisions made during preconstruction have translated into outcomes during construction.

The Carolina Sewer Trunk Rehabilitation Project is replacing a deteriorating, nearly 90 year old 42-inch trunk sewer extending 1,700 LF from SW Slavin Road beneath Interstate 5 to Macadam Avenue. This presentation will walk through construction progress and highlight what changed once excavation began including final design decisions such as open cut versus trenchless construction and assumptions related to rock excavation and underground obstructions.

Panelists representing the Owner (City of Portland BES), Engineer of Record (WSP), and Contractor (J.W. Fowler) will each share their perspectives into what worked as planned and what required adjustment during construction. The discussion will include managing subsurface uncertainty for both microtunnel and open cut segments, as well as adjusting support of excavation plans and construction methods in response to field conditions.

In alignment with the conference theme, Rising to the Moment: Advancing a Sustainable Water Future, the panel presentation and Q&A session will demonstrate how multiple stakeholders collaborated from project kickoff through construction and how the project team works together to respond effectively to construction

phase challenges. The panelists will share how early collaboration during preconstruction built a foundation for managing changes in the field and improving issue resolution as conditions evolved.

Speaker(s):

Sarah Lingley, sarah.lingley@wsp.com, WSP, Portland, Oregon

Sarah Lingley is a civil engineer with 16 years of experience as a consultant in the water industry, leading the project management, design, and construction of sewer, stormwater, and drinking water system improvement projects. She serves as the Design Team Project Manager for the BES Carolina Sewer CM/GC project, coordinating a multidisciplinary team from design through construction and supporting early contractor engagement.

Ainsworth Marshall, Ainsworth.Marshall@portlandoregon.gov, City of Portland Bureau of Environmental Services, Portland, Oregon

Ainsworth Marshall is a civil engineer with more than two decades of experience delivering complex infrastructure projects and guiding high-performing technical teams. He currently serves as aa Senior Project Manager with the City of Portland's Bureau of Environmental Services, where he oversees planning, design, and execution of major capital projects.

Chris Bottoms, chrisb@jwfowler.com, J.W. Fowler, Portland, Oregon

Chris Bottoms is the Division Manager of JW Fowler Tunneling and a graduate of the Colorado School of Mines with a degree in Civil Engineering. He specializes in tunneling and trenchless construction and has supported the delivery of complex underground i

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Combining Innovation and Funding to Meet Challenges in Rigby, Idaho

Description:

The City of Rigby faced challenges from a new, stringent winter ammonia permit limit and rapid population growth. The City felt limited in its options that did not involve taking on significant debt. However, while evaluating alternatives, the team identified a new biofilm technology that could provide significant value and reduce the project cost. The technology had not been proven in a winter climate as cold as Rigby's, so the City embarked on a trial that proved successful and helped the City meet both the new ammonia limits and increase the treatment plant's overall capacity.

This presentation will discuss the approach and results of this recently completed project. Even with the savings, the City still needed help to fund the treatment plant improvements, which for a community of its size, posed several challenges. This presentation details the pilot results, the treatment plant improvements, and the creative financing strategies that culminated in a growth-ready project for the City.

Speaker(s):

Eric Roundy, P.E., BCEE, eroundy@kellerassociates.com, Keller Associates, Inc., Meridian, Idaho

Eric has more than 20 years of experience designing and evaluating wastewater treatment systems. He was involved in the planning, piloting, design, and construction of the Rigby project.

Commissioning Starts on Day 1: Building a Startup Ready Facility

Description:

The purpose of this presentation is to show that commissioning begins on Day 1. The Medford Duff Water Treatment Plant increased capacity from 45 MGD to 65 MGD while keeping the existing plant fully operational. Because the facility remained online throughout construction, every decision was made to protect ongoing operations and support a smooth startup.

Startup planning began early in the project. Functional test plans were developed in alignment with the specifications, and Factory Acceptance Testing (FAT) requirements were defined before equipment was fabricated and shipped. We used ACC (Autodesk Construction Cloud) and maintained detailed submittal logs to track reviews, equipment status, and readiness milestones, ensuring clear documentation and coordination.

The team worked closely with the Owner to plan for large water demands associated with leak testing, performance testing, and filter media washing. Equipment storage, preservation, and readiness were addressed early to prevent delays during startup.

This approach reduced startup delays, minimized rework, and limited warranty issues. Clear planning, documentation, and communication allowed commissioning activities to proceed without disrupting plant operations. Early involvement of operations staff also improved system readiness at turnover.

This project demonstrates that commissioning is a process that starts on Day 1. Early planning and consistent coordination lead to a smoother and more predictable startup.

Speaker(s):

Keith Beckman, Keith.beckman@mwhconstructors.com, Slayden Constructors, Grants Pass, Oregon

Keith Beckman, Slayden Commissioning & Startup Lead, 14 years-experience including 12 years of licensed Wastewater Operator in Oregon

Curtis Fenner, curtis.fenner@mwhconstructors.com, , ,

Curtis Fenner, Slayden Project Manager, Project manager on the Robert A. Duff filter, reservoir, and pumping expansion project. 8 years of CM/GC project management experience.

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Connecting Nutrient Management to Oxygen Available for Puget Sound Organisms

Description:

The Puget Sound region is navigating complex decisions on how to manage nitrogen to maintain healthy marine habitats. But when and where will organisms face the greatest risk from excess nitrogen? The answer depends not just on oxygen concentrations, but on temperature; as warmer water holds less oxygen, while at the same time organisms living there require more.

This presentation introduces the metabolic index to help translate potential nutrient management into biologically meaningful outcomes. It is an approach that combines modeled temperature and dissolved oxygen to evaluate whether metabolic conditions are sufficient for a species to carry out vital functions to sustain themselves. Applied using the Salish Sea Model outputs from Washington State nutrient-management scenarios, initial findings focus on three species of ecological, cultural, and economic importance - Dungeness crab, Chinook salmon, and English sole. Results reveal where and when each faces the greatest risk from low oxygen, considering both oxygen and temperature, and species-specific oxygen requirements drawn from a large body of experimental research.

As wastewater nutrient limits evolve, the metabolic index provides a way to evaluate what those changes mean for organisms — revealing which areas and species face the greatest risk from low oxygen now, while offering a framework to evaluate how warming temperatures may compound those risks.

Speaker(s):

Stefano Mazzilli, mazzilli@uw.edu, Puget Sound Institute, University of Washington, Seattle, Washington

Stefano Mazzilli is a senior research scientist at the University of Washington Puget Sound Institute (PSI) focusing on issues related to water quality management. At PSI he has supported the formation of the Salish Sea Modeling Center, as well as the model's application to nutrient reduction planning by utilities in the region. Stefano's research interest is the interchange of science and decision making, drawing on more than 20 years of experience in biogeochemistry and applied coastal oceanography.

Marielle Kanojia, marlars@uw.edu, , ,

Marielle Kanojia is Director of Engagement for University of Washington Puget Sound Institute. She supports collaboration across a range of Puget Sound Institute's projects related to nutrients, PCBs, modeling, and more. Prior to joining Puget Sound Institute, Marielle led community outreach for municipalities and public agencies throughout the Sound at EnviroIssues. Marielle also previously managed PureBlue's water technology accelerator, crowdsourced innovative technology solutions at XPRIZE, and facilitated large-scale change at Deloitte.

Constructability Review 101 – Fundamentals, Benefits, and Practical Examples

Description:

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Complex wastewater treatment plant projects require rigorous coordination among owners, designer professionals, and contractors to ensure designs can be translated efficiently into constructed reality. A constructability review is a systematic, independent evaluation of design documents performed by construction professionals to identify errors, omissions, conflicts, and ambiguities before they reach the field. This presentation introduces the fundamentals of constructability reviews, best practices, and uses real-world examples from several water and wastewater projects across the country to help the audience understand their potential impact on the success of a project.

The session outlines a practical constructability review methodology conducted at 30%, 60%, and 100% design completion. Early-phase reviews focus on conceptual coordination across civil, structural, mechanical, electrical, and process disciplines. Mid-stage reviews simulate construction sequencing, verifying that details such as equipment clearances, material compatibility, utility conflicts, and staging logistics are feasible. Final reviews confirm document completeness and bid readiness. A key principle is “mentally building the project” sheet by sheet to verify drawings contain all elements required for construction

The presentation also demonstrates how constructability review input improves project phasing at an operating facility, enabling bidders to price work more accurately and confidently. Ultimately, constructability reviews are not merely technical checks but strategic risk-management tools. When performed methodically by experienced professionals, they enhance document quality, support fair pricing, and foster cooperative project delivery—benefits that apply to wastewater infrastructure projects of any size or complexity.

Several constructability review examples will be provided for the audience, including projects related to: BioCEPT headworks, digester construction, cogeneration facility, and various electrical upgrades.

Learning Objectives:

- Obtain an understanding of constructability review and how they are utilized
- Develop a standard review methodology and documentation
- Review real project examples and how constructability reviews can provide the owner with cost savings
- Apply lessons learned from these real world examples to assist your organizations in providing project cost savings

Speaker(s):

Adam Rector, adam.rector@accenture.com, Accenture Infrastructure and Capital Projects, Seattle, Washington

Adam Rector has over fourteen years of experience delivering large-scale water and wastewater programs for public utility agencies. He specializes in project management and quality control, project scheduling, cost control, and delay analysis and mitigation. Adam’s expertise also includes program master scheduling, cost estimating, commissioning, site investigations, and risk assessment. He has a proven record of success in regulatory compliance, quality control, and leading complex infrastructure projects from planning through execution.

Counter the Scour! How Large Woody Material can be used to Protect Assets and how to Manage Risks

Description:

Large woody material (LWM) can be a powerful tool in the toolbelt of agencies and engineers to protect infrastructure and other assets from stream channel erosion/migration, as well as to provide habitat creation and enhancement. This session will dive into how LWM can be designed for stability and benefit, and risks to consider for mitigation or decision making.

LWM can be used to protect key assets, such as pipelines, roadways, structures, etc., from nearby stream or surface water channels from eroding and migrating toward such assets, threatening their stability and design life. However, many designers are unsure of when to use LWM, how to design effective LWM structures, and what risks to be aware of that need to be mitigated.

This session is intended to clarify those uncertainties through examples of different types of log structures, such as log jams, log racks, sweepers, among many others, and an introduction to the design workflow and available tools for design. This overview will be followed by a discussion of how streams can respond to installed LWM, such as local scouring, debris racking, stream constriction, stream migration, etc., along with examples of such natural processes occurring.

Since unexpected local scour where LWM is installed is one of the biggest risks to the assets that we are wanting to protect, we will conclude by discussing strategies that can be used to manage such risks, including preformed pools to encourage scour to develop where desired and strategic LWM structure selection and placement.

Speaker(s):

Paul Beskow, pbeskow@geoengineers.com, GeoEngineers, Inc., Tacoma, WA

Paul is a civil and hydraulics professional engineer and project manager with over 13 years of experience on extensive and diverse public works, water resources, habitat, and parks projects for agencies throughout the Pacific NW. While his specialty is hydrologic and hydraulic engineering services for stream, lake, and bank restoration, he also brings experience in water/wastewater infrastructure, stormwater management, erosion and sediment control and environmental protection, parks and trails, dry utilities, roadways and sidewalks, pedestrian safety and ADA compliance, jurisdictional representation, public engagement, right-of-way (ROW) acquisition, rural and urban projects, bidding and award support, construction management, maintenance of traffic, and construction inspection services. He is experienced in seamlessly leading and managing interdisciplinary design teams while still engaging in the technical details of a project to reach streamlined, effective, and constructable deliverables for all types and sizes of projects, programs, and clients.

Crawling Out of the Graveyard: Practical Learnings from Utilities Transitioning from 24/7 Staffing

Description:

Onsite, 24/7 WWTP staffing is becoming increasingly difficult to sustain due to workforce shortages, labor costs, and operator burnout. The question is no longer whether technology can support unstaffed operation, but whether utilities are willing to rethink long-standing assumptions about risk, control, and operator presence; how can we improve engagement and quality of life for operators?

Transition toward unstaffed graveyards is supported by automation, remote monitoring, targeted on-call response systems, and a paradigm shift- a cultural and operational leap through rethinking risk tolerance, modernizing control and communications, and redesigning procedures to ensure reliability without physical presence.

The experiences from the Victor Valley Wastewater Reclamation Authority (VVWRA) in California and Aarhus Vand (AV) in Denmark demonstrate that successful transitions to unstaffed operation are possible across different regulatory frameworks and cultures.

Transitioning to remote operation required close coordination between operations and IT teams. Both utilities addressed challenges related to network segmentation, secure remote access, alarm delivery pathways, and data governance. Nightly callouts were experienced during initial phases of remote operation, the frequency of which were incrementally reduced through instrumentation, data validation, cameras, and risk analyses to reduce the number of critical alarms.

The process required visible leadership and meaningful involvement from operations staff. By evaluating both consequence and likelihood of failures, teams were able to distinguish between risks that required capital investment, risks that could be mitigated through automation, and risks that could be consciously accepted.

AV succeeded in fully automating wastewater treatment, only staffing operators on weekdays. VVWRA has transitioned all operations from night and swing shifts to days, without losing any staff.

Speaker(s):

Thomas Maere, tmae@dhigroup.com, DHI, ,

As a Wastewater Treatment Specialist with a PhD focused on optimization of MBR technology, Thomas helps utilities improve wastewater treatment plants through process modeling and control, and by implementing digital twins for real-time insights into plant performance. Thomas has a broad skillset based on education in engineering, environmental, and agricultural sciences, with a specialization in biological wastewater treatment, mathematical modelling, and process optimization through various projects.

Critical Early Planning for Program Delivery: Keys to Long-Term Success

Description:

Public water and wastewater agencies across the Pacific Northwest are facing growing capital improvement programs (CIPs) driven by aging infrastructure, regulatory compliance, resiliency planning, equity, and sustainability goals. At the same time, agencies must deliver projects efficiently, maintain uninterrupted operations, and maximize limited public resources. To meet these challenges, many agencies are exploring

programmatic approaches to capital delivery—but often without a clear roadmap for how to prepare for or initiate these programs successfully.

This 101-level introductory session provides a practical overview of the foundational elements required to transition from traditional project delivery to a programmatic CIP approach. The presentation is designed for professionals who are new to program management or are considering whether a programmatic approach is right for their agency.

Using King County's Wastewater Treatment Division and the South Treatment Plant Facility Program as a real-world example, the session focuses on transferable lessons learned that apply to agencies of varying sizes and organizational maturity. Rather than a detailed case study, the presentation highlights common challenges, strategic prioritization, decisions, and early actions that influence long-term program success.

Two critical success factors consistently emerge during early program development:

1. Agency Preparation – Building organizational readiness through early planning, leadership alignment, stakeholder buy-in, and intentional cultural change.

2. Program Initiation – Investing in a dedicated initiation phase to establish governance, roles and responsibilities, decision-making authority, and performance expectations.

The presentation will discuss why agencies often underestimate the importance of preparation and initiation, how insufficient upfront investment can lead to delays and inefficiencies, and how clear governance and leadership commitment help programs move forward with confidence and accountability.

Attendees will leave with:

- A clear understanding of programmatic delivery at a foundational level
- Practical steps to assess agency readiness before launching a program
- Common pitfalls to avoid during program initiation
- A simple framework to support informed decision-making for future CIP delivery

This session supports PNCWA's mission by providing accessible, actionable guidance to help agencies deliver reliable infrastructure and advance a sustainable water future.

Speaker(s):

Petra Liskova, petra.liskova@jacobs.com, Jacobs, Bellevue, WA

Petra is a program manager and certified project manager (PMP) with 15 years of experience focused on water/wastewater projects for municipal clients. She has been responsible for managing complex projects and programs with skillsets that go beyond project management tasks, such as identifying interdependencies across portfolios, operations and interested parties engagement, and identification and capitalization of cost efficiencies. She is exceptional at building and leading cohesive, high functioning program teams and anticipating, managing,

and resolving problems efficiently. Petra fosters an environment of empowerment and collaboration, leading teams to define problems, gather solutions, and come to consensus on decisions in a timely manner.

Anna James, Anna.James@jacobs.com, Jacobs, San Francisco, CA

Anna is a civil and environmental engineer and program leader with 15 years of experience delivering complex water, wastewater, and resilience infrastructure programs for public agencies. She brings a strategic, results-driven approach to program leadership, aligning governance, funding, and delivery to advance large-scale initiatives. Anna has a proven track record managing high-value, multi-interested party programs and securing over $500M in state and federal funding to support critical infrastructure investments. She is recognized for her ability to navigate complexity, drive alignment across agencies and partners, and deliver lasting community benefits. She is a collaborative, trusted leader who fosters accountability, builds high-performing teams, and mentors emerging professionals.

Cybersecurity Induced Billing System Outage: A Case Study in Customer Communication and Operational Resilience

Description:

In February 2026, WES faced an unprecedented service outage due to a nationwide outage caused by a cybersecurity incident affecting our third-party provider for our online and automated phone/text utility payment systems outage. This case study highlights the strategies and actions taken to maintain customer trust and service continuity during a high-pressure, time-sensitive event. These efforts were supported by proactive communication measures, including real-time web updates, direct customer outreach, and stakeholder engagement. This presentation will explore lessons learned in crisis communication, operational agility, and staff recognition. Presentation aims to offer practical insights for public utilities seeking to strengthen customer confidence during a utility payment systems outage.

Speaker(s):

Alexa Morris, amorris@clackamas.us, Clackamas Water Environment Services, Oregon City, Oregon

Alexa Morris is a strategic communicator with over 10 years of experience in public engagement.

In her current role as Utility Relations Coordinator for Clackamas Water Environment Services, she is responsible for external affairs, which includes overseeing large scale projects with significant visibility to ratepayers and key stakeholders.

She holds a bachelor's in Rhetoric and Media Studies from Lewis & Clark College and a master's in Strategic Communication from the University of Oregon.

Erin Blue, EBlue@clackamas.us, Clackamas Water Environment Services, Oregon City, Oregon

Erin Blue is the Finance Manager for Clackamas Water Environment Services, where she has more than 10 years of experience in local government utility finance and operations. Erin oversees WES' financial services and utility billing operations and recently helped lead response efforts during a cybersecurity-induced billing system outage disrupting payment operations.

Data Driven Headworks Design

Description:

Each wastewater treatment facility faces unique influent characteristics, making site-specific screening evaluations critical for optimizing headworks performance. At Alexandria Renew Enterprises (AlexRenew), field testing was performed to assess existing coarse and fine mechanical screens and evaluate alternative configurations.

Using on-site screening capture testing, various combinations of coarse and fine sieve openings and geometries were tested under average dry-weather conditions. Results showed the existing coarse screens removed an average of 0.7 cubic feet of solids per million gallons (CF/MG). In contrast, a configuration of a 19 mm slotted coarse screen followed by a 6 mm perforated plate fine screen achieved an average Screen Capture Ratio of 52%—a projected threefold increase in solids removal.

Beyond capture efficiency, testing provided valuable insight into screen hydraulics, blinding tendencies, and compatibility with existing infrastructure. This approach demonstrates how field data can guide screen selection, improve debris removal, reduce downstream maintenance, and extend equipment service life.

The case underscores the value of empirical testing in headworks design. By quantifying capture rates, headloss behavior, and solids characteristics, utilities can make more informed upgrade decisions tailored to their specific flow conditions and operational priorities.

Speaker(s):

Tim Matheis, timothy.matheis@hydro-dyne.com, Hydro-Dyne Engineering, TUALATIN, Oregon

Tim Matheis has experience (30 years combined) in odor control and headworks design including screening and grit capture. Tim has 9 patents registered with the USPTO for inventions relating to wastewater and air treatment. Tim has published 5 technical papers with the Water Environment Federation regarding wastewater treatment. Tim has a BS in Chemical Engineering from Ohio State. Tim's hobbies include sailing, old cars and oil painting.

Delivering Differently: Making Sense of Collaborative Delivery Options

Description:

Water and wastewater utilities continue to face significant challenges to address regulatory mandates, aging infrastructure and constituents of growing concern. Issues such as market saturation, escalation, supply chain issues, and limited staff continue to strain public-sector owners' ability to deliver significant capital improvement programs. To manage these challenges, wastewater utilities are embracing Collaborative Delivery

methods which go beyond traditional design-bid-build by providing a wider range of solutions to address specific water and wastewater project needs, integrating both the design and construction phases to optimize innovation, speed, quality control, and risk management. As a result, collaborative delivery is the fastest growing form of project delivery in the water sector. Recent studies by the FMI Corp. predicts that spending on collaborative delivery projects will grow by more than 40% over the next 4 years.

The Water Collaborative Delivery Association (WCDA) is a leading professional association dedicated to advancing successful collaborative delivery solutions for the water and wastewater sector. WCDA serves as a leading source of best practices, knowledge, and resources with the tools designed to help owners, design-build firms, engineering firms, construction firms, and suppliers leverage the power of collaborative delivery to achieve better project outcomes, together.

This presentation will provide a fundamental overview of each delivery model, based on the WCDA Water and Wastewater Collaborative Delivery Handbook. The collaborative delivery spectrum will be defined, and then a deeper description of each delivery method will be provided in turn: construction management at-risk (aka CM/GC or GC/CM), progressive design-build, and fixed-price design-build—defining the similarities and differences among them. This material will be summarized with an overall comparison of each of the common delivery methods, highlighting their relative attributes and when each should be considered.

*** Note to Organizers - this is truly a 101 for an 'Alternative' Delivery track. Provided generally the same presentation last year and it was very well attended. Happy to give the same presentation, or tailor to address a specific focus.

Speaker(s):

Michelle Green, Michelle.Green@jacobs.com, Jacobs, Portland, Oregon

Michelle is an industry leader in developing and promoting best practices for use in implementation of successful collaborative delivery projects. She has extensive experience guiding projects delivered through collaborative delivery methods. As Jacobs' Water Market Design-Build Lead in the Western US, Michelle leads PDB and DB build projects, design for CMGC projects, and serves as an Owner's Advisor services for PDB and CMGC projects.

Kristen Jackson, kristen.jackson@jacobs.com, Jacobs, Portland, Oregon

Kristen is an experienced Project Manager with extensive wastewater treatment project experience. She has delivered projects utilizing every form of collaborative delivery, including CM/GC, PDB, Design-Build and Design-Build-Operate.

Demonstrating the ecological benefit of reuse water for wetland restoration using environmental DNA metabarcoding

Description:

Environmental DNA (eDNA) has exploded as a field of study in the past decade, with increasing crossover into the realms of water quality and environmental assessment. eDNA metabarcoding involves sequencing multiple

genes from environmental samples to identify the organisms present across all major taxa, from bacteria to vertebrates. At Clean Water Services (water resources management utility based in Hillsboro, OR), our water reuse program is expanding to include irrigation of agriculturally impacted wetlands. The goal of this is twofold: to restore the natural wetland hydrology of the site and provide a mechanism to help meet our thermal discharge regulatory limits during warm months. As part of a much larger, comprehensive pilot study at our Thomas Dairy water reuse site, we used eDNA metabarcoding to document how irrigation with reuse water affects the ecology of the site. Thrice per growing season over three seasons, we collected triplicate soil cores from designated treatment/control plots in three soil types. Replicates were composited, for a total of 54 samples sequenced across a panel of 7 barcoding genes capable of identifying bacteria (16S), eukaryotes (18S), invertebrates (CO1), fungi (ITS1), mycorrhizal fungi (WANDA-AML2), plants (ITS2), and vertebrates (Vert12S). Sequencing and initial data processing was performed by a contract lab (eDNA Explorer, Santa Cruz, CA). Species richness increased in irrigated plots for all markers except CO1 and ITS1, with a dramatic increase in the mycorrhizal fungi marker (WANDA-AML2). Shannon alpha diversity indices increased with irrigation (comparing paired samples) for two of three soil types, and all three soil types had increased diversity in the CO1 marker. Beta diversity was assessed using nonmetric multidimensional scaling (NMDS) ordination with Bray-Curtis dissimilarity indices. We found no significant differences between irrigated and non-irrigated soils across all soil types (individual genes as well as combined, n = 7,381 taxa), indicating irrigation produced no major shifts in the ecosystem community structure – a positive result for our reuse program. Our eDNA data support land application of reuse water as a beneficial use, as measured by increased species richness and diversity, as well as abundance of beneficial species, particularly soil microbes and mycorrhizal fungi.

Speaker(s):

Hannah Ferguson, FergusonF@CleanWaterServices.org, Clean Water Services, Hillsboro, OR

Hannah Ferguson holds a Master's Degree in Biology from Ball State University. In her five years at Clean Water Services (now at the level of Operations Analyst), she has spearheaded our rapidly expanding eDNA program, including metabarcoding for water quality monitoring, assessing salmonid passage with in-house droplet digital PCR, and developing a novel method of tracking the invasive Emerald Ash Borer beetle.

DeRisking PFAS Compliance: Integrating RSSCTs and Machine Learning for Smarter Treatment Selection

Description:

In April 2024, EPA finalized the National Primary Drinking Water Regulations (NPDWR) for six PFAS compounds—PFOS, PFOA, PFNA, PFBS, PFHxS, and HFPO-DA (GenX)—requiring compliance by April 2029. Utilities must now identify cost-effective and technically sound treatment strategies tailored to their unique water quality, PFAS speciation, and existing infrastructure.

Advanced treatment technologies such as granular activated carbon (GAC), ion exchange (IX), and reverse osmosis are capable of PFAS removal; however, performance varies significantly based on site-specific conditions and media selection. To support data-driven decision-making, ten utilities representing diverse geographies, source waters, PFAS profiles, and treatment configurations were evaluated in a nationwide study.

For each utility, historical water quality and treatment data were compiled, and water samples were tested using rapid small-scale column tests (RSSCTs) to simulate full-scale GAC and IX performance. RSSCTs were designed using the constant diffusivity (CD) approach to provide cost-effective, predictive performance modeling. A comprehensive database combining new RSSCT data with published literature and full-scale results was developed. Machine learning tools were then applied to predict PFAS treatability based on water quality and operational variables.

This work provides utilities with a practical framework to narrow treatment alternatives and reduce uncertainty in technology selection as they prepare for regulatory compliance.

Attendees will learn:

- Key considerations for selecting GAC or IX under the new PFAS regulations
- How RSSCTs can predict full-scale PFAS removal performance
- How machine learning can support treatment optimization and reduce pilot costs
- A structured approach to de-risking PFAS treatment decisions

Speaker(s):

Joe Downey, PE, jdowney@ardurra.com, Ardurra, Mobile, AL

Joe Downey is the Southeast Region Director and Senior Process Engineer for Ardurra Group and is a professional engineer in Alabama, Georgia, Florida and Tennessee. Joe is based out of Auburn, Alabama but spends most of his time traveling to provide senior engineering management services for municipal water and sewer clients throughout the Southeast and has been part of numerous design awards from the American Council of Engineering Companies and the Design-Build Institute of America. Joe attended Auburn University and obtained a Bachelor of Civil Engineering degree in 1985 and a Master of Science degree in 1991. Joe has been in the municipal utility business for more than 40 years and currently serves on the Civil and Environmental Engineering Advisory Board for Auburn University, as well as serving as Adjunct Instructor for multiple water and wastewater courses at Auburn University. He has been married to his wife Susan for 37 years and they have 3 adult children and 3 grandchildren.

Raj Chavan, Ph.D., PE, PMP, LEED, rchavan@ardurra.com, Ardurra, Boise, ID

Raj Chavan is the National One Water Director for Ardurra. Raj holds a Ph.D. and a Master's Degree in Civil and Environmental Engineering from the University of Nevada, as well as a bachelor's degree in Civil Engineering from Shivaji University. Raj is a professional engineer licensed in several states, a certified project management professional (PMP), and LEED-accredited. He is based in Las Vegas, NV.

Designing for Flexibility: PilotScale Digestion for Long Term Solids Planning

Description:

As utilities across North America face aging infrastructure alongside increasing capacity demands driven by population growth, innovative and flexible planning approaches are critical to identifying cost-effective, data-driven solutions for the future. Beginning in 2018, Brown and Caldwell partnered with Metro Vancouver to design and implement a Pilot Digestion Optimization Facility (PDOF) at the Lulu Island Wastewater Treatment Plant, a facility experiencing near-term capacity constraints and long-term solids management challenges.

The PDOF is a series of three pilot digestion skids and a feed skid, enabling Metro Vancouver to evaluate various novel and emerging digestion processes without impacting full-scale digester operations. The PDOF was intentionally designed for flexibility, allowing operators to adjust hydraulic residence times (HRT), operate across a wide temperature range (35°C to 75°C), and be modular for relocation to other facilities as future needs evolve. The PDOF was designed for an initial test configuration of temperature phased anaerobic digestion (TPAD), but modularity of the facility was key in providing the flexibility to test various processes that were not defined yet during design.

Pilot testing began in 2023 with a baseline digestion study comparing pilot-scale and full-scale digester performance, demonstrating system scalability. Following this test, PDOF tested various retention times at thermophilic and mesophilic temperatures, including hyperthermophilic, and then completed various configurations for staged digestion processes including acid-gas and TPAD. This testing approach, developed in close collaboration with operations, produced robust data to support informed decision-making.

The PDOF's unique design configuration, combined with detailed test planning and operator engagement, has positioned Metro Vancouver to advance business case evaluations, engage regulators with confidence, and refine promising solids management alternatives for future implementation. This presentation will highlight the PDOF's design and testing program, summarize key lessons learned, and discuss practical considerations for utilities seeking flexible pilot-scale solutions to support long-term planning.

Speaker(s):

Tyler Barber, tbarber@brwncald.com, Brown and Caldwell, Vancouver, British Columbia

Tyler is Brown and Caldwell's market leader for British Columbia and has 15 years of experience working with municipal wastewater treatment plants, planning through construction. Recently, he has spent the last several years leading pilot digestion work with Metro Vancouver to aid in understanding capacity limitations.

Designing for Resilience: Delivering the Fry Creek Pump Station to Protect Aberdeen from Tidal and Storm Driven Flooding

Description:

The City of Aberdeen's new Fry Creek Pump Station delivers a critical upgrade to flood-control infrastructure in one of Washington's most flood-prone regions. Located within the 2,500 square mile Chehalis Basin, Aberdeen and neighboring Hoquiam have experienced 14 federally declared flood disasters in the past 50 years, with chronic tidal inundation and increasingly severe storm events threatening more than $1 billion in residential,

commercial, and public infrastructure. As the largest drainage basin in Aberdeen and the shared outfall for both cities' stormwater systems, Fry Creek is highly susceptible to backwater flooding when precipitation events coincide with high tides in Grays Harbor. Aging facilities, channel constriction, and sedimentation has further reduced system capacity, causing frequent flooding of homes, businesses, transportation corridors, and critical facilities.

To address these challenges, a comprehensive multi-project flood reduction strategy was funded through more than $130 million in state, federal, and local investment. The $22 million Fry Creek Pump Station is the first major component of this program completed to date. The pump station features four vertical axial flow pumps providing a firm pumping capacity of 300 cubic feet per second, making it one of the largest stormwater pump stations in western Washington. The facility incorporates tide gates, fish passage-compliant barrel screens, and year around flow management to protect migratory salmonids, including coho salmon and coastal cutthroat trout. The system is designed to accommodate future sea level rise and increased storm intensity for long-term system resilience.

The Fry Creek Pump Station now delivers reliable flood protection and enables the advancement of the North Shore Levee and North Shore Levee West projects. Once the full suite of flood control improvements is complete, more than 5,000 properties are expected to be removed from FEMA designated flood zones, providing transformational economic, social, and environmental benefits for these historically underserved communities. The presentation will include exploration of the design aspects of the system, including the flood gates, fish screens, wet well, and siphon energy recovery basins.

Speaker(s):

Charlie Allaben, charlie.allaben@hdrinc.com, HDR, Bellevue, Washington

Charlie's engineering experience includes pumping station design, pumping system performance testing, troubleshooting, hydraulic engineering, and design of hydraulic structures. He has served as a representative on Hydraulic Institute committees for 25 years. His practical experience working in a physical hydraulic modeling laboratory provides him an exceptional understanding pumping system hydraulics.

David Kuhns, david.kuhns@hdrinc.com, HDR, Olympia, WA

David is a senior water/wastewater engineer with 16 years of experience at HDR, serving in key roles of design lead, project engineer, and project manager. His work covers a broad spectrum of utility design and planning efforts involving wastewater, water, and stormwater infrastructure. He has delivered pumping system designs across Washington, ranging from compact chemical dosing systems to complex sewer lift stations and high-capacity stormwater pump stations. Beyond pump station work, David brings extensive expertise in hydraulic design for both pressure and gravity conveyance systems, as well as hydraulic modeling of municipal water distribution networks for communities throughout the state.

Designing Nanobubble Pilots That Deliver: Lessons from Previous Experimental Frameworks

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

Nanobubble (NB) technology is being evaluated widely for objectives ranging from foam control to improved nitrifier health, aeration efficiency, and process stability. However, reported outcomes vary widely by facility, highlighting the need for effective trials to confirm the effect of nanobubbles on various treatment units. This paper presents a practical, defensible framework for designing nanobubble demonstrations that generate statistically meaningful, actionable results. Lessons are drawn from two prior full-scale demonstrations and a 12 month study currently underway at the LOTT Clean Water Alliance in Olympia, Washington.

LOTT initiated this study to evaluate whether nanobubble augmentation can further improve the performance of an already well-operated WRRF. Objectives include enhanced energy efficiency, sustainability, cost control, and biological stability, particularly during periodic receipt of septage-type flows. Rather than equipment selection, this presentation focuses on how experimental design can determine whether trial outcomes are conclusive or ambiguous. Key considerations include well-defined mechanisms of action, careful selection of normalized performance metrics and statistical tests, and experimental controls that isolate nanobubble effects from seasonal and operational variability. The LOTT study was designed to address common pitfalls observed in earlier trials. For example, aeration efficiency metrics were normalized to SRT and MLSS to control for seasonal and operational variability, and energy usage, which is dependent on pump curves and equipment fatigue, was replaced with an airflow metric.

This presentation also compares two previous demonstrations, one conclusive trial from South Carolina, and one from Wisconsin which is more challenging to interpret. It covers lessons learned, such as selecting sampling points downstream of confounding recycle flows, using on/off testing to augment year-over-year comparisons, and how to develop clear evaluation criteria for technologies (like NBs) that affect multiple plant processes. Generalizable best practices for designing technology trials will be discussed, and we will review which claimed benefits of nanobubble technology were clearly demonstrated in these two demos, and which may require more evidence.

Beyond nanobubbles, this work offers a transferable model for evaluating emerging technologies. As utilities in the Pacific Northwest face increasing regulatory pressure and limited capital, rigorous pilot and demonstration design is essential for making confident, data-driven decisions.

Speaker(s):

Jon Liberzon, LiberzonJ@bv.com, Black & Veatch, Irvine, California

Jon is Emerging Technologies Process Engineering Lead at Black & Veatch. He has over 13 years of experience in wastewater treatment with a focus on innovative processes and biological nutrient removal. He is currently also a Ph.D. candidate at the University of California, Irvine.

Stephen Taylor, stephentaylor@lottcleanwater.org, LOTT Clean Water Alliance, Olympia, Washington

Stephen Taylor is a Planning Engineer with the LOTT Clean Water Alliance in Olympia, Washington. He works with LOTT staff to plan and advance projects that improve and extend the life of LOTT's treatment facilities. Stephen also manages LOTT's Future Technologies Pilot Team which identifies and tests emerging technologies to see if they are worth implementing full-scale. Stephen holds a Bachelor of Science in Mechanical Engineering and before working for LOTT spent 23 years in the private-sector managing projects and supporting the manufacturing of Sharpie® markers, aluminum cans, and air compressors.

Designing Smarter: How Digital Twins Reduce Construction Cost in Aeration Basin Upgrades

Description:

Digital twins are increasingly recognized as powerful tools in the water sector, most commonly applied to optimize day-to-day operations at wastewater treatment facilities. However, their potential value during the planning and design phase—where long-term performance, capital cost, and operational flexibility are defined—remains underutilized.

This presentation highlights a case study demonstrating how a digital twin was applied during early design to improve decision-making, reduce risk, and significantly lower capital costs for aeration basin upgrades. Jacobs is collaborating with the City of Vancouver, Washington, to design improvements to the Marine Park Wastewater Treatment Facility aeration basins to address operational challenges including sludge popping in secondary clarifiers during summer months and inability to operate step-feed effectively.

During predesign, a digital twin tool known as Hybrid Optimizer (HO) was used to support process evaluation. Leveraging commonly available plant historical data, HO's soft sensor capability generated high-resolution influent profiles that enabled dynamic simulation of real operating scenarios. This approach reduced uncertainty associated with conservative design assumptions and allowed the team to evaluate alternatives that would not have been feasible using traditional steady-state methods alone.

Key findings from the digital twin analysis included:

- Peak loading, peak flow, and coldest temperature conditions do not occur simultaneously and should not be treated as a single design basis
- Ammonia-based aeration control is a feasible strategy to maintain nitrogen compliance while reducing energy use
- Optimal mixed liquor recirculation rates could be identified to avoid pump oversizing
- Planned aerobic zone mixers were unnecessary based on simulated minimum aeration demand
- Step-feed sensitivity analysis informed optimal locations and flow splits

Combined with CFD modeling of anoxic selectors and collaborative workshops with operations and process engineers, the digital twin analysis contributed to more than $6.5M in construction cost savings.

This presentation will demonstrate how applying digital twin tools during design—not just operations—can enable utilities to right-size infrastructure, reduce capital expenditures, and deliver more resilient, operationally informed treatment solutions.

Speaker(s):

Bruce Johnson, bruce.johnson2@jacobs.com, Jacobs, Denver, CO

Mr. Bruce Johnson is a wastewater technology senior fellow with Jacobs located in Denver. He has been doing wastewater treatment design for over 35 years, the last 31 of which has been with CH2M/Jacobs where he has held the roles of wastewater process and simulation global technology leader.

Designing with Intent: Constructability Driven SOE Designs for the Carolina Trunk Sewer Rehabilitation Project

Description:

The Carolina Trunk Sewer Rehabilitation Project in Portland, Oregon, involves replacing a nearly 100-year-old, failing brick-lined sewer. The project will help improve the region's wastewater system and extend the service life of this critical sewer infrastructure.

The project requires constructing four shafts along a 1,600-foot alignment. Each shaft presented unique challenges related to depth and footprint, proximity to I-5, nearby businesses, and high-traffic residential neighborhoods, as well as jobsite access and construction sequencing. Two of the shafts are located adjacent to I-5. Some of the construction will take place over an active large-diameter sewer beneath an existing buried railroad bridge, and because of the project's urban setting, construction access and equipment staging are limited.

Key design considerations of the shaft support-of-excavation (SOE) systems focused on consistency in member sizing, connections, and detailing to support constructability and provide clarity for the contractor during construction. This approach allowed the design to be adapted for each shaft location while maintaining a uniform overall structural system. Consistency with the various structural elements - lagging, piles, struts, and walers, tiebacks, and thrust frames - provided familiarity for both the design team and contractor. This simplified design modifications during early construction when actual site conditions or loading conditions varied. Focusing on these key design considerations reduced the potential for errors and improved the overall efficiency of the SOE construction.

Speaker(s):

Conner Bauman, bauman@delveunderground.com, Delve Underground, Portland, Oregon

Conner is an Associate Structural Engineer with over 10 years of experience in Delve Underground's Portland office. He specializes in the design of support of excavation systems for access shafts, portals, and underground structures. Conner has been involved in a wide range of projects—including water and wastewater, transit, and mining—across the Pacific Northwest, as well as in New York, Vancouver, BC, and Australia and New Zealand.

Digestion Without Indigestion: Adaptive Planning for Biosolids Resiliency and Risk Management in the face of Uncertainty

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

Utilities are being asked to strengthen biosolids resiliency amid uncertain drivers including co-digestion programs, regulatory changes, market volatility, and staffing constraints, all while maintaining stable operations. The City of Portland Bureau of Environmental Services (BES) recently completed a Resource Recovery Plan for the Columbia Boulevard Wastewater Treatment Plant (CBWTP), The biosolids portion of that plan paired a long-range digestion capacity forecast with a monitoring and trigger framework.

CBWTP's solids train includes six primary mesophilic anaerobic digesters, producing Class B biosolids and biogas that is upgraded to renewable natural gas (RNG). The digestion capacity analysis incorporated near-term process changes such as co-thickening and future co-digestion of source-separated food waste and FOG with uncertainty in both timing and volume. Analysis of historical performance data guided creation of a dynamic model to forecast future loads and performance.

The adaptive planning was anchored on two governing Class B performance criteria, volatile solids reduction (>= 38%) and solids retention time (>= 15 days) which translated to two performance triggers in addition to other identified potential triggers such as land application, phosphorus, and biogas market shifts; fuel and hauling cost changes; and regulatory need or political pressure for Class A or PFAS reduction in biosolids. For each of these the plan defined leading indicators and developed forecasting tools to avoid premature capital spending or inadequate time for studies, designs, and construction of improvements needed to maintain compliance and manage risk. The plan found that primary digestion capacity is likely adequate through 2045. The strategy incorporates enhanced monitoring, periodic forecast updates to allow the plan to continue to adapt moving forward.

Attendees will gain a replicable method for communicating capacity, redundancy, and timing; a structured monitoring approach to distinguish true capacity limits from correctable instability; and a practical model for integrating uncertainty into long-term planning.

Speaker(s):

Jen Murphy, jmurphy@parametrx.com, Parametrix, Seattle, Washington

Jen Murphy, PE, CSE, is a Sr Consultant, Project and Program Manager, and Systems focused Mechanical, Process, and Controls engineer at Parametrix with more than 20 years of experience in wastewater treatment and resource recovery. She was the project manager and lead planner for the City of Portland BES Columbia Boulevard Resource Recovery Plan, the long-range adaptive plan this presentation draws from, and has managed digestion and biosolids projects across the Pacific Northwest, including the $35M anaerobic digester upgrades at LOTT's Budd Inlet Treatment Plant. She also currently serves as 2nd Vice Chair of the WEF Municipal Resource Recovery Design Community.

Heather McKenna, heather.mckenna@portlandoregon.gov, City of Portland, Bureau of Environmental Services, Portland, Oregon

Heather McKenna is an Supervising Engineer for the Process, Integration and E,I&C Group in the City of Portland's Treatment and Pumping Systems Division. She currently focuses on process control and automation for the City's wastewater treatment plants and pump stations. Previously, Heather drove product development of novel water purification systems and activated carbon (AC) products in private industry. Heather holds a BS, ME, and PhD in Environmental Engineering Sciences from the University of Florida and maintains a PE in the state of Oregon.

, , City of Portland, Bureau of Environmental Services, Portland, Oregon

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Digging into NoDig: Intro to Trenchless Technologies

Description:

Conveyance projects are increasingly attentive to community needs that require reducing traffic and noise disruptions, hazards of open excavations, and spoils to be transported and potentially disposed. Trenchless technologies are increasingly used to address these issues, particularly in confined site footprints and crowded utility corridors. Successful trenchless projects depend heavily on informed and intentional design decisions made well before construction. This presentation will equip newcomers, as well as professionals seeking a refresher, with the information necessary to consider trenchless technologies on their next conveyance project.

A brief history of trenchless methods will be discussed for clarity on how these technologies developed, followed by an overview of the most common methods used in the water and wastewater industry and where they are typically applicable: horizontal directional drilling (HDD), jack and bore, pipe ramming/moling, and cured in place pipe (CIPP). We will then focus on design considerations common to all trenchless projects, such as subsurface utility engineering (SUE) quality levels, geotechnical data needs, soil and groundwater conditions, client standards, and right of way or jurisdictional requirements.

Method specific design considerations will be discussed in greater detail, emphasizing factors that often drive feasibility and risk. Topics include allowable pipe bending radius, depth and alignment constraints, utility clearances, hydraulic impacts of reduced internal diameter, suitability for gravity systems, and continuity of service requirements. The presentation highlights the importance of coordinating design assumptions with realistic construction constraints, including entry and exit locations, staging areas, bore pits, and bypass pumping.

Attendees will gain a foundational understanding of where each method excels with context from the Pacific Northwest, the guiding principles behind methods, and common design considerations and pitfalls. By the end of this session, participants will understand not only how trenchless technologies work, but why they are essential tools for advancing a sustainable water future.

Speaker(s):

Ross Varin, ross.varin@meadhunt.com, Mead & Hunt, Seattle, Washington

Ross is a Wastewater Supervisor in Mead & Hunt's Seattle office with 13 years' experience in wastewater engineering.

Digital Dreams, Operational Reality Innovation Without the Shiny Object Syndrome

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

Water and wastewater utilities across the Pacific Northwest are under constant pressure to modernize. Some operational systems have not seen a major upgrade since everyone was worried about Y2K. Others are investing steadily in new tools but quietly wondering why their systems still do not talk to each other. Most sit somewhere in between, managing aging infrastructure while being pitched the next breakthrough in artificial intelligence, predictive analytics, or digital twins. Operational technology can absolutely improve asset performance, reduce costs, and make life easier for crews in the field. But buying software is not the same as becoming innovative.

Across large, medium, and small utilities, the pattern is surprisingly familiar. SCADA systems outlive their original design life. New applications are added with enthusiasm but without integration plans. Leaders feel pressure to "do AI" before defining the question they want answered. Modeling tools promise clarity but require governance, clean data, and long-term maintenance that were never part of the original excitement. Innovation begins as a strategy and sometimes ends as a subscription.

And then there are the people. Innovation does not fail because operators resist change. It fails because organizations underestimate the effort required to prepare staff, align expectations, and build confidence in new tools. Training is treated as an event instead of a process. Cultural readiness is assumed rather than cultivated. Without clear direction, safe decision pathways, and visible executive support, even the best technology struggles to take root.

This session explores how to prepare both systems and staff for sustainable innovation. It examines technology and non-technology change, including service delivery models, asset management maturity, sustainability planning, affordability strategies, and equity centered engagement. Drawing from practical experience, the presentation introduces six innovation enablers that separate useful progress from expensive distraction: clarity of direction, decision pathways, funding flexibility, technology and data foundation, people and culture, and implementation capacity.

Whether serving twenty thousand customers or two million, the real challenge is not finding new ideas. It is preparing the organization to make those ideas work.

Speaker(s):

Scott Bash, scott.bash@stantec.com, Stantec, Bellevue, Washington

Scott Bash is the Director of Systems and Operational Technologies at Stantec in Bellevue, Washington. He is an information technology and asset management industry veteran of over 30 years with broad experience in water, wastewater and urban drainage. He has designed asset management and technology solutions for local governments and public agencies in Europe, Australia, Southeast Asia and throughout North America. His recent attention has been in developing integrated business intelligence solutions and helping organizations integrate data with asset management best practices that align with ISO 55000 standards.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Don't be the frog in the warming waters. Operations and climate change: a primer and a peer sourced set of vulnerabilities and solutions to prepare for a resilient water system today

Description:

Everyone is affected by the big changes we see with warming environments. Yet people live in warm environments around the world and have thrived. We do not need a revolution, rather, we need an evolution of practices and facilities. This session will start with the basics of how the climate in the Pacific Northwest is expected to change over the next several generations and what kinds of chronic or acute events we should expect to see and manage through. Then we will host a discussion that tracks the stages of the water treatment and delivery system to name the challenges and what we can do about those challenges with social, programmatic, and engineered solutions.

This primer and structured thought exercise is meant for everyone involved in the water sector from water supply to water treatment to water storage and distribution. The climate changes are already arriving and will demand a slow and incremental evolution of infrastructure and that is best done with a forward-looking intentional program versus a reactive program with surprise risks and costs to recover from.

Key points from this session include:

- What our region will experience in the future for climate and future physical conditions
- What part of our water systems will be vulnerable to what threats
- How we can avoid, prevent, or adapt to these likely threats and conditions to keep the level of service moving forward
- Who must we look out for that may be most affected by a disruption in service and what we can do to serve them well

Speaker(s):

Beth Miller, bmiller@parametrix.com, Parametrix, Eugene, OR

Beth is a scientist who applies her analytical and research skills to help clients understand the most up to date information about how climate change is going to affect their world and build a plan to thrive into the future. She provides detailed analyses of the best available climate projections to help her team design to future conditions and runs focused workshops so her clients get all the information they need to make critical decisions. For communities, she translates the complex scientific research into understandable information and facilitates discussions with community stakeholders to plan for an equitable and thriving future.

Tracy Lunsford, TRLunsford@Parametrix.com, Parametrix, Eugene, Oregon

Tracy has 15 years of experience in climate and sustainability planning, policy and programs. She combines deep experience managing programs for local public agencies and serving local and state agency clients, from financial analysis, to managed planning and implementation projects, to tracking and reporting on progress toward goals. Tracy leads Parametrix's local agency Climate and Sustainability practice with greenhouse gas

(GHG) inventory and mitigation scaling, climate action planning, fleet fuel switching, transit electrification, and more. She brings a deep understanding of equity and economic empowerment, paired with climate planning, technical research, and analysis experience.

Layne McWilliams, lmcwilliams@parametrix.com, Parametrix, Hayden, ID

Layne has a diverse background in design, construction, energy, and law. As such, he has experience in all phases of wastewater infrastructure projects, from planning, financing, and preliminary design through contracting, construction, commissioning, and

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Down the Drain and in your Brain

Description:

Interactive exhibits, sticker passports, science notebooks for the wetlands, water cycle bracelets and so much more! During this presentation, Spokane County will share their creative methods to engage students and the public for wastewater and stormwater education along with tips and tricks to start and grow and education programs.

The Water Resource Center at the treatment plant has four interactive exhibits covering the Human Water Cycle, the river and aquifer connection, a matching puzzle game for tips to protect the aquifer and stormwater system, and a vacuum powered membrane filtration model that kids can test out.

To help engage students during tours, the education team recently created sticker passports. These passports show a simplified map of the facility with all the major processes numbered. The students are given a set of custom stickers that represent each of the treatment steps. As the tour progresses, students add their stickers to the right spots on the map – and the stickers aren't in order, so they have to pay attention to get everything right! When the students have completed their passport, they get a fun sticker proclaiming them a wastewater wizard, dung diva, turd herder, or another moniker.

Spokane County also owns a nearby wetland, Saltese Flats, that has been restored and opened to the public with trails and the Doris Morison Learning Center. Each spring, the educators grab their waders and binoculars for an award-winning, six-week program that reaches every fifth grader in the local school districts – over 1500 students per year!

For younger kids, educators use Drippy the Water Drop to explain the water cycle and then kids act out where water can go. The room is set up with several stations representing places water is found, and students roll a dice to determine which station to go to next. At each station they get a bead representing their current location to add to a bracelet. At the end, they have a fun bracelet to remember their individual water journey!

If your facility is looking for ways to increase your public outreach and have fun doing it, come join us!

Speaker(s):

Hannah Thomascall, hthomascall@spokanecounty.org, Spokane County, Spokane, Wa

Hannah Thomascall graduated from Auburn University with a bachelor's degree in Biosystems Engineering and interned as a state regulatory agent. She has worked at the Spokane County Regional Water Reclamation Facility (SCRWRF) for the past five years and currently serves as the Water Reclamation Project Manager. Hannah oversees the operations contract of the facility as well as the NPDES permit and associated studies.

Elisabeth Murphy, emurphy@spokanecounty.org, Spokane County, Spokane, WA

Elisabeth Murphy obtained her bachelor's degree at Whitworth University in Elementary Education in 2018. From there, she went on to work in the Mead and Spokane school districts for almost six years, serving in teaching roles ranging from intervention support specialist to math teacher, to science specialist. While being in a regular classroom with students was fulfilling, what she most wanted to teach about was the environment and student's connection and stewardship to it. In spring of 2023, a position with the County to be an Environmental Educator opened and this position was truly the perfect fit. Elisabeth's position is split doing water and waste education to mainly K-12 students but also to any community group/interested party who wants to learn more about our regions water and waste systems. Students can take field trips to the Spokane County's Water Resource Center to participate in fun activities dedicated to water stewardship and education or come to the City of Spokane's Waste to Energy for a tour of the facility. When she is not meeting with students at these locations, Elisabeth is doing presentations in their classrooms and leading them through activities based around waste reduction and proper water stewardship.

Durham WRRF Tertiary Filter Performance Optimizations

Description:

Clean Water Services (District) operates their Durham Water Resource Recovery Facility (WRRF) with a combination of a biological phosphorus removal in their secondary treatment process and chemical phosphorus removal in primary and tertiary treatment. This combination has allowed the Durham facility to consistently meet their seasonal (May-Oct) effluent total phosphorus (TP) permit limit of 0.11 mg/L. Crucial to achieving this stringent limit are the plant's 13 granular media filters which remove total suspended solids (TSS) containing organic and precipitated phosphorus. Beginning in 2023, the District observed declining filter TSS removal performance which lowered the reliability in operating comfortably below their TP limit. By midway through the 2024 season, effluent TSS concentrations were higher than the plant had seen since 2014.

This prompted the District to embark on a filter investigation and optimization project performed by first assessing filter health, followed by a benchtop review of the tertiary treatment process. Filter health was characterized through a suite of diagnostic tests including backwash turbidity profiling, filter coring and media retention analysis, and filter support systems evaluation. The findings of these evaluations led to the District carrying out extensive media cleaning, media top-ups, and improvements to the filter's auxiliary surface wash system and backwash operation. The media cleaning effort included a bench-scale chemical cleaning study, in situ chemical cleans, and physical organics removal with filter media lancing. The process review involved a probability analysis of six years of operational data and led to recommendations in changes to tertiary alum dosing and pH and alkalinity adjustment ahead of the 2025 season.

Key outcomes of the project:

- Filter TSS removal performance was restored to the best levels seen in the last decade of operation.
- The Durham WRRF was able to reliably meet its 0.11 mg/L TP limit in the 2025 season.

This session will present the process analysis, filter diagnostics, and results of the filter improvements for the 2025 TP permitted season and review ongoing process improvements looking upstream of the filters at Durham's tertiary clarification process.

Speaker(s):

Alex Crozes, acrozes@carollo.com, Carollo Engineers, Portland, Oregon

Alex Crozes, PE is a wastewater process engineer with Carollo Engineers with 8 years experience and was the project engineer for the project.

Jana Otero, OteroJ@CleanWaterServices.org, Clean Water Services, Tigard, Oregon

Jana Otero, PE is an engineer and project manager for Clean Water Services in Tigard, OR. She currently manages capital improvement projects ranging from small, in-house rehabilitation projects to larger, multimillion dollar projects at the Durham Wastewater Resource Recovery Facility. She has worked on wastewater projects for over 9 years, both as a design consultant and as a public employee.

Matthew Christensen, ChristensenM@CleanWaterServices.org, Clean Water Services, Tigard, Oregon

Matthew is an operator at Clean Water Service's Durham WRRF. He was the lead operator for the project and brings over 15 years of experience.

Emergency Repair and LongTerm Rehabilitation of Goedeck Trunk, RUSA's Primary Wastewater Conveyance Asset

Description:

Roseburg Urban Sanitary Authority (RUSA) provides sanitary sewer service to the City of Roseburg and the adjacent Urban Growth Boundary. The Goedeck Trunk is a 36" to 42" diameter concrete trunk sewer that conveys the majority of the service area's wastewater flow to RUSA's wastewater treatment plant. Extreme wet weather in March of 2025 led to excessive flows and resulted in a collapse of the pipe just downstream of a significant confluent with a siphon and the need for an emergency repair. The collapse resulted in a 20-foot deep sinkhole and significant debris accumulation in the downstream pipe. During the emergency repair, RUSA discovered that this primary trunk sewer had corrosion issues that necessitated a longer-term rehabilitation project.

This presentation will discuss the flow and corrosion conditions that likely led to the pipe failure, the challenges RUSA faced to handle a significant pipe collapse in the midst of extreme wet-weather, the steps RUSA took to facilitate an emergency repair, and the design and construction of the subsequent rehabilitation project. Audience members will learn about the nature of biogenic sulfide corrosion in cementitious pipe materials,

how emergency contracting was conducted, and the steps and schedule needed to manage a long-term rehabilitation solution.

Speaker(s):

Ryon Kershner, ryon@rusa-or.org, Roseburg Urban Sanitary Authority, Roseburg, Oregon

Ryon Kershner is the Engineering and Operations Manager for the Roseburg Urban Sanitary Authority. He is a certified Collections Operator II, a licensed PLS, and has been with RUSA since 2009.

Clay Jordan, clay@rusa-or.org, Roseburg Urban Sanitary Authority, Roseburg, Oregon

Clay is an Engineering Technician II with the Roseburg Urban Sanitary Authority. He has a degree in Civil Engineering, 25 years of experience in the public works field, and served as the project manager for the Goedeck Trunk Rehabilitation Project.

Rob Lee, PE, PMP, rob.lee@leewayengineeringsolutions.com, Leeway Engineering, Portland, Oregon

Rob Lee is a principal engineer with Leeway Engineering. He has 27 years of experience, is a licensed PE, and is known as a national expert on cured-in-place pipe rehabilitation.

Empowered Operators Deliver Energy Savings

Description:

Across the Pacific Northwest, wastewater resource recovery facility (WRRF) operators are rising to the moment—demonstrating that meaningful energy savings and exceptional water quality can go hand-in-hand. Through practical, low- and no-cost operational strategies, many facilities have achieved annual energy reductions exceeding 10%, all while strengthening reliability and protecting public health.

Energy use accounts for a significant share of municipal budgets nationwide, and WRRFs are among the most energy-intensive public services. Traditional design approaches emphasize meeting peak conditions, navigating uncertainty in flows and loads, and ensuring resilience for future demands. While essential, these conservative assumptions often lead to facilities operating below optimal efficiency during typical daily conditions. Today, as communities work toward a more sustainable water future, operators are increasingly embracing energy performance as a core operational responsibility—not an afterthought.

This panel will highlight the experiences of operators from several Pacific Northwest WRRFs who have advanced energy management within their organizations. Panelists will discuss how they challenged long-held assumptions, identified hidden inefficiencies, and implemented operational refinements that delivered measurable energy and cost savings without compromising treatment performance. Their examples show that even facilities considered “optimized” can uncover new opportunities when energy becomes a lens for decision-making.

The session will also explore the broader organizational impacts of integrating energy considerations into daily operations and long-term capital planning. From improving staff engagement to shaping future upgrade

decisions, these facilities illustrate how operator-driven energy management supports both near-term performance and long-term sustainability goals.

Attendees will gain practical insights into how WRRFs of all sizes can incorporate energy awareness into their culture, overcome barriers to change, and contribute meaningfully to a sustainable water future—one operational improvement at a time.

Speaker(s):

Matt Smeraglio, matt.smeraglio@cascadeenergy.com, Cascade Energy, Portland, OR

Matt Smeraglio is a Senior Energy Efficiency Engineer at Cascade Energy, where he partners with water and wastewater operators and engineers to reduce energy costs at treatment plants. His experience spans energy efficiency consulting for capital improvement projects, low- and no-cost strategic energy management programs, and utility grant funding. Matt holds an M.S. in Mechanical Engineering from Portland State University, a B.S. in Mechanical Engineering from the University of Portland, and he is a registered Professional Engineer in the state of Oregon.

Equitable Workforce Development Models for Large Utilities

Description:

Beyond building and maintaining functional infrastructure, creating workforce development opportunities represents one of the most meaningful ways a public utility can invest in its community and ensure the people it serves can afford the water quality benefits it provides. In this session, participants will hear about three programs at the King County Wastewater Treatment Division (WTD) and how they coalesce to provide paid, hands-on job training and equitable workforce development opportunities for a diverse population seeking careers in clean water.

First, participants will hear about WTD's Workforce Development Program, which provides recruitment, training, placement, and retention services for entry-level candidates who are new to the clean water sector and building their skillsets. Since 2019, program staff have transformed 20 participants into innovative clean water professionals. The Workforce Development Program boasts a 90% retention rate, with the majority of participants securing a subsequent position at WTD in less than one year.

Next, we will cover WTD's Partners in Water Program, a collaboration between WTD and local community-based organizations (CBOs) serving immigrant, refugee, and underrepresented communities for the purpose of advancing equitable community engagement. In 2025, Partners in Water launched a Career Pathways pilot project focused on expanding access to WTD career opportunities by improving HR systems and centering community voices in recruitment and hiring practices. In 2026, the project will expand to include representation from three local CBOs and focus on co-developing a plan for sharing WTD opportunities with CBOs across King County, testing community-based workforce development programing, and ensuring community perspectives are represented in workforce development strategic planning.

We will conclude with an overview of the project-specific workforce development opportunities being pursued by WTD's Capital Equity Program, which advances equity through the planning and delivery of its capital

portfolio. WTD has begun pursuing partnerships with internal and external workforce development programs, including King County's JumpStart program for adults starting careers in clean energy and the skilled trades; a deconstruction training partnership with CBOs supporting individuals facing systemic barriers to employment; and community greening training partnerships with CBOs funded by WTD's WaterWorks Grant Program.

Speaker(s):

Eli Weiss, elweiss@kingcounty.gov, King County Wastewater Treatment Division, Seattle, Washington

Eli Weiss is the Partners in Water Program Manager at the King County Wastewater Treatment Division in the Seattle area. His work focuses on facilitating equity focused projects that bring community-based organizations to the table to work on collaborative planning projects alongside County Wastewater Treatment division staff. Eli has a background in education and community engagement and has been supporting cross sector collaboration and collective impact throughout his career. In addition to King County, he has done this work on behalf of non-profits, Community based organizations, schools, companies, and startups.

Margo Iniguez Dawes, miniguezdawes@kingcounty.gov, King County Wastewater Treatment Division, Seattle, Washington

Margo Iñiguez Dawes is the Capital Equity Program Manager at the King County Wastewater Treatment Division in the Seattle area, which is on track to spend $1 billion per year on capital projects by 2030. Her work focuses on integrating strategies across contracting equity, workforce equity, meaningful community participation in decision-making, equitable siting and design, and equitable project scoring criteria for prioritization—all for the sake of ensuring that major public investments have economic benefits for and are made with input from the people they most impact. Margo has a planning and civil engineering background and a decade of experience in public infrastructure, mostly in transportation but for the past year in wastewater treatment as well. She is a big film buff and loves attending and producing film festivals, and she also has season tickets to each of the professional women's sports teams in Seattle.

Evolving Puget Sound Nutrient Database to Support Broader Nutrient Program

Description:

In 2022, as part of a grant from the Washington Department of Ecology to the Association of Washington Cities, moderate and small dischargers were provided the opportunity to request technical support in developing their Nutrient Optimization Plans and Nutrient Reduction Evaluations. Twenty-three utilities took advantage of the program, and the support AWC/Jacobs provided. As part of the program a point source database was developed that included all 58 municipal point source dischargers. The database was populated with information from the utilities that participated in the program as well as published data from the dominant dischargers in the nutrient optimization plans.

Data captured in the database includes:

- Design and 2022 Influent Flows (mgd)
- General Permit Action Levels (lb TIN/yr)

- 2022 Effluent TIN Concentration and Load (lb TIN/yr)
- Optimization Capital and O/M Costs and Expected Optimized TIN Reductions
- NRE Capital and O/M Costs and Expected TIN Reductions
- $/lb TIN Removed for Proposed Optimization and NRE Improvements
- Future Power consumption, where available
- Current Residential Household Sewer Rates
- Estimated Residential Household Sewer Rates with NRE/Optimization Improvements
- Sewer rates as %/Median Household Income and Lowest Quintile Residential Indicator (LQRI)

This presentation will provide an overview of the database as it stands today and As Ecology moves forward with an evolving program, NREs developed under this program may need to be updated with modeled loads presented in the Puget Sound Advanced Restoration Plan (June, 2025). In addition, action levels from the Puget Sound Nutrient General Permit (December, 2021) are being replaced with nearer term annual TIN load caps, based on 2019 through 2024 performance.

To seek broad scale funding opportunities and to inform basin wide decision making, utilities should work together to keep this tool up to date and to better allow them to communicate impacts of the program to rate payers, Ecology and political figures. The Utility Caucus and AWC both provide a nexus for the database to be leveraged going forward.

Speaker(s):

Amanda McInnnis, amanda.mcinnis@jacobs.com, Jacobs, Missoula, MT

Amanda is an experienced principal project manager with a broad range of water, wastewater, effluent management and stormwater experience, including project management, planning, permit assistance, funding assistance, design, and construction. With over 26 years of experience, she completed multiple facilities plans and is the Senior project manager on the Association of Washington Cities work that developed the Puget Sound Nutrient Database.

Extension of BEAM tool for assessing PFAS emissions and sustainability metrics in biosolids thermal processes

Description:

Per- and polyfluoroalkyl substances (PFAS) have undoubtedly impacted the world of biosolids management. While our industry strives to adapt to changing regulations, we lack methods for assessing the impact of PFAS in tandem with more traditional concerns such as global warming and eutrophication potential. Through this Water Research Foundation Project (#5211), an adapted version of the industry standard BEAM tool was

developed to provide a user-friendly life cycle assessment (LCA) based method for quantifying the impacts of various biosolids treatment trains under a variety of conditions (NEBRA et. al., 2024). Toxicity tracking specifically focusing on PFAS and heavy metals were incorporated into this tool based on both experimental and literature data. Five different biosolids management options including thermal drying only, pyrolysis (at low and high temperature), gasification, and incineration, were compared in the tool. Respect to global warming and eutrophication potentials, pyrolysis was the best alternative due to benefits associated with biochar. The relative impact of PFAS on ecotoxicity and cancerous toxicity was small due to the relatively larger impact from heavy metals, but there was an appreciable impact on non-cancerous toxicity from PFAS. Consequently, incineration and gasification had lower PFAS emission potential as well as non-cancerous toxicity potential, particularly under a scenario with high PFAS destruction in gas phase end products. This analysis highlights the relative importance of PFAS when taken into context with other known and regulated toxicants such as heavy metals. This work integrates LCA and PFAS into a simplified, user friendly tool that offers flexibility and supports holistic sustainability evaluation. It allows side by side comparison of multiple sustainability metrics such as global warming potential, eutrophication potential, and other toxicity impact categories. The tool enables alternatives analysis beyond greenhouse gases and improves understanding of environmental impacts across individual processes and solids treatment train combinations.

By focusing on PFAS transformation and removal, the tool aligns with growing industry momentum in biosolids management and empowers users to trace the fate of contaminants from process to end use, revealing insights that drive smarter, more sustainable decisions.

Speaker(s):

Francesca Cecconi, cecconif@bv.com, Black & Veatch, Walnut Creek, California

Francesca is a process engineer with 9 years' experience in wastewater treatment working at Black & Veatch. She holds bachelor and master degrees from the University of Florence, Italy in Environment Engineering and a PhD from UC Irvine. At Black & Veatch, she specializes in nutrient removal design and research, process optimization, energy and cost analysis, and carbon accounting.

FFRPP Force Main Rehabilitation – The New Standard in Pressure Pipe Lining Systems

Description:

In 2024, the City of Riverside faced a significant challenge in rehabilitating a 2-mile-long, 24-inch concrete-lined and coated steel force main installed in the 1970s. Following a failure in the early 2000s, the pipeline was decommissioned and left out of service. The City's initial choice, a cured-in-place pipe (CIPP) solution, exceeded the $7 million budget by nearly 30%, leading them to explore alternatives. A more recent technology, a close-fit Flexible Fabric Reinforced Plastic Pipe (FFRPP) system was introduced to the U.S. in 2022. It is a semi-structural Class 3 pipe rehabilitation system. The slightly rigid liner maintains a round shape inside the pipe even without pressure. It is flexible and can easily be pulled through 45 degree bends. By reducing access pits from 20 to 11 and liner installations from 15 to 8, this product brought the project back within budget at $6.75 million. This project is one of the largest FFRPP in the world and shows its capability in complex pipeline geometry situations. This solution was not available in this size two years ago. This project shows the evolution

of the FFRPP liner rehabilitation solution and its capabilities to save millions of dollars over competing liner systems and full replacement projects. This presentation will explore the technical and logistical advantages of the novel FFRPP system and the project's role in setting a new standard for force main rehabilitation.

Speaker(s):

Matthew Izzard, matthew@piperelinesolutions.com, CPM Pipelines, Phoenix, Arizona

With 30 years of experience in the trenchless industry and his previous role as Executive Director of the North American Society for Trenchless Technology (NASTT), Matthew Izzard will be presenting on FFRPP.

Finding the Path: When to Choose GC/CM or Progressive Design-Build for Linear Conveyance

Description:

Delivery method selection strongly influences outcomes on linear conveyance projects, where live flows, constrained corridors, trenchless segments, easements, and environmental limitations create distinct risks. Choosing the right delivery approach shapes how risk, cost control, schedule, and technical complexity are managed over long project timeframes. For owners and utilities, aligning the delivery approach with project uncertainties and stakeholder needs can improve budget confidence, decision-making, and overall project reliability, while for designers and contractors it leads to clearer accountability, better collaboration, and more efficient execution. Grounded in recent Pacific Northwest experience, this presentation will compare contexts in which various delivery methods can be advantageous without prescribing a single 'best' answer.

Major delivery attributes translate directly into conveyance specific results: early contractor involvement mitigates risk associated with tie ins, bypassing, and means and methods; open book estimating aligns scope and budget; early work packages and long lead procurement support challenging schedules; and, for Progressive Design Build (PDB), design and performance requirements can be coupled when outcomes matter most. However, in certain situations, alternative delivery may not add value.

This presentation offers a practical and decision-oriented framework for selecting General Contractor/Construction Manager (GC/CM) or PDB, in addition recognizing when traditional Design Bid Build (DBB) remains the better path. For Washington owners, it briefly notes how to align selection rationale with RCW 39.10 and Project Review Committee expectations for alternative public works. Finally, it will describe at a high level how owners plan for an off-ramp if needed.

Attendees will take away: (1) an identification of conveyance-specific project drivers which may inform delivery method justification; and (2) a playbook for implementation covering owner's advisor roles, open-book negotiation, early works, and when to pivot back to DBB. The result is a repeatable, defensible selection process that improves cost and schedule certainty while maintaining operability and regulatory compliance for linear conveyance programs.

Speaker(s):

Patrick Weber, pweber@brwncald.com, Brown and Caldwell, Seattle, Washington

Patrick Weber is an Owner's Advisor and Civil Engineer in Brown and Caldwell's Seattle office. He is a member of BC's national Owner's Advisor Practice, focused in the Pacific Northwest. He provides OA services for design-build, GC/CM, and other collaborative delivery projects through the full project lifecycle, starting with delivery method evaluation and continuing through the procurement process and oversight of the design and construction phases.

First Time Supervisor? Don't Just Survive, Thrive!

Description:

You've done great in your work and you're considered a rising star. Now they're promoting you to be a first time supervisor. And they're sure you'll do great in this new role. But wait, they aren't providing any formal training and while you're an expert at what the group does, you have very little training and experience in managing and supervising those who do that work. This presentation will provide information on not only how to make the transition but for you and your group to excel. We'll discuss the key transition from "I" to "We" and the fundamentals of being a great supervisor – trust and integrity, clear communication, and accountability. We'll use examples from top leaders and authors such as Kim Scott (Radical Candor), Brene Brown (Dare to Lead), Ken Blanchard (the One Minute Manager), and Hershey and Blanchard (Situational Leadership). We'll also tackle the thorny issues many new supervisors face – managing former peers, the "friendship trap", providing constructive criticism, and delegation guilt – all in an informative and lighthearted presentation.

Speaker(s):

Jason Flowers, jflowers@geosyntec.com, Geosyntec Consultants, Inc., Seattle, WA

Jason is a Senior Engineer for Geosyntec Consultants. He is the current committee chair for the Leadership Development Committee and was previously the chair for the Biosolids and Sustainability Committee. He has 25+ years of experience with a technical focus on biological wastewater treatment.

Mark Poling, mark@wastewater.or, Clean Water Management, Grand Rapids, MI

Mark is an independent consultant and sole proprietor of Clean Water Management, a consulting firm focusing on utility management. He is a past member of the Water Environment Federation (WEF) House of Delegates, a former Trustee of the WEF Board, and a WEF Fellow. He is also a past president of the PNCWA. He has nearly 40 years of experience at Clean Water Utilities including utility management, water resource recovery facility operation, maintenance, design, and construction.

Fixed Covers, Secure Future: A Digester Upgrade Strategy Focused on Safety, Simplicity, and Emissions

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

LOTT Clean Water Alliance provides wastewater management services for the urban areas of Lacey, Olympia, Tumwater, and Thurston County, Washington. LOTT operates the Budd Inlet Treatment Plant (BITP) and two reclaimed water plants. BITP is a secondary treatment plant, originally built in the 1950s, with many subsequent upgrades. The solids handling facilities were constructed in 1982, with steady upgrades over the past 10 years.

Phase 2 improvements focus on replacing aging equipment while modernizing sludge mixing and gas handling systems to reduce GHG emissions. The existing floating covers are being replaced with stainless steel fixed covers, eliminating fugitive methane emissions. Although stainless steel covers have a higher upfront cost, they will eliminate coating system failures and reduce maintenance needs over the life of the covers, demonstrating LOTT's long-term and lifecycle-based approach to decision making.

New linear motion mixers modernize an aging gas mixing system. These mixtures feature low power requirements with simpler O&M needs. Improved mixing will also result in better digestion and increased gas production. The mixers replace an existing gas mixing system, enabling removal of all but one backup gas compressor and significantly reducing gas piping within the control building.

A modern enclosed waste gas burner is replacing a candlestick flare, resulting in lower emissions through increased destruction efficiency.

One unique design feature that provided several lessons learned during construction is the new concrete 'ring beam' installed along the inside perimeter of the digester wall. The existing walls are posttensioned and incompatible with a fixed cover, requiring the ring beam to support the heavier fixed cover. Integrating the ring beam required extensive coordination with the cover manufacturer and using ground penetrating radar to verify the location of tendons during both design and construction.

The first of four digesters is expected to be completed and operating in March 2026.

Speaker(s):

Hannah McLean, hmclean@parametrix.com, Parametrix, Olympia, WA

Hannah McLean is a senior engineer and project manager with Parametrix. Hannah has worked in consulting for the past 11 years all throughout the Pacific Northwest. As an engineer, her primary focus is on sewer and facility planning projects. She also manages a range of projects primarily in wastewater treatment and conveyance practices from detailed design through construction.

Karina Woodland, kwoodland@brwncald.com, Brown and Caldwell, Seattle, WA

Karina Woodland is a staff process mechanical engineer with Brown and Caldwell. She has 7 years of consulting experience, during which she has primarily focused on design for digestion and solids handling systems. Prior to entering the consulting world, she obtained her Masters of Science in environmental engineering at Michigan Technological University where she worked on a Class A biosolids treatment pilot scale.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Flowing Together: Spokane Turns RealTime Data into Action to Advance Stormwater Treatment and Protect the Spokane River

Description:

The City of Spokane, WA, has worked for decades to protect the Spokane River from untreated stormwater runoff and combined sewer overflows. As part of its Six-year Capital Improvement Program (2021-2026), the City deployed real-time remote monitors throughout its separated stormwater systems to better understand the wet weather conditions and associated runoff that flow to the river.

The real-time monitors provided the data needed to develop and calibrate hydraulic modeling efforts used to right-sizing future stormwater storage and treatment facilities, with the ultimate future goal of capturing and reducing pollutants flowing into the river. Spokane also uses this data and analysis to strengthen grant applications submitted to the Washington State Department of Ecology for funding opportunities.

Attendees of this presentation will gain practical insight into how the City of Spokane leveraged real-time remote monitoring to proactively advance regulatory compliance, optimize infrastructure investments, secure external funding, and enhance protection of both the community and the environment.

Spokane's wastewater and stormwater network is extensive, consisting of about 870 miles of combined and separated sanitary sewer lines, 14 miles of sanitary sewer force mains, 357 miles of stormwater lines, and nearly 22,000 stormwater inlets, along with numerous swales and detention facilities. Spokane collected continuous monitoring data from 2022 through 2024 across the largest MS4 basin outfalls and conveyance points.

Around-the-clock monitoring allowed the City to capture storm events of varying intensity and duration, generating a robust dataset for calibration. By integrating real-time field data with its Geographic Information System (GIS), Spokane is developing and refining hydraulic stormwater models that simulate how rainfall translates into runoff. They are evaluating flow volume, timing, and rate as water moves through pipes and storage facilities. This data-driven approach supports more accurate capacity analysis, improved flood risk mitigation, and informed infrastructure design.

Compared to the City's current monitoring approach; area-velocity (AV) and level flow meter data, real-time level remote monitoring provided continuous and real-time reviewable results to ensure notification of rainfall's immediate impacts or inconsistencies. The monitors also required less power consumption reducing the number of monthly field visits to replace battery packs or to upload the data.

Speaker(s):

Adam Rhoades, EIT, arhoades@spokanecity.org, City of Spokane, WA, Spokane, Washington

Adam Rhoades is an Associate Engineer with the City of Spokane Integrated Capital Management department, working in stormwater and wastewater capital planning and design. His experience includes GIS analysis, SWMM modeling, feasibility studies, model calibration, and extensive spreadsheet-based evaluations. He combines multiple analytical tools to assess alternatives, optimize performance, and support data driven decision making for the City's infrastructure systems.

From Aging to Amazing: Pump Station Retrofit Wins and the Moments That Made Us Smarter

Description:

Explore the critical decisions involved in upgrading and modernizing existing pump stations of many shapes and sizes. The session covers how to assess pump performance and condition, select replacement equipment, and suggest when modifications to wet wells, piping, or structures may be warranted. Participants will learn how electrical system constraints, controls integration, and fire and life safety code requirements influence retrofit feasibility and design. Discussion will highlight how thoughtful planning minimizes shutdowns, enhances reliability, and extends asset life. Real world examples will showcase common pitfalls such as mismatched hydraulics, inadequate bypassing, and overlooked code triggers that can trip up the project. This session is ideal for engineers, owners, and operators seeking practical guidance for delivering safe, compliant, and effective pump station retrofits.

Speaker(s):

Adam Crafts, adam.crafts@consoreng.com, Consor, Portland, Oregon

Adam Crafts is a principal engineer and project manager with 25 years of experience specializing in water and wastewater conveyance infrastructure.

From Cake to Product: Transforming Class A Biosolids Through Biodrying

Description:

Many water resource recovery facilities (WRRFs) have invested in Class A anaerobic digestion to reduce odors and improve biosolids quality. However, a persistent challenge remains: despite meeting Class A requirements, dewatered biosolids cake often resembles Class B material and is largely limited to land application on agricultural farmland—frequently located far from the treatment facility. These constraints increase hauling costs, limit beneficial use options, and reduce operational flexibility.

This presentation introduces a simplified and effective approach for transforming Class A biosolids cake into a higher-value, more versatile product using an aerated static pile (ASP) biodrying process. The process leverages naturally occurring biological activity within the biosolids to generate heat and remove moisture, increasing solids content to approximately 55–60 percent in less than two weeks.

The ASP biodrying approach blends a portion of previously biodried Class A material with freshly dewatered Class A cake to create a mixture with sufficient porosity and bulk density to support forced aeration. Continued aerobic biological activity generates heat, rapidly elevating temperatures and driving moisture removal while maintaining Class A biosolids status. No external amendments or supplemental energy inputs are required.

Field-scale demonstrations of this process have been conducted at two WRRFs in the United States and one in the United Kingdom. Results indicate that ASP biodrying can reduce biosolids tonnage by approximately 50

percent, resulting in substantial reductions in hauling and land application costs. The resulting product exhibits characteristics similar to a stabilized compost or soil amendment, enabling beneficial use in landscaping, turf, and ornamental horticulture applications and expanding options beyond traditional agricultural land application.

The presentation will describe the ASP biodrying process and summarize key findings from the field demonstrations, including impacts on product quality, volume reduction, operational considerations, and methane emissions compared to conventional storage of Class A biosolids cake. The session will provide utilities with practical insights into how ASP biodrying can enhance biosolids management strategies while improving cost efficiency and beneficial use outcomes.

Speaker(s):

Todd O. Williams, todd.williams3@jacobs.com, Jacobs, Charlotte, North Carolina

Todd Williams is a biosolids subject matter expert with over 40 years of experience.

From Cost to Impact: Reframing Water Investments for Value

Description:

Water utilities are increasingly moving beyond traditional least-cost planning toward value-based strategies that recognize water infrastructure as a catalyst for community well-being, economic vitality, and environmental resilience. As utilities confront aging assets, evolving regulations, shifting demographics, affordability pressures, and climate uncertainty, infrastructure decisions must address more than compliance and reliability, they must demonstrate broader, measurable value.

This session introduces a practical Value of Water framework to help utilities holistically justify investments and communicate their benefits effectively. Rather than focusing solely on capital cost, the framework integrates environmental, social, and economic outcomes, such as public health protection, ecosystem enhancement, economic growth, job creation, and long-term resiliency, into planning and prioritization processes. By reframing water infrastructure as a strategic investment rather than a cost center, utilities can unlock solutions that deliver ripple effects across communities and gain broader stakeholder support.

Through case studies and applied discussion, participants will explore how value-driven decisions have led to measurable outcomes, including improved equity, strengthened climate resilience, regional collaboration, and economic development. Examples will highlight approaches such as benefit-cost analysis that incorporates non-traditional metrics, regionalization and reuse strategies that generate shared gains, and communication techniques that address the chronic undervaluation of water services.

Participants will gain practical tools to:

• Quantify benefits beyond financial metrics, including public health, environmental protection, and social equity.

• Balance competing priorities across diverse beneficiaries while maintaining reliability and affordability.

• Craft compelling narratives that resonate with elected officials, regulators, and customers.

By the end of the session, attendees will be equipped with actionable strategies to integrate environmental, social, and economic value into infrastructure planning; evaluate investments through a resiliency and equity lens; and communicate the full return on water investments in ways that build durable stakeholder support. In an era defined by climate uncertainty and demographic change, adopting a value-based framework enables utilities to deliver legacy projects that strengthen communities, protect ecosystems, and sustain economic growth for generations to come.

Speaker(s):

Luke Pinto, lpinto@hdrinc.com, HDR, Seatlle, Washington

Luke Pinto is a PE with eight years of experience in wastewater treatment, nutrient optimization, and project delivery across the Northwest. He serves on the Engineers Without Borders Board of Directors, reflecting a ten-year commitment to humanitarian engineering. Outside work, Luke can be found adventuring around the PNW with his wife and their two dogs.

From Data to Decision: PFAS Treatment Strategies for Landfill Leachate

Description:

Per- and polyfluoroalkyl substances (PFAS) have drawn increasing scrutiny due to their persistence, mobility in environmental systems, and growing concerns regarding human health effects. For landfill owners/operators, this scrutiny translates into a pressing need to manage PFAS in landfill liquids responsibly and cost-effectively. Although landfills are not direct sources of PFAS, they serve as passive receivers of PFAS containing waste from consumer products, industrial sources, and municipal waste streams. As a result, landfill liquids often contain PFAS at levels requiring specialized management before discharge to wastewater resource recovery facilities (WRRFs) or the environment. Conventional wastewater treatment is generally ineffective at removing PFAS, prompting the solid waste industry to pursue targeted treatment technologies tailored to the unique properties of these compounds.

Leachate contains a broad range of organic and inorganic constituents at elevated concentrations that can inhibit PFAS removal, foul treatment systems, and impose operational constraints that limit the applicability of certain technologies. At the same time, PFAS regulations continue to evolve as analytical methods improve, health-based standards advance, and technology performance data expand. Collectively, these factors require landfill owners/operators to identify reliable PFAS management strategies that are aligned with the stewardship expectations of WRRFs and other waste managers.

This presentation summarizes findings from recent comparative evaluations of PFAS treatment technologies applicable to landfill leachate and highlights data driven insights from bench/pilot testing and onsite case studies. Evaluation criteria include compatibility with leachate chemistry, treatment effectiveness, technology maturity, capital and operating costs, and requirements for residuals management. The technologies applicable to leachate include foam fractionation (FF) and high-pressure membrane systems such as reverse osmosis (RO).

Sorption technologies using activated carbon, anion exchange resins, and novel sorbents may also be employed given adequate pretreatment or as a polishing step. PFAS destruction methods via electrochemical oxidation (EO), supercritical water oxidation (SCWO), and other emerging technologies are also assessed, although full-scale validation remains limited. Operational considerations and strategies for managing treatment residuals are also addressed. The goal of this presentation is to equip landfill owners/operators with a comprehensive understanding of the applicability, benefits, and limitations of available PFAS treatment technologies to support informed decision-making.

Speaker(s):

Rob Rebodos, rrebodos@brwncald.com, Brown and Caldwell, Seattle, Washington

Rob Rebodos is the Industrial Water - Solid Waste Technical Leader at Brown and Caldwell. He holds a PhD in Civil/Environmental Engineering from Virginia Tech and has 17 years of experience as an environmental engineer and consultant.

From Deterministic Design to Risk-Based Sewer Planning Under Climate Uncertainty

Description:

Clean Water Services (CWS), Oregon, is incorporating climate change into sanitary sewer and stormwater capital planning by transitioning from deterministic design assumptions toward a risk-based framework that explicitly accounts for climate uncertainty. Rather than relying on a single regional projection or design storm, this work develops station-scale precipitation projections that represent a defensible range of future conditions relevant to local infrastructure decisions.

Using a machine-learning–based downscaling framework, daily and hourly precipitation outputs from 27 CMIP6 global climate models were translated to 14 local CWS monitoring stations. The analysis incorporates multiple emissions pathways, SSP2-4.5 and SSP3-7.0, resulting in hundreds of individual model realizations and more than 26,000 model-years of data. The methodology preserves projected changes in rainfall intensity, frequency, and extremes while maintaining consistency with observed local precipitation statistics. Retaining the full model and scenario ensemble enables conversion of a massive raw climate dataset into actionable engineering metrics, such as exceedance frequencies and sensitivity of system performance thresholds, rather than a single “most likely” outcome.

CWS is using these data to evaluate wet-weather risk, system performance, and long-term capital needs across a wide range of plausible futures. This ensemble-based approach allows planners to assess how often performance criteria may be exceeded, how vulnerable assets are to extreme precipitation, and where investments most effectively reduce risk under climate uncertainty.

CMIP6 was selected over legacy CMIP5-based regional projections because CMIP6 models have been shown to better reproduce historical climate processes in the western United States and reflect the most current understanding of future emissions trajectories under IPCC AR6. In addition, commonly used CMIP5 products for the Portland region rely on a limited number of model realizations and generalized spatial scales, which are insufficient for evaluating localized, risk-based infrastructure decisions. The CMIP6 ensemble downscaling

framework presented here provides improved scientific defensibility, greater transparency in uncertainty, and a transferable methodology for utilities seeking locally relevant climate inputs for capital planning.

Speaker(s):

Amin Mahdipour, MahdipourA@cleanwaterservices.org, Clean Water Services, Portland, Oregon

Scott Mansell, MansellS@CleanWaterServices.org, Clean Water Services, Portland, Oregon

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From Episodic VE to Continuous Value Management: Lessons from Seattle's Mouth of Duwamish CSO Program

Description:

Traditional value engineering (VE) has often been treated as a point-in-time event in project delivery. This presentation reframes VE within a broader value methodology (VM) system as a continuous process intentionally embedded in a collaborative delivery context. Using Seattle's Mouth of Duwamish CSO program – a multi-billion-dollar initiative composed of three GC/CM projects: the South of Downtown (SODO) Wet Weather Treatment Station (SODO WWTS, ≈$2.1B), the Influent/Effluent Conveyances and Outfall (IECO, ≈$550M), and the Chelan Wet Weather Storage (Chelan WWS, ≈$800M) – we demonstrate how continuous value management can transform preconstruction from a sequence of meetings entrenched in advancing design with the engineer of record and contractor into a living process that drives cost optimization, schedule refinement, functional performance, and risk reduction throughout design development. The program integrates conceptual design VE sessions focused on specific scope elements and known risks with planned 30% and 60% design VE studies and further integrates VE effort findings with constructability workshops and other VM practices: rolling value registers, collaborative risk/opportunity reviews, target value design checks, constructability huddles, and decision log discipline. The result is a "both/and" approach, honoring proven VM fundamentals while expanding them with real-time data, GC/CM trade partner insights, and progressive design alignment. This integration of both traditional VE studies and smaller, more agile VE efforts into other project management and value management processes provides additional opportunities to harness and leverage the VE alternatives and other key findings from VE efforts. We'll share how this cadence has surfaced incremental value improvements (e.g., scope-right-sizing, standardization, interface simplification, and means-and-methods–informed design choices) and strengthened confidence in budget and schedule under wet-weather performance requirements. Aligned with PNCWA's theme - Rising to the Moment: Advancing a Sustainable Water Future – this case study shows how VM has been adapted from workshop-centric to system-centric in a alternative/collaborative delivery environment for preconstruction services, enabling program-level growth in benefits realization and optimizing the focus on total value management in balancing functional performance with cost, schedule, and risk. We close with a practical playbook for organizations seeking to scale VM across multi-contract, high-risk infrastructure portfolios without losing the rigor of classical function analysis and the creativity of FAST-driven ideation.

Speaker(s):

Tyler Brenton, tbrenton@parametrix.com, Parametrix, Minneapolis, MN

Tyler has experience providing project controls and project planning and development services for various infrastructure projects. He has led value engineering, risk management, constructability reviews, and other value-improving efforts for wastewater, transit, and various infrastructure development projects throughout the Puget Sound region and around the United States. His project experience includes significant coordination with municipalities, water and sewer utility districts, design and construction firms, and other public and private stakeholders. Tyler co-develops strategies and creative solutions with clients to maximize value, reduce risk, meet strategic goals, and deliver projects on time and within budget.

Greg Brink, GBrink@parametrix.com, Parametrix, Tucson, AZ

Greg is an industry-recognized program/project delivery and project controls consultant with extensive technical knowledge and hands-on experience delivering projects. He leverages an understanding of engineering, construction, process management, project controls, and organization effectiveness to tactically to apply his foundation in engineering, construction, project delivery, economics, and technology management to achieve meaningful results.

From General Permit to Individual NPDES Permits: Navigating Nutrient Regulation in Puget Sound

Description:

The Washington waters of the Salish Sea, including Puget Sound, continue to experience declining dissolved oxygen levels that threaten aquatic life, treaty-protected fisheries, and regional recovery goals. Washington State Department of Ecology's (Ecology) scientific investigations and modeling identifies excess nitrogen loading — much of it from municipal wastewater treatment plants designed to meet secondary treatment standards — as a key contributor to this impairment. Addressing nutrient pollution has therefore become a central component of Washington's strategy to restore and protect the Salish Sea ecosystem.

In 2022, Ecology issued the Puget Sound Nutrient General Permit to regulate nitrogen discharges from 58 publicly owned treatment works (POTWs). In 2025, the Washington Pollution Control Hearings Board invalidated the permit, creating both a legal setback and a policy pivot for nutrient management in the region. Ecology has since committed to incorporating nutrient reduction requirements into individual NPDES permits, with permit renewals across the Northwest and Southwest regions prioritized in the coming year.

This presentation will outline Ecology's approach to individual permitting, including how interim limits are derived and the technical and policy work still needed to establish final effluent limits aligned with Puget Sound recovery goals. It will also discuss implementation challenges facing utilities, including planning uncertainty while final limits are developed, the significant cost of treatment upgrades, and the reality of constrained funding. Lessons learned from early permit renewals and public involvement requirements during permit reissuance will also be highlighted.

Attendees will gain regulatory clarity and insight into evolving nutrient requirements, helping utilities plan strategically amid a period of transition and regulatory uncertainty.

Speaker(s):

Eleanor Ott, eleanor.ott@ecy.wa.gov, WA State Department of Ecology, Olympia, Washington

Eleanor (Ellie) Ott is a lead environmental engineer for the WA State Department of Ecology in the Southwest Region Office. She has worn many hats at the agency since starting with the Water Quality Program in 2012. In her current role, Ellie writes discharge permits for municipal wastewater treatment plants and works to solve complex permitting issues in her region. Immediately prior to this position, Ellie developed the Puget Sound Nutrient General Permit. She moved to Olympia in 2016 from Spokane where she worked for Ecology's Eastern Region Office as a permit writer and facility engineer. Ellie also serves as the vice chair for PNCWA's Government Affairs Committee.

Shawn McKone, shawn.mckone@ecy.wa.gov, , ,

Shawn McKone is a senior Environmental Engineer and Municipal Wastewater Permits Unit Supervisor in the Washington State Department of Ecology's Northwest Region office in Shoreline. With 22 years of experience as a water quality regulator at the Department of Ecology, Shawn has worked with very large to very small communities to find regulatory solutions to a broad array of water quality issues, including nutrient reduction and combined sewer overflows. He also contributed to the 2022 update of the Criteria for Sewage Works Design (Orange Book) document that added guidance related to nutrient removal technologies. Shawn is a licensed engineer in Washington and holds a Bachelor's and Master's degrees in Environmental Engineering from Oregon State University.

From GIS to GIIS: The Next Evolution of Utility Intelligence

Description:

Context and Challenge

Wastewater utilities across the Pacific Northwest are navigating aging infrastructure, rising capital costs, workforce transitions, and increasing climate variability. At the same time, digital platforms, utility network models, and AI-enabled analytics are advancing at a pace unprecedented in modern utility practice. Industry conversations around digital twins and predictive asset management reflect a clear trajectory toward more connected and behaviorally accurate system representations. Yet the ability to leverage these tools depends less on software availability and more on data maturity and system integration.

Key Observations from Practice

As a practitioner involved in hydraulic modeling and master planning, I have observed that while GIS data frequently informs planning models, the insights generated are rarely reintegrated into broader operational intelligence. Integration, data governance improvements, and cross-platform alignment are often excluded from project scope due to budget and schedule constraints. As a result, utilities produce valuable reports and models, but underlying datasets do not consistently evolve in a way that prepares them for intelligence-driven planning.

Approach

This presentation explores the evolution from Geographic Information Systems (GIS) to Geographic Information & Intelligence Systems (GIIS). The shift is not about new software; it is about readiness. The discussion focuses on practical steps utilities can take today: strengthening data standards, aligning modeling outputs with asset management systems, and intentionally reintegrating planning insights into operational datasets. Emerging AI applications are framed as tools that can enhance automation and iterative planning—provided the underlying data foundation is prepared.

Industry Value

As intelligence-based tools become a strategic inevitability, utilities must become intelligence-ready—not simply tool-ready. GIIS offers a practical framework for strengthening data foundations, improving long-term affordability, and advancing a sustainable water future.

Speaker(s):

Mike Van Doorn, mike.vandoorn@stantec.com, Stantec, Vancouver, Washington

Mike Van Doorn, P.E., PMP brings nearly 30 years of expertise in water transmission hydraulics, CIP development, and GIS-integrated system planning - helping utilities translate complex infrastructure data into defensible, decision-ready investment strategies.

Marty Anderson, Marty.anderson@stantec.com, , ,

Marty Anderson is a Senior GIS Analyst with Stantec with nearly 15 years of experience in geospatial analysis and hydraulic modeling. He specializes in GIS-integrated infrastructure workflows — from DTM development and model post-processing to spatial decision frameworks supporting long-range municipal system planning.

From Limits to Markets: Assessing the Feasibility of a San Francisco Bay Nutrient Water Quality Trading Program

Description:

San Francisco Bay wastewater dischargers face a major, near-term planning challenge under the 2024 Nutrients Watershed Permit, which establishes enforceable numeric nitrogen limits to reduce the risk of harmful algal blooms. The final requirement—an aggregate 40% reduction from 2022 dry-season loading by 2034—could drive substantial capital upgrades, with regionwide compliance costs estimated on the order of $11 billion.

This presentation discusses the context of the San Francisco Bay and summarizes an initial feasibility assessment conducted for Bay Area Clean Water Agencies to evaluate whether water quality trading between the permitted dischargers can serve as a technically credible, legally durable, and economically viable compliance alternative for the permittees. The assessment entailed a review of the necessary foundations for a trading program, including the permit and legal/regulatory context, the current state of the watershed science, support from the potential participants, and the anticipated demand for a trading program.

The findings indicate that trading is likely viable in San Francisco Bay, with leading indicators of success present: strong participant interest, credible scientific resources, and an apparent gap in compliance pathways that

trading could fill. The preliminary analysis identified likely buyers and sellers and a potential market large enough to justify program development. The analysis also highlighted key uncertainties that must be resolved to support near-term utility decision-making and inform program design and implementation.

Ultimately the findings support the development of a Bay-wide point-to-point trading framework, which would be incorporated into the Watershed Permit to enable trading of nitrogen reductions between the regulated utilities.

Speaker(s):

Chris Thomas, cthomas@thefreshwatertrust.org, The Freshwater Trust, Portland, Oregon

Chris Thomas has been with The Freshwater Trust for over 10 years as a Policy Specialist and Attorney. During this time, he has developed and supported many watershed-based Clean Water Act compliance programs, including water quality trading programs. Building on a previous analysis for the San Francisco Bay dischargers, The Freshwater Trust was retained to develop a point source trading program for nutrient discharges to the San Francisco Bay.

Mike Falk, mike.falk@hdrinc.com, HDR, Inc, Sacramento, California

Mike Falk has been with HDR since completing his graduate studies at UC Davis in 2008. He currently serves as HDR's West Region Wastewater Lead. This project is apart of the regional study on nutrient management across the Bay Area which Mike has been supporting since 2010.

From Pilot to FullScale: Navigating the Integration of Advanced Thermal Technologies for PFAS Removal in Biosolids

Description:

Recent pilot-scale demonstrations have proven that combining thermal drying with pyrolysis or gasification is a viable pathway for PFAS removal in biosolids. As the industry moves from testing to implementation, several full-scale facilities are currently under construction globally.

Stantec will provide an industry update and a strategic roadmap for deploying these technologies, specifically addressing:

- Global Project Status: An overview of commissioned units in the U.S. focused on PFAS destruction, alongside international projects in Europe and Australia centered on carbonization through true pyrolysis.
- Operational Lessons Learned: Practical solutions for persistent implementation challenges, including the management of dust, tar, siloxane formation, and safety protocols.
- Technological Integration: Evaluating the synergy between established drying methods and emerging gasification/pyrolysis units, with a focus on energy recovery and sustainability.

- Strategic Phasing: Guidelines for a phased implementation approach, ensuring utilities can adopt thermal drying today while maintaining the footprint and energy compatibility for future advanced thermal upgrades.

This presentation will offer a comprehensive roadmap for scaling advanced thermal solutions to achieve PFAS-free biosolids and long-term operational sustainability.

Speaker(s):

Don Song, don.song@stantec.com, Stantec, Portland, Maine

Don is a senior environmental engineer and former wastewater treatment plant operator with more than thirty years of hands-on experience in wastewater treatment, biosolids processing, and advanced thermal technologies. Don's technical expertise centers on biosolids management and resource recovery, with specialized experience in thermal drying, anaerobic digestion, pyrolysis, and PFAS mitigation technologies.

From Red Tape to Green Lights! How CM/GC Can Expedite Project Delivery and Bolster Owner Engagement

Description:

Aging wastewater treatment plants across the Pacific Northwest are facing increasing regulatory pressure, rising construction costs, and the urgent need for capacity and process upgrades—all while maintaining uninterrupted service. Traditional design–bid–build delivery methods often struggle to keep pace with these demands, resulting in schedule delays, budget overruns, and limited constructability input during design.

This presentation explores the Construction Manager/General Contractor (CMGC) project delivery method as a powerful alternative for complex wastewater treatment plant upgrades. Through real-world project examples and lessons learned, the session will demonstrate how early contractor involvement, progressive pricing, and collaborative risk management can significantly reduce uncertainty, improve constructability, and accelerate project delivery—without sacrificing quality or regulatory compliance. We will also explore the candid discussions that happened between the engineer and the CMGC, reflecting on how each party delivered, where expectations were missed, and how strengthened collaboration ultimately resulted in a successful project.

Attendees will gain insight into:

- How CMGC integrates contractor expertise during design to optimize phasing, safety, and plant operations
- Strategies for managing risk, cost, and scope in active treatment facilities
- Capacity constraints (looming moratorium) and the time to act was now! Enter CMGC!.
- Methods for maintaining regulatory compliance and continuous treatment during construction

- Key contract structures and procurement considerations for public agencies

By the end of this session, utility owners, engineers, and project managers will understand how CMGC can shift projects from reactive problem-solving to proactive collaboration—turning complex infrastructure upgrades into predictable, resilient successes.

Speaker(s):

Jordan Parker, jparker@jub.com, J-U-B Engineers Inc., Idaho Falls, Idaho

Jordan has more than 18 years of experience in civil engineering, working on a wide range of public and private infrastructure projects. Throughout his career, he has successfully delivered complex projects by consistently providing high-quality work and maintaining a strong commitment to client service. His construction experience includes coordinating project schedules, reviewing and processing contractor pay applications, administering field changes, and serving as a liaison between owners and contractors. This hands-on background has strengthened Jordan's ability to design and deliver complex engineering projects under both design-bid-build and CM/GC delivery methods.

Justin Blickle, jblickle@gseconstruction.com, GSE Construction, Twin Falls, Idaho

Justin has over 20 years of experience in heavy engineering, environmental, and industrial construction. He has managed construction on projects, both as an on-site project manager and off-site division manager. Having worked on CM/GC, design-build, and progressive design-build projects, Justin has led teams through project valuation, constructability reviews, value engineering, partnering with owners, schedule development, and budget negotiations. Justin has also led teams to deliver projects in operating facilities "inside the fence" as well as those with public interface, ensuring that local aesthetics are met and providing outreach to the community.

From Regional Discharge to Hillside Reuse: Designing Affordable Wastewater Solutions for Small Communities

Description:

The Silver Valley in northern Idaho consists of several small communities located within a narrow canyon corridor where wastewater has historically been conveyed to regional treatment facilities discharging to the Coeur d'Alene River. Increasing nutrient regulations, regional capacity constraints, and rising wholesale treatment costs prompted the Kingston-Cataldo Sewer District to evaluate alternatives to provide reliable and affordable wastewater treatment while supporting watershed protection goals.

A facility planning effort evaluated conventional treatment expansion, continued regional treatment, and reuse alternatives. The District selected development of a Class C land application reuse facility designed to separate the system from regional discharge and beneficially reuse treated effluent through irrigation of a managed tree crop. Regulatory criteria influenced key design elements including irrigation acreage, storage capacity,

monitoring requirements, and expansion flexibility, including incorporation of storage safety factors and reuse permitting criteria.

The project includes a new lift station and transmission system conveying wastewater more than 530 feet in elevation to a hillside treatment and storage facility consisting of a three-cell lagoon system and multi-zone spray irrigation network. The facility provides approximately 22.5 million gallons of storage and incorporates phased irrigation expansion to accommodate buildout flows using seasonal mass balance modeling to support storage reliability. Key design challenges included hydraulic pump and force main sizing under high-head, low-flow conditions, lagoon storage balancing for seasonal irrigation demand, irrigation distribution across steep terrain using contour-based zoning, and integration of reuse buffer zones and groundwater monitoring requirements.

The project experienced significant cost escalation and scope refinement between planning and construction due to inflation, pandemic-related market conditions, regulatory refinements, and infrastructure relocation requirements. Project estimates increased from approximately $2.9 million during early planning to final bid results exceeding $13 million. The project team restructured scope and financing, securing a funding package primarily consisting of state grants supplemented with low-interest loan financing.

This presentation will highlight engineering design strategies and lessons learned implementing reuse infrastructure under rapidly changing cost and regulatory conditions. Attendees will gain insight into how small communities can evaluate reuse and other treatment strategies to improve resilience, reduce regional infrastructure burden, and maintain affordability.

Speaker(s):

Ashley Williams, PE, awilliams@welchcomer.com, Welch Comer Engineers, Coeur d Alene, ID

Ashley is a Senior Project Manager at Welch Comer Engineers with 15 years of experience in municipal water and wastewater engineering, known for her collaborative approach to utility planning and her ability to guide complex infrastructure projects from concept through construction. Her experience includes wastewater system rehabilitation, facility planning, lift station improvements, and regional sewer infrastructure projects throughout Idaho and Washington.

Nathan Wright, PE, nwright@welchcomer.com, Welch Comer Engineers, Coeur d Alene, ID

Nate is a Project Engineer at Welch Comer Engineers with 13 years of experience in municipal water, wastewater, stormwater, and environmental engineering, known for bringing creative and practical solutions to complex utility projects. His experience includes wastewater treatment improvements, collection systems, facility planning, impact fee studies, and regional infrastructure projects throughout the Inland Northwest.

Jon Groth, kcsewer@outlook.com, , ,

Jon is the District Manager for the Kingston-Cataldo Sewer District with more than 20 years of experience in wastewater and utility operations. Known for his hands-on, customer-focused approach, he oversees wastewater collection system operations, mainten

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

From Risk toward Resilience: Climate Adaptation for King County's WW Infrastructure

Description:

King County Wastewater Treatment Division (WTD) is developing a Long-Term Wastewater Climate Adaptation Plan to address climate preparedness for the regional wastewater system. WTD's treatment plants, combined sewer overflow facilities, pump stations and hundreds of miles of sewer lines are already experiencing climate change impacts. This critical system protects water quality and public health for nearly two million people in the Puget Sound region.

The system faces growing challenges not only from increasing wet-weather flows and rising sea level, but also a growing population, aging infrastructure, changing regulations, wildfire risk, and rate affordability. WTD's approach to climate adaptation for this large wastewater system is expected to include:

1) Climate Vulnerability and Risk Assessment: Detailed analysis of how climate change may impact the regional wastewater system, including river flooding vulnerability and system-wide climate risk assessment.

2) Adaptation Strategies Development: Identification of near-term and long-term investments to enhance climate resilience.

3) Integration Guidance: Development of processes to integrate climate considerations into ongoing long-term planning and project delivery.

4) Funding Readiness: Conceptual project development to maximize readiness for climate resiliency funding opportunities.

5) Long-term Monitoring Plan: Framework for tracking climate impacts and adaptation measure effectiveness over time.

This presentation will provide insights from the data and analysis for the system-wide climate risk assessment being completed in 2026, integrating the latest research results in climate planning and adaptation from University of Washington, the Water Utilities Climate Alliance, and other sources.

We will present the planning roadmap developed through this work that will guide the full Wastewater Climate Adaptation Plan (scheduled for completion in 2029). Key lessons for other utilities addressing climate-related risks and adaptation will be presented, bringing together best practices from water as well as other sectors such as electric utilities.

Like other utilities are facing, there are limited funds available to address significant climate risks. The County's aging infrastructure needs major investments, and this plan will need to coordinate and integrate into other system planning work happening simultaneously. The goal of this presentation is to share resources, strategies and opportunities across our industry to maximize risk resilience when faced with many competing challenges.

Speaker(s):

Jennifer Belknap, jbelknap@carollo.com, Carollo Engineers, Seattle, WA

Jennifer Belknap has over 25 years of experience in utility management and capital program delivery, with a focus on supporting communities in developing infrastructure and operations that increase resiliency, sustainability and shared prosperity.

From Stalemate to Solution: How Community Engagement Resolved a Four Decade Wastewater Challenge in Fall City

Description:

For more than four decades, the Fall City Business District (FCBD) faced an unresolved wastewater challenge that threatened public health, degraded water quality in the Snoqualmie River, and constrained the vitality of its rural downtown. The problem originated in 1929, when transportation improvements forced buildings to be reconstructed over existing drain fields, resulting in widespread septic system failures and chronic nonconformance across the district.

Over the years, multiple engineering studies proposed technically feasible solutions, yet none advanced to implementation. Proposed approaches either imposed prohibitive costs on individual property owners or introduced excess infrastructure capacity that could enable higher density redevelopment—conflicting with the community's desire to preserve Fall City's rural character. This stalemate persisted for decades, leaving the district in crisis. By 2016, King County Public Health estimated that fewer than one-third of properties with permanent structures had approved wastewater systems, creating a significant public health and environmental risk.

Beginning in 2021, Jacobs and King County pursued a fundamentally different path forward—one that placed community engagement at the center of technical decision-making. Through transparent communication, iterative dialogue, and a clear understanding of local priorities, the project team reframed the problem and redefined success. The resulting wastewater solution was intentionally right-sized, resolving failing systems and protecting the Snoqualmie River while deliberately limiting future capacity to align with the community's vision.

The selected approach—a STEP collection system followed by membrane bioreactor treatment producing high-quality effluent and subsurface drip irrigation within a local park—demonstrates how technical innovation can be paired with social acceptance when solutions are designed with, rather than for, the community.

This presentation will share lessons learned from transforming decades of stalemate into a community-supported solution, offering a transferable model for small and rural communities seeking sustainable water infrastructure that balances public health, environmental protection, and local values.

Speaker(s):

Brian Shuck, brian.shuck@jacobs.com, Jacobs Engineering, Bellevue, Wa

Brian Shuck is a civil and environmental engineer with over a decade of experience supporting water and wastewater infrastructure projects across the Pacific Northwest. He serves as a Project Manager at Jacobs, leading teams delivering complex municipal projects from planning through construction while driving technical quality and client success.

Brian has supported projects spanning planning, design, and construction, with technical experience in wastewater conveyance, hydraulic modeling, odor control, and pump station design. He served as Project Manager and Project Engineer for this project from initial planning through final design and closeout. Brian holds a Bachelor of Science in Civil Engineering from the University of Washington.

Jeff Wilson, jwilson@verdantas.com, Verdantas, Seattle, Wa

Jeff Wilson is an environmental and water quality professional with over 18 years of experience supporting water quality, wastewater, and aquatic remediation projects. He serves as a national group leader at Verdantas and has a particular focus on water quality and site remediation in aquatic environments.

Jeff has supported water quality–related projects nationally and internationally, addressing impacts from residential, commercial, and industrial discharges to a range of aquatic systems. He previously served as the Capital Project Manager for King County during the conceptual and design phases of the Fall City Large On Site Septic System (LOSS) project and continues to support King County during implementation and closeout.

Jeff holds a Bachelor of Science in Biology and a Master of Science in Civil and Environmental Engineering from the University of Washington, and has conducted doctoral research at Sorbonne University in France.

From Submittal to Decision: Strengthening Stormwater and Floodplain Development Review

Description:

A well-integrated development review program is critical to regulatory compliance, protection of public infrastructure, and sound municipal decision-making. This 101-level presentation provides a practical overview of reviewing development and redevelopment projects for compliance with MS4, floodplain, and FEMA-related requirements, while supporting broader City priorities for resilience, green infrastructure, and equitable project delivery.

The presentation draws on experience supporting municipal development review programs across urban and rural jurisdictions, including current contracted development review support for Skagit County and the City of Richmond, Virginia, as well as prior experience with the City of Blaine, City of Ferndale, City of Lynden, and Washington State Department of Ecology Stormwater Grant Technical reviews. This work includes serving as a contracted reviewer embedded within local government, supporting municipal utilities balancing development pressures, and coordinating with state and federal regulatory agencies.

Technical topics include stormwater management plan review, floodplain and no-rise evaluations, coordination of CLOMR/LOMR submittals, and integration of green infrastructure within regulatory frameworks. Emphasis is placed on identifying frequent deficiencies in development submittals and applying practical strategies to resolve them efficiently, reducing resubmittals and review timelines.

Beyond technical review, the presentation addresses navigating competing priorities among internal City departments, coordinating with state and federal agencies, and working productively with developers and their

consultants. Real-world examples illustrate approaches that improve consistency, transparency, and predictability in the review process.

Attendees will leave with a clearer understanding of development review fundamentals, practical tools for improving review outcomes, and strategies for strengthening collaboration across agencies—supporting more resilient, sustainable, and predictable project delivery.

Speaker(s):

Dan Gariepy, dan.gariepy@tylin.com, TY Lin, Olympia, WA

Dan Gariepy brings more than 30 years of experience in hydraulic, civil, and stormwater engineering and modeling to TYLin. He specializes in supporting complex stormwater and floodplain development reviews through advanced hydraulic analysis, regulatory coordination, and data-driven decision making. Dan has extensive experience working on transportation, rail, municipal, and land development projects, with a focus on helping agencies and project teams navigate permitting, compliance, and floodplain impacts.

As TYLin's hydraulic modeling expert, Dan has developed and reviewed numerous riverine hydraulic models supporting approvals from the U.S. Army Corps of Engineers and FEMA, including Conditional Letters of Map Revision (CLOMR) and Letters of Map Revision (LOMR). His experience includes evaluating development impacts within floodplains and floodways, reviewing drainage and conveyance systems, and supporting resilient infrastructure planning.

Prior to joining TYLin, Dan served as Chair of the Stormwater Technical Team at the Washington State Department of Ecology, where he worked on Municipal Stormwater NPDES Permits and co-authored the Stormwater Management Manual for Western Washington. He also served as a technical reviewer for hundreds of grants and supported statewide stormwater programs, including TAPE and SAM. His broad background in stormwater, groundwater, environmental, municipal, and drinking water engineering provides a practical and regulatory-focused perspective on development review and infrastructure design.

Kripa Chandran, Kripa.chandran@tylin.com, , ,

Kripa Chandran is a surface water engineer and hydraulic modeler specializing in stormwater and floodplain analysis for infrastructure and development projects. As one of TYLin's primary modelers, Kripa supports project teams and agencies through detailed hydrologic and hydraulic evaluations that inform development review, permitting, and flood risk assessment.

Her expertise includes advanced modeling using PCSWMM and HEC-RAS 1D and 2D to evaluate drainage systems, floodplain impacts, conveyance capacity, and watershed response under existing and future conditions. Kripa has contributed to a variety of transportation, municipal, and land development projects, helping clients move efficiently from technical submittal to informed regulatory and engineering decisions.

Recognized for her technical excellence and leadership potential, Kripa received TYLin's Elevation Award for Emerging Professional. She is known for her strong analytical skills, collaborative approach, and ability to translate complex hydraulic modeling results into practical solutions that support resilient and compliant project delivery.

Fundamental Concepts in Biological Nutrient Removal

Description:

As wastewater treatment facilities face increasingly stringent nutrient permit requirements, understanding the fundamentals of biological nutrient removal (BNR) has become essential for effective process design and optimization. Facilities across the region face variable nutrient permit limits, differing in both the specific parameters regulated and the stringency of their allowable values, which in turn shapes the design considerations and process choices for effective BNR.

This presentation covers foundational knowledge for understanding the BNR process for anyone looking to strengthen their working knowledge of biological processes that support nutrient removal.

The session will introduce core terminology and concepts, including:

- The roles of anaerobic, anoxic, and aerobic zones in secondary treatment systems and how each environment supports specific microbial activities. Attendees will gain an understanding of carbon fractionation and why rbCOD, VFAs, soluble and colloidal COD, and other fractions play a defining role in nutrient transformation and overall process performance.

- Nitrogen removal pathways such as nitrification, denitrification, and anammox will be explained in the context of ammonia, nitrate, nitrite, and nitrogen gas conversions.

- Biological phosphorus removal will also be covered, covering how phosphate accumulating organisms (PAOs) uptake and store phosphorus and how BNR zone configuration influences their performance.

- Common BNR configurations used to treat nitrogen such as the MLE process and configurations used to treat nitrogen and phosphorus such as the A/O, A2O, and UCT processes will be discussed in detail, with explanations of how each process arranges anaerobic, anoxic, and aerobic zones to drive specific nutrient transformations. The presentation will highlight which nutrients are oxidized or reduced within each zone, and how these reactions shape overall process behavior. How microorganisms within these zones compete for available carbon and nutrients, and how this competition influences the effectiveness of nitrification, denitrification, and enhanced biological phosphorus removal processes will be covered. This will illustrate how effluent targets and influent characteristics inform the selection of an appropriate BNR configuration.

By the end of the session, attendees will be equipped with a practical framework for evaluating BNR configurations and key questions to consider when planning or modifying nutrient removal processes.

Speaker(s):

Christine Hengel-Prom, HengelPromC@bv.com, Black & Veatch, Seattle, Washington

Christine is a process engineer for Black & Veatch in Seattle, WA with 6 years of experience. Her experience is centered around wastewater treatment plant design including enhanced primary treatment, pump hydraulics, primary and secondary clarifier design, biological nutrient removal improvements, and sludge thickening.

Getting Back on Track: Overcoming Schedule Challenges with Progressive DesignBuild

Description:

King County Wastewater Treatment Division's M Street Trunk is a reinforced concrete pipeline in Auburn, Washington, that conveys untreated wastewater to WTD's South Treatment Plant in Renton, Washington. Installed in 1963, the M Street Trunk has deteriorated due to the long-term effects of hydrogen sulfide exposure. With over 13,800 feet of reinforced concrete pipe to rehabilitate, the project's alignment cut through city streets, airport property, and residential neighborhoods. Additional complexities included routing diversion piping, securing right-of-way permits, and coordinating with external agencies, such as the municipal airport, all of which added layers of logistical and regulatory challenges.

This presentation shows how the Progressive Design-Build (PDB) delivery method helped a project team align, recover lost time, and move forward with construction. Initially selected for its flexibility and collaborative nature, PDB proved essential when the project hit a series of setbacks: key personnel changes, incomplete design deliverables, unexpected permitting tied to ADA ramp replacements, and a potential scope change near the airport that delayed the second phase of the project.

Utilizing "Design-Build Done Right" best practices enabled innovative solutions. The PDB team and County focus on collaboration, partnering, and building trust had all stakeholders and personnel building a cohesive and synced team with forward momentum. The PDB team also worked with the County through implementation of new workflows for County processes that better suited the PDB model. Recognizing the critical timeline, the team broke the project into two packages, allowing work to move forward on one section during the first seasonal construction window.

The project is on track with Package 1 design completed in July 2025 and construction under way as of September 2025.

This presentation will highlight the lessons learned, including the importance of transparency, role ownership, and real-time decision-making. It will also showcase how the PDB model's adaptability and collaborative spirit were instrumental in navigating real-world constraints and delivering a solution for a vital piece of infrastructure.

Speaker(s):

Brad Florentin, bradflorentin@kennedyjenks.com, Kennedy Jenks, Denver, Colorado

Brad Florentin, P.E., DBIA, is a Principal, Senior Project Manager/Construction Manager, and the Director of Collaborative Delivery at Kennedy Jenks. He leads multidisciplinary teams of engineers and scientists to deliver complex water and infrastructure projects that strengthen and sustain communities through collaborative delivery.

With broad experience across every phase of project development—including chartering, budgeting, technical assessment, design, permitting, construction, monitoring, and client advisory—Brad brings a comprehensive understanding of project lifecycles and risk management. His clear communication style and ability to align owners, contractors, technical teams, regulators, and the public have fostered long-standing client partnerships and consistently successful project outcomes.

GHGs for poop? We've got the scoop! There's new GHG guidance created specifically for the water sector.

Description:

For water utilities to play their part in the path to net zero carbon emissions, they first have to understand the sources of GHG emissions throughout each aspect of operations. Yet, until now, there has not been dedicated GHG accounting guidance that meets the specific operational realities of the water sector. Default methods have cobbled together existing methodologies developed with other sectors in mind – leading to gaps in accounting for potential emissions sources, using emissions factors that are meant for other, distinct processes, and an inability to show progress toward net zero.

Attendees will gain a practical understanding of how the guidance aims to bring clarity, consistency, and comparability to water sector GHG inventories — from source water to solids handling. We'll also explore how improved accounting can support decarbonization goals.

Whether you're just beginning to "digest the data" or refining an existing inventory, this session will help you clear the air about what's in the water — and in your carbon ledger. Expect practical insights, plain language explanations, alliteration, and plenty of puns.

Join us to get ahead of the curve with the new protocol. We'll provide an overview of the protocol now dedicated to Footprint the Flush, Inventory your Influent, and Digest your Data.

Speaker(s):

Tracy Lunsford, trlunsford@parametrix.com, Parametrix, Eugene, OR

Tracy was a collaborator in the development of the Water Sector Climate Emissions Quantification Guidelines recently released by Water Research Foundation (Project 5188). Tracy has 15 years of experience in climate and sustainability planning, policy and programs. Tracy leads the public sector Climate and Sustainability Management practice at Parametrix with greenhouse gas (GHG) inventory and mitigation scaling, climate action planning, fleet fuel switching, transit electrification, and more.

Stephen Greenslade, sgreenslade@parametrix.com, Parametrix, Portland, OR

Stephen is a data-focused planner specializing in equitable climate planning for communities. As a certified Sustainability and Climate Risk (SCR) professional through the Global Association of Risk Professionals, Stephen brings expertise in examining climate-related financial and economic risks, identifying risk transmission channels, and developing strategies to reduce vulnerability for communities and infrastructure. Recent work has included quantifying unfunded infrastructure decommissioning costs under various financial assurance policy scenarios, which influenced energy transition policy at state and federal levels. Stephen is skilled at building custom tools, calculators, and spatial models to support policy, infrastructure planning, and investment prioritization.

Going Together to Go Farther: Regional Collaboration for Better Outcomes

Description:

The proverb "If you want to go fast, go alone; if you want to go far, go together," may not be the first thing that comes to mind when utilities work to improve services, comply with regulations, and manage risk. Yet in an environment of increasingly conflicting priorities, limited funding, and significant uncertainty, collaboration represents an opportunity to achieve outcomes that no single utility could achieve alone.

This presentation will explore how collaboration and governance can align incentives across utilities, municipalities, and major water-dependent sectors who materially shape regional water outcomes. Through systems thinking, communities can design solution portfolios rather than one-off projects, strategically sequence investments, and identify no-regrets actions that perform across variable futures. Shared governance also increases transparency and enables earlier course correction, reducing the likelihood of high-cost stranded assets.

Attendees will come away with an understanding of:

- The types of goals collaborating utilities may seek to achieve, common features of successful collaboration, and how an outcome-based purpose can create durable relationships, distilled from a survey of over 15 regional water quality, water supply, watershed, and resilience programs across the United States.
- How planning on a utility-by-utility basis, while sensible locally, can increase regional risks through redundant investments, uncoordinated project timelines, and cumulative water quality issues that undermine broader ecosystem goals.
- How regional coordination helps distribute risk through joint capital investments, watershed-scale optimization, and adaptive management strategies that spread regulatory and ecological risks across the system, reducing the chance that any one community faces undue costs or negative impacts.
- The conditions under which regional collaboration delivers the greatest value, including regulatory inflection points, major capital decision windows, ecosystem thresholds, and emerging cross-sector pressures.
- Areas where collaboration could benefit our region, explored through a panel discussion with utilities on topics such as nutrients, water reuse, and work force development.

The water infrastructure industry is facing new and complex challenges whose implications span diverse drivers. While a single utility may face these challenges alone, a sustainable water future may require looking beyond organizational and jurisdictional boundaries toward a more collaborative future, a future where going together goes farther.

Speaker(s):

Elizabeth Lowell, elowell@brwncald.com, Brown and Caldwell, Seattle, WA

Elizabeth works with utilities in the Pacific Northwest and across the country to solve complex problems and make decisions when multiple stakeholders and objectives are involved. She is a strategic thinker with an eye toward implementation, specializing in the development of plans that align to an organization's mission, vision, and values while including tactical considerations such as organizational capacity, financial resources, and timing. Elizabeth also has significant expertise in asset management, from developing Strategic Asset Management Plans (SAMPs) to performing technical analyses regarding asset risk, condition, and renewal needs. Her experience spans drinking water, wastewater, and stormwater. She is also an experienced project manager.

Manon Fisher, MFisher1@BrwnCald.com, Brown and Caldwell, Denver, CO

Manon is a strategic advisor specializing in risk management, long-range planning, and organizational change in the water sector. Her work aims to empower leaders to better prepare for a changing future, while developing more vibrant and resilient communities.

Grease, Gas, and the Bottom Line: Twelve Years of FOG Facility Operations at the Durham WRRF

Description:

In 2014, Clean Water Services commissioned a dedicated Fats, Oils, and Grease (FOG) Receiving Station at the Durham Wastewater Treatment Plant to support its broader transformation from a wastewater treatment plant to a resource recovery facility. The goals were ambitious: increase digester gas production, reduce the cost of treating FOG in the liquid stream, provide a valuable community service, and generate revenue through hauled waste acceptance. Like many utilities pursuing co-digestion, the District faced a critical question: could this investment convert waste into a sustainable resource while remaining operationally manageable?

Over twelve years, the facility has received nearly 100 million gallons of FOG. The data now allows for a candid evaluation.

This presentation examines original design assumptions, projected versus actual loading rates, and anticipated financial returns, followed by a discussion of operational realities: material handling challenges, equipment reliability, odor control, contamination management, and staffing impacts. A central theme is the evolving partnership between engineering and operations and maintenance staff. Through iterative modifications—both planned and reactive—the system was refined to improve safety, reliability, and performance. Lessons learned highlight the importance of designing not just for throughput, but for maintainability and operator acceptance.

Most importantly, long-term financial outcomes are evaluated, including capital investment, O&M expenditures, tipping fee revenue, impacts to digester performance, and downstream effects on biosolids management and energy recovery. Assumptions that proved optimistic, conservative, or incomplete are discussed transparently.

Beyond the technical analysis, this session addresses the human side of implementation. FOG receiving does not directly support NPDES compliance and can be unpopular with operators. Attendees will gain insight into

change management strategies, cross-department collaboration, and cultural shifts necessary to successfully integrate resource recovery initiatives into plant operations.

After a dozen years, the question is no longer theoretical: Was it worth it?

Speaker(s):

Kevin Wegener, wegenerk@cleanwaterservices.org, Clean Water Services, Hillsboro, OR

Kevin Wegener is a Senior Process Analyst with Clean Water Services and has 19 years of experience in the wastewater industry. He specializes in anaerobic digestion, biogas utilization, and hauled waste programs, with a focus on process optimization and renewable resource recovery. Kevin holds a Grade 4 Wastewater Treatment certification and an Associate degree in Water and Environmental Technology. In addition to his technical work, he is a longtime participant, coach, and advocate for Operations Challenge and workforce development within the wastewater industry.

Dan Garbely, dgarbely@hazenandsawyer.com, Hazen and Sawyer, Portland, OR

Dan Garbely has 25 years of experience in the Portland wastewater market. He was in the unique position to have worked on the design and construction of the Durham FOG facility as a consultant before joining Clean Water Services to assist staff with operational and maintenance challenges, before ultimate managing the retrofit to the facility in 2021.

Groundwater Changes and its Effects on Underground Electric Infrastructure

Description:

As sea levels rise, inland groundwater tables rise, which leads to saltwater intrusion, higher soil saturation, increased contaminant mobility, and more corrosive subsurface conditions. These changes can threaten underground electrical infrastructure. This research investigates how rising groundwater can affect the reliability and resilience of Seattle's electric utility system, specifically the underground network operated by Seattle City Light. Using projections from new groundwater modeling, observations from monitoring wells, and geospatial analyses, this study evaluates where and when groundwater levels approach buried electrical assets. Field investigations, site inspections, soil and groundwater chemistry analyses, and vulnerability assessments are used to evaluate groundwater-related impacts on the buried assets. Hydrogen sulfide gas accumulation in enclosed underground spaces is also evaluated as a related consequence of prolonged saturation in this coastline city. Preliminary results identify areas of intermittent flooding that can lead to an increase in corrosion, material degradation, and operational risk for Seattle City Light engineers and operators. These findings support climate adaptation planning to improve the resilience of underground electrical infrastructure under rising sea levels and changing hydroclimatic extremes.

Speaker(s):

Lauren Koonce, lakoonce@uw.edu, University of Washington, Seattle, WA

I am a graduate student in Environmental Engineering at the University of Washington and work with the Natural Resources and Hydrologic Licensing Division at Seattle City Light. My research focuses on groundwater change, sea level rise impacts on underground infrastructure, and the chemical analysis and interpretation of groundwater conditions affecting corrosion potential and infrastructure vulnerability. I have 1 year of experience in focused groundwater vulnerability research and 5 years of experience working in environmental and climate-related fields.

High Performing Teams That Deliver: Practical Lessons for Wastewater and Stormwater Projects

Description:

In the wastewater and stormwater industry, project success depends as much on how teams work together as on technical expertise. Industry studies consistently show that poorly performing teams are the leading cause of project and organizational failures, with 86% of employees and executives citing lack of collaboration and communication as the primary reason projects and initiatives fail. As projects grow more complex, including the need to collaborate across organizations, disciplines, and cultures, the ability to build and sustain high-performing teams has become critical to achieving successful outcomes.

This presentation explores practical and tested approaches for developing and sustaining high-performing teams, across owner, consultant, and contractor organizations. Drawing on more than 45 years of combined experience, the presenters share proven strategies used on projects ranging from small operational improvements to multimillion-dollar capital programs.

Topics include how to assess team functionality, strategies to build trust and to support open communication and collaboration, effective tools to keep teams on track, and the importance of leadership in creating a shared ownership of successful outcomes. This session will include real-world examples from wastewater and stormwater projects, demonstrating how these concepts have been applied with teams of varying size, complexity, and organizational structure. Lessons learned will be an integral part of the case studies.

Attendees will leave with practical strategies and tools they can immediately apply as project managers, team leaders, people managers, and stakeholders to improve teamwork and improve project outcomes.

Speaker(s):

Keith Ward, kward1@brwncald.com, Brown and Caldwell, Seattle, WA

Keith Ward, PMP, PE has more than 34 years of infrastructure delivery and organizational leadership experience in the private and public sectors across the United States and internationally. He's worked as an engineer, construction manager, project manager, and program director on a variety of wastewater, stormwater, and combined sewage projects and programs. Keith is passionate about the power of teams and has successfully developed and led a variety of teams from small teams to up to 400 consultants and contractors.

Kerri Franklin, kfranklin@enviroissues.com, EnviroIssues, Seattle, WA

Kerri is a Principal at EnviroIssues with more than 15 years of experience leading

engagement and building effective project teams on a wide array of projects across the Pacific Northwest. With a passion for the intersection of all things water and community, she's become a known resource for helping teams define goals, establish effective processes, and build strong working relationships that can navigate the challenges all project teams face. Her commitment to client relationships and effective communication underscores her reputation as a trusted partner in building lasting partnerships and moving projects forward.

HighRate Clarification for Wet Weather Resilience: Actiflo BenchScale Study

Description:

Systematic assessment of water and wastewater pump stations and treatment facilities is both labor- and data-intensive. This presentation explores strategies to streamline data collection and manage information digitally throughout all phases of a condition assessment project. The approach improves efficiency in field data gathering, asset evaluation, and communication of results—supporting capital improvement planning across a range of facility types.

A key innovation was the implementation of a fully digital workflow—from mobile field data collection to real-time cloud-based transmission and centralized analysis. Standardized assessment criteria were developed to evaluate mechanical, electrical, instrumentation and control, and emergency power assets for condition, performance, reliability, and obsolescence. These metrics enabled calculation of the Asset Health Index (AHI), Likelihood of Failure (LoF), and Remaining Service Life, which guided the prioritization of rehabilitation and replacement projects.

The methodology has been successfully applied to both small lift stations and large, complex treatment facilities, demonstrating its scalability and adaptability. A major success of the project was the creation of a Microsoft Power BI dashboard that visualized assessment data, analytical results, and project recommendations. This interactive platform empowers users to explore system health, asset-level insights, and investment planning across the full planning horizon.

The presentation will showcase the methodology, digital tools, and visualization strategies used in the project—demonstrating how a scalable, data-driven approach to asset management accelerates decision-making, enhances transparency, and strengthens long-term infrastructure reliability.

Speaker(s):

Brent Robinson, brobinson@brwncald.com, HDR, Irvine, California

Brent Robinson is a planning engineer and integrated planner focused on wet weather challenges in the Pacific Northwest. His work has included combined sewer overflow management, infiltration and inflow management, regulatory engagement, and long range infrastructure planning. He also serves as Brown and Caldwell's Washington State offices operations manager.

Karstin Jacobson, Karstin.Jacobson@Seattle.gov, , ,

Karstin Jacobson is a drainage and wastewater engineer for Seattle Public Utilities who hasn't always felt like he fit the traditional mold of an "engineer," but is grateful for his over a decade of experience working in public infrastructure where he serves as the glue bring people together on complex projects. Rooted in those relationships, he is passionate about creating multi benefit, equity driven solutions and fostering environments where teams feel supported, connected, and energized by the work they do together.

How to plan for growth when working with overly optimistic developers

Description:

The City of Pocatello has conducted an update to their Collection System Master Plan (CSMP), completed in mid 2026. In the 2016 timeframe a new interstate interchange was approved for development just north of the City and with it a plan for explosive growth that would almost double the City's served population and expand the service area. A decade later with the new interchange constructed, development has occurred, however at a measured pace. Always optimistic, developers are still planning for growth that would exceed collection system capacity requiring improvements in excess of $50M (collections only).

A central focus of the CSMP is balancing developer optimism with realistic, data-driven planning. Consor working with the City, developed a CSMP identifying specific flow triggers at key points in the system that show phased expansion of the system, but not before it is warranted. This approach also provides the City with flexibility on how the costs are apportioned between the development and existing customers.

The CSMP also included a detailed condition assessment of the City's 24 lift stations. Similar to many utilities, the City has a smorgasbord of lift station types with many in less than ideal locations relative to access and property or easement ownership. Figuring out where to make investments in current facilities versus constructing new, were key decisions. The CSMP in addition to identifying capacity related projects, included details on what improvements were to be implemented at lift stations between capital and O&M budgets.

Recommendations for CCTV efforts were provided with specific capital projects identified for large diameter mains that could not be assessed by the City.

This presentation will highlight how Pocatello used flow triggers, condition assessment, and phased planning to manage uncertainty, address developer-driven growth expectations, and develop a capital improvement plan that aligns with both near-term financial constraints and long-term system needs.

Speaker(s):

Brad Mercure, brad.mercure@consoreng.com, Consor, Salem, Oregon

Brad Mercure is a Professional Engineer with 16 years of experience in wastewater infrastructure projects across Oregon and Southwest Washington. He specializes in wastewater planning and collection system modeling and has led or supported numerous wastewater facility plans and collection system master plans throughout Oregon, Washington and Idaho.

Austin Suing, asuing@pocatello.gov, City of Pocatello, Pocatello, Idaho

Austin is an Engineer for the City of Pocatello managing municipal construction projects for public works.

Hydro Logic: Data Driven Decisions for Current and Future Facilities in Floodplains and Floodways

Description:

This presentation provides utility owners and consultants with a practical framework for evaluating asset vulnerability to flooding and navigating regulatory compliance for facilities located in floodplains and floodways. The presentation is centered on a case study from an Indianapolis surface water treatment plant constructed in the late 1980s that is currently undergoing a large scale expansion. The case highlights the importance of integrating national, state, and local flood mapping resources with ground truthed topographic data when planning infrastructure improvements.

The presentation outlines a structured approach for assessing asset vulnerability by comparing Base Flood Elevations (BFEs) to local topography and applying design standards such as flood protection grade . Attendees will learn strategies for evaluating and permitting and design that supports resilient infrastructure in flood prone areas. In this case study, the absence of updated FEMA mapping and changes over a 35 year period resulted in the identification of a 0.97 foot discrepancy between FEMA and locally derived BFEs. This difference had significant implications for both the placement of new facilities and the need to harden existing infrastructure against flood damage.

The BFE assessment process began with defining FEMA floodplain and floodway boundaries. While FEMA maps provide an initial understanding of flood risk, the presentation emphasizes situations where additional analysis is necessary. Best available data included statewide and localized mapping sources, site specific surveys, and coordination with the state regulatory agency and local Floodplain Administrator to identify applicable map revisions, amendments, or localized hydraulic models.

The presentation concludes with a discussion of permitting considerations from initial planning through construction and post-construction for above grade and below grade infrastructure, emphasizing design strategies for critical assets such as pumps and electrical equipment.

Speaker(s):

Dan Gariepy, dan.gariepy@tylin.com, TY Lin, Olympia, WA

Dan Gariepy brings more than 30 years of experience in hydraulic, civil, and stormwater engineering and modeling to TYLin. Recognized as a hydraulic modeling expert, Dan has led and supported complex riverine and floodplain analyses for transportation, rail, municipal, and land development projects across the country. His work has included the development and peer review of hydraulic models that supported successful approvals from the U.S. Army Corps of Engineers and FEMA, including Conditional Letters of Map Revision (CLOMR) and Letters of Map Revision (LOMR).

Dan's expertise spans floodplain management, stormwater compliance, watershed analysis, and resilient infrastructure planning, helping agencies and facility owners make informed, data-driven decisions for both existing and future assets in flood-prone environments. Prior to joining TYLin, Dan served as Chair of the Stormwater Technical Team at the Washington State Department of Ecology, where he contributed to Municipal Stormwater NPDES Permits and co-authored the Stormwater Management Manual for Western Washington. He also supported statewide stormwater innovation and performance programs, including TAPE and SAM.

In addition to his hydraulic and stormwater expertise, Dan has broad experience in groundwater, environmental, municipal, development, and drinking water engineering, providing clients with practical and technically sound solutions to complex infrastructure challenges.

Kripa Chandran, kripa.chandran@tylin.com, , ,

Kripa Chandran is a surface water engineer and hydraulic modeler with specialized expertise in floodplain analysis, stormwater systems, and hydrologic and hydraulic modeling. As one of TYLin's primary modelers, Kripa supports complex infrastructure and resilience projects through the development and application of advanced modeling tools, including PCSWMM and HEC-RAS 1D and 2D.

Kripa has contributed to a wide range of projects involving flood risk evaluation, drainage analysis, and watershed and transportation infrastructure planning, helping clients better understand current and future floodplain conditions and make informed, data-driven decisions. Her technical capabilities include hydraulic model development, calibration, floodplain mapping, and analysis of stormwater conveyance systems in both urban and riverine environments.

In recognition of her technical excellence, leadership potential, and contributions to the profession, Kripa was honored with TYLin's Elevation Award for Emerging Professional. She brings a strong analytical approach and collaborative mindset to multidisciplinary projects focused on resilient and sustainable infrastructure solutions.

I/I CostEffectiveness 101: DataDriven Decisions for Wet Weather

Description:

When wet-weather flows push system limits, utilities face investment decisions that directly impact ratepayers' dollars, regulatory compliance, and long-term system resilience under climate pressure. With limited capital, determining whether to invest in reducing infiltration and inflow (I/I) or expand hydraulic capacity becomes a high stakes question. The answer is rarely straightforward—and the method used to analyze cost-effectiveness can meaningfully shift the outcome.

This session introduces the fundamentals of cost-effectiveness analysis for rainfall-derived I/I management, using two real-world case studies. In one regional program, performance standards were set for satellite systems, and cost-effectiveness analysis guided investment decisions. The case study demonstrates how a calibrated regional model combined with realistic unit costs can reveal the breakpoints where I/I reduction becomes more cost effective than adding conveyance or treatment capacity. This matters because utilities

often assume capacity expansion is the safer or simpler investment, but that choice can swing based on assumptions around levels of service, future loading, and system degradation.

In another case, modeling and sensitivity analysis for a Pacific Northwest utility revealed that even aggressive rehabilitation would not eliminate the need for hydraulic improvements. Lessons learned from dozens of I/I reduction projects nationwide underscores a key takeaway: assumptions about I/I drivers and cost inputs can significantly shape the perceived value of each strategy. Blended approaches may help utilities avoid overbuilding expensive capacity and instead target I/I reduction where it delivers the greatest return.

In short, the case studies show how different assumptions can lead to very different answers—and why utilities must understand those assumptions before making major investments.

Attendees will:

- Gain a clear understanding of structured, data-driven approaches for evaluating I/I cost-effectiveness—especially the critical role of unit cost assumptions for I/I reduction.

- Recognize how projected increases in I/I due to system degradation can drive long-term I/I management planning.

- Learn how modeling assumptions and analytical methods can influence decisions toward rehabilitation or capacity improvements.

Whether you're new to I/I management or refining your approach, this session will help you see beyond the numbers and understand their underlying drivers—supporting more informed and sustainable long-term investment decisions.

Speaker(s):

Brent Robinson, brobinson@brwncald.com, Brown and Caldwell, Seattle, WA

Brent Robinson is a planning engineer and integrated planner focused on wet weather challenges in the Pacific Northwest. His work has included combined sewer overflow management, infiltration and inflow management, regulatory engagement, and long range infrastructure planning. He also serves as Brown and Caldwell's Washington State offices operations manager.

Implementation of a Major Wastewater Plant Expansion through the use of Progressive Design Build

Description:

Puget Sound is confronting escalating nutrient-related challenges, prompting utilities across the region to consider transformative upgrades to their wastewater treatment systems. Meeting emerging regulatory expectations will require advanced Biological Nutrient Removal (BNR) strategies, and many communities are evaluating Membrane Bioreactor (MBR) technologies as a pathway to achieving consistently low nitrogen limits within constrained sites. As Puget Sound utilities prepare for potentially massive capital programs, the Big Creek project—the largest pure gravity MBR facility in the world—offers valuable lessons in technology

selection, phasing, and alternative delivery. This presentation will highlight key takeaways that can inform Puget Sound agencies as they navigate the scale, complexity, and opportunities of next generation nutrient removal investments.

Georgia's Big Creek Facility exemplifies these opportunities, having recently achieved a major milestone with the successful completion of their plant expansion. Delivered through a Progressive Design-Build approach, this $350 million, 32 million gallon per day advanced treatment facility replaced an aging plant while substantially reducing pollutant loadings to the Chattahoochee River and supporting long term regional growth.

The project team navigated unprecedented challenges, including the COVID-19 pandemic, global supply-chain disruptions, and extreme construction-cost inflation, all while maintaining continuous operation of the existing facility throughout construction and commissioning.

Central to the project's success was a deeply rooted culture of collaboration established during preconstruction and sustained throughout the six-year delivery period. This presentation chronicles that journey, illustrating how a commitment to true partnership and a shared focus on successful outcomes informed every major decision.

The facility employs Membrane Bioreactor (MBR) technology and, due to unique site topography, was implemented as a fully gravity-driven system. The process design incorporates Ammonia-Based Aeration Control (ABAC) and sidestream enhanced biological phosphorus removal, enabling cost-effective compliance with stringent nitrogen and phosphorus discharge limits. Numerous additional innovations—ranging from flexible process configurations to community-sensitive construction approaches—were developed through the active, collaborative engagement of all team members.

Over more than seven years of planning, design, construction, and commissioning, the project required over 1.6 million labor hours to achieve completion. The team is proud of the outcome and looks forward to sharing applicable takeaways for the Puget Sound about this story of resilience, innovation, and achievement.

Speaker(s):

Rick Kelly, rkelly@brwncald.com, Brown and Caldwell, Seattle, Washington

Rick Kelly is a senior process engineer with Brown and Caldwell in Seattle, WA with over 20 years experience in wastewater process design, optimization and troubleshooting.

Kelly Comstock, kcomstock@brwncald.com, Brown and Caldwell, Atlanta, Georgia

Kelly Comstock is a senior project manager with Brown and Caldwell with over 30 years experience in leading large water and wastewater treatment projects. He has extensive experience with collaborative delivery and served as Project Manager on the Big Creek WRF project.

Improving CSO Metals Removal: Bench Scale Results and Treatment Pathways

Description:

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

The Elliott West Wet Weather Treatment Station (EWWTS) has operated since 2005, treating combined sewage from the Denny and Lake Union CSO basins and discharging to Elliott Bay. The existing facility contains pumps, horizontal screens, and chemical disinfection, and operates under King County's National Pollutant Discharge Elimination System permit (NPDES) for West Point Treatment Plant. Historically, EWWTS has had difficulty meeting permit requirements, which prompted an alternatives analysis and the current design of upgrades to the facility. Additionally, the Washington State Department of Ecology issued a renewed NPDES permit in 2024 with additional effluent limits, including new interim and final limits for total copper and total zinc.

The EWWTS upgrades are being designed to comply with the 2024 permit. Planned improvements include upgraded influent pumps, a new screening facility, new ballasted sedimentation with chemical systems, and ultraviolet disinfection to replace chemical disinfection. Outfall upgrades are under consideration and will be implemented if necessary to meet permit requirements.

Bench scale ballasted sedimentation testing has been conducted during wet weather since 2021 and will continue through 2027. Using combined sewage samples collected during storm events, (typically >0.5 inches of rainfall) bench testing helps define performance expectations and dose ranges for coagulant, polymer, and heavy metal precipitant (HMP) chemicals, as well as compatibility with UV disinfection.

Additional bench scale testing was performed at an existing King County ballasted sedimentation facility (Georgetown Wet Weather Treatment Station, or GWWTS), to evaluate multiple HMP dosing locations along the treatment process. These results will support planned full scale testing at GWWTS and inform chemical dosing design for the upgraded EWWTS.

Copper and zinc in CSO flows include both suspended and dissolved fractions, with dissolved metals often representing a significant portion of the total. While ballasted sedimentation provides removal of suspended portions of copper and zinc, adding HMP enables removal of dissolved metals, improving the likelihood of meeting new permit limits.

This presentation will summarize results from multiple seasons of bench scale testing and outline future testing plans. It will also discuss how incorporating HMP into the upgraded treatment process may provide a cost-effective approach to achieving copper and zinc compliance.

Speaker(s):

Natalie Gustafson, natalie.gustafson@jacobs.com, Jacobs Engineering Group Inc., Seattle, Washington

Natalie is a wastewater engineer at Jacobs in Bellevue and focuses on design and planning of combined sewer overflow treatment and storage facilities, wastewater treatment plant upgrades, and biosolids and resource recovery projects. She has over nine years of engineering experience and has worked on projects across the Pacific Northwest and the Midwest. She holds professional engineering licenses in Washington and Indiana.

John Carter, jocarter@kingcounty.gov, King County Department of Natural Resources and Parks- Wastewater Treatment Division, Seattle, Washington

John is a process engineer with over five years of experience, currently working for King County Wastewater Treatment Division on wet weather treatment station design, process optimization, and operations. Prior to working with the County, he worked in consulting on wastewater treatment plant design and construction and on nutrient removal with activated granular sludge during his Masters work at the University of Washington.

Shannon Cavanaugh, scavanaugh@brwncald.com, Brown and Caldwell, Seattle, Washington

Shannon is a process engineer at Brown and Caldwell in Seattle and works on wastewater treatment, biosolids, and wet weather planning and design projects with a focus on biological nutrient removal and greenhouse gas accounting and monitoring. She is acti

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Innovative Temporary Disinfection Strategy Saves Construction Time and Money

Description:

The City of Tacoma North End Treatment Plant is planning a disinfection upgrade to increase disinfection capacity and improve performance reliability. A disinfection upgrade is necessary to maintain regulatory compliance at current and future peak flows, as the existing disinfection contact basin (DCB) does not meet the 20-minute minimum contact time requirement.

Disinfection is currently achieved through on-site hypochlorite generation with contact time achieved in the DCB. Following a recent disinfection evaluation, the City elected to continue using on-site hypochlorite generation. The upgrade will replace the existing generator with a higher-capacity unit, update other system components, add a new dechlorination system, and expand the DCB to include four new passes. Because construction will require taking either portions of the DCB or the entire basin out of service, and because on-site generation will be interrupted during generator replacement and related system upgrades, a temporary disinfection system will be needed.

Brown and Caldwell (BC) evaluated three alternatives for temporary disinfection: delivered hypochlorite, trailer-mounted ultraviolet (UV), and peracetic acid (PAA). PAA was selected due to its expected lower contact time compared to hypochlorite and reduced costs and footprint compared to UV. The team developed an innovative approach to achieve the required contact time using the plant's infrastructure. During current dry weather maximum day flow, the onshore portion of the outfall pipe flows partially full, providing minimal contact time. To assess improvements, an existing hydraulic model was run to evaluate the increase in contact time achieved by installing temporary stop log weirs along the outfall.

BC conducted jar testing to determine optimal PAA dose at various contact times needed to meet the regulatory fecal coliform limits. Testing showed that doses as low as 3 mg/L were feasible with less than 8 minutes of contact time. These findings support taking the entire DCB out of service during dry-weather months if one temporary stop log is installed. During this presentation we will dive further into the analyses behind this temporary disinfection strategy that will shorten construction duration and thus reduce costs.

Speaker(s):

Patricia Tam, ptam@brwncald.com, Brown and Caldwell, Seattle, Washington

Patricia Tam is a Senior Process Engineer at Brown and Caldwell. She has 30 years of experience specializing in wastewater treatment process design and analysis. She has led projects across the U.S., focusing on biological and chemical treatment systems, plant capacity assessments, aeration and disinfection system upgrades, and process modeling.

Inside the First Full-Scale Microbial Hydrolysis Facility

Description:

Utilities are facing converging pressures to reduce biosolids management costs, improve energy efficiency, and decarbonize operations—all while maintaining reliability and regulatory compliance. As many facilities pursue energy neutrality or climate-positive performance, attention is shifting from whether to enhance anaerobic digestion to which technologies are sufficiently mature for full-scale deployment.

The Microbial Hydrolysis Process (MHP) is emerging as one of the few scalable digestion-enhancement technologies capable of delivering near-term, measurable benefits. MHP accelerates the breakdown of recalcitrant carbohydrates, enabling more complete anaerobic digestion. Pilot installations have demonstrated increases in volatile solids reduction from approximately 60% to more than 75%, resulting in reduced biosolids volumes and lower hauling and disposal costs. Acids produced during the process can also increase biogas production or be used as a supplemental carbon for secondary treatment. In addition, certain system configurations can achieve Class A pathogen reduction, offering added flexibility for utilities facing tightening land-application constraints.

Building on successful pilot projects in the United States, VandCenter Syd (VCS) in Denmark is implementing the world's first full-scale MHP system at the Ejby Mølle Water Resource Recovery Facility. To support design decisions and investment planning, Jacobs developed a dynamic process model using SUMO to evaluate digestion performance under MHP operation. While the process requires thermal input, a novel vacuum-based heat-recovery system significantly reduces net energy demand and offers potential applications elsewhere in wastewater treatment. As a net energy-producing utility, VCS already exports electricity and district heat. With additional biogas production and reduced biosolids handling costs, the utility anticipates recovering its capital investment in less than 10 years. Construction is scheduled to begin in early 2026.

This presentation will share insights from the ongoing design and economic evaluation of the Ejby Mølle system, highlighting key decision drivers and considerations for utilities evaluating digestion enhancement technologies to advance energy, sustainability, and biosolids-management goals.

Speaker(s):

Cameron Clark, Cameron.Clark@jacobs.,com, Jacobs Engineering, Seattle, WA

Please request from Cameron directly in July. This is being provided on his behalf while he is out of country in the month of June.

Integrated MicroSorbent Adsorption and Pile Cloth Media Filtration for Advanced Removal of Organic Micropollutants and PFAS in Wastewater Effluents

Description:

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

The removal of organic micropollutants (OMPs) from wastewater treatment plant (WWTP) effluents has progressed from academic research to full-scale implementation as regulatory requirements become more stringent. In parts of Europe, including Germany, effluent standards require up to 80% removal of selected OMPs, driving utilities to adopt advanced tertiary treatment processes that are both effective and economically viable. Concurrently, growing regulatory focus on per- and polyfluoroalkyl substances (PFAS) has intensified the need for treatment solutions capable of addressing multiple contaminant classes within existing plant footprints.

This study presents laboratory, pilot-scale, and full-scale evaluations of an integrated treatment approach combining micro-sorbent adsorption with coagulation/flocculation (C/F) and pile cloth media filtration (PCMF). The micro-sorbent is a fine-particle adsorbent with high adsorption efficiency, enabling up to a 75% reduction in sorbent mass compared to conventional granular activated carbon (GAC). PCMF, a widely applied tertiary filtration technology, is equipped with specialized cloth media designed to retain micro-sorbent particles and associated flocs while accommodating elevated solids loading.

Following conventional biological treatment and secondary clarification, the process includes micro-sorbent and coagulant dosing, a flocculation period of 5–10 minutes, and subsequent PCMF filtration. Laboratory adsorption tests demonstrated that micro-sorbent dosages of approximately 10 mg/L achieved ultraviolet absorbance at 254 nm (UV254) removal of about 40% and dissolved organic carbon (DOC) removal of approximately 25% within 10 minutes of contact time. OMP removal increased with sorbent dosage and showed minimal sensitivity to contact time, indicating rapid adsorption kinetics. By comparison, powdered activated carbon required longer contact times to achieve similar performance.

Pilot testing confirmed that micro-sorbent addition up to 15 mg/L did not increase PCMF backwash frequency or volume, whereas metal salt dosing alone significantly increased backwash demand due to higher solids surface loading. Additional testing targeting PFAS removal achieved greater than 70% removal at low influent concentrations using micro-sorbent dosages between 5 and 30 mg/L, with adsorption equilibrium reached within 5–10 minutes.

These results demonstrate that micro-sorbent adsorption integrated with PCMF provides a compact, flexible, and operationally robust solution for simultaneous removal of OMPs and PFAS, supporting future regulatory compliance within a One Water framework.

Speaker(s):

John Dyson, jdyson@aqua-aerobic.com, Aqua-Aerobic Systems, Inc., Loves Park, IL

John holds a B.S. degree in Chemistry from Longwood College. He has experience working with many treatment technologies in all parts of water and wastewater facilities. In his over the 30+ years, worked on many projects and technologies. John experience with the many technologies gives him a unique ability to evaluate and determine the best solutions for clients. In addition, he has been involved in the introduction of several new technologies through his career including clarification processes, membranes, filtration technologies and adsorption process.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Integrating Partial Denitrification–Anammox and Biological SelectionDriven Densification in a FullScale ContinuousFlow Facility Under Stringent Nitrogen Limits

Description:

A 3.5-year full-scale demonstration integrated methanol-driven partial denitrification–anammox (PdNA) and biological selection-driven sludge densification in a 67 MGD step-feed biological nutrient removal (BNR) facility with tertiary moving bed biofilm reactors. The objective was to develop a simple intensification strategy capable of meeting advanced nitrogen limits while reducing carbon and energy demand using existing infrastructure.

Three operational phases were evaluated: conventional nitrification–denitrification (NdN), conventional PdNA initiated through controlled ammonia bleed-through and moderate dissolved oxygen (2–3 mg L^{-1}), and densified PdNA (dPdNA) achieved by redistributing influent flow to strengthen upstream substrate exposure and feast-to-famine selection pressure. Routine monitoring included nitrogen species, sludge settleability, particle size distribution, extracellular polymeric substances, and normalized methanol and aeration consumption.

PdNA was successfully enriched in situ without anammox seeding and maintained stable performance across seasonal conditions. Effluent ammonia remained below 0.5 mg L^{-1} and total nitrogen below 3 mg L^{-1}. Anoxic ammonia removal confirmed effective coupling between partial denitrification and anammox. Compared with NdN operation, methanol demand decreased by 25% and aeration energy by 12%, demonstrating that reliable PdNA performance can be achieved using straightforward operational control rather than advanced aeration systems.

Simultaneously, sludge compaction improved substantially as the process transitioned to dPdNA. Average sludge volume index decreased from approximately 110–120 mL g^{-1} under conventional operation to about 80 mL g^{-1}, with statistically significant improvement ($p < 0.01$). Particle size distribution shifted toward larger aggregates and protein-rich extracellular matrices, indicating stronger microbial cohesion. These changes resulted entirely from biological selection and did not require hydrocyclones or physical selectors.

The integrated framework provided complementary benefits: PdNA buffered ammonia breakthrough at lower solids retention time, while densification enhanced biomass retention and clarifier stability. Together they created a resilient operating envelope that consistently achieved stringent nitrogen limits with lower resource consumption.

This study demonstrates that continuous-flow facilities can simultaneously implement PdNA and densified activated sludge using simple flow redistribution and moderate oxygen control. The approach offers a practical, scalable pathway for upgrading existing BNR plants to high-efficiency nitrogen removal with reduced carbon use, lower aeration demand, and improved solids management.

Speaker(s):

Yewei Sun, ysun@hazenandsawyer.com, Hazen and Sawyer, Fairfax, VA

Yewei Sun is the Director of Process Intensification at Hazen and Sawyer. He received his Ph.D. degree in Civil Engineering from Virginia Tech in 2020, where he also received his BS in 2014 and MS in 2016. He has over eight years of experience on the mathematical modeling and process design of advanced biotechnologies, e.g. densification, biofilms, and anammox for water/wastewater treatment.

Intense Intensification Modeling: Improved Sensitivity and Capacity Analyses of Densified Sludge

Description:

The densified sludge (DS) process is commonly used to enhance secondary wastewater treatment, with hydrocyclone wasting gaining traction in continuous flow systems. However, effective modeling practices for such systems remain underexplored. This study evaluates two primary modeling approaches: defining state variable retention fractions by cyclones and using a zero-dimensional DS model to differentiate granule and floc biomass. While the DS model simplifies cyclone modeling, it lacks thorough sensitivity analysis and case study documentation.

This research aims to improve hydrocyclone-based DS modeling through (1) sensitivity analysis of key input parameters and (2) a case study on hydrocyclone wasting capacity modeling. Sensitivity analyses were conducted using SUMO's A2O plant + Cyclone simulation, integrating the DS model add-on. The study focused on nitrogen and phosphorus removal indicators, including densified biomass fraction (FGranule), nitrifying biomass fraction, and effluent quality.

Key calibration parameters include biomass diffusion resistance (DR) and mass split to cyclone underflow. DR impacts substrate-organism kinetics, while mass split influences flocculant suspended solids retention. Findings indicate that higher DR reduces FGranule by inhibiting granule biomass growth. Under high DR, nitrification slightly decreases, but total nitrogen in effluent also drops, potentially due to increased anoxic biomass. While phosphorus accumulating organisms (PAO) remain largely unaffected, ammonia oxidizing bacteria (AOB) and nitrite oxidizing bacteria (NOB) significantly decline under high DR conditions.

A case study at Bozeman Water Reclamation Facility (WRF) assessed inDENSE hydrocyclone wasting implementation, revealing key findings:

1. Modeled granulation trends aligned with expected results.

2. Hydrocyclones reduced solids retention time (SRT) by 40%, and granule retention was 1.6 times floccular retention.

3. Minimum SRT required for permit compliance decreased by 45%, highlighting improved sludge efficiency.

4. Hydrocyclones increased maximum month flow capacity by 13%.

5. Effluent winter ammonia and summer phosphorus loads decreased by 45% and 66%, respectively.

6. InDENSE capacity costs ($1.4M/MGD) were comparable to a bioreactor upgrade ($1.5M/MGD) but significantly lower than a new bioreactor ($5.2M/MGD).

The findings suggest DS modeling is a viable tool for planning-level wastewater treatment optimization. These modeling efforts show promising results and improve nutrient treatment and capacity planning.

Speaker(s):

Luke Pinto, lpinto@hdrinc.com, HDR, Seattle, Washington

Luke Pinto is a PE with eight years of experience in wastewater treatment, nutrient optimization, and project delivery across the Northwest. He serves on the Engineers Without Borders Board of Directors, reflecting a ten-year commitment to humanitarian engineering. Outside work, Luke can be found adventuring around the PNW with his wife and their two dogs.

Introduction to Hydraulic Modeling Applications of Hydraulic Modeling in Water, Stormwater, and Wastewater Infrastructure Design

Description:

Hydraulic modeling can inform the design of water and wastewater infrastructure, including collection systems, pipelines, pump stations, treatment plants, diversion facilities, storage facilities, and outfalls. Hydraulic models range from 1-D models of closed-conduit or open-channel flow to 2-D and 3-D hydrodynamic and computational fluid dynamics (CFD) models. There are steady-state, unsteady-state, and transient models. These are all computational models. Depending on the complexity of design, even the 3-D CFD models may not be adequate and may require physical hydraulic models. Sometimes, a hybrid approach using both computational and physical models is efficient in identifying and resolving hydraulic issues.

This presentation discusses the range of hydraulic modeling tools available for water, wastewater, and stormwater infrastructure projects, and provides guidance on selecting the most appropriate modeling approach for specific design scenarios. It also discusses when, during the planning and design process, modeling should be conducted to maximize technical and economic benefits. Based on over 49 years of combined experience of the authors and performance of over 200 such studies, and applications of computer and physical models, the authors present a framework for selecting the appropriate modeling tool at the appropriate stage of a project. The objective is to provide design engineers with reliable, decision-support information that promotes cost-effective design and construction while ensuring structural integrity and operational performance. Model selection depends on both the design stage and the complexity of the hydraulic structure. Modeling conducted during the planning phase differs significantly in scope, level of detail, and objectives from modeling performed at the final design stage. Early-stage models often focus on feasibility, alternative evaluation, and system behavior under a range of assumptions, whereas final design models emphasize detailed hydraulic performance, optimization, and risk mitigation. The goal is to strategically align modeling tools with project needs to improve design robustness, reduce uncertainty, and control project costs and schedules.

This session will present examples of current applications of hydraulic modeling for the design and retrofit of wastewater treatment facilities; combined sewer overflow (CSO) planning and design; upgrades to pumping facilities and drop structures; diversion structures; and outfalls. Examples will include projects completed for King County, Seattle Public Utilities, and other large municipal utilities across the United States. This session is intended for managers and engineers within public works and municipal agencies, including cities and counties,

as well as professionals in engineering and consulting firms engaged in the planning and design of wastewater and stormwater infrastructure systems.

Speaker(s):

Mizan Rashid, mrashid@rieconsultants.com, RIE Consultants, Redmond, WA

Mizan is a water resources engineer and president of RIE Consultants. He has 30 years of experience in hydraulic and hydrologic engineering and modeling in support of design of water, wastewater, and stormwater facilities such as collection systems, conveyance facilities, pipeline, pump stations, treatment plants, storage tanks, and outfalls. He has been performing CFD modeling and surge/transient analyses among other hydraulic modeling ranging from 1-D to 3-D models. He is the president of RIE consultants.

Ashraful Islam, maislam@rieconsultants.com, RIE Consultants, Redmond, WA

Ashraf is a principal hydraulic engineer and vice president of RIE Consultants. He has 20 years of experience in hydraulic and hydrologic engineering and modeling in support of design of water, wastewater, and stormwater facilities such as collection systems, conveyance facilities, pipeline, pump stations, treatment plants, storage tanks, and outfalls. He has been RIE's lead modeling engineer and has been a leader in CFD modeling and transient/surge analyses.

Is Your Concrete Quiet Quitting? Restoring Service Life for Critical Wastewater Facilities

Description:

Across the United States, wastewater utilities are entering a pivotal era: the concrete structures built during the wave of Clean Water Act investments in the late 1970s and early 1980s are now reaching 45+ years of service life in corrosive environments. Many of these assets are difficult to inspect—requiring confined space entry, diving, bypass pumping, or significant operational coordination—so their true condition is often unknown. As a result, many agencies may be carrying significant structural, operational, and financial risk without fully realizing it.

Proactive asset managers are increasingly recognizing that deferred action can escalate long-term rehabilitation costs and jeopardize system reliability. Comprehensive condition assessments provide the data needed to quantify deterioration, prioritize investments, and plan for major rehabilitation before failures occur or service disruptions become unavoidable.

This presentation highlights lessons learned from recent concrete condition assessment and rehabilitation at the Columbia Boulevard WWTP (Portland), Clackamas Water Environment Services' Tri-City and Kellogg Creek Water Resource Recovery Facilities (WRRFs), and Metropolitan Wastewater Management Commission's Water Pollution Control Facility(WPCF). These case studies demonstrate how specialized inspection techniques and laboratory analyses can identify mechanisms such as paste acidification, chemical attack, and physical distress—providing a clear foundation for both near-term action and long-term planning.

The session will also outline practical rehabilitation approaches, including demolition strategies, surface preparation, concrete repair materials selection, temporary facilities planning, quality assurance, and measurement and payment considerations. Together, these elements form a repeatable roadmap for managing aging concrete assets in a resource-constrained environment.

Attendees will gain insight into the scale of the industry's reinvestment needs, the risks of relying on incomplete condition data, and the tools available to plan and execute concrete rehabilitation programs that extend asset life and manage capital expenditures responsibly.

Speaker(s):

Riley Walsh, riley.walsh@jacobs.com, Jacobs, Corvallis, OR, Oregon

Riley Walsh, PE is a civil engineer and project manager with over 11 years of experience focused on wastewater infrastructure, condition assessment, and rehabilitation of aging assets. He has led and supported projects involving concrete deterioration evaluation, structural rehabilitation planning, and construction delivery for major treatment facilities and pipelines. Riley's work emphasizes helping utilities understand asset condition, manage risk, and implement practical strategies to extend the service life of critical wastewater infrastructure.

Leadership Development Through Operations Challenge

Description:

Technical skills are only one component of successful utility operations. Effective communication, teamwork, adaptability, leadership and creating connections often determine how well crews perform during routine work and emergency response. While Operations Challenge has long demonstrated the value of these skills, its developmental benefits are typically experienced only by competition teams.

This presentation explores how former competitors have adapted the core principles of Operations Challenge into an experiential leadership workshop designed for employees across an organization. Rather than focusing on competition, the workshop places participants in a realistic emergency response scenario inspired by a Cascadia Subduction Zone earthquake. Teams must rescue an injured coworker, assess atmospheric hazards, restore a damaged sewer line, perform lockout/tagout, unclog and return a pump to service, and coordinate multiple simultaneous tasks while operating under time pressure.

Attendees will learn how the workshop was intentionally designed to reveal leadership behaviors such as communication, delegation, decision-making, trust, adaptability, and shared accountability. The session will also discuss the role of iterative practice, structured debriefs, mentor facilitation, and video review in accelerating learning beyond what traditional classroom leadership training can provide.

Speaker(s):

Kevin Wegener, wegenerk@cleanwaterservices.org, Clean Water Services, Hillsboro, OR

Kevin Wegener is a Senior Process Analyst with Clean Water Services and has 19 years of experience in the wastewater industry. He specializes in anaerobic digestion, biogas utilization, and hauled waste programs, with a focus on process optimization and renewable resource recovery. Kevin holds a Grade 4 Wastewater Treatment certification and an Associate degree in Water and Environmental Technology. In addition to his technical work, he is a longtime participant, coach, and advocate for Operations Challenge and workforce development within the wastewater industry.

Chris Carsner, carsnerc@cleanwaterservices.org, Clean Water Services, Hillsboro, OR

Leading a Multigenerational Workforce Through AI Adoption

Description:

Artificial Intelligence (AI) is increasingly embedded in water and wastewater industry engineering and operations through predictive asset management, energy optimization, management of SCADA system, condition-based maintenance modeling, automated compliance reporting and safety measures in place for the equipment and people. We have about four generations in the work force- the baby boomers with institutional knowledge and Gen Z with strong digital fluency and data expectations. It is very important to have strong organizational leadership through this AI transformation to get the full benefit. The leadership challenge is not choosing between experience and innovation- it is integrating both.

This session explores practical strategies for leading multi-generational technical and operations teams during AI adoption. When it comes to AI- there are common excitement, fear, and myth among all age groups, and there are age specific perceptions and variable speed of adoption. To make the matter more challenging, the work force may not be co located and some members may work remotely. A leader needs to work across generational, technological, geography, time zones, and cultural differences within the work force and keep them inspired and motivated for organizational excellence and resiliency through the changes. Overall strategy may include some or all of the following considerations:

1. Assess generational strengths within their workforce and align those strengths with AI-enabled operational initiatives.

2. Design cross-generational mentoring models, including reverse mentoring, to accelerate digital fluency while reinforcing operational judgment.

3. Integrate AI tools into standard operating procedures (SOPs) in ways that maintain regulatory compliance, safety, and process reliability.

4. Implement retention strategies that increase engagement among both experienced staff and early-career professionals during technological change.

All these elements need to be considered within the framework of mutual trust, empathy, transparency, clear communication, and a sense of strong ethics. This session will expand on the ideas and will elaborate on the key elements of this abstract.

Speaker(s):

Mizan Rashid, Ph.D., PE, PMP, CFM, mrashid@rieconsultants.com, RIE Consultants, Redmond, WA

Mizan is a water resources engineer and president of RIE Consultants. He has 30 years of experience in water and environmental engineering and line management. He has managed hydraulic and hydrological engineering practice for large consulting and engineering firms as department manager, and regional-, national-, and global practice lead. Mizan is enthusiastic about leadership and believes it is important for success of any organization. He has been serving as a sustainability commissioner at the City of Sammamish, WA since 2025.

Mark Poling, mark@wastewater.org, Clean Water Management, Chicago, IL

Mark is an independent consultant and sole proprietor of Clean Water Management, a consulting firm focusing on utility management. He is a past member of the Water Environment Federation (WEF) House of Delegates, a former Trustee of the WEF Board, and a WEF Fellow. He is also a past president of the PNCWA. He has nearly 40 years of experience at Clean Water Utilities including utility management, water resource recovery facility operation, maintenance, design, and construction.

Learning how to juggle: Multidisciplinary project management 101

Description:

Management of multidisciplinary wastewater design projects presents unique challenges integrating diverse expertise and the need for seamless coordination among various technical disciplines. Projects require collaboration among process, pipeline, civil, structural and controls engineers as well as environmental scientists and regulatory experts, all working toward the common goal of creating sustainable wastewater solutions. Effective project management in this context requires a strategic approach to communication, risk management, resource allocation, and scheduling, ensuring that all team members remain aligned throughout the project lifecycle.

Communication: Establishing and maintaining effective project communication both amongst the project team and with project stakeholders is critical to project success. Project managers have myriad tools to utilize for communication, and each project phase requires consideration of the best methods.

Risk Management: Early identification of project risks and associated mitigation strategies can help keep project delivery on track. Regular review of the project risk register allows for reconsideration of the right path forward using the best available information.

Resource Allocation: Effective resource management ensures that the right expertise is available at the right time. Moreover, integrating digital design technologies and conventional design strategies, is becoming increasingly important in wastewater design projects.

Schedule Management: Managing the complexity of the project schedule, including the interdependencies of each discipline working toward design milestones, requires clear communication of the needs of each discipline and honest discussions about delivery. The establishment of clear communication channels and a strong

project governance framework to ensure that all team members are updated on progress, issues, and decisions.

Additionally, project managers must balance competing priorities, such as technical feasibility, budget constraints, regulatory compliance, and environmental sustainability throughout project delivery.

Successful project management of multidisciplinary wastewater design projects requires strong leadership, effective communication, and an understanding of both technical and environmental considerations. With these elements in place, project teams can achieve their objectives of delivering sustainable, efficient, and cost-effective wastewater treatment solutions. This presentation will discuss best practices and available tools to support communication, risk and resource management and scheduling, as well as other project delivery considerations.

Speaker(s):

Laura Nolan, Laura.Nolan@hdrinc.com, HDR, Inc., Spokane, WA

Laura is a senior project manager with HDR, based in Spokane. She has 20 years experience managing multidisciplinary water and wastewater projects, through planning, design and construction.

Lessons from Supporting 10+ Miles of Large Diameter Pipeline Construction

Description:

Delivering more than 10 miles of large-diameter steel transmission pipelines for the Willamette Water Supply Program (WWSP) gave our team a unique opportunity to support one of the Pacific Northwest's largest pipeline infrastructure programs through both design and construction. As consulting engineers responsible for preparing seven design packages and providing engineering services during construction (ESDC), we gained valuable insights into the challenges, uncertainties, and coordination efforts required to implement complex linear infrastructure across multiple jurisdictions.

One major lesson learned centered on unexpected or inaccurately mapped utilities, which affected constructability and field decision-making. Early in the project, these issues highlighted the limitations of historic as-builts used to understand existing conditions. This reinforced the importance of comprehensive utility potholing during design to verify conditions and reduce risk before construction. We will share approaches for incorporating newly discovered utilities into contract documents and maintaining clear communication through RFI logs, email documentation, and collaborative resolution processes.

Working across overlapping county, city, and railroad jurisdictions required extensive coordination and relationship-building. These partnerships proved essential for successful permitting, right-of-way access, and hazard-mitigation planning. Aligning WWSP pipeline construction with Washington County and City of Beaverton roadway projects highlighted the importance of early, consistent coordination between the Program and each jurisdiction throughout design and construction.

The presentation will also cover strategies for balancing scope, budget, and contingency, including managing "side quests" such as construction deviations from design, additional utility investigations, and emergent safety concerns. Examples of responses to unexpected conditions, conservative design around existing utilities, and utility relocations for unavoidable conflicts will be included. These case studies illustrate how proactive contingency planning and adaptable ESDC support helped the project stay on track while returning unused budget to the client.

By sharing these lessons learned, attendees will gain practical insights into navigating the technical, administrative, and relational complexities inherent in major pipeline construction. These experiences offer a framework for improving constructability, reducing risk, and strengthening partnerships on future linear infrastructure projects.

Speaker(s):

Jennifer Kersh, jkersh@brwncald.com, Brown and Caldwell, Portland, OR

Jennifer is an Associate Environmental Engineer with Brown and Caldwell in Portland, Oregon, specializing in water/wastewater convenance, treatment process design, and infrastructure delivery. Her technical experience includes master planning, alternatives evaluations, hydraulic and mass balance analyses, process mechanical design, and construction support for conveyance pipelines and municipal treatment facilities in the Pacific Northwest. Jennifer holds a bachelor's degree in chemical engineering from Washington State University, a master's degree in environmental engineering from the University of Washington, and is a licensed Professional Engineer in the State of Oregon.

David Kelly, DKelly@BrwnCald.com, Brown and Caldwell, Portland, OR

David Kelly is a civil engineering professional based in Portland, Oregon, and an Oregon native from the Rogue Valley, with over 15 years of experience in residential construction. He holds a bachelor's degree in Environmental Engineering. His recent work includes design and engineering services during construction for large-diameter drinking water pipelines, construction management for filtration facilities, and permitting and easement acquisition. He also has experience in GIS-based mapping and data collection. Known for his detail-oriented approach, David focuses on collaboration, efficiency, safety, and delivering practical, resilient solutions for community-focused infrastructure projects.

Lessons Learned in Condition Assessment of the Inverness Force Main System

Description:

The City of Portland's Inverness Force Main system conveys raw wastewater from the Inverness Pump Station in northeast Portland nearly 11 miles to the Columbia Boulevard Wastewater Treatment Plant. The pump station and force main provide service for 11,000 acres, representing roughly 12% of the City's service area. The Inverness system consists of a single 36-inch pipeline located that conveys flow west from the pump station to Delta Park. At Delta Park, the single 36-inch force main splits into parallel 20-inch and 30-inch force mains that convey flow to the wastewater treatment plant site. The force main segments are constructed of bar wrapped

steel cylinder pipe (AWWA C303). Flow from the two force mains rejoin in a single 36-inch pipe upstream of the plant headworks.

The force main was constructed in the late 1990s to replace an existing 24-inch force main, however the City does not have records of pipeline pigging or inspection being conducted. Since 2014, multiple failures have occurred in the force main, requiring emergency repairs. The City of Portland Bureau of Environmental Services (BES) partnered with the JW Fowler/Stantec Design Build team to provide initial scope confirmation, condition assessment, and design and construction of recommended improvements to the Inverness Force Main system.

The initial phase of the project included confirming the scope of the inspection activities and identifying a preferred approach for conducting cleaning and inspection of the Inverness Force Main system. The project team selected a three-phase inspection program including: 1) leak, debris, and gas pocket detection using INGU Pipers® free-swimming inspection spheres; 2) internal pipeline inspection using the SmartFoam Pig from i2i Pipelines; and 3) excavation at key locations to examine the exterior pipe conditions and collect ultrasonic thickness measurements of the steel cylinder.

This presentation will provide an overview of the Inverness system and history, describe the inspection alternatives evaluation and selection process, review results and lessons learned from the pipeline inspection, and discuss how inspection results are being used to determine recommended pipeline repairs.

Speaker(s):

Heather Stephens, Heather.Stephens@stantec.com, Stantec, Portland, Oregon

Heather Stephens is a senior principal and project manager with 30 years of experience in the wastewater industry.

Brenda Sherwood, Brenda.Sherwood@portlandoregon.gov, City of Portland Bureau of Environmental Services, Portland, Oregon

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Leveraging genomic techniques to inform harmful algal bloom (HAB) management strategies

Description:

Harmful algal blooms (HABs) result from the proliferation (known as a “bloom”) of microscopic, plant-like organisms that have a negative impact on human or environmental health. These range from nuisance blooms to toxic algal blooms, whose causative organisms produce toxins that harm humans or animals. The Fernhill Natural Treatment System (NTS) is a constructed wetland that discharges to the Tualatin River in Washington County, Oregon. Some portions of the NTS have proven vulnerable to HAB events, presenting yearly operational challenges for permit compliance, as an active bloom restricts NTS discharge. A combination of techniques are used to control HABs in the NTS, and understanding which HAB is present facilitates efficient management practices. The goal of this project is twofold: 1) To identify HAB organisms in the NTS using genetic techniques, and 2) to determine if there are indigenous cyanophages (viruses that infect cyanobacterial HABs) that infect them. Indigenous cyanophages specific to the dominant HAB species present

an opportunity for a novel, highly targeted, and environmentally neutral method of biological (enzymatic) HAB control. This approach would use purified phage enzymes to target HAB species, and could potentially be applied in situ as a future bloom treatment. This presentation will discuss our efforts to identify host HAB organisms and their respective cyanophages. Briefly, we used advanced genetic techniques to identify HAB cyanobacterial species that appear in the NTS, as well as their associated viruses. Using paired ligation metagenomic sequencing, we identified five HAB species from 3 separate bloom seasons between 2022-2024, and illuminated previously unknown host/virus relationships. The indigenous cyanophages found in this study will inform future phage lysin pilot studies of biological HAB mitigation at the NTS. Of the HAB organisms identified, two (Microcystis and Pseudanabaena) are resistant to nutrient control, as Microcystis scavenges phosphorus from sediments, and Pseudanabaena can fix nitrogen from air. These results indicate traditional nutrient control strategies will be less effective for bloom management, requiring alternative strategies like aeration, sonication, and water retention. This study will inform future HAB management strategies at the NTS and help identify pivot points in bloom control.

Speaker(s):

Rachel Golda, goldar@cleanwaterservices.org, Clean Water Services, Hillsboro, OR

Rachel Golda is a researcher at Clean Water Services in Oregon, where she leads the Emerging Contaminants group. Her work focuses on real-world water challenges like PFAS, microplastics, and algal toxins, with the goal of improving water quality in the context of wastewater engineering.

She has over 15 years of experience in applied research and holds M.S. and Ph.D. degrees in Environmental Science and Engineering from Oregon Health & Science University. She's also active in the water sector through organizations like Water Environment Federation and the Oregon Association of Clean Water Agencies.

Leveraging MABR Intensification Technology to Remove Nitrogen within Existing Tankage

Description:

Central San has been evaluating nitrogen removal technologies to meet adopted Bay Area discharge limits. The technology selection should ideally a) fit within the existing tankage (nearby soil is contaminated), ii) maintain operating at a relatively low solids residence time (SRT; <1.4 d) (due to capacity and foaming concerns), and iii) robust enough to handle cyanide from incinerator (used for biosolids handling) air pollution control equipment scrubber water that is returned to their activated sludge. The cyanide is reliably removed within their existing activated sludge, but it has been shown through bench-scale tests to stifle the growth of microbes essential for nitrogen removal.

Of the technologies considered, the membrane aerated biofilm reactor (MABR) technology stood out for piloting as it has the potential to address all of Central San's constraints. While attractive, there are still capacity concerns as most MABR installations to date have relied on a combination of the suspended growth biology

and the MABR's biofilm for nitrogen removal. Given that, the pilot has focused on nitrogen removal via the MABR biofilm (minus nitrification from the suspended growth biology).

The MABR pilot (2-4 gpm) was operated for 6-months in 2024 and it focused on three core objectives:

1) Phase I (completed): Efficacy at removing nitrogen (minus scrubber water toxins) while maintaining a relatively low suspended growth SRT (<1.4 d).

2) Phase II (completed): Confirm that the MABR biofilm can remove nitrogen in the presence of scrubber water.

3) Phase III (summer/fall 2024): Determine the impact of carbon loading on the biofilm's capacity to remove nitrogen.

Overall, the pilot was deemed successful as it had reliable nitrification and modest denitrification (upwards of 40 percent). The scrubber water impacts were short-lived as the biofilm quickly recovered from any scrubber water slugs. The data suggests minimal impacts on operations while maintaining capacity.

The next step is a full-scale demonstration where 1 of 4 treatment trains will be retrofitted with MABR cassettes (summer 2026). The demonstration results will inform final selection at Central San.

The presentation will introduce the technology, the project goals/objectives, the experimental design, the performance results, and next steps.

Speaker(s):

Mike Falk, mike.falk@hdrinc.com, HDR, Sacramento, California

Mike is HDR's West Region Wastewater Lead where he has been employed since finishing his graduate studies in 2008. This presentation is based on an intensification pilot performed in 2024 that has resulted in a full-scale demonstration.

Lift Station Design 101

Description:

This presentation covers lift station design and optimization, with a direct focus on day-to-day operations, maintenance, and long-term system management. Participants will review key lift station configurations—including self-cleaning wet wells, trench systems, cylindrical pit stations, and traditional wet-well/dry-well designs—and understand how each affects reliability, maintenance effort, safety, and lifecycle cost. The session also explores sewage pump technologies, common control strategies, and accessory equipment that influence efficiency, redundancy, and operator experience.

From an engineering, operations, and maintenance perspective, this training explains the core principles that drive effective lift station performance. Attendees will learn how design decisions impact real-world operations, apply troubleshooting techniques to identify and resolve common lift station problems, and recognize early warning signs of failures in clogging, ragging, controls, ventilation, and equipment wear. Strategies to optimize

system performance, reduce downtime, and extend equipment life will be demonstrated using practical examples familiar to wastewater operators and managers.

Properly designed and operated lift stations are critical to protecting water quality, maintaining reliable wastewater conveyance, and safeguarding public health. By understanding how design features, controls, and maintenance practices work together, operators can improve system reliability, reduce emergency responses, minimize sanitary sewer overflows, and lower overall operational and maintenance costs. The knowledge gained from this training enables operators to make informed decisions that support regulatory compliance, system resilience, and long-term protection of public health.

Speaker(s):

Curtis Butterfield, PE, cbutterfield@kellerassociates.com, Keller Associates, Inc., Richland, Washington

Curtis Butterfield has 9 years of engineering experience and 15 years for contracting experience. He is the Office Manager / Project Manager for the Richland office. His experience spans booster stations, lift stations, water and wastewater treatment, warehouses, workshops, office and laboratory space, and more. Curtis has completed a range of tasks to support these projects, including interdisciplinary project coordination, technical calculations, site work, facility and equipment layouts, design, technical reports, assembling construction documents, bid services and evaluations, project cost estimating, and serving as Owner's Representative during construction. With his unique skillset, Curtis can provide a broad perspective and design approach that results in functional and cost-effective solutions.

Julia Reese, jreese@kellerassociates.com, Keller Associates, Inc., Coeur d'Alene, Idaho

Julia, has over 5 years and serves as a Design Lead on a variety of wastewater lift station projects. She has played a key role in delivering wastewater pumping facilities throughout Idaho, contributing to both small, local lift stations and large, complex regional systems, ranging in size from 0.1 MGD to 37 MGD. She offers technical experience in equipment sizing and selection, mechanical layout, site planning, and other pertinent design factors on both greenfield and rehabilitation projects. Julia is responsible for assisting with hydraulics, concept evaluations, cost estimating, pump evaluation, mechanical design, and other lift station design services.

Making Digester Gas Work: Renewable Natural Gas Case Study

Description:

Bioenergy recovery systems transform the energy content of digester gas (DG) into a readily useable form such as electricity, heat, or conditioned fuel for equipment. In the last decade, conversion of DG to renewable natural gas (RNG) for pipeline injection has emerged as another commercially viable alternative. Wastewater agencies in the United States have been moving towards RNG because of its financial value and public-private-partnership delivery opportunities. However, RNG projects come with a host of challenges and potential pitfalls around regulatory markets, pipeline interconnection standards, technology selection, and market uncertainty that agencies should be aware of.

Clean Water Services (CWS) is a water resources agency located in Hillsboro, Oregon who exemplifies this trend towards RNG. CWS historically relied on engine-generators for bioenergy recovery at their Rock Creek WRRF ("Rock Creek"); so, when that system reached the end of its useful life, CWS initially assumed a straightforward replacement project. However, after evaluating a variety of bioenergy alternatives and project delivery scenarios, CWS decided to design an RNG facility, instead, with the intent to self-own and operate the facility. This facility will be the third WRRF RNG system in Oregon upon completion.

The goal of this presentation is to share CWS's RNG planning, design, and procurement process to uncover the challenges, lessons learned, and solutions. Topics covered in this presentation shall include the following:

- Bioenergy alternatives evaluation - how to assess bioenergy and project delivery alternatives to ensure a project meets your organization's environmental, financial goals and risk tolerance; why CWS chose RNG.
- RNG technology selection – overview of technologies; key selection factors including cost, efficiency, exhaust emissions control, and ability to meet local pipeline specifications; technology(s) that CWS shortlisted.
- Procurement approach – CWS's decision to pre-select RNG equipment during preliminary design.
- Other considerations:
  - >Understanding the different markets and market risks for RNG;
  - >Public-private partnerships for RNG project delivery.
- Project status.

Speaker(s):

Adam Behr, abehr@hazenandsawyer.com, Hazen and Sawyer, Raleigh, North Carolina

Adam Behr is a Principal Engineer at Hazen and Sawyer with five years of experience working in energy production and optimization at water and wastewater plants in the U.S. and globally.

Karen Bill, billk@cleanwaterservices.org, Clean Water Services, Hillsboro, Oregon

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Market Pulse: How to Use Market Soundings to Improve Collaborative Delivery Procurement

Description:

What if you could just ask contractors directly about your project – does it appeal to them? What risks and challenges do they see? Well… you can!

Market sounding with design and construction firms is a proactive and strategic approach to enhancing project delivery. The approach includes engaging potential contractors early in the project delivery process to gauge market interest, assess project feasibility, discuss performance requirements, and gather valuable insights on risks, costs, market conditions, and schedule feasibility. It enables project owners to make better-informed

delivery method decisions, so that projects are executed efficiently, within budget, and to the desired quality standards. By directly engaging with the contractor community, project owners can better understand market conditions, technical capabilities, and potential challenges, leading to better procurements and improved project delivery.

The market sounding process typically includes one-on-one meetings, surveys, and/or industry forums where contractors provide feedback on project scope, design, delivery method and schedule. This early engagement helps identify barriers to project delivery that may not be evident through traditional procurement channels. For example, contractors may highlight concerns over unrealistic project timelines, unclear scope, unanticipated risks or cost challenges that could impact project feasibility or contractor interest.

Additionally, market sounding helps verify that project expectations align with the capabilities and capacity of the market. It allows project owners to gauge contractor confidence in the project, potential interest in bidding, and capacity to deliver the project on time and within budget.

The market sounding benefits are multifaceted. By incorporating contractor feedback, project owners can refine project requirements, adjust procurement strategies, and mitigate risks before they become significant issues. This can lead to more competitive proposals, optimized project costs, and improved delivery schedules. Market sounding also contributes to building stronger relationships between industry representatives and owners. It fosters transparency and trust between contractors and owners, setting a collaborative tone for future interactions.

This presentation will draw from regional market sounding efforts to describe the process of planning a market sounding, performing contractor outreach, and leveraging feedback for a successful project. Attendees of all experience levels will learn actionable ways to deliver a market sounding and how to incorporate market feedback into the procurement process.

Speaker(s):

Shelby Hodge, shelby.hodge@hdrinc.com, HDR Engineering, Inc., Bellevue, WA

Shelby Hodge is an environmental engineering consultant, with most of her 14-year career spent in the municipal wastewater sector. At HDR, she is the Project Delivery Lead for the Washington Water Business Group where she leads project delivery, mentorship, and career development in the areas of program/project management, collaborative delivery, and owner's advisory services for the business group. She has supported multiple clients with planning and delivering complex wastewater projects across the PNW.

Laura Nolan, laura.nolan@hdrinc.com, HDR Engineering, Inc., Spokane, WA

Laura is a senior project manager with HDR, based in Spokane. She has 20 years experience managing multidisciplinary water and wastewater projects, through planning, design and construction.

MBR Treatment Facilities in Practice: Overview, Applicability, and Procurement

Description:

Membrane Bioreactor (MBR) systems have emerged as a transformative technology in wastewater treatment, offering high-quality effluent, compact footprints, and operational flexibility. This presentation provides a comprehensive exploration of three pivotal aspects essential for utilities considering MBR implementation: system design and operational considerations, evaluation of MBR suitability, and the importance of early planning and pre-procurement.

The session begins with an overview of MBR system design, highlighting the integration of biological treatment and membrane filtration. Key operational considerations—including membrane selection, fouling management, process control, and maintenance—will be discussed to illustrate how thoughtful engineering decisions directly impact system reliability, efficiency, and lifecycle costs. Attendees will gain insights into how design variables such as influent characteristics, loading rates, and process configuration must align with the utility's specific objectives.

Next, the presentation examines the decision-making process for determining whether an MBR is the right fit for a utility. Criteria such as staffing requirements, regulatory limits, influent characteristics, effluent quality goals, space constraints, and funding availability will be analyzed. Real-world examples will demonstrate how utilities can balance these factors, leveraging MBR's advantages while being mindful of potential trade-offs in capital and operational expenditures. The session will offer a structured evaluation framework to help stakeholders assess technical feasibility, cost-effectiveness, and long-term value.

Finally, the importance of early planning and pre-procurement activities will be emphasized. Successful MBR projects hinge on proactive stakeholder engagement to select an MBR equipment supplier that best fits the project's needs. The presentation will outline best practices for developing scoring criteria based on owner priorities and selection committee members, clear project specifications, engaging qualified vendors, and anticipating future operational needs. By learning from industry experience, participants will be equipped to navigate common challenges, mitigate risks, and set their projects up for sustainable success.

This session is intended for utility managers, operators, and engineers seeking actionable guidance on MBR technology.

Attendees will leave with a deeper understanding of how to approach MBR implementation holistically, emphasizing alignment between technology, utility goals, and project delivery.

Speaker(s):

Kelsey Wagner, kelsey.wagner@ae2s.com, AE2S, Bozeman, MT

Kelsey is a Project Manager and Engineer at AE2S with 12 years of experience providing engineering services for water, wastewater, and reuse projects in Montana, Utah, Colorado, and Canada. Ms. Wagner has a Bachelor of Science degree from Montana State University in Geohydrology with a Water Resources minor; and a Master of Engineering degree in Civil and Environmental Engineering from Utah State University. She spends her free time outside with her golden retriever, Ruby.

Membrane Disc Diffusers - Clean or Replace

Description:

Today, membrane fine bubble disc diffusers are the dominant fine bubble diffuser specified throughout the United States. Fine bubble membrane disc diffusers offer excellent oxygen transfer efficiency, air on/air off operation, and long diffuser life at a lower cost compared to other disc diffusers. But there has long been a debate regarding membrane disc diffusers. To clean or replace?

Some believe you should operate membrane diffusers as long as possible without diffuser maintenance, then when necessary buy new and replace them. This belief is founded on the premise that the cost of diffuser replacement and any potential decrease in diffuser performance are low relative to diffuser cleaning costs.

Others believe you should clean your membrane diffusers as often as necessary to keep the overall system operating at peak performance, deferring replacing membrane diffusers. This belief contends keeping membrane diffusers operating close to new is best to keep annual operating costs as low as possible.

Until recently, the most viable ways to clean membrane diffusers involved scrubbing them with a stiff brush, applying mild acid cleaners, or both. This requires having access to the diffusers, either by draining a basin or by removing a grid (if you have this option). However, diffuser equipment suppliers have developed in-situ cleaning systems that offer the ability to clean diffuser without draining basins. In some situations, in-situ cleaning has been shown to be more effective than manual cleaning of membrane diffusers.

This presentation will communicate conclusions based on data collected at Wisconsin wastewater treatment plants. In one case, an activated sludge treatment system has membrane disc diffusers more than 5 years old with no maintenance. The pressure on the aeration blower has steadily increased, and the system pressure is affecting performance. Diffuser maintenance is now needed. This will be compared with a municipal wastewater treatment plant contracted to replace its ceramic diffusers with membrane diffusers.

The time, cost, and operational impact of the cleaning and replacement cases will be explored, with valuable insights for audience members who find themselves in the familiar “Clean or Replace?” predicament.

Speaker(s):

Jon Butt, jon.butt@meadhunt.com, Mead & Hunt, Milwaukee, Wisconsin

Jon is a Market Leader for Mead & Hunt with 30 years of experience with equipment and design. Jon has a chemical engineering degree from the University of Wisconsin – Madison and an MBA from Cardinal Stritch University. Jon specializes in water and wastewater engineering including primary, secondary, and tertiary, and solids management. Jon helps clients with energy efficiency, energy recovery, resource harvesting, water reuse, and operations trouble shooting.

Microtunneling to Minimize Community and Environmental Impacts

Description:

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

The Eugene Water & Electric Board (EWEB) is constructing two 3.75-million-gallon welded steel tanks at its College Hill site in Eugene, Oregon, as part of a major system resilience upgrade. A critical project component involves installing dual transmission mains beneath the active intersection of Lincoln Street and W 23rd Avenue. This urban corridor—constrained by mature trees, existing utilities, steep slopes, and limited right-of-way—required a construction method that minimized surface disturbance, community impacts, and schedule risk.

Microtunneling was selected to install a 72-inch steel casing approximately 450 feet long, containing a 30-inch welded steel pipe and a 24-inch ductile iron carrier pipe. The decision followed a comprehensive comparison of construction alternatives, with particular focus on geotechnical conditions, risk exposure, and public impact.

Open-cut construction would have required trench depths up to 30 feet, placing the alignment within the Eugene Formation sandstone, which presents unconfined compressive strengths up to 4,000 psi. Excavation in these conditions would have required extensive blasting—an approach deemed unacceptable due to vibration, noise, safety concerns, permitting complexity, and neighborhood disruption. These limitations made open-cut construction infeasible.

Although microtunneling is often considered a higher-cost option, it proved the most economical and lowest-risk solution when evaluated across total project cost, traffic and neighborhood impacts, and schedule reliability. The slurry Microtunnel Boring Machine (MTBM) minimized vibration, controlled groundwater, required only two shafts, and preserved nearly all surface features.

This presentation will review the rationale behind EWEB's selection of microtunneling, including alternative analysis, geotechnical constraints, cost evaluation, and public outreach. It will also discuss MTBM performance in rock and highlight how the College Hill project demonstrates the value of trenchless technology in delivering resilient, community-friendly infrastructure.

Speaker(s):

Brendan O'Sullivan, Brendan.OSullivan@consoreng.com, Consor, Portland, Oregon

Brendan O'Sullivan is an Area Principal and Technical Practice Leader for Trenchless Technologies at Consor, based in Portland, Oregon. With more than 21 years of industry experience, he has contributed to a wide range of projects across the United States, serving in design, construction administration, and technical leadership roles. His expertise spans both large- and small-diameter sanitary sewer, stormwater, and water pipeline systems, with a focus on the application of trenchless technologies.

Glen Wheeler, glenw@jwfowler.com, JW Fowler, Dallas, Oregon

Glen Wheeler is the Chief Tunnel Engineer for JW Fowler Tunneling, based in Dallas Oregon. He leads technical development of JWF's most challenging trenchless projects with a focus on new tunnel installations including microtunneling, hard rock tunneling, pipe ramming, earth pressure balance tunneling, and deep shafts. He earned his Bachelor of Science degree in Mining Engineering and a Graduate Certificate in Underground Construction and Tunneling from the Colorado School of Mines. Glen continues to further education and training in the trenchless construction industry by authoring technical papers, presenting case studies, and participating on technical publication committees.

Mind the Gap: Navigating the Critical Friction Between Engineered Theory and Manufactured Truth

Description:

A critical piece of any wastewater project is ensuring the design needs align with the equipment and materials provided by manufacturers, and it is the responsibility of General Contractors to ensure a smooth transition from theoretical design to manufactured reality. This presentation explores means and methods used to bridge the gap between engineered theory and manufacturing reality, prioritizing both buildability and cost-effectiveness. Using past experiences in which Slayden has driven this coordination process, we will highlight how we leverage both traditional documentation review and modern VDC technology, such as virtual walkthroughs and system clash detection, to facilitate communication between engineers and manufacturers. We will also provide context on how to employ both the engineers' knowledge of complex system design, and the manufacturers' technical expertise to come to a solution that results in a well-built, easily installed, and cost-saving system and/or building. This presentation will allow the audience to walk away with new tools that they can use to ensure that what is designed for the job and what ends up being delivered align. Additionally, these newly developed methods will help to provide manufacturers with extra time to meet design criteria, as well as providing engineers with ample time to adjust and review their design based on their collaboration with the contractor and manufacturer. The value in connecting the design to reality early in the project comes in a swath of forms. The most obvious benefit is the time and money that is saved by preventing issues before they reach the field. However, benefits are also seen from ensuring the system meets all the requirements specified in the design, so the system can function as intended. Lastly, and most importantly, this process allows for increased understanding from all sides of what is being built. This additional context makes for a safer working environment where risks are much easier to identify leading to a situation where all sides can be on the same page about what steps need to be taken to transition this design from paper to reality.

Speaker(s):

Tanner Windom, Tanner.Windom@mwhconstructors.com, Slayden Constructors, Salem, Oregon

Tanner is a Lead VDC Engineer with Slayden Construction, and has been here for 3 years leading design resolution as part of our BIM team. Already in his young career he has developed full civil construction model for jobs ranging in value from $240M and down to $5 Million. He has lead clash detection for mechanical design on 6 construction projects and led tracking using drone mapping for earthwork quantification.

Keith Beckman, keith.beckman@mwhconstructors.com, Slayden Constructors, Estacada, Oregon

Keith is a Project Manager and Commissioning Manager with Slayden Construction. He brings 14 years of water and wastewater experience, including participation in nine CM/GC projects and ten full treatment plant startups. He is a a licensed wastewater operator, and has played a role on design, owner and construction side of infrastructure projects throughout his career.

Mission Ready: Recruiting the Next Wave of Water Operators from the Military

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

As experienced operators and maintainers across the water sector approach retirement, utilities face a growing workforce gap that threatens the reliability of critical infrastructure. While many organizations are actively exploring workforce development strategies, one significant and often underutilized talent pipeline continues to grow each year: military veterans.

Thousands of service members leave active duty annually with strong technical aptitude, discipline, safety awareness, and a deep sense of public service—qualities that align closely with careers in water and wastewater operations and maintenance (O&M). This presentation introduces the Hydro Heroes initiative, a new regional workforce development program designed to connect military talent with O&M career pathways in the water sector.

Hydro Heroes launched at the Rocky Mountain Water Environment Association (RMWEA) Conference in August 2025 and is now being established concurrently in the RMWEA and Pacific Northwest Clean Water Association (PNCWA) regions. The initiative is building regional platforms with national scalability that link military communities to utilities, training providers, and certification pathways. The program focuses on:

- Introducing military members and families to water sector careers through outreach, education, and hands-on exposure
- Supporting candidates as they explore industry career options
- Augmenting existing training programs to help with entry-level certifications
- Connecting utilities with established federal and water-sector workforce programs
- Creating a replicable model that can be adopted by other regions nationwide

This session provides actionable guidance for organizations looking to strengthen their workforce pipelines while honoring service and building long-term operational resilience. Attendees will learn:

- What military transition programs already exist and how utilities can access them
- Resources and tools for engaging active-duty and separated service members
- How utilities can begin tapping into this talent pool with minimal upfront effort

Speaker(s):

Dotti Ramey, dotti.ramey@gmail.com, Jacobs Engineering, Bellevue, WA

Dotti is an operator and engineer with over 30 years experience in the environmental engineering field. Supporting our veterans and our operations and maintenance professionals is her passion born of her work in wastewater treatment and the experiences of her kids who are veterans.

Becca Chapa, Chapabr@bv.com, Black & Veatch, Denver, CO

Becca is an operator and engineer with 10+ years of plant operations and consulting experience. Her experience with veterans as operators and maintainers is the foundation for her supporting and honoring both our active/veteran military and the operators and maintainers we all rely on.

Modeling Aquifer Storage and Recovery for Thermal Mitigation on the Tualatin River, OR

Description:

Wastewater discharges to the Tualatin River are regulated under temperature standards intended to protect salmonids and other fish. With projected population growth and increasing thermal sensitivity under climate change, additional strategies may be required to maintain long term compliance. This study evaluated Aquifer Storage and Recovery (ASR) as a potential thermal mitigation strategy using the CE-QUAL-W2 hydrodynamic and temperature model.

The CE-QUAL-W2 model, previously developed and calibrated for the Tualatin River and Hagg Lake system, was applied over a seven year simulation period from 2013 through 2019. Seasonal ASR operations were represented as winter surface water withdrawals and corresponding summer discharges of stored colder water. Scenarios included pilot scale and full-scale configurations that varied discharge timing, flow magnitude, and recovery temperature. Model outputs were evaluated for changes in flow, water surface elevation, seven-day average of the daily maximum temperature, fish migration blockage criteria, and thermal credit generation.

Simulated winter withdrawals of 2 to 5 cubic feet per second produced minimal changes in downstream hydraulic conditions. Reductions in streamflow represented a small fraction of average winter flows, with negligible changes in velocity and water surface elevation even during the driest simulation year. These results indicate low potential for hydraulically driven habitat effects under the modeled withdrawal rates.

During summer discharge periods, ASR scenarios reduced modeled seven-day average daily maximum temperatures relative to baseline conditions. Cooling effects were greatest near the discharge location and attenuated with distance downstream, though measurable reductions persisted to the downstream boundary of the modeled reach. Scenarios initiating discharge earlier in the summer and using colder recovery temperatures produced the largest and most sustained reductions. Several full-scale scenarios also reduced the number of modeled exceedance days associated with fish migration blockage criteria.

Thermal credit calculations reflected these temperature reductions, with higher credits associated with earlier seasonal discharge and lower discharge temperatures. Overall, the CE-QUAL-W2 modeling demonstrates that ASR can provide measurable thermal mitigation benefits, supporting its consideration as an element of a basin wide thermal compliance strategy.

Speaker(s):

Zoe Rodriguez del Rey, zoe@annearwaterresources.com, Annear Water Resources, Portland, OR

Zoe Rodriguez del Rey is an environmental scientist with 20 years of experience in water resources planning. She has worked for public utilities including the Coachella Valley Water District (CA) and Portland Water Bureau (OR) and now serves as Principal at Annear Water Resources.

Jared Kinnear, KinnearJ@CleanWaterServices.org, , ,

Jared Kinnear is the Water Resources Project Manager at Clean Water Services in Oregon where for over 15 years his work has focused on water reuse and recycled water programs.

Modeling Carbonate Alkalinity Enhancement Impacts on Biological Nutrient Removal

Description:

Calcium carbonate ($CaCO_3$) dosing for wastewater alkalinity enhancement (WAE) has the potential to couple durable carbon dioxide removal (CDR) with improved biological nutrient removal (BNR). However, rigorous quantification of these coupled benefits requires models that resolve interactions among carbonate chemistry, mineral dissolution, and activated sludge biology. Respiration, nitrification, denitrification, and $CaCO_3$ dissolution are dynamically linked through pH and alkalinity. Nitrification consumes alkalinity and lowers pH, constraining ammonia oxidation, whereas $CaCO_3$ dissolution restores alkalinity and buffers pH, potentially increasing nitrification capacity and downstream nitrogen removal. Most established process models represent BNR kinetics but lack detailed treatment of carbonate speciation, calcite saturation state, dissolution kinetics, and particle-size effects, limiting their ability to attribute geochemical CO_2 uptake and nitrogen performance outcomes under operational constraints.

We developed a modular Python-based digital twin for WAE applications that integrates Activated Sludge Model biology with a carbonate-system solver and $CaCO_3$ dissolution kinetics. Facilities are represented as directed graphs of reusable unit processes with phase-aware hydraulics, enabling separation of hydraulic and solids residence times. Equipment-aware aeration with PI/PID dissolved oxygen control supports counterfactual scenario analysis. Embedded mass-balance verification ensures chemical and hydraulic consistency and reproducibility. The model is driven by routine plant monitoring data, including flows, recycle rates, aeration settings, and nutrient and alkalinity measurements, with flow-weighted averaging aligned to composite sampling.

The framework was configured for a 30 MGD enhanced nutrient removal facility in Connecticut operating seasonally in four-stage Bardenpho and Modified Ludzack–Ettinger modes. Model predictions were benchmarked against multi-year pre-deployment data and a year-long $CaCO_3$ dosing campaign (November 2024–November 2025; mean 4.3 Mg d^{-1}). Relative to baseline (2019–2024), effluent alkalinity increased by 33 mg L^{-1} as $CaCO_3$ and pH increased by 0.28 units. Mean ammonium removal increased by 70%, and total nitrogen removal increased by 16% on paired sampling days. Final effluent total nitrogen and ammonium concentrations decreased by 37% and 57%, respectively.

The digital twin reproduced observed shifts in alkalinity and ammonium removal (alkalinity slope 0.98, R^2 = 0.55; ammonium removal slope 0.90, R^2 = 0.90). These results demonstrate that $CaCO_3$-based WAE can enhance nitrogen removal at full scale while enabling mechanistic attribution of treatment performance and geochemical CO_2 uptake within plant-specific operating limits.

Speaker(s):

Ben Geyman, ben@crewcarbon.com, CREW, New York City, New York

Benjamin Geyman is a Biogeochemical Modeler at CREW Carbon, where he develops scientific software and process models to better understand the impacts and benefits of wastewater alkalinity enhancement. Ben completed Ph.D. in Environmental Science and Engineering at Harvard University, where he researched the

global biogeochemical cycle of mercury (Hg). His work bridges geochemistry, wastewater process modeling, and applied environmental technology.

Nick Popolizio, nick@crewcarbon.com, CREW, New York City, NY

Nick Popolizio holds 15 years of experience in the water industry. His career spans roles in plant-level operations, engineering, and technical leadership. Before joining CREW, Nick worked in process engineering roles at Veolia in Southern California, and more recently, commercial management roles at Kurita in the greater Portland area. Nick holds a Bachelors of Science in Civil & Environmental Engineering from The University of Connecticut.

Modernizing SCADA Communication with Private Cellular Networks

Description:

Reliable SCADA communications are essential for wastewater system operations, data collection, and alarm management. As utilities face increasing expectations for cybersecurity, system resiliency, and advanced functionality, traditional communication approaches are being pushed beyond their original intent. Legacy 150, 450, and 900 MHz radio systems remain reliable for basic monitoring and control but lack the bandwidth needed for capabilities such as remote troubleshooting, programming, and full system-wide SCADA access. Leased communication services—including fiber, public cellular, and satellite—offer higher performance but introduce recurring costs, coverage limitations, and dependence on third-party service availability. For utilities with many remote sites, these tradeoffs can significantly affect long-term operating costs and resiliency.

This presentation explores private cellular networks as an alternative or complement to legacy radio and leased services. A privately owned cellular network provides high-bandwidth wireless communication with no monthly service fees, greater control over cybersecurity, and reduced exposure to service disruptions. It can serve as a primary SCADA communication system or as a redundant path to enhance resiliency during outages or emergencies.

Through a case study, the presentation will walk through the design and implementation of a private cellular network for water/wastewater industry SCADA communications. Topics include system architecture, coverage planning, cybersecurity considerations, integration with existing SCADA infrastructure, and lessons learned. The discussion will compare private cellular performance and lifecycle costs to traditional radio and leased communication options, highlighting where each approach is best suited.

Attendees will gain practical insight into:

- When private cellular networks make sense for wastewater SCADA systems
- How ownership of communication infrastructure can improve cybersecurity and resiliency
- The operational and financial tradeoffs between legacy radio, leased services, and private cellular
- Opportunities to expand SCADA functionality beyond basic monitoring and control
- Considerations for SCADA communication infrastructure design and implementation

This session provides a realistic framework to help utilities evaluate next-generation wireless SCADA communication strategies.

Speaker(s):

Jeff Kanyuch, jeff.kanyuch@jacobs.com, Jacobs Engineering, Corvallis, Oregon

Jeff is a principal control system / SCADA project manager based in Jacobs' Corvallis, Oregon, design center. He has over 35 years of experience managing control system implementations and is responsible for control system delivery on all of Jacobs' design-build projects in the Western United States. Jeff has a BS in Electrical Engineering from University of Dayton (Ohio) and an MBA from Oregon State University. Jeff is a certified Project Management Professional (PMP) and has a professional engineering license in 7 states and Guam.

Andy Huffman, andy.huffman@medfordwater.org, Medford Water, Medford, Oregon

Andy Huffman is the Senior Capital & Special Projects Manager for Medford Water. Andy has been part of the capital improvement team for 16 years and has been fundamental in the delivery of $140 million in capital design and construction. He has also been part of the WIFIA and BRIC funding team which has been successful in securing $132 million in loans and grants.

Trevor Klatt, Trevor.Klatt@jacobs.com, Jacobs Engineering, Albany, Oregon

Trevor is an I&C / automation delivery specialist with 18 years of industry experience, including 11 in Jacobs Corvallis, Oregon, design center. Trevor has been working with Medford Water on SCADA improvements for 5 years and led the master planning and d

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Nanobubble Pretreatment as an Intensification Strategy at the Budd Inlet Treatment Plant

Description:

The Budd Inlet Treatment Plant (BITP) in Olympia, Washington, is owned and operated by the LOTT Clean Water Alliance. LOTT sought to increase operational resiliency and nitrification during the seasonal period. To support LOTT, Nanobubble (NB) pretreatment was implemented upstream of primary treatment for a one-year demonstration period beginning in December 2025.

NBs are ultra-fine gas bubbles (< 200 nm) that remain suspended in liquid and exhibit unique properties that make them highly effective in enhancing wastewater treatment performance. Their electrochemical surface activity attracts and destabilizes hydrophobic compounds, disrupting emulsions and surfactant accumulation. Their high interfacial area, stability, and Brownian motion improve interactions between microbial communities and substrates. Most notably, NBs catalytically enhance enzymatic reactions, accelerating the hydrolysis of slowly biodegradable COD into readily biodegradable COD—improving substrate availability and utilization. These biocatalytic effects represent a novel advancement in process intensification for the wastewater sector.

The system was installed by producing NBs into a sidestream flow pumped from the primary effluent splitter box to the head of the individual primary clarifiers. Despite the increase in surface overflows rates due to the NB system recycle, the facility observed an increase in primary TSS removal from 69.5% to 70.8% and 74.8% in December, January, and February, respectively.

In secondary treatment, average SSVI remained much more steady than previous cold- and wet-weather periods. MLSS decreased by over 7% without sacrificing nitrification. Additionally, Nitrification Efficiency (mg NH3-N oxidized/g MLSS-scfm-day) increased by >29%, equating to reduced solids loading on the secondary clarifiers and reduced blower energy for the same ammonia load without increasing effluent ammonia. Operations staff have also noted the absence of scum in the first anoxic zone.

This presentation will provide an overview of the NB pretreatment system, implementation considerations, and performance outcomes. Attendees will understand the biocatalytic nature of nanobubbles and how their unique physical and chemical properties enhance biological nutrient removal (BNR), solids separation, and enzymatic activity in municipal wastewater treatment. Attendees will also understand how a nanobubble pretreatment demonstration can better inform future planning efforts and reduce forecasted capital expenditures.

Speaker(s):

Paul Jue, pauljue@lottcleanwater.org, LOTT Clean Water Alliance, Olympia, Washington

Paul Jue is the Process Control Supervisor at the LOTT Clean Water Alliance in Olympia, Washington. Since joining LOTT in 1992, Paul Jue has been instrumental in optimizing biological nutrient removal (BNR) processes in a four-stage Bardenpho system, focusing on enhancing nitrogen removal while managing operational challenges such as septage impacts, heavy metal inhibition, and seasonal process instability. Paul Jue holds a master's degree in environmental microbiology from the University of Oregon and is passionate about integrating innovative tools like BioWin and AI models with SCADA systems to improve real-time process control and data-driven decision-making in wastewater treatment.

Stephen Taylor, stephentaylor@lottcleanwater.org, LOTT Clean Water Alliance, Olympia, Washington

Stephen Taylor is a Planning Engineer with the LOTT Clean Water Alliance in Olympia, Washington. He works with LOTT staff to plan and advance projects that improve and extend the life of LOTT's treatment facilities. Stephen also manages LOTT's Future Technologies Pilot Team which identifies and tests emerging technologies to see if they are worth implementing full-scale. Stephen holds a Bachelor of Science in Mechanical Engineering and before working for LOTT spent 23 years in the private-sector managing projects and supporting the manufacturing of Sharpie® markers, aluminum cans, and air compressors.

Riley Murnane, riley@moleaer.com, Moleaer, Scottsdale, Arizona

Riley brings nearly a decade of water and wastewater engineering experience, previously serving as a process engineer at Hazen and Sawyer. His career has been spent supported the planning and design of municipal wastewater treatment facilities across the

Navigating Complex Biological Nutrient Removal Process Selection Decisions in an Uncertain Regulatory Climate

Description:

In September 2021, Oregon DEQ adopted an NPDES permit for discharges from the City of Medford's (City's) Regional Wastewater Reclamation Facility (RWRF) to the Rogue River. The renewed permit includes load-based, seasonal nutrient limitations that translate to concentration-based limits of 3.2 mg/L TN and 0.4 mg/L TP.

The nutrient limits were driven by the Rogue River as being identified as impaired with respect to Oregon's biocriteria standards. However, because a TMDL addressing the biocriteria impairment has not been developed at the date of permit issuance, Oregon DEQ employed a different methodology to establish the in-stream nutrient targets for the facility's discharge.

In 2024, DEQ approved the City's Facilities Plan that evaluated a range of alternatives for meeting the nutrient limits. These included 5-Stage Bardenpho process, an Aerobic Granular Sludge (AGS) process, and Membrane Bioreactor (MBR)-based system. With the exception of the MBR, a second-stage filtration process would also be required to meet the final effluent targets. The analysis concluded that the 5-Stage Bardenpho process was preferred due to its lower energy and chemical costs, and because it provides the highest flexibility. The latter criterion was particularly important due to uncertainties related to the nutrient limitations.

In June 2025, approximately 18 months into the design phase, the City completed a Stressor Analysis. This study demonstrates that the primary and diagnosed stressors in the Rogue River are increased nitrogen (ammonia and nitrate) from the RWRF Outfall. However, phosphorus was not identified as a stressor.

The City is now working with DEQ and it appears that some relief regarding the phosphorus requirements is possible in the next permit renewal. These changes will have a substantial impact on the process design approach. This City has subsequently developed a design approach through the CMGC project delivery process to provide the flexibility needed to adjust as the permit renewal is completed. This presentation will provide insights into how the City has navigated treatment process selection and evaluation in this uncertain regulatory climate.

Speaker(s):

Kathryn Gies, kgies@westyost.com, West Yost Associates, Concord, California

Kathryn Gies has been helping communities solve complex wastewater and recycled water challenges for more than 25 years. As the planning and process design lead for West Yost Associates and current Past President of the California Water Environment Association - she is a self-described "wastewater treatment nerd". She is deeply passionate about contributing to the advancement of our industry and helping utilities do more with limited resources. Since 2018, Kathryn has been working closely with the City of Medford to develop a and implement a "right-fit" nutrient treatment strategy for region's unique water resources.

Johnny Leavy, Johnny.Leavy@cityofmedford.org, City of Medford, Medford, Oregon

Johnny Leavy is the Water Reclamation Division Manager for the City of Medford's Regional Water Reclamation Facility, where he leads wastewater operations, regulatory compliance, safety, and capital improvement efforts for a 25-person team. With more than 20 years of experience in municipal wastewater treatment, laboratory oversight, pretreatment, and process optimization, he is currently helping lead a $300 million capital program focused on nutrient limits and recycled water implementation in the Rogue Valley.

Navigating Turbulence: Underground Stormwater Design in a Constrained Corridor

Description:

A roadway's drainage challenges, such as narrow right-of-way, utility conflicts, and need for underground detention and treatment, including flow compliance and pipe slope considerations, can present significant hurdles for stormwater management compliance. The City of Pullman Airport Road project demonstrates how stormwater design can become uniquely complicated inside a constrained underground corridor.

Located in eastern Washington, east of the City of Pullman near the Washington/Idaho border within the Palouse Basin, the project seeks to improve access to the Pullman-Moscow Regional Airport (PMRA) through amendments to the Airport Road corridor, including roadway widening, reconstruction of the roadway surface, and the addition of pedestrian and multimodal pathways over approximately 2 miles. The design intends to preserve the natural drainage system and minimize the impacts of site stormwater discharges to the maximum extent practical. However, site constraints deemed surface facilities for stormwater management technically infeasible: soils wouldn't support infiltration; right-of-way is limited; and the adjacent airport's restrictions to avoid wildlife attractants precludes the use of vegetated swales and bioretention facilities to treat and attenuate flow. As a result, stormwater management facilities consist of surface collection in catch basins and pipes routed to underground detention and treatment facilities prior to discharge offsite.

This project includes six discreet gravity stormwater systems that discharge to existing outfalls, which greatly restricts the elevation drop across systems. To minimize the size of each treatment system, Mead & Hunt designed stormwater treatment downstream of detention. Across the six systems, a cumulative total of 29,925 CF of underground storage is provided for the project all located within the roadway right-of-way. Future utility extensions along the centerline and south side of the roadway forced most of the stormwater infrastructure to the northern, upslope side of the road to maintain separation. The stormwater system had over 70 other utility crossings to dodge across the length of the project.

This presentation will address the unique detention and treatment configurations used to stay inside of the roadway right-of-way, the shallow stormwater conveyance used to successfully cross the other utilities, and project-wide discharge balancing in order to meet flow compliance requirements.

Speaker(s):

McKailee Beck, mckailee.beck@meadhunt.com, Mead & Hunt, Portland, Oregon

McKailee Beck is an Engineer-in-Training for Mead & Hunt with 3 years of experience in civil and water resources engineering. McKailee has a civil engineering BS from Washington State University. McKailee specializes in stormwater, water, and wastewater planning and design.

Bob Thayne, bob.thayne@meadhunt.com, Mead & Hunt, Portland, Oregon

Bob Thayne is the Northwest Water Department Manager for Mead & Hunt with 25 years of civil engineering experience in water resources, land development, transportation, and utilities. Bob has an engineering degree from Walla Walla University and an MS in Mechanical & Aerospace Engineering from University of California, Irvine. Bob specializes in stormwater management planning and design, including stormwater collection and conveyance, quality and quantity control, and green infrastructure design. Bob helps clients with solutions to protect public safety, protect environmental quality, and protect infrastructure investments.

Novel Aeration Control Delivers Energy Savings and Improved Nutrient Removal

Description:

WWTPs can improve BNR and reduce energy consumption in their secondary treatment process by modifying their aeration and mixing control strategy to dynamically adjust to changing influent conditions. Optimizing the biological process for carbon, DO and nutrient management requires a balanced design approach which considers the initial operating conditions while accommodating the design loading conditions which are often based on future projections. Sufficient aeration turndown achieves treatment needs without compromising the aeration capacity needed for future design conditions. Additionally, directing influent embedded carbon to benefit denitrification and EBPR.

FlexZone integrates BioMix, diffused aeration, instrumentation and controls to ensure precision aeration control while meeting treatment objectives. FlexZone includes one or more subzones including both BioMix and aeration grids that overlap and can be operated concurrently or independently. Subzone environments are dynamically adapted to influent loading changes while optimizing the bioreactor for nutrient removal, carbon management, and energy efficiency.

Results of a two-year demonstration at NEW Water Green Bay WI Facility are presented. This unique study used full-scale, side-by-side testing to evaluate low DO impacts and control strategies. Energy savings and nutrient removal improvements validated the improvements realized from low DO operation.

Speaker(s):

Mark Gehring, mark.g.gehring@xylem.com, EnviroMix, Grafton, WI

Mark Gehring is a director of regional sales at EnviroMix, Inc. He has received his B.S. in wastewater treatment from the University of Wisconsin at Stevens Point. Mark has more than 30 years of experience in wastewater treatment, with specialty in biological wastewater treatment systems, nutrient removal and water reuse. Mark is a member of Water Environment Federation and a certified wastewater treatment plant operator – Grade 4 in the State of Wisconsin.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Nutrient Removal 101: From Conventional Activated Sludge to Advanced Technologies for Stringent Compliance," Abstract ID 83 has been accepted for presentation

Description:

As nutrient discharge limits tighten nationwide, wastewater utilities must understand both foundational and advanced nutrient removal strategies to ensure reliable compliance. This session provides a comprehensive, technically grounded overview of nutrient treatment, from the fundamentals of conventional activated sludge (CAS) to cutting edge biological and hybrid technologies achieving ultra-low nitrogen and phosphorus limits.

The presentation begins with core CAS principles, including nitrification/denitrification kinetics, SRT and DO management, carbon to nitrogen ratios, and process stability considerations. It then builds toward enhanced biological nutrient removal (EBNR) systems such as A2/O, step feed BNR, and multi-stage Bardenpho processes, focusing on carbon requirements, process stoichiometry, operator control points, and common troubleshooting scenarios.

Advanced technologies such as membrane bioreactors (MBRs), shortcut nitrogen pathways (nitritation/denitritation and anammox), integrated fixed film activated sludge (IFAS), densification, and high-rate phosphorus polishing, are examined with respect to effluent quality performance, operational complexity, footprint constraints, and lifecycle cost. Each technology is supported by case studies and real-world comparisons, highlighting performance under different flow regimes, influent loads, and regulatory targets. These examples are selected to show how solutions scale from small regional facilities to large metropolitan utilities.

Learning Objectives

Operators will learn:

- How to manage SRT, DO, carbon availability, and process control for stable nutrient removal.
- Troubleshooting strategies for nitrification loss, filament outbreaks, and process upsets.

Engineers will learn:

- How to size, design, and model CAS, BNR, and advanced nutrient removal systems.
- How to evaluate emerging technologies for footprint, energy, and cost efficiency.

Managers will learn:

- How regulatory drivers influence technology selection and capital planning.
- How case studies demonstrate scalability, risk mitigation, and long-term O&M implications.

This session benefits beginners by building strong foundational understanding while providing experts with comparative performance data, advanced process insights, and lessons learned from full-scale installations.

Speaker(s):

Murthy Kasi, mkasi@ardurra.com, Ardurra, Las Vegas, Nevada

Murthy Kasi is a Water/Wastewater Technology Leader with expertise in advanced treatment processes. He specializes in nutrient removal, helping municipal and industrial facilities meet stringent discharge standards. Murthy's experience spans process design, modeling, optimization, and troubleshooting, as well as water quality modeling and mixing zone studies. He has supported numerous municipalities with permitting and compliance. An active member of AWWA and WEF, Murthy has authored WEF manuals and factsheets and currently serves as Chair of WEF's Chemical Phosphorus Removal group and Vice Chair of its Research and Innovation Program Committee. Murthy holds a Ph.D. in Civil Engineering and is a licensed Professional Engineer in Nevada, Idaho, Arizona, and North Dakota.

Austin Carnes, , City of Boise, Boise, Idaho

Ron Gearhart, , Eagle Sewer District, Eagle, Idaho

Nutrient Removal Performance to Inform Technology Based Effluent Limits: A Deep Dive into Removal Performance across the United States

Description:

For more than twenty years, the question of "how low can we go" with effluent concentrations of nitrogen and phosphorus has been discussed and debated in the wastewater industry. This presentation will explore the most comprehensive new analysis of advances in nutrient removal technology since the Water Research Foundation's Nutrient Challenge program and publication of the 2011 Parker and Bott report (WERF 2011). This analysis will inform both nutrient standards and technology benchmarks, such as the Washington regulation for All Known, Available, and Reasonable methods of prevention, control, and Treatment (AKART).

In EPA Region 8, numeric nutrient standards have been the basis for impairment listings and TMDLs that resulted in requirements for effluent concentrations below the limits of treatment technology. Consequently, numeric nutrient standards in Montana and Colorado necessitated the use of technology based effluent limits (TBELs) for nutrients for successful compliance, such as Regulation 85 in Colorado that sets TBELs for total phosphorus and total inorganic nitrogen.

To inform the long-term approach to nutrient regulation in Colorado, stakeholders are currently engaged in a two-phase process: Phase I (through 2027) focuses on a short-term extension of Regulation 85 and Phase II (2028-2029) will help establish a long-term approach to Colorado nutrient regulation. As part of this process, HDR has been engaged to perform an analysis of the nutrient removal treatment performance and reliability at treatment plants across Colorado and other states.

The session will focus on the methods for obtaining and analyzing data from the treatment plants and the results of the treatment performance and reliability analysis. In addition to providing water quality monitoring data, the treatment plants were asked to complete a survey with questions regarding process configuration, chemical usage, and costs. The resulting analysis is based on over 70 datasets.

The datasets were analyzed using the technology performance statistics framework developed as part of the Water Research Foundation's Nutrient Challenge that quantifies the performance and reliability of a given

treatment process. The results of this analysis will provide a benchmark to inform policies for future nutrient effluent limits across the United States.

Speaker(s):

Charles Hammond, charles.hammond1@hdrinc.com, HDR, Folsom, CA

Charles Hammond is wastewater engineer with HDR. He is a licensed Professional Engineer in California and holds a doctorate in civil and environmental engineering from UC Davis. His consulting practice has focused on regional nutrient management in diverse watersheds across the western United States, wastewater process engineering, and analysis of wastewater collection systems.

On Time and Under Pressure: Collaborative Upgrades to Nampa's Influent Systems

Description:

The City of Nampa's aging headworks presented multiple challenges for City operators. High concentrations of hydrogen sulfide created safety hazards, and outdated equipment was becoming increasingly unreliable, often resulting in costly equipment rentals to maintain service during lengthy downtimes for repairs. The City knew it was time to replace the facility, and quickly. They decided to use the Construction Manager/General Contractor (CM/GC) delivery process so they could maintain a high level of involvement throughout design and open opportunities to accelerate procurement and work packages.

Keller Associates began design of the new 37-million-gallon-per-day influent pump station and headworks facility while the City selected the CM/GC contractor. The project included an accelerated design schedule due to the nature of the City's existing pump station and headworks facility. As the preliminary design concluded, the City selected IMCO as the CM/GC for the project. IMCO quickly integrated into the project team with the City and Keller, providing insight into cost modeling, recommending early procurement items, and helping to break off construction packages to meet the City's schedule goals. This collaboration led to the procurement of long-lead equipment, including the critical process equipment (submersible pumps, screens, grit removal, and odor control) and electrical items (motor control centers, transformers, and switchgear). The early works included the concrete work for the deep influent splitter box and the wet well with depths of nearly 40 feet.

The CM/GC delivery method allowed the project team to collaborate and deliver a successful project that evaluated cost-saving measures, accelerated the schedule, and was completed within budget. This presentation highlights coordination efforts between the City, Keller, and IMCO for the new headworks facilities.

Speaker(s):

Michael Schulz, mschulz@kellerassociates.com, Keller Associates, Inc., Meridian, Idaho

Michael Schulz graduated from Boise State University with a master's degree in civil engineering, with a water and wastewater emphasis. In the past five years, he has worked on design and construction projects, taking a

leadership role during construction, totaling over $50 million. Recent experience includes the Star Sewer and Water District's Membrane Bioreactor Expansion and the City of Gooding's Sequencing Batch Reactor Improvements.

Nick Miller, nmiller@imcoconstruction.com, IMCO Construction, Boise, Idaho

Shannon Johnson, johnsons@cityofnampa.us, City Of Nampa, Nampa, Idaho

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Operating Experience with DAS, ABAC, and Sidestream Nutrient Removal at the Boulder WRRF

Description:

The City of Boulder's Water Resource Recovery Facility (WRRF), a 25 mgd-rated facility, has recently commissioned plant-wide nutrient upgrades to meet more stringent nitrogen and phosphorus limits. Commissioned in mid-2025, the Phosphorus Upgrades Project (PUP) is demonstrating stable nitrogen and phosphorus removal performance and is undergoing ongoing optimization. This presentation summarizes operating results and lessons learned from upgrading a nitrogen-removal facility with whole-plant phosphorus removal improvements while retaining nitrogen removal capabilities through intensified treatment, including densified activated sludge (DAS).

Historically, Boulder's secondary process relied on a four-stage Bardenpho configuration with mixed liquor recycle and external carbon to reliably meet total nitrogen limits. Anticipating near-term phosphorus limits and future tightening of nitrogen limits, the City pursued PUP improvements to support robust enhanced biological phosphorus removal (EBPR), reduce aeration demand, maintain nitrogen removal with reduced or eliminated external carbon, and mitigate internal nutrient recycling from the sidestream. The PUP integrates four major complementary elements to support the City's desired outcomes.

(1) Selective wasting hydrocyclones (inDENSE®) were installed to preferentially remove lighter floc while retaining denser DAS biomass, resulting in sustained sludge volume index (SVI) values below 75 mL/g with increased mixed liquor concentrations and higher clarifier loading rates.

(2) The bioreactor was reconfigured to a low DO A/O process with a dedicated anaerobic selector designed for feast–famine conditions and EBPR, supported by ammonia-based aeration control (ABAC).

(3) Aging turboblowers were replaced with high-efficiency dual-core turboblowers, and large bubble mixing was added to maintain solids suspension at very low airflows, enabling stable low DO operation.

(4) Calcium chloride dosing was implemented into an existing post-aerobic digester (PAD) to remove orthophosphate as a calcium phosphate precipitate, achieving approximately 80% sidestream orthophosphorus removal, while maintaining its nitrogen removal capabilities.

Since commissioning the upgrades in June 2025, the WRRF has observed improved settleability and clarifier reliability, effluent phosphorus below 1 mg/L, and a substantial reduction in internal phosphorus and nitrogen recycle from the sidestream. SND performance has not eliminated the need for supplemental carbon dosing;

however, ongoing aeration control optimizations are underway to improve nitrate removal while maintaining EBPR.

Speaker(s):

Nathan Brown, nathan.brown@stantec.com, Stantec, Denver, CO

Nate is a Regional Wastewater Sector Leader for the US Mountain West at Stantec. He has over 22 years of experience in wastewater treatment and his technical expertise includes process intensification, mainstream and sidestream nutrient removal and recovery, secondary aeration, and biosolids treatment. Nate is passionate about recovering resources and reducing the environmental footprint associated with wastewater treatment.

Operational Tradeoffs Between Nutrient Removal and N_2O Emissions in Aerobic Granular Sludge Systems

Description:

Aerobic granular sludge (AGS) technology offers a compact, energy efficient solution for biological nutrient removal, yet its greenhouse gas footprint—particularly nitrous oxide (N_2O) emissions—remains a central operational challenge. This study examined how granule size distribution and dissolved oxygen (DO) control shape microbial stratification, process kinetics, and N_2O generation using granules collected from a pilot AGS system at the West Point Treatment Plant (King County, WA).

The results demonstrated clear size based performance differences: smaller granules (212–1000 µm) achieved 1.2–3.1times higher nitrogen and phosphorus removal rates compared to larger granules (2.0–2.7 vs. 0.7–1.9 mg N/g VSS/h), driven by greater aerobic volume and enriched populations of ammonia oxidizing bacteria and PAOs. However, these same small granules produced substantially higher N_2O emissions than larger granules (0.0025–0.007 vs. 0.001–0.002 mmol N/g VSS/h) due to deeper oxygen penetration that suppressed anoxic zones and hindered complete denitrification.

DO setpoints above 2 mg O_2/L amplified N_2O production across all size fractions, while DO levels of 1–2 mg O_2/L supported strong nutrient removal with reduced emissions. The findings highlight a key operational insight: selecting for moderately small granules while avoiding excessive aeration can balance AGS treatment performance with climate focused emission reduction goals.

These findings emphasize the need to carefully balance granule size selection with DO control to optimize AGS performance while minimizing greenhouse gas impacts. The findings are directly relevant to utilities considering AGS for nutrient-limited watersheds and climate-focused regulatory frameworks common in the Pacific Northwest. By translating microbial-scale mechanisms into practical operational guidance, this work supports data-driven decision-making for sustainable wastewater treatment design and operation.

Speaker(s):

Bao Nguyen Quoc, BNguyenQuoc@BrwnCald.com, Brown and Caldwell, Seattle, Washington

Bao Nguyen Quoc is a Senior Staff Environmental Engineer at Brown and Caldwell with deep roots in wastewater treatment research. He earned his doctorate from the University of Washington, where he spent nearly five years conducting hands-on research at the intersection of microbiology and wastewater engineering — including real-world consulting with King County and the City of Edmonds to help retrofit their treatment plants for enhanced nutrient removal. His work with aerobic granular sludge technology, nitrogen and phosphorus removal, and molecular microbiology gives him a unique ability to translate cutting-edge research into practical knowledge.

Operator-Centered and Multi-Modal Training for Complex Projects - Ship Canal Water Quality Project Storage Tunnel Training Program

Description:

While design and construction of large, complex wastewater infrastructure is a significant challenge for successful capital projects, ensuring operations staff are confident, prepared, and invested in running the system is just as crucial to long-term success. Without well-equipped operations staff, infrastructure may be subject to decreased life expectancy and weakened performance. Effective training is often an overlooked aspect of project delivery that can greatly improve the efficiency of capital projects.

Seattle Public Utilities (SPU) and King County's (KC) joint Ship Canal Water Quality Project (SCWQP) is an expansive storage and conveyance system designed to significantly reduce combined sewer overflows into the Lake Washington Ship Canal, Salmon Bay, and Lake Union. The Storage Tunnel project consists of a 2.7-mile long 19-foot diameter Storage Tunnel and four shaft sites with new equipment and operating systems.

Extensive planning and coordination were required to ensure the training program met the project's unique needs prior to asset handover to the utility. With support from Jacobs and Brown and Caldwell, SPU implemented an operator-centered training program that prioritized O&M staff concerns and engagement with iterative feedback as a key element throughout the program. Surveys, Q&A follow-up, and informal discussion with attendees were used to refine materials, adjust pacing, and identify knowledge gaps. Through transforming training into a collaborative process, this approach improved comprehension and retention of materials while building ownership and trust among O&M staff. Training content was delivered in both classroom and field sessions, and each session was recorded to provide attendees and future new employees with reference materials.

The lessons learned from the SCWQP Storage Tunnel training program demonstrate the value of operator-focused staff training when implementing new and complex capital projects. Attendees will leave this presentation with practical frameworks and replicable tools for developing effective training programs, along with insights on how centering operator voices can increase engagement, improve system operations, and support safer, more resilient infrastructure.

Speaker(s):

Asa Chavez-Knight, Asa.Chavez-Knight@seattle.gov, Seattle Public Utilities, Seattle, WA

Asa Chavez-Knight is a PNW-raised, Latina first-generation graduate & emerging professional from a low-income background. She is currently working on W/WW/CSO CIP projects as a part of the Project Delivery & Engineering branch at SPU. Asa is passionate about all things related to water, the environment, and creating a diverse and inclusive world.

Juliana Andrade, jandrade@brwncald.com, Brown and Caldwell, Seattle, WA

Juliana Andrade is an Environmental Engineer at Brown and Caldwell based in Seattle. Her work covers a broad range of water and wastewater projects, primarily involving comprehensive planning, regulatory compliance, asset management, and modeling for stormwater and wastewater systems.

Optimizing a Combined Sewer Overflow Long Term Control Plan Using Alternative Delivery Methods to Deliver CSO HighRate Treatment

Description:

This presentation provides a case study of the City of Lafayette, Indiana and how this vibrant community has optimized each project within the 20 year Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) to address the specific and changing needs of the community, alternating projects at each phase to change what was envisioned in the initial plan to provide the greatest benefit to the community. This has including changes to address localized flooding, redevelopment of key historic properties as well as partnering to cleanup and re-establish riverfront corridors. A key to the CSO LTCP program success has been the implementation of alternative project delivery utilizing an State specific model similar to Washington State General Contractor/Construction Manager (GC/CM). Alternative project deliver was key to success of constructing the CSO High-Rate Treatment (HRT) facility within schedule and meet to the financial constraints. This presentation will detail both the planning and screening of CSO technologies, the selected alternative, as well as the collaborative value engineering process that was possible because of the alternative delivery method in place.

Speaker(s):

Yan Duan, yan.duan@tylin.com, TYLin, Indianapolis, IN

Mr. Yan (Yen) Duan (Dwan) received his Master of Science in Environmental Science degree from Indiana University and is a Project Manager with about 11 years of experience in the modeling, planning, design, and construction services of wastewater collection and treatment. His project experience has included the modeling and design of many wastewater storage system that cover the spectrum from traditional concrete storage to alternative pipe storage method for clients throughout the Midwest. Mr. Duan is a registered professional engineer in Indiana.

Tim Healy, tim.healy@tylin.com, TYLin, Indianapolis, IN

Mr. Tim Healy, P.E., is an Office Director and Project Manager with TYLin, bringing more than 20 years of experience in the planning, design, and construction of wastewater collection systems and rehabilitation projects. His expertise spans sewer system renewal, trenchless rehabilitation technologies, and complex infrastructure delivery for municipal clients. Tim has led projects involving both new collection system

infrastructure and rehabilitation of aging assets, with a strong focus on sustainable, cost-effective water and wastewater solutions

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Optimizing Avian Influenza A(H5) Detection in Surface Waters with eDNA Mobile Filtration Sampler

Description:

The Oregon Wastewater Surveillance Program, a collaboration between Oregon State University (OSU), Oregon Health Authority (OHA), and utility partners, provides accessible and actionable public health data through routine wastewater surveillance. This data is integral to the state's pandemic preparedness. In late 2021, highly pathogenic avian influenza A (H5Nx clade 2.3.4.4b) spread into North America, causing poultry outbreaks in the United States by spring of 2022. In March of 2024, it began causing outbreaks among cattle populations. While the risk of human infection is currently low, its potential pandemic risk assessment is moderate, prompting the program to add analysis of influenza H5. Eventually, environmental surface water analysis of H5 may add to the robust dataset helping proactively identify trends in pathogen transmission.

Efforts to analyze H5 or other pathogens in the environment would require field collection, transportation to OSU, and analysis in a laboratory setting. This protocol features several steps in which viral signal can degrade. The coupled effects of extended time between sampling and processing, constrained sample volumes and low viral concentrations may yield too low of a concentration for sequencing and identification of avian influenza subclades or other pathogens. Methodology to sample larger volumes of surface water for pathogen detection is being developed that may address these concerns.

Experiments with the Smith Root eDNA Sampler, a mobile filtration system, in place of vacuum filtration, have been initiated. Utilization of this system dramatically increases possible filter volume and eliminates the need for transportation between the sample and filtration locations. Further optimization and testing of this technique, beginning with membrane material selection, will be performed to determine the impact on signal strength. Additionally, as the presence of H5 in surface waters may vary seasonally, microbial source tracking kits will also be used for assay optimization.

Speaker(s):

Bella Beha, behai@oregonstate.edu, Oregon State University, Corvallis, Oregon

Bella Beha is a fourth-year Honors Environmental Engineering student with a minor in Chemistry at Oregon State University. She has been working with the Oregon Wastewater Surveillance program for a year and a half.

Optimizing SBR Aeration Through Data-Driven Modeling

Description:

Sequencing batch reactors (SBRs) are typically operated with fixed cycle times designed to ensure complete nitrification under worst-case loading and temperature conditions. Under normal operation, this conservative approach often results in excess aeration after nitrification is complete, leading to unnecessary energy use and underutilized treatment capacity. At the Calera Creek Water Recycling Plant (CCWRP), five SBR basins operate in time-sequenced phases to achieve full nitrification required by the discharge permit, but the facility lacks real-time indication of nitrification completion. Reducing aeration duration would lower energy demand and create idle time that could be reallocated to increase fill fraction, improve hydraulic buffering, or enhance wet-weather capacity without physical expansion.

Simulation exercises were performed with DHI's WEST process modeling tool. Scenarios explored tradeoffs between treatment capacity and nitrification performance by varying the number of active basins and fill strategies. Operating fewer tanks concentrated biomass and improved nitrification, reducing effluent ammonia but decreasing operational margin. Operating more tanks increased idle time and available capacity but degraded nitrification for the same aeration input. Scenarios with extended fill phases performed poorly due to insufficient airflow per basin to meet instantaneous oxygen demand.

The model was also used to evaluate aeration control based on nitrification endpoint detection using robust online signals such as DO and ORP. A multivariate Hotelling T^2 approach was implemented to identify conditions consistent with nitrification completion without direct ammonia measurement. Over the evaluation period, average aeration time per cycle was reduced by approximately 28% compared to time-based control, while total daily blower runtime remained unchanged.

Dynamic modeling enabled efficient screening of operational strategies, while multivariate endpoint detection shows promise for increasing operational flexibility. Full-scale validation using existing sensors is recommended prior to implementation.

Speaker(s):

Thomas Maere, tmae@dhigroup.com, DHI, ,

As a Wastewater Treatment Specialist with a PhD focused on optimization of MBR technology, Thomas helps utilities improve wastewater treatment plants through process modeling and control, and by implementing digital twins for real-time insights into plant performance. Thomas has a broad skillset based on education in engineering, environmental, and agricultural sciences, with a specialization in biological wastewater treatment, mathematical modelling, and process optimization through various projects.

Optimizing the Benefits of I/I Reduction: Oregon City's Approach to Private Side Laterals

Description:

The City of Oregon City is the oldest city in Oregon, and Wallis Engineering has been the consultant manager of Oregon City's I/I Reduction Program since 2021. This $30M program has a goal of reducing I/I by 65% in select

sewer basins. Ultimately, the goal is to address I/I as an alternative to costly infrastructure improvements for Clackamas Water Environment Services (the regional wastewater treatment provider). While developing the program with the City, we determined that the best way to achieve this challenging goal was to rehabilitate not just the public-side sewer main and laterals, but also the private-side laterals.

Addressing private-side laterals can be incredibly challenging, because it requires private property owners to agree to contractors working on their property - and the unavoidable impacts that occur. To manage this challenge, we developed a highly-effective design-build style approach to rehabilitating private laterals. Our approach has allowed us to reduce design investigation efforts and contractor construction risks in rehabilitating highly variable private laterals. Overall, this has minimized the cost of I/I reduction for the City.

In order to maximize property owner participation and the overall program's effectiveness, we've led a robust public outreach effort. This allowed us to obtain property owner permission up to, and even during construction - without delaying the schedule. On the most recent construction contract for the program, we received property owner permissions from approximately 88% of the involved properties. The program has been enormously popular with property owners, and neighborhood associations have been true partners with the City in getting the word out.

We will talk about how the I/I Reduction Program was developed, how projects to address I/I reduction are determined, and the full approach we take to private side lateral rehabilitation with this program. I'll also discuss the results of flow monitoring after improvement projects have taken place, and the progress the City has made in achieving their goal.

This presentation should be of interest to those looking for a road map to optimizing I/I reduction within a limited budget.

Speaker(s):

David Brokaw, david.brokaw@walliseng.net, Wallis Engineering, Vancouver, Washington

With 30 years of experience, Dave Brokaw is a senior civil engineer and project manager at Wallis Engineering. He specializes in managing complex utility and street reconstruction projects. He has also managed and led design of a variety of stormwater system improvement projects. He has managed multi-year infrastructure upgrade projects for several municipalities that included both utility and transportation components. He is currently in the 5th year of managing the Oregon City's I&I program.

Prior to his 16 years at Wallis, Dave managed a transportation group for Opus International Consultants in New Zealand and worked for BKF Engineers in San Jose, CA. Dave has a bachelor's degree in civil engineering from California Polytechnic State University – San Luis Obispo.

Outside of work, Dave spends an inordinate amount of time shuttling his three kids between activities. When he's not doing that, he enjoys backpacking trips with his family in the Pacific Northwest.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Origin of a Species: The Evolution of the Modern Day Mechanically Cleaned Bar Screen

Description:

This presentation will trace the development of bar screens over the past hundred years, focusing on distinct types of screens and major technical advancements. Since many screens are still functional, a comparison of the advantages and disadvantages of each screen including capital cost, overall maintenance, durability, treatment capacity, operational flexibility and other factors will be made. The presentation will discuss where and how they are best utilized and will address various design considerations for each type of screen that a consulting engineer should consider when recommending a bar screen. Finally, this paper will explore strategies to extend the lifespan of existing bar screens by a decade or more, with a particular focus on mitigating the impact of flushable wipes— a persistent challenge in modern wastewater treatment.

Speaker(s):

Gary M. Lohse, P.E., garylohse@gmail.com, Atlas-SSI Inc, Hoiuston, TX

Mr. Lohse has a BS in Environmental Engineering from the Pennsylvania State University and a MS in Civil Engineering from the Arizona State University. He has a Professional Engineer's License in the states of Arizona, Pennsylvania and New Jersey. He has earned operator licenses for Wastewater Collection and Treatment and for Water Distribution and Treatment in the State of Arizona. Mr. Lohse has also received a Project Management Professional license. He has over twenty-five years of experience in the water and waste water industry and has worked for a variety of firms including HDR Engineers, American Water, Veolia Water, Alfa Laval, DeNora and Hydro International. Mr. Lohse is currently the Municipal Western Regional Sales Manager for Atlas-SSI, a leading supplier manufacturer of traveling water screens, trash racks, bar screens and grit processing equipment.

Andrew Maguire, , WSG & Solutions Inc, Montgomeryville, PA

People and Pixels: Leading and Managing in an Increasingly Virtual World

Description:

Humans have evolved through millennia of in-person interaction. Yet in just a few years, utilities and public agencies have found themselves navigating a fundamental shift in how work gets done – leading teams and making decisions through a screen. Remote employees with work-life balance expectations, hybrid work schedules, and rapidly advancing digital tools have pushed utilities and municipalities further into the virtual environment – without the benefit of the millennia of practice. This shift to the two-dimensional workspace introduces complexity to direction-setting, decision-making, resource allocations, performance management, and change management across teams, projects, programs, and organizations.

In this 101-level session we explore what participants and their organizations are experiencing, display techniques for managing productive virtual interactive sessions, and learn of the forthcoming influences upon our increasingly virtual world.

The session begins with a live, participant-driven survey to characterize current workplace realities across the audience, including the prevalence of remote and hybrid work, availability of in-person interaction, and the extent to which key decisions are made virtually. Results will be displayed in real-time, allowing participants to benchmark their organizations against peers across the region.

Building on this shared context, the presentation will highlight:

- A successful example of how one of the Pacific Northwest's largest wastewater utilities carried out a direction-setting and decision-making process entirely virtually.

- Practical techniques for designing and facilitating productive virtual sessions that drive alignment, accountability, and timely decisions.

- Impressions of emerging trends influencing the virtual workspace, including generational workforce expectations, the use of virtual project delivery tools, and anticipated application of artificial intelligence.

Participants will leave with a sense of how peers are navigating this increasingly virtual world, how to manage a successful virtual decision-making process, and what to expect as our industry continues to evolve with new digital tools. This session is relevant for utility leaders, project managers, and team leaders seeking to strengthen organizational performance.

Speaker(s):

Dan Speicher, dan.speicher@jacobs.com, Jacobs, Bellevue, WA

Dan brings 30+ years of infrastructure experience, beginning with environmental documentation for transportation projects. An MBA graduate, he combines technical industry knowledge with a strong focus on how teams and organizations deliver for public and private clients. He develops, aligns, facilitates, and mentors teams to drive project and program success. Over 28 years at Jacobs, he has supported municipalities, ports, airports, state and federal agencies, advanced facilities, public works departments, and utilities.

Permits, Petitions, and Progress: Delivering Under the Three Basin Rule

Description:

In March 2023, Marion County initiated the design and construction of a new wastewater treatment plant on behalf of the North Santiam Sewer Authority and the City of Mill City to replace aging infrastructure and support the rebuilding of communities devastated by the 2020 wildfires. The project is funded through the American Rescue Plan Act (ARPA), which requires strict compliance with federal procurement, reimbursement, and reporting standards, as well as adherence to a firm construction completion deadline of October 2026, when the funding expires.

At the time of permitting and early construction, Oregon regulations prohibited wastewater treatment systems from discharging into the Clackamas, McKenzie (above river mile 15), and North Santiam basins without an NPDES Permit due to their designation as high-quality drinking water sources for municipalities and

downstream users. Marion County issued a petition on Aug 30, 2024 to grant DEQ the authority to issue a new NPDES permit to discharge into these water sources. In December 2025, while the project was under active construction, the Oregon Department of Environmental Quality (DEQ) revised the Three Basin Rule, allowing DEQ to issue a new water quality permit that will allow the facility to discharge to these basins under limited circumstances consistent with the stated objectives of the Three Basin Rule.

This presentation explores how Marion County, with support from Slayden and Keller, navigated updated regulations during active project delivery under a CM/GC contract. The accelerated design and early work packages (initiated prior to final permit issuance) were critical to meeting ARPA's fixed October 2026 deadline and would not have been feasible under a traditional delivery model. The discussion highlights how early contractor involvement and a collaborative contractor–client relationship enabled construction to proceed while permitting evolved, and how regulators and project proponents interpreted transitional provisions, relied on previously approved standards, and defined compliance pathways for a facility already under construction. It also examines the tension between evolving regulatory objectives and federally funded schedules that limit the practical integration of newly adopted policy standards.

This case demonstrates how rule changes can introduce significant compliance, schedule, and funding risks for projects operating under federally imposed deadlines. Lessons learned emphasize the importance of proactively evaluating existing regulations to identify opportunities for thoughtful modifications that better serve the community. As emergency funding programs and regulatory updates continue across the Pacific Northwest, this case study offers a practical framework for managing regulatory change without sacrificing project certainty.

Speaker(s):

Luke Jones, luke.jones@mwhconstructors.com, Slayden Constructors, Salem, Oregon

Luke Jones is a Project Engineer at Slayden Constructors with one year of experience supporting the construction of wastewater infrastructure projects that serve growing communities. Based in Oregon, he enjoys contributing to projects that improve public utilities and help expand reliable infrastructure for local residents.

Tsigereda Woldegiorgis, TWoldegiorgis@co.marion.or.us, Marion County, Salem, Oregon

Tsigereda is a seasoned engineer with a master's degree in civil engineering and over a decade of infrastructure experience, currently leading the North Santiam Canyon Sewer Project for Marion County Public Works in Oregon.

Pamela Villarreal, pvillarreal@Kellerassociates.com, , ,

Pamela has 14 years of experience with various aspects of environmental remediation, stormwater, water, and wastewater treatment from the preliminary planning and development stages through design and construction management. She holds a bachelor's degree

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PFAS Mitigation at Water Reclamation Facilities Leveraging Existing Processes

Description:

Per- and polyfluoroalkyl substances (PFAS) present a persistent challenge for water reclamation facilities (WRFs) because they resist conventional treatment and accumulate in both effluent and biosolids. This study, conducted under Water Research Foundation Project 5212, evaluates whether enhanced aeration—paired with targeted capture of PFAS-enriched aerosols and foams—can offer a practical, scalable removal strategy that integrates into existing WRF infrastructure. The research pursued three goals: demonstrating PFAS removal through aerosol and foam capture, validating results at full scale, and designing a prototype collection system.

Bench-scale tests used fine-bubble aeration and sorbent pads placed at varying heights to measure PFAS capture under controlled conditions. Results showed removal efficiency strongly depended on aeration intensity and collection distance. At optimized conditions—high aeration and a 2.5-cm sorbent pad height—PFOS removal reached 97%, while several other PFAS exhibited 65–75% removal. Removal patterns aligned with air-water interfacial sorption behavior, indicating that PFAS with higher surface activity more readily partition into aerosols. Precursors such as 6:2 fluorotelomer sulfonamido propyl betaine also decreased significantly (94%), suggesting benefits for both terminal compounds and precursors.

A field demonstration at a major municipal WRF confirmed these trends. Sampling of wastewater, the surface microlayer (SML), and stable foam showed substantial PFAS enrichment at air-water interfaces; enrichment factors exceeded 1,000 for PFOS in foam and reached 64 in SML samples. Flux measurements demonstrated rapid decreases in PFAS concentration with increased height above the water, reinforcing the importance of near-surface capture. Screening-level modeling suggested PFOS reductions of up to 99% could be achieved at full scale under optimized conditions.

To translate these findings into practice, the team developed a prototype aerosol/froth collection device incorporating inverted funnels and continuous capture vessels. Field deployment showed effective real-world performance and the potential for basin-wide, near-complete PFOS removal. Because this approach leverages existing aeration systems, requires no chemical additives, and involves minimal retrofits, it offers a cost-effective and sustainable pathway for utilities navigating increasingly stringent PFAS regulations. The study recommends further work to refine system design, evaluate long-term performance, expand PFAS species coverage, and manage concentrated PFAS residuals.

Speaker(s):

Michael Cubas, cubasmp@cdmsmith.com, CDM Smith, Los Angelos, CA

Michael Cubas holds a Bachelor of Science in Civil Engineering from Loyola Marymount University and is a water resources engineer in the CDM Smith Water Resources Group. Michael has over 13 years of utility and consulting experience leading multidisciplinary efforts on complex initiatives including PFAS sampling and data analysis, risk and resilience assessments, and development of asset management frameworks for large-scale infrastructure systems. His work spans emerging contaminant composite and grab sample planning, execution and analysis, facility and asset condition assessments, and project management, integrating data-driven insights into practical, implementable solutions.

Piloting MABR Nitrogen Removal Under Real World Operating Constraints

Description:

Many wastewater treatment plants in the Pacific Northwest face tightening nitrogen permit requirements while managing aging infrastructure and constrained footprints. Cold-weather performance, energy efficiency, and constructability within existing tanks are key considerations. Innovative biological treatment technologies, such as membrane aerated biofilm reactors (MABRs), offer potential advantages for process intensification but require site-specific evaluation.

The City of Klamath Falls Spring Street Sewage Treatment Plant is engaged in long-term planning to address increasingly stringent nitrogen limits. To inform future planning and reduce uncertainty, a 24-week pilot study was conducted to evaluate MABR performance, operational constraints, and data needs for full-plant process modeling.

A pilot-scale MABR study was conducted using a skid-mounted ZeeLung MABR system at the Spring Street facility. Mixed liquor was withdrawn as a slipstream from the middle of the anaerobic zone of the main aeration basin, screened, treated through the MABR pilot, and discharged to drain. Reliable screening of mixed liquor was identified as a critical pre-requisite for stable MABR operation.

Early phases of the pilot were dominated by efforts to establish reliable mixed-liquor screening, while later phases focused on evaluating the influence of hydraulic loading on biofilm development and nitrification performance. Plant operators ran the pilot day-to-day, including probe calibration, field analyses using Hach test kits, and routine sampling. Pilot data were used to support calibration of a full-plant BioWin model.

The pilot study demonstrated that observed MABR performance is strongly influenced by feed characteristics, screening reliability, and hydraulic conditions.

During stable operating phases, nitrification rates ranged from approximately 1.07 to 1.31 g-N/ m^2/d, despite lower-than-anticipated influent ammonia concentrations. Nitrification performance varied with hydraulic loading, with higher flow rates associated with reduced biofilm thickness and lower observed nitrification rates, likely due to increased hydraulic scour. Key outcomes include identification of mixed-liquor screening as a critical operational consideration, recognition of hydraulic scour as an important factor influencing biofilm development, and generation of site-specific data to inform process modeling and future planning. Operator-led pilot operation improved data quality and provided valuable hands-on experience, reducing uncertainty associated with potential process intensification strategies.

Speaker(s):

Anne Conklin, aconklin@carollo.com, Carollo Engineers, Seattle, WA

Dr Conklin is a Chief Technologist at Carollo Engineers and has more than 20 years of experience in facility planning and wastewater treatment process modeling.

Nikita Kowal, NKowal@carollo.com, Carollo Engineers, Portland, Oregon

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Pipe Ramming for the Frogs

Description:

The Palensky Wildlife Underpass Project (Project) installed a wildlife underpass beneath the four-lane Lower Columbia River Highway (US 30) to reconnect restored wetlands adjacent to the Columbia River to the Tualatin Mountains, northwest of Portland, Oregon. The underpass was designed to provide a safe passage corridor for the Northern Red-legged Frog, designated as a Sensitive Species, as the frogs migrate between their mountain and wetland habitats. A Feasibility Study evaluated four trenchless methods for installing a 54-inch diameter, 1-inch-thick steel casing pipe to function as the underpass, with piping ramming selected as the preferred method.

The road embankment fill used for US 30 construction presented installation challenges as well as settlement risks for pipe ramming. The design also had to address the practical challenges of a construction work zone situated between US 30 and a railroad as well as the anatomical characteristics of the Northern Red-legged Frog. Critical design elements for Project success included approximately 600 linear feet of custom cast-in-place concrete channelizing/retaining walls, illumination light boxes, and specialty features inside the casing to encourage usage by frogs.

This presentation will discuss the multi-agency Project approach, geotechnical conditions, frog-friendly design, and construction.

Speaker(s):

Brandon Falk, brandon.falk@consoreng.com, Consor, Portland, Oregon

Brandon Falk is a Professional Engineer with eight years of experience serving municipal clients throughout the Pacific Northwest, including water and wastewater pipelines, condition assessments, pump stations, and stream improvement projects. He has a strong background in trenchless technologies for both rehabilitation and new installation projects.

Brendan O'Sullivan, brendan.osullivan@consoreng.com, Consor, Portland, Oregon

Brendan O'Sullivan is a Principal Engineer and Trenchless Technologies Technical Practice Leader for Consor working out of Portland, Oregon. He has 21 years of experience in the consulting industry serving municipal clients throughout the United States.

PNW WateReuse: Water Right Considerations

Description:

The presentation will introduce water rights law and policy interaction with water reuse, compare and contrast the law and policy of Idaho, Oregon and Washington, and offer observations on current issues and opportunities.

Speaker(s):

Adam Gravley, awg@vnf.com, , ,

Adam Gravley earned his JD at Georgetown University Law Center in 1990. He has over three decades experience representing both public and private clients in environmental law with a particular focus on resolving water issues in operational, transactional, litigation, and public policy settings. His comprehensive practice includes water rights permitting, transfers, and appeals; general stream adjudications; settlement, mediation, and collaborative resolutions; water supply agreements; public water system and drinking water regulation; water quality regulation and resource protection; entity and regional governance; legislation and agency rule-making; and related real estate, municipal, and public utility law matters.

Policy Shifts & Technology Transitions: Scaling Biosolids Thermal Drying for Long Term Resilience

Description:

The biosolids management landscape in the United States is shifting rapidly as regulatory, economic, and environmental pressures limit traditional practices such as Class B land application and landfill disposal. Several states have enacted PFAS-related restrictions. Maine was the first to ban land application and sale of PFAS-containing biosolids, while Colorado, Connecticut, Massachusetts, Maryland, Michigan, Minnesota, New Hampshire, New York, and Wisconsin have implemented monitoring or tighter land-application controls. Rhode Island now requires quarterly PFAS testing and allows regulators to deny permits if levels are excessive. These actions have increased uncertainty for utilities seeking reliable, long-term biosolids solutions.

Landfill options are also tightening due to PFAS liability, leachate challenges, and increased regulatory scrutiny. National guidance now emphasizes PFAS monitoring, source reduction, and risk management, further narrowing conventional disposal pathways.

As a result, many utilities are turning toward thermal drying to produce Class A biosolids, providing a product with broader end-use and disposal flexibility, reduced volume, lower hauling requirements, and improved marketability. Thermal drying also provides agencies with a treatment pathway that can bypass digestion when digestion is not cost-effective or when Class A standards can be met through drying alone. Bypassing of digestion, directly to drying, retains additional thermal value if considered as a fuel source.

Business case evaluations—incorporating life-cycle analysis of capital costs, operating and energy costs, hauling and disposal fees, and optional digestion processes—have emerged as the primary decision-making framework guiding these investments. These analyses allow utilities to compare multiple biosolids management scenarios under future regulatory uncertainty, including PFAS-related liabilities and reduced outlet availability.

This presentation will present regulatory trends, PFAS-driven constraints, and their impact on biosolids planning. Attendees will learn how to develop a defensible business case, compare lifecycle costs, evaluate digestion versus direct-to-dryer options, and assess outlet risk.

Case studies will demonstrate how utilities have used this structured, scenario-based approach to support thermal drying investments. The methodology is scalable for utilities of all sizes and can be tailored to local regulations, market conditions, energy prices, and growth forecasts to support resilient, future-ready biosolids strategies.

Speaker(s):

Jeremy Koch, jkoch@ardurra.com, Ardurra Group, Inc., Miami, Florida

Jeremy's is a professional engineer and Ardurra Water Market Director for the east regions with 29 years of experience. His technical and project delivery experience is focused on assisting municipal clients on a broad spectrum of potable water, wastewater and water management issues, including treatment facilities, conveyance systems, biosolids management, water reclamation, and utilities management. Process, pumping and piping include evaluation and design for more than 40 treatment facilities (up to more than 250 million gallons per day), 150 pumps stations and conveyance pipelines ranging up to 96-inch diameter. Program management and utility master planning range from small to large scale (>1MM pop.) to address issues including regulatory compliance, water supply, energy management, water quality, residuals/biosolids management and capital planning.

Post Point's Nutrient Reduction Evaluation Findings

Description:

For the past 6 years, the Washington State Department of Ecology (ECY) has been developing regulations associated with controlling nitrogen discharged into Puget Sound because of reported low dissolved oxygen levels. The City of Bellingham's Post Point WWTP operates an activated sludge process to meet effluent BOD5 and TSS NPDES limits. Incorporating nitrogen removal into plant operation would require investing in an unprecedented level of additional infrastructure. The City is focused on collaborating with ECY to ensure that the nutrient regulations that are being developed are science-based, appropriate for their community, result in public and ecologically meaningful outcomes, and balance the highest water quality attainable with utility rates that support community affordability.

Even though the 2022 Puget Sound Nutrient General Permit was invalidated in 2025, the City of Bellingham has voluntarily continued with development of the Nutrient Reduction Evaluation (NRE) to help inform the potential impacts to its existing infrastructure. Evaluation efforts included reviewing representative alternatives to achieve a seasonal effluent total inorganic nitrogen (TIN) concentration of 3 mg/L (April – October). The three alternatives evaluated included 1) conventional treatment expansion, 2) intensification with a membrane aerated biofilm reactor (MABR) and 3) a split-plant approach that maximizes nitrogen removal capacity using existing infrastructure and constructing additional capacity in the smallest footprint using membrane bioreactor (MBR) technology.

The cost and non-cost impacts of these three alternatives were compared to allow for a selection of a 3 mg/L (seasonal) alternative to include in the NRE. Through this process, the planning team documented the impacts of each alternative on 14 community values metrics determined by the planning team.

Key preliminary findings included:

- All alternatives completely utilize the south expansion area of the site, representing a full and complex buildout of the available treatment plant space, and limiting future capacity upgrades.

- Energy use increased between 30 to over 130 percent of current levels.
- AACE class 5 capital cost opinions for the nitrogen reduction infrastructure upgrades were in the $300 million range.

This session will also present the background on ECY's modeling results in Bellingham Bay along with the results of the City's NRE.

Speaker(s):

Anne Conklin, aconklin@carollo.com, Carollo Engineers, Seattle, WA

Dr Conklin is a Chief Technologist at Carollo Engineers and has more than 20 years of experience in facility planning and wastewater treatment process modeling.

Progressive Design Build Provides Lessons Learned from the Pandemic for Critical Infrastructure

Description:

The COVID 19 pandemic tested the resilience of utilities by disrupting staffing, supply chains, and decision making while the need for safe, reliable water never stopped. This presentation shares lessons learned from the City of Lewiston, Idaho as it delivered a critical water treatment plant project during the pandemic, with a focus on delivery excellence, utility leadership, and operator resilience.

Lewiston serves a population of about 34,000 through a blended water system. The City's largest and preferred source was a 100 year old water treatment plant with aging infrastructure, limited redundancy, a constrained site, and growing risk of failure. These challenges were compounded by limited rate capacity and the need to maintain public confidence during a global health crisis.

To manage risk under uncertainty, the City selected Progressive Design Build (PDB). This delivery method supported early and continuous collaboration among utility leadership, operators, engineers, contractors, and regulators. Open book pricing and design to budget principles helped leaders make informed decisions while conditions were rapidly changing. Operators played a central role in evaluating alternatives, planning temporary operating conditions, and shaping constructability decisions.

Resilience strategies focused on both water supply and project delivery. Water modeling, well reliability improvements, evaluation of water chemistry, and contingency planning—including temporary treatment solutions to help protect continuous service. Delivery risks were addressed through early procurement of long lead equipment, close coordination with the membrane supplier, and early, frequent engagement with operations and permitting agencies.

The key takeaway is simple: resilient utilities rely on strong leadership, empowered operators, and clear communication. When uncertainty is high, PDB delivery can facilitate early collaboration, honest discussions about risk, and practical contingency planning to help keep systems reliable and communities protected.

Speaker(s):

Michael Fuss, Michael.Fuss@Stantec.com, Stantec Consulting Services Inc., Boise, ID

Michael is a professional engineer with more than 37 years of experience in municipal utilities, regulatory compliance, and consulting. At Stantec, Michael supports alternate delivery and business development efforts across the water sector, helping clients successfully achieve strategic goals. He has been with Stantec for 8 years where with every community we redefine what's possible.

Quantifying PFAS in Crops and Wetland Vegetation at Land Application Sites

Description:

Per- and polyfluoroalkyl substances (PFAS) are persistent environmental contaminants with documented potential to harmfully affect human health. Uptake of PFAS into vegetation represents a potential pathway for human exposure and ecosystem impact through the food web and is of great concern to utilities doing land application of reuse water or biosolids. While ongoing scientific and regulatory efforts have made substantial progress in characterizing PFAS in water and soil, our understanding of PFAS uptake and bioaccumulation in vegetation is much more limited.

Consequently, uncertainty remains in exposure assessment and risk evaluation for human and ecological receptors, leading to speculation and broad generalizations about the relative risk or safety of land application of reuse and biosolids. Wastewater utilities need data on PFAS in vegetation to protect their land application programs and address concerns from regulators, farmers, and the public.

This knowledge gap is driven in part by the absence of standardized analytical methods for PFAS in plant tissue. For example, EPA Method 1633A includes standard methods for soil, water, biosolids, and animal tissue, but not plant tissue. Establishing a reliable method for vegetation is essential for informed decision-making, regulatory development, and safe expansion of water reuse practices.

Clean Water Services practices beneficial reuse via biosolids land application and use of Class A reuse water to irrigate golf courses and restored urban wetlands. While we have extensively studied PFAS in soil and groundwater, our knowledge of PFAS in vegetation has been limited by the lack of a method. This presentation will discuss the establishment, validation, and preliminary application of an analytical method for quantifying PFAS in vegetation based on EPA and FDA methods, developed in-house. This method can be used across a broad range of vascular plants relevant to water reuse and environmental monitoring applications. We will discuss the development and onboarding of the PFAS vegetation method, including data from interlaboratory validation to assess method reliability and reproducibility. Preliminary results from wetland vegetation from the site of an ongoing reuse pilot for a restored urban wetland will be presented, as well as initial testing of crops grown under controlled mesocosm conditions.

Speaker(s):

Kimia Tabib, TabibK@CleanwaterServices.org, Clean Water Services, Hillsboro, Oregon

With years of lab experience, Kimia Tabib joined Clean Water Services as an Operations Analyst, focusing on emerging contaminants. In 2025, she completed her master's thesis at Oklahoma State University on PFAS uptake in herbs, earning the Graduate Research Excellence Award. Her presentations also received recognition from the American Chemical Society (ACS) and the Association of Environmental Engineering and Science Professors (AEESP).

Quantitative Water Quality Risk Assessments

Description:

As regulatory limits continue to tighten to protect public health and the environment, utilities across the region will need to execute transformative upgrades to their wastewater treatment systems. One method to addressing increasing regulations in historic receiving waters is to consider Recycled Water applications that remove flow from traditional discharges.

A major hurdle to the acceptance of water recycling by regulators and the public is the perceived risk associated with consuming recycled water, whether intentionally or incidentally. A utility seeking to augment their system with reclaimed water must demonstrate this practice does not create undue excess risk from a health risk perspective. Southern Water Services Limited (SWS) in the UK, which provides water services to 2.7 million customers, has adopted quantitative relative chemical assessment (QRCA) to evaluate water recycling as a strategic alternative to meet future demands. A treatment pilot consisting of sequential ultrafiltration, reverse osmosis, and ultraviolet advanced oxidation processes was installed at a local municipal water treatment facility. To assess risk, 296 chemical contaminants of health concern—including trace organics, pesticides, pharmaceuticals and personal care products, disinfection byproducts, volatile organic compounds, metals, and inorganics—were measured before and after each treatment step and in two existing surface waters for 12 months.

This study presents the results of a novel stochastic QRCA approach using Monte Carlo simulations developed for SWS to compare relative health risks at each sample location and assess the viability of recycled water as a solution to water quantity and quality questions. The presentation will demonstrate how the results of QRCA can be applied to guide decision making around water recycling as well as teach the audience the basics of health risk assessment methods. Ultimately, this study provided Southern Water with a comprehensive set of risk probability distributions to communicate with regulators and inform the design of a future Water Recycling Plant.

Speaker(s):

Topher Jones, TJones1@brwncald.com, Brown and Caldwell, Seattle, WA

Topher is Brown and Caldwell's Water Reuse National Technology and Innovation Leader. He specializes in technical evaluations that incorporate uncertainties and risks to inform decision making. He received his PhD at the University of Colorado Boulder where he connected technical considerations to decision-making practices.

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Reducing Risk and Improving Performance in Thermal Hydrolysis Systems

Description:

Thermal hydrolysis pretreatment (THP) has become an attractive option for utilities seeking to increase digester capacity, improve biogas production, and reduce biosolids management costs. THP can significantly improve anaerobic digestion performance by increasing volatile solids destruction, enhancing biogas yields, improving dewaterability, and enabling higher digester loading rates or reduced digester volumes. Despite its demonstrated benefits, broader adoption has been slowed by uncertainty related to operability, maintenance burden, and downstream impacts. Utilities interested in implementing THP must weigh high capital costs, increased system complexity, and operational considerations such as maintenance burden, health and safety risks, and potential downstream impacts on liquid treatment processes against potential benefits.

To address these and other challenges, the Water Environment Federation launched the RISE (Research and Innovation for Strengthening Engagement) program with the goal of accelerating adoption of innovative technology. Equipment suppliers, academic researchers, consultants, and most North American utilities with interest or direct experience in hydrolysis formed a RISE focus group centered on "Improving Pre Digestion Hydrolysis". The group identified common questions, challenges, and opportunities that affect system performance and ease of ownership. These issues were distilled into three overarching themes: improving operability and process performance; managing end product considerations; and addressing health, safety, and staffing impacts associated with THP systems.

The RISE effort enabled candid peer to peer knowledge sharing on topics such as steam and energy management, sludge cooling, pre and post digestion dewatering, odor control, sidestream impacts, and strategies for reducing maintenance effort across pressure vessels, heat exchangers, pumps, and pneumatic systems. This group's findings, which were presented in a 2.5 hour long technical session at the 2025 WEF Residuals and Biosolids Conference (by 5 US utilities operating THP systems), will be distilled in this presentation for PNCWA.

This session translates those lessons learned into actionable insights for engineers, operators, utility managers, and industry partners considering or operating THP systems. Attendees will gain an understanding of how collaborative learning can reduce risk, and where future innovation and optimization efforts should be focused to improve the performance and sustainability of pre-digestion thermal hydrolysis programs.

Speaker(s):

Tom Nangle, tnangle@brwncald.com, Brown and Caldwell, Raleigh, North Carolina

Tom is Brown and Caldwell's Solids National Specialty Leader and has planned, designed, provided construction, startup, and troubleshooting services for solids facilities around the country. He chairs WEF's "High Performance Digestion" Task Force, as well as chaired WEF's "Improving Pre-Digestion Hydrolysis" Focus Group. He has been an instructor for Anaerobic Digestion and Solids Handling courses at Wastewater Operators Schools and is passionate about making water reclamation solids facilities safer, more efficient and easier to own and operate.

Reimagining Water Utility Automation: Lessons from the City of Conroe's Software Defined Transformation

Description:

Water utilities are at a crossroad, facing pressures from aging infrastructure, evolving regulations, climate change, workforce retirements, and growing demand for real-time insights. Traditional automation systems, built on proprietary, vertically integrated architectures, have served for decades but now hinder innovation. Their rigidity, high upgrade costs, and limited scalability slow adoption of advanced technologies like predictive analytics, digital twins, and cloud orchestration, leaving utilities less agile.

Enter Software-Defined Automation (SDA), a new paradigm that decouples control logic from hardware, enabling centralized orchestration through containerized software modules. Leveraging open standards and interoperable frameworks, SDA offers flexibility, scalability, and future-proofing. The City of Conroe, Texas, provides a compelling example.

City of Conroe: A Utility's Journey

As one of the fastest-growing U.S. municipalities, Conroe needed to modernize water and wastewater infrastructure for resilience and growth. Partnering with Schneider Electric, the city deployed SDA across 19 facilities in just eight months—a transformation of technology, operations, and workforce engagement.

The transition began with assessing legacy assets for SDA compatibility and integrating predictive maintenance and AI. Workforce readiness was critical; operators received hands-on training to build confidence and foster a proactive culture.

Daniel Roberts, Conroe's Water & Sewer Superintendent, shared: "When legacy systems were out, we relied on manual controls and even customers as our warning system. Gathering data took four to five hours daily for one or two operators. Now, that information is ready each morning across all 19 sites. EcoStruxure Automation Expert has reduced recovery time by up to 80%."

Practical Lessons and Benefits:

•Workforce Empowerment: Training and user-friendly tools helped staff shift from reactive to proactive operations.

•Tangible Outcomes: SDA improved resilience, cybersecurity, and vendor independence, enabling faster anomaly response, streamlined reporting, and reduced manual work—delivering cost savings and reliability.

•Intangible Value: Embracing change fostered innovation and adaptability, setting a benchmark for smart water infrastructure and inspiring other municipalities.

City of Conroe's success shows SDA can unlock agility, data-driven decisions, and sustainability. As challenges evolve, utilities would benefit greatly from including SDA in long-term roadmaps. This session offers actionable insights for evaluating SDA readiness and influencing industry standards through collaborative engagement.

Speaker(s):

Aayush Patel, aayush.patel@se.com, Schneider Electric, Dallas, TX

Aayush Patel holds a Bachelor's degree in Computer Engineering from Purdue University. His passion for sustainability and automation led him to a career at Schneider Electric where he has driving business development for Schneider Electric's Open Software Defined Automation platform. He has been working with municipalities across the Midwest to migrate their automation to an open standard. He is dedicated to advancing the field of industrial automation through innovative solutions that prioritize efficiency, resiliency, and sustainability.

Remote Lab: Rapid On-Site Detection of Candida auris in Wastewater

Description:

Wastewater surveillance is a method for the detection of pathogens in wastewater, and has been widely adopted for monitoring viral and bacterial pathogens present in a community. However, wastewater surveillance for fungal species remains limited. The yeast Candida auris is an emerging multidrug-resistant pathogen and a growing public health concern. The aim of this project is to develop an on-site method for the detection of C. auris in wastewater through a three-step process: sample collection, nucleic acid extraction, and DNA amplification. Samples are collected through an in-pipe passive sampler developed at Oregon State University. To determine what method of nucleic acid extraction works best for fungi, an experiment using Saccharomyces cerevisiae as a surrogate for C. auris was conducted comparing pathogen, soil, and soil extraction kits. To assess the performance of each kit, endpoint PCR and gel electrophoresis were conducted. C. auris DNA was amplified using loop-mediated isothermal amplification (LAMP). LAMP is a method for amplifying DNA using probes designed to target a specific region of the organism’s genome. Changes to the fluorescence, color, or turbidity indicate the presence of the target DNA. Fluorescent and colorimetric LAMP were used to detect and quantify the presence of extracted DNA. Future work will focus on in-the-field applications. This project provides a framework for incorporating fungal targets into wastewater surveillance, expanding the scope beyond viral and bacterial pathogens and supporting early, rapid detection of potential threats to public health.

Speaker(s):

Ollie Cook, cookkei@oregonstate.edu, Oregon State University, Corvallis, Oregon

Ollie is a second-year undergraduate bioengineering student at Oregon State University. They have been working in a lab on this project for a year and a half.

Research and Regulation: Proactively and Reactively Investigating Industrial Sources of Nitrification Inhibition

Description:

Three Clean Water Services (CWS) water resource recovery facilities must operate to consistently meet low effluent ammonia permit limits during the low river flow season. Ammonia oxidizing bacteria are highly sensitive, and each WRRF has experienced short-term nitrification inhibition events attributed to inhibitory chemicals in the influent. These acute disruptions threaten ammonia permit compliance and can have other negative impacts on the treatment process. Unique to CWS, the ordinance regulating non-domestic waste dischargers includes language prohibiting disruption of POTW processes; a violation may be issued even if the POTW does not experience a permit violation.

To safeguard nitrification performance, CWS implemented targeted nitrification rate testing to identify industrial effluents with the potential to inhibit biological ammonia oxidation. This process aims to enable CWS to address effluents or chemicals of concern via source control before an acute event occurs.

This project began in 2024 with an effort to troubleshoot recurring inhibition events at the Forest Grove WRRF that had persisted for several years. Regulatory, research, and operations staff partnered to conduct weekly nitrification rate testing using grab and composite samples from industries regulated by the Industrial Pretreatment Program. Significant Industrial Users (SIUs) are identified and prioritized by the Environmental Services department based on factors such as known or potential chemical constituents in the waste stream, current discharge volumes and loadings, and projected growth.

Inhibition potential is evaluated using a streamlined nitrification rate assay in which reactors are dosed with industrial effluents or chemicals of concern. Testing uses both acclimated and non-acclimated biomass from multiple WRRFs and simulates industrial discharge concentrations representative of average and high loading conditions to match current or future discharge scenarios.

This presentation will cover the interdepartmental approach used at CWS to identify and evaluate potential sources of nitrification inhibition. A case study will illustrate how this process led to the identification of an industrial discharger whose chemical releases repeatedly disrupted nitrification, ultimately leading to enforcement action.

Speaker(s):

Cierah Alferness, AlfernessC@CleanWaterServices.org, Clean Water Services, Hillsboro, Oregon

Cierah Alferness is an Environmental Services Specialist at Clean Water Services. She has been in this role for 1.5 years and specializes in industrial permitting and source tracking.

Leila Barker, BarkerL@cleanwaterservices.org, Clean Water Services, Tigard, Oregon

Leila Barker is a Principal Process Engineer at Clean Water Services with over ten years of experience in biological wastewater treatment. She has conducted extensive testing using both pure cultures and WRRF biomass to assess the inhibitory impacts of heavy metals and industrial discharges.

Restoring Historic Drainage Systems and Managing Risk with MultiObjective Regional Stormwater Facilities

PNCWA2026 Annual Conference – Sept. 13-16, Spokane, WA

Description:

Between stringent regulatory requirements, consideration for downstream systems, private property constraints, constructability constraints, and the need to remain fundable across an implementation timeline, municipal stormwater projects face a growing list of challenges. The City of Wilsonville, Oregon (a Phase I MS4 community known for sustainable and progressive approaches to stormwater management) has faced and overcome each of these through the planning and delivery of its Ash Meadows Regional Stormwater Facilities.

Wilsonville implemented a robust planning process to evaluate, prioritize, design, permit, and ultimately construct the Ash Meadows facilities. Project planning efforts began in 2021 with the proposed removal of a flow control structure on Boeckman Creek, originally constructed to limit flows through a Boeckman Road culvert, as part of a roadway widening, bridge replacement, and stream restoration project. Removal of the flow control structure introduced risks to the downstream creek system, infrastructure, and property owners due to increased in-channel flow and velocity. To mitigate these risks, Wilsonville took a comprehensive planning approach that integrated hydraulic modeling, stakeholder coordination, and a long-term implementation strategy.

Through iterative 1D and 2D hydraulic modeling, the City evaluated a range of in-channel and upland storage alternatives before selecting a concept that reroutes approximately 40 cfs of flow from the Boeckman Creek Basin, restores historic drainage patterns, and discharges into the adjacent Coffee Creek Basin. The selected solution routes flow through a network of existing and modified private detention ponds, culverts, and bioretention features and required careful negotiation of competing objectives, including maintenance of existing water surface elevations on private property and preservation of downstream peak flow conditions during the 100-year, 24-hour design storm. Achieving these goals demanded extensive coordination with landowners, adaptation of legacy infrastructure, and unique permitting approaches. Design began in 2024, construction is underway, and the project is expected to mitigate approximately 80% of the anticipated increase in peak flow to Boeckman Creek.

This case study will describe transferable lessons learned from initial planning through detailed design for this unique, multi-objective project. Attendees will leave with practical strategies for navigating regulatory complexity, aligning public and private interests, and delivering resilient, multi objective stormwater projects.

Speaker(s):

Thomas Suesser, tsuesser@brwncald.com, Brown and Caldwell, Portland, OR

Thomas is a water resources engineer based in Portland, OR with 7 years of experience working on stormwater planning and design, climate resilience, wet weather planning, and hydraulic modeling.

Kaitlin Vacca, kvacca@brwncald.com, Brown and Caldwell, Philadelphia, PA

Kaitlin's expertise is within stormwater management using innovative practices including green stormwater infrastructure, nature-based design, and technology-based solutions. Dr. Vacca has a broad range of technical expertise, a track record of taking on large, complicated problems, and defining smaller, actionable and practicable steps, and 17 years of combined academic and professional engineering experience.

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Rising to Coastal Risk – Relocating the 55th Street Pump Station

Description:

The City of Newport, Oregon is addressing increasing risk to its wastewater infrastructure due to ongoing coastal bluff erosion along the central Oregon coast. The existing 55th Street Pump Station provides critical service to nearby residences but is located adjacent to an actively eroding bluff, creating long-term concerns related to reliability, public health, and system resiliency. In response to these growing challenges, the City initiated the 55th Street Pump Station Mitigation Project to proactively address climate-driven risk while advancing a sustainable, long-term conveyance solution.

Several mitigation alternatives were evaluated, including bluff stabilization, relocation, and system reconfiguration. Each alternative was assessed based on erosion risk reduction, constructability, environmental considerations, cost, and operational impacts. Early geotechnical investigations identified challenging subsurface and groundwater conditions, while site constraints and contractor input helped refine feasible construction approaches and eliminate alternatives with higher long-term risk.

Using a divide and conquer approach, the selected alternative relocates the existing 55th Street Pump Station away from the coastal bluff and implements a dual pump station configuration consisting of a new Meander Street Pump Station and a relocated 55th Street Pump Station. This approach substantially reduces exposure to future bluff erosion while minimizing gravity sewer regrading and limiting impacts to surrounding properties through targeted use of private grinder systems. Precast concrete wet wells were selected for both pump stations to provide flexibility in construction methods, allowing installation using either caisson methods or traditional shored excavation depending on final groundwater conditions.

Speaker(s):

Travis Meyette, tmeyette@WindsorEngineers.com, Windsor Engineers, Ridgefield, WA

Travis Meyette has 6 years of experience in civil engineering and construction management. He has focused on projects involving collection system improvements, including water booster stations, wastewater pump stations, decant station, I&I rehabilitations, and minor WWTP upgrades.

Shawn Spargo, sspargo@windsorengineers.com, Windsor Engineers, Portland, OR

Shawn Spargo has over 25 years of experience in civil, environmental, and remediation engineering, construction management, and facility operations. Over the past 15 years, he has focused on projects involving wastewater treatment facility process selection, design, and construction. Recent projects include the Estacada Wastewater System Improvements CMGC project, for which Shawn served as the Project Manager and Engineer of Record for the treatment facility; Project Manager for the Hauled Waste, Aerobic Digester and Dryer Upgrade Project for Three Rivers Regional, Longview Washington; and the City of Hermiston Recycled Water Plant Improvements Project, where Shawn produced detailed plans and specifications for their membrane bioreactor upgrade and collection system capital improvement plan.

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Rising to the Moment Through Interface Management in Complex Capital Programs

Description:

Advancing a sustainable water future requires more than building new infrastructure—it requires coordinated delivery of complex capital programs while maintaining reliable operations and meeting regulatory and community expectations. Across the Pacific Northwest, water and wastewater utilities are rising to this moment as they deliver multiple, overlapping projects in active facilities. As program complexity increases, so does the number of interfaces between projects, operations, contractors, regulators, and third parties. Poorly managed interfaces are a common source of schedule delays, scope conflicts, rework, and frustration. This presentation explores Interface Management as a practical, program level discipline that supports more predictable delivery and long term system sustainability.

Interface Management provides a structured approach to identifying, documenting, and managing the interdependent relationships that exist across concurrent projects and operating environments. Rather than relying on informal coordination or institutional knowledge, effective interface management establishes clearer ownership, defined workflows, and transparent communication throughout the program lifecycle. Early identification of interfaces, combined with consistent tracking and escalation, helps teams address issues before they begin to effect operations, construction, or public service.

The session highlights practical strategies utilities can apply at scale, including centralized interface registers, standardized templates, and schedule based triggers to monitor interface health. Emphasis is placed on integrating interface management into existing program governance and day to day project controls, making it part of how work is delivered rather than a reactive overlay.

Real world examples from large wastewater programs illustrate how disciplined interface management can improve coordination, reduce conflict between overlapping work, and maintain alignment with operational constraints. Attendees will leave with practical tools and frameworks to reduce risk, improve reliability, and apply interface management in complex capital programs. This session is intended for utility owners, program managers, and project managers seeking actionable approaches to rise to the moment while advancing a sustainable water future.

Speaker(s):

Nicole Ream, Nicole.Ream@Stantec.com, Stantec, Denver, CO

Nicole has a deep knowledge of programs gained through direct experience on large water and infrastructure projects and programs with a total capital value of $3.8 billion. As Stantec's Program Management Construction Management (Water) Operations Leader, she routinely guides the development and implementation of major programs to assure timely delivery of activities within budget and in alignment with quality standards and program goals. Nicole is particularly adept at working with large teams, leveraging her strong facilitation skills to guide effective strategy development and keep team members organized around implementation. Nicole has also synthesized her expertise in program management, business process, and strategic planning to help numerous municipal clients improve the consistency, quality, and transparency of their project management and procurement

processes.

Gabe Solmer, Gabe.Solmer@Stantec.com, Stantec, Portland, OR

Gabe Solmer is a Program Manager with Stantec's Program Management and Construction Management team. She has more than two decades of experience with public agencies and nonprofits, including a nine-year career at the Portland Water Bureau, Oregon's largest water utility. Her tenure included four years as the Administrator, developing and implementing an employee-led Strategic Plan, and overseeing Portland's largest capital project, the Bull Run Filtration Program. At Stantec, Gabe has worked on large megaprojects in the Pacific Northwest, including program management for King County and Cascade Water Alliance. Gabe is recognized for applying her executive leadership, ability to unite diverse groups for common purposes, proactive and risk management approach, and exceptional communication skills to deliver sustainable water infrastructure solutions.

Rising to the Moment Through Practical Shut Down Planning

Description:

Advancing a sustainable water future requires more than new infrastructure—it demands reliable operations, resilient systems, and disciplined coordination as utilities modernize aging assets. Across the Pacific Northwest, water and wastewater utilities are delivering critical capital improvements within live facilities while maintaining uninterrupted service to their communities. Planned shutdowns represent pivotal moments where sustainability, reliability, and safety converge. When poorly managed, they can undermine operational resilience and public trust. When planned proactively, they become opportunities to strengthen both.

This presentation explores how structured Shut Down Planning supports a sustainable water future by protecting system reliability, safeguarding staff and the public, and enabling efficient delivery of capital improvements. Rather than treating shutdowns as isolated construction events, the approach presented frames them as shared operational commitments that must balance long term infrastructure renewal with day to day service obligations.

Key topics include early identification of shutdown requirements, clear definition of operational constraints, standardized request and approval processes, and integration with utility wide planning and scheduling. The session emphasizes early and ongoing collaboration between capital delivery teams, operations, and maintenance to support shutdown decisions, align with operational priorities, regulatory requirements, and community expectations.

Drawing on real world experience from active wastewater facilities, the presentation highlights common challenges—such as competing shutdown requests, evolving conditions, and protecting project delivery schedules—and practical strategies to address them.

Attendees will leave with practical tools to elevate shutdown planning from a reactive task to a core program capability, reducing unplanned outages, improving safety outcomes, and extending the life and performance of critical assets. This session is intended for utility owners, operations leaders, planners, and project managers seeking actionable approaches to advance resilient and sustainable utility systems.

Speaker(s):

Nicole Ream, Nicole.Ream@stantec.com, Stantec, Thornton, CO

Nicole has a deep knowledge of programs gained through direct experience on large water and infrastructure projects and programs with a total capital value of $3.8 billion. As Stantec's Program Management Construction Management (Water) Operations Leader, she routinely guides the development and implementation of major programs to assure timely delivery of activities within budget and in alignment with quality standards and program goals. Nicole is particularly adept at working with large teams, leveraging her strong facilitation skills to guide effective strategy development and keep team members organized around implementation. Nicole has also synthesized her expertise in program management, business process, and strategic planning to help numerous municipal clients improve the consistency, quality, and transparency of their project management and procurement

processes.

Hana Kim, Hana.kim@stantec.com, Stantec, Tampa, FL

Hana is an Implementation Specialist with 5+ years of experience in project controls, digital transformation, and construction technology solutions. Led multiple system implementations to streamline workflows, improve data visibility, and drive project efficiency. PMP-certified with a background in industrial engineering.

Christina Vanburen, Christina.Vanburen@Stantec.com, , ,

Christina is a Deputy Program Manager that specializes in initiation and implementation of water infrastructure related Programs with a strong focus on improving and developing tools and processes to initiate, monitor, control projects, and to enhance col

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Risk, Reward and Reality – Structuring Your Project So That Contractors Want to Hard Bid

Description:

Design-bid-build has long been the traditional project delivery method for utility owners to promote price competition for the rate payers' interests. However, in today's busy municipal construction market hard bidding is often less attractive to contractors compared to alternative delivery opportunities.

This presentation explores strategies to make hard-bid projects more attractive contractors. Topics will include: 1) risk allocation and packaging including contract terms, subcontracting approach, clarity of documents, and establishment of baselines, and 2) increased competition through contractor prequalification, thoughtful bid timing, and proactive industry outreach.

The intended audience for this presentation is engineers and utility owners looking to strengthen bid participation and improve procurement outcomes.

Speaker(s):

Chris Baersten, ChrisBaersten@KennedyJenks.com, Kennedy Jenks, Tacoma, WA

Chris Baersten is a Project Manager and Project Engineer with Kennedy Jenks. Chris has over 15 years of experience managing, designing and planning sewer and water projects. Chris has performed the process mechanical design on treatment plants, pump stations and conveyance projects. Chris is a licensed professional engineer (in WA and OR), a project management professional and an Envision certified sustainability professional.

Risky Business: A Collaborative Approach to Risk and Vulnerability in Comprehensive Planning

Description:

Wastewater utilities are continually navigating new and unpredictable challenges with aging infrastructure, evolving regulatory expectations, financial pressures, and long-term operational uncertainty. As a result, Wastewater Comprehensive Plans (WWCPs) or General Sewer Plans (GSPs) are crucial as long-term planning frameworks that balance technical priorities with risk, organizational capacity, and stakeholder values. This presentation describes the ongoing City of Chehalis WWCP with a primary focus on how Kennedy Jenks's integrated Business Risk and Vulnerability Assessment (BRVA) was implemented as a core planning element to align capital improvements with the City's values and operational priorities.

Using the City of Chehalis WWCP as a case example, this presentation focuses on the BRVA process and the role of collaboration in shaping meaningful risk discussions with multiple interested parties. Contrary to traditional methods of risk assessment, the BRVA combines technical information, operational realities, and a utility's business goals to reach a shared understanding of risk that supports prioritization within the broader planning effort.

The BRVA was implemented through facilitated conversations that intentionally brought together utility operators – who are not typically included in risk assessments – and engineers, who are often removed from the realities of day-to-day plant operations. The discussions explored how assets function together, detailed where vulnerabilities emerge, and identified how risks are experienced operationally. BRVA conversations can also highlight deficiencies in business/O&M practices or identify potential one-time, low-cost improvements that can be implemented immediately to reduce risk without requiring a full CIP effort. Emphasis is placed on how this shared understanding of system vulnerabilities and capital needs shaped the way improvements were sequenced within the WWCP. The discussion highlights how BRVA functions as an organizing structure within comprehensive planning rather than a standalone exercise.

This discussion will be delivered collaboratively by the consultant team and utility representatives, offering both planning and operational perspectives. Key takeaways include how BRVA supports planning approaches tailored to individual utility contexts, encourages utility participation throughout the planning process, and can be adapted for utilities of varying size and complexity seeking a practical, structured approach to long-term capital planning.

Speaker(s):

Ryan Haller, RyanHaller@kennedyjenks.com, Kennedy/Jenks Consultants, Inc., Federal Way, Washington

Ryan has 8 years of experience as an Environmental Engineer with a strong background in consulting, including stormwater management, water treatment processes, hydraulic modeling, and wastewater management. He is proficient in using advanced software tools such as Bentley's HAMMER CONNECT, SewerGEMS, WaterGEMS, PondPack, Innovyze's InfoWorks, and Esri's ArcGIS. He has performed hydraulic and transient modeling studies to evaluate and improve the performance of existing systems. His expertise extends to preparing environmental permit applications and utilizing Geographic Information Systems technology to analyze spatial data related to ground elevation changes. His experience conducting comprehensive assessments of wastewater collection systems and utilizing hydraulic modeling to evaluate system performance will help him identify areas of concern and propose solutions for capacity enhancements and infrastructure rehabilitation.

Swati Maurya, SwatiMaurya@kennedyjenks.com, Kennedy/Jenks Consultants, Inc., Federal Way, Washington

Swati Maurya is an environmental engineer at Kennedy Jenks with experience supporting wastewater comprehensive planning and municipal utility projects across the Pacific Northwest. Her work includes wastewater treatment facility evaluations, hydraulic analyses, inflow and infiltration assessments, capital improvement planning, and regulatory compliance support. She has contributed to planning-level recommendations for wastewater treatment plants, pump stations, reclaimed water systems, and biosolids handling facilities.

Justin Phelps, jphelps@ci.chehalis.wa.us, City of Chehalis, Chehalis, Washington

Justin Phelps is the Wastewater Superintendent for the City of Chehalis, where he oversees operations and maintenance of the Chehalis Regional Water Reclamation Facility and the city's wastewater collection system. He has experience in wastewater treatmen

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Separating Out the Crap: How to Innovate in a Changing Industry

Description:

Today, in a world of digital twins, artificial intelligence, and asset management programs, utility leaders must distinguish between trendy sales pitches and proven solutions. By looking at past innovations, municipalities can better adapt to an ever-changing industry.

For decades, proactive maintenance has been the go-to strategy to reduce overflow risk. But in Charlotte, North Carolina, this approach became a challenge. Despite cleaning more sewer lines each year, backups and overflows persisted. The problem was a lack of information. There was no way to assess a line's condition before cleaning, leading to wasted time and resources.

Through a partnership with UNC Charlotte and support from the National Science Foundation, Charlotte Water helped pioneer the first acoustic inspection device. This tool "yells" down a pipe while a receiver in the next manhole "listens." The sound that passes through is converted into a score, giving operators a real-time measure of flow capacity. Because each test takes only three minutes, Charlotte gained a faster, more efficient way to screen lines before cleaning. The result: the same cleaning volume but now directed only where it was needed most.

The program proved successful. Charlotte Water reduced unnecessary cleaning without an increase in backups or SSOs, setting the stage for a condition-based approach. Over time, acoustic inspection spread across the United States and internationally, helping utilities balance efficiency with risk reduction.

Nearly 20 years later, PNW utilities face similar challenges - how to adopt new technology without chasing trends. Acoustic inspection offers one clear lesson: when innovation directly solves operational problems, it endures. In 2025, utilities across the Pacific Northwest inspected over 8.5 million feet of gravity sewers using acoustic inspection. This presentation will look at how various PNW municipalities have leveraged this technology to improve efficiently and how these technological success stories inform current efforts to build smarter, condition-based maintenance programs that adapt to a changing industry.

Speaker(s):

Sam Taaffe, staaffe@infosense.com, InfoSense, Auburn, Washington

Sam Taaffe is the Northwest Territory Manager for InfoSense, providing solutions for local wastewater utilities to help optimize their maintenance programs. He works with municipalities in Washington, Oregon, Montana, and Alaska to utilize the SL-RAT (Sewer Line Rapid Assessment Tool) for sewer maintenance and the Wet Well Wizard for Lift Stations. Sam grew up in Washington, attended Cal Poly for a degree in business, and currently resides in Bonney Lake.

David Lane, david@docosewer.org, , ,

David is a Senior Inspector/Operator for Douglas County Sewer District, working with the utility for over 20 years. David received a Bachelor's in Chemistry from Central Washington University, and has been key in implementing the SL-RAT (Sewer Line Rapid Assessment Tool) into Douglas County's sewer maintenance program, work orders, and GIS.

Shaving the Peaks in Battle Ground: A Case Study in Equalization

Description:

This project solved a sewer equalization problem for the City of Battle Ground. The City's wastewater is pumped to the regional Salmon Creek Treatment Plant. The sewer system frequently experiences high flows during storm events due to groundwater and surface water infiltration. The high flows cause capacity concerns and were threatening system reliability. The resulting Wastewater Equalization and Sewer Receiving Station project was completed to mitigate risks of sanitary sewer overflows. Windsor Engineers was supported by subconsultants Kennedy Jenks, HHPR, and Industrial Systems, Inc.

The project required extensive modeling of current and future peak flow rates and calculation of maximum equalization storage needs. The modeling analysis considered weather data, sewer system impacts, growth projections, infrastructure aging, and regulatory standards. Following the modeling effort, a decision was made by the City and the consultant team on how to address equalization needs while meeting Department of Ecology approval.

An engineering report was prepared that considered various alternatives. The recommended solution involved supplementing existing equalization storage with additional storage utilizing existing concrete basins that were no longer in use. The basins were formerly part of a wastewater treatment plant. With the benefit of a condition assessment and some low-cost mechanical upgrades, the basins were converted to aerated equalization basins. This sustainable approach saved millions of dollars, shortened the construction schedule, and provided a model for efficient infrastructure redevelopment.

Construction was completed by Tapani Inc. The facilities were tested, commissioned, and are now in service. The equalization facilities are now considered 'built-out' until a future regional sewer conveyance expansion is completed.

The PNCWA presentation will focus both on the modeling methods to determine equalization storage needs for such a large service area as well as the innovative technical solution that resulted in significant cost savings by repurposing existing infrastructure.

Speaker(s):

Travis Meyette, tmeyette@WindsorEngineers.com, Windsor Engineers, Ridgefield, WA

Travis Meyette has 6 years of experience in civil, environmental, and hazardous materials engineering, and construction management. He has focused on projects involving various collection system improvements, including water booster stations, wastewater pump stations, decant stations, I&I rehabilitations, and minor WWTP upgrades.

Travis Tormanen, ttormanen@WindsorEngineers.com, Windsor Engineers, Ridgefield, WA

Travis Tormanen is a Principal Engineer with Windsor Engineers. He has over 30 years of experience in the municipal water/wastewater industry and is licensed to practice engineering in 11 states. Travis has worked on numerous City of Battle Ground wastewater projects over the last two decades as well as various Southwest Washington sewer planning and design projects for various agencies.

Simulation of West Point Treatment Plant Steady and Transient Hydraulic Operating Conditions to Inform Design of Hardwired Control Interlock/Alarm and Flood Risk Reduction System (FRRS)

Description:

The West Point Treatment Plant (WPTP) is a significant wastewater facility located right on the Puget Sound, bordering Seattle's Discovery Park. The plant serves a large area, managing wastewater from Seattle, Shoreline, North Lake Washington, North King County, and parts of Snohomish County. Its operational capacity is substantial, with influent flows varying from 90 to 440 million gallons per day (MGD). On February 9, 2017, during heavy rainfall in the Seattle area, WPTP was operating at peak hydraulic capacity, then a partial interruption of power supply occurred. The ensuing cascade of events caused failure in few structures in the treatment plant, ending in flooding of WPTP and the bypass of an estimated 180 million gallons of stormwater

mixed with untreated sewage into Puget Sound. Following this event, King County Wastewater Treatment Division (WTD) took proactive steps to strengthen the overall flood protection strategy by introducing new independent layers of defense and improving the existing safety layers by having three safety layers in total: 1) the Passive bypass weir (PW), 2) Hardwired level switch high-high safety control interlocks (LSHH) and the 3) Flood risk reduction system (FRRS). These systems were specifically designed to enhance system redundancy, provide an extra safeguard against potential flooding scenarios, and ensure that flood risk could be effectively mitigated even in the event of a failure or reduced performance of the existing protective measures at the West Point facility. In this study, a detailed and fully integrated simulation model using MIKE Plus software (version 2025) has been developed with the objective of representing the complete hydraulic profile of WPTP. The primary objective of developing this model is to evaluate and analyze the steady state and transient hydraulic behavior of WPTP under a range of operational conditions, such as reproducing past events such as 2017 event. Specifically, the model aims to simulate system responses to varying influent flow rates and transient events across the plant. First, a detailed model of the WPTP (containing controls) is developed and run under steady-state flow conditions to establish the baseline hydraulic behavior of the system. Following model development, the steady-state simulations are calibrated and validated using measured flow data and water surface elevation records collected across the facility to ensure the model's reliability, and alignment with observed field conditions. Once the steady-state model is verified, the second subtask involves simulating a series of failure and disturbance conditions, referred to as transient flow events, to evaluate the system's hydraulic response under dynamic, non-steady operating scenarios. In this phase of the study, the model is initially subjected to two distinct transient failure past events to thoroughly assess and validate its performance, stability, and reliability when simulating dynamic transient conditions. Following the completion of the transient verification stage, three additional scenarios—specifically involving pumping station shutdown events—are implemented and evaluated using the model. Results from these simulations are used to determine water surface elevations at various locations of the treatment plant and to install sensors to monitor and manage operations and to avoid flooding.

Speaker(s):

Mahsa Ahmadpoor, mahmadpoor@rieconsultants.com, RIE Consultants, Columbia, South Carolina

Dr. Mahsa Ahmadpoor is a Water Resources Engineer specializing in hydraulics, hydrology, river morphology, and urban flood analysis. She has experiences in developing advanced numerical models to simulate hydraulic and morphological processes in rivers, stormwater collection systems, and urban watersheds. Her expertise spans hydrological modeling, sediment transport analysis, GIS applications, enabling her to address complex water resource and infrastructure challenges with a multidisciplinary approach.

So you think you want an Actuator?

Description:

Valve and gate actuation can play a critical role in mechanical systems that support water, wastewater, stormwater and recycled water treatment, supply, collection and distribution. Valve and gate actuation requires multidisciplinary design and planning for utility owner's and operators to see value and use in their installation. This presentation will describe the basics associated with the design of actuators for valves and

gates including type (electric vs. pneumatic), operations considerations, coordination with control systems, and coordination with vendors. The presentation will highlight best practices, common pitfalls, and lessons learned from real-world applications.

The intended audience for this presentation includes engineers and operators involved in the planning, design, and operation of facilities with actuated valves.

Speaker(s):

Chris Baersten, ChrisBaersten@KennedyJenks.com, Kennedy Jenks, Tacoma, Washington

Chris Baersten is a Project Manager and Project Engineer with Kennedy Jenks. Chris has over 15 years of experience managing, designing and planning sewer and water projects. Chris has performed the process mechanical design on treatment plants, pump stations and conveyance projects. Chris is a licensed professional engineer (in WA and OR), a project management professional and an Envision certified sustainability professional.

Source Water Characterization and Pilot Planning for Advancing Potable Reuse in the Pacific Northwest

Description:

As communities across the United States face increasing pressures on water resources, the LOTT Clean Water Alliance, a regional utility serving Lacey, Olympia, Tumwater, and Thurston County in Washington State, is taking a proactive approach to long-term water sustainability through a potable reuse demonstration project.

LOTT currently produces Class A reclaimed water at the Budd Inlet Treatment Plant (BITP). Building on this foundation, the utility is constructing a small-scale advanced treatment pilot facility to produce Class A+ reclaimed water suitable for potable reuse. The pilot will evaluate two advanced treatment trains: Reverse Osmosis-Based Advanced Treatment (RBAT) and Carbon-Based Advanced Treatment (CBAT). These treatment approaches will be assessed for performance, operational complexity, and regulatory acceptance. The Class A+ water produced will support public outreach efforts, including beverage production with local partners, to enhance community understanding of potable reuse and build public trust.

As a key first step in the study, LOTT conducted a robust source water characterization effort between January and June 2025 on the BITP final effluent and Class A reclaimed water. Samples were collected to characterize and confirm baseline source water quality and seasonal variability. Samples were tested for 371 water quality constituents, both federal and state regulated and unregulated emerging contaminants, which included treatment differentiators (e.g., sodium, chloride), DBPs and disinfectants, PFAS, risk-based pharmaceutical and personal care products, microorganisms, and constituents with Maximum Contaminant Levels as regulated by EPA. Data collected helped identify constituents of concern in the source water to inform appropriate sampling and monitoring protocols for use during the piloting effort. Furthermore, a risk-based framework screening tool

was implemented to estimate the removal of contaminants across each unit process in the anticipated treatment trains to inform expected removal and confirm selection of appropriate unit processes.

The decision to pursue potable reuse reflects LOTT's long-term commitment to resilient water supply planning. This presentation will highlight LOTT's comprehensive source water characterization effort and results that helped inform pilot operations and sampling/monitoring, as well as next steps in the demonstration study.

Speaker(s):

Victoria Nystrom, vnystrom@hazenandsawyer.com, Hazen and Sawyer, Seattle, WASHINGTON

Victoria Nystrom is a Senior Principal Engineer with Hazen and Sawyer. She works on drinking water process and treatment projects across the country with a focus on corrosion control treatment, pilot testing for multiple containment removal, and regulatory compliance. She received her MS in Environmental Engineering and BS in Biological Systems Engineering at Virginia Tech. Ms. Nystrom is the chair of the PNWS AWWA Water Quality Committee and a supporting member of the AWWA Inorganic Contaminants Research Committee.

Stephen Taylor, stephentaylor@lottcleanwater.org, LOTT Clean Water Alliance, Olympia, WASHINGTON

Stephen Taylor is a Planning Engineer with the LOTT Clean Water Alliance in Olympia, Washington. He works with LOTT staff to plan and advance projects that improve and extend the life of LOTT's treatment facilities. Stephen also manages LOTT's Future Technologies Pilot Team which identifies and tests emerging technologies to see if they are worth implementing full-scale. Stephen holds a Bachelor of Science in Mechanical Engineering and before working for LOTT spent 23 years in the private-sector managing projects and supporting the manufacturing of Sharpie® markers, aluminum cans, and air compressors.

Startup & Optimization of Pocatello's Biosolids Reuse and Recovery Process

Description:

Until 2025, the City of Pocatello had one of the largest liquid biosolids handling and land application practices in the Pacific Northwest—storing digested biosolids in an onsite lagoon that was out of capacity and land applying on nearby agricultural fields. To address capacity limitations in their existing lagoon, the City implemented mechanical dewatering in a phased approach to balance project costs with available capital budgets and limit the financial impact on the community.

The City's primary and secondary biosolids are treated in mesophilic anaerobic digesters and then held in a sludge holding tank prior to dewatering. Dewatered solids are stored and land applied seasonally on the same farm fields used previously. The startup of the new dewatering process began in the 2nd Quarter of 2025. Additionally, the City is considering a composting trial as a potential new commodity, and the dewatering system provides the City with flexibility to test this option.

The transition to mechanical dewatering has not been entirely smooth, but the City has observed substantial benefits to overall biosolids handling capacity and the biological treatment process. The throughput of mechanical dewatering units is limited, so annual digester cleaning can cause issues with biosolids storage and

affect the dewatering equipment itself. In addition, finding the right polymer combination for the biosolids has been key to finding more optimal dewatering performance at the facility. The actual land application of dewatered biosolids presents unique challenges, and the City has been making adjustments to optimize application. Each of these challenges will be discussed, along with the creative solutions being incorporated into the facility's optimization.

Speaker(s):

Justin Bloxham, jbloxham@pocatello.gov, City of Pocatello, Pocatello, Idaho

Justin Bloxham is the Operations Supervisor for the City of Pocatello's Water Pollution Control Facility, overseeing daily operations at the facility.

Jared Richens, jrichens@kellerassociates.com, Keller Associates, Inc., Pocatello, Idaho

Jared Richens served as the project engineer for Pocatello's Biosolids Project. He has a master's degree in Civil and Environmental Engineering from Utah State University and is a licensed professional engineer in Utah and Idaho with 9 years of experience.

Colter Hollingshead, chollingshead@kellerassociates.com, Keller Associates, Inc., Pocatello, Idaho

Colter Hollingshead served as the project manager for Pocatello's Biosolids Project. He has a master's degree in Civil and Environmental Engineering from Utah State University, and is a licensed professional engineer in Utah, Wyoming, and Idaho with 15 ye

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State Point in Practice: Validating Assumptions and Making Daytoday Operational Decisions

Description:

State Point Analysis (SPA) is a simple but well-loved tool that is used across the industry to evaluate secondary clarification capacity. Clean Water Services (CWS)' operations and process engineers collaborate to ensure the tool can indicate risk under conditions that change over time, such as flows, settling characteristics, nitrification requirements and underflow pumping capacity.

This presentation will describe the SPA tool used by CWS and added functionalities, which consists of a typical graphical representation of a solids balance around the clarifier. It plots a solids flux curve that is constructed using Vesilind settling parameters. Understanding the site-specificity of these parameters requires field testing to create a relationship to Sludge Volume Index (SVI). As part of active validation efforts, CWS conducts settling column tests in-house to develop this relationship and evaluate changes. A comparison to textbook relationships demonstrates the value of in-house measurements to assess capacity and predict issues.

The SPA tool was expanded to include a Mixed Liquor Suspended Solids (MLSS) calculator to simulate solids dilutions by changing aeration basin (AB) configurations. This feature can be verified using operational data and

online instrumentation. With regular use, operators can gain a sense of how much dilution is possible after changing AB configuration, to increase hydraulic loading capacity ahead of wet weather events.

This spreadsheet-based tool is readily available for operators to simulate clarification scenarios under different process conditions and is a learning resource for newer generations. The limitations of SPA and risk factors can be understood with consistent use and by comparing to full-scale operation. Recurring validation of key assumptions (i.e. Vesilind parameters) can increase confidence and help establish safety factors.

Spreadsheet-based tools such as SPA make it easier for utilities to evaluate risks by allowing them to directly manage and adjust key assumptions. Validation efforts will be discussed during this presentation, which will summarize the uses of SPA to make day-to-day operational decisions at CWS. These include:

- Evaluating impacts of worsening SVI due to filament overgrowth.
- Managing risk of operating with limited underflow pumping capacity.
- Preparing for high flows by simulating flow distributions and basin configurations.

Speaker(s):

Ornella Sosa-Hernandez, sosahernandezo@cleanwaterservices.org, Clean Water Services, Tigard, Oregon

Ornella Sosa-Hernandez is a Process Engineer in the Research and Innovation Department at Clean Water Services. She received her Ph.D. of Science and Engineering from the Monterrey Institute of Technology and Higher Education in Mexico specializing in Environmental Systems, after obtaining a Bachelor of Science in Biotechnology Engineering.

Erik Lorntson, lorntsone@cleanwaterservices.org, Clean Water Services, Hillsboro, Oregon

Erik is a Senior Process Analyst with Clean Water Services, bringing over 18 years of experience between CWS and Crater Lake National Park. He possesses a grade IV certification in Wastewater Treatment, an A.A.S. in Water and Environmental Technology, and a B.S. in History. Erik oversees the day-to-day process control and reporting for all Preliminary, Primary, Secondary, Tertiary, and Chemical management at the Rock Creek Water Resource Recovery Facility in Hillsboro, OR.

Stormwater 2.0: Managing Emerging Contaminants and Evolving Water Quality Rules

Description:

Stormwater and wastewater utilities across the Pacific Northwest are facing increasingly complex regulatory expectations, which will only become more complex in response to new contaminants of emerging concern (CECs). Compounds such as 6PPD-quinone, nutrients, and microplastics are reshaping how agencies think about permit compliance, infrastructure investment, and watershed protection. These challenges also present opportunities to rethink traditional approaches and implement more integrated, watershed-scale solutions that deliver environmental and community benefits.

This session explores practical strategies for advancing stormwater management in response to evolving regulatory and water quality pressures. Rather than focusing solely on compliance, the presentation highlights

how agencies can combine innovative technologies, regional coordination, and adaptive planning to address uncertainty while improving long-term outcomes. Key topics include:

- Regional versus distributed approaches to stormwater treatment and flow control, including benefits and tradeoffs related to maintenance, cost, and community outcomes
- Emerging treatment technologies and best practices to address CECs, including application of natural treatment systems commonly used in the wastewater sector—such as subsurface gravel wetlands—and when these systems may be most effective
- Navigating regulatory uncertainty, including municipal stormwater permits and Endangered Species Act considerations, particularly in response to 6PPD-quinone and other CECs

This session will provide:

- A practical overview of 6PPD-quinone, nutrients, and microplastics, their environmental impacts, and how agencies are responding amid evolving science and regulations
- Current understanding of treatment and implementation strategies for CECs
- Insights into how combining regional and site-scale BMPs can optimize water quality performance, regulatory compliance, cost efficiency, and community benefits

The discussion will be grounded in real-world examples, including Seattle Central Waterfront and Arboretum Headwaters (Seattle, WA), Long's Pond (Landcaster, PA), and Karcher Wetland (Nampa, ID).

If presented as a 50-minute session, the final 20 minutes will include an interactive workshop to identify shared challenges, collaboration opportunities, and research or regulatory needs relevant to the PNCWA community.

Speaker(s):

Jana Crawford, jana.crawford@jacobs.com, Jacobs, Bellevue, Washington

Jana Crawford has over 20 years of experience in the stormwater field in Washington State. Jana serves as Jacobs' Stormwater Retrofits Lead, advising on and/or managing Jacobs' portfolio of stormwater retrofit projects and tying in best practices and evolving technology to address both well-known and emerging contaminants such as 6PPD-Q. Prior to joining Jacobs, she spent 17 years working for the Washington State Department of Transportation in the Stormwater Branch and has experience in erosion and sediment control, total maximum daily loads (TMDLs), stormwater retrofit, and municipal permit implementation.

Dustin Atchison, dustin.atchison@jacobs.com, Jacobs, Bellevue, Washington

Dustin Atchison is an experienced Project Manager and Global Technology Lead with extensive experience in Stormwater Management and Green Infrastructure. Skilled in Drainage, Water Resource Management, ecosystem restoration, fish passage, education and planning. Inspired by bringing solutions that enhance community and social benefits.

Stormwater Infrastructure Maintenance Overview

Description:

Urban stormwater management systems are composed of both green and gray infrastructure, and are comprised of a combination of flow control, conveyance, treatment, and discharge structures, that together make up stormwater facilities, each of which may be either publicly or privately owned. Maintenance responsibilities for stormwater facilities vary depending on ownership, location, and facility type, and in some cases may be shared across multiple public and/or private entities. This presentation highlights the importance of effective stormwater management and identifies responsible parties for municipal separate storm sewer system maintenance, using the City of Spokane as an example. Additionally, common stormwater assets will be identified, their maintenance requirements will be summarized, and typical indicators of maintenance deficiencies will be reviewed.

Speaker(s):

Becky Casey, rlcasey@spokanecity.org, City of Spokane, Spokane, Washington

Becky Casey is an Environmental Analyst in the Wastewater Management Department at the City Spokane, where she has worked for the past two years. Her prior background is in analytical chemistry and regulatory compliance for pharmaceutical manufacturing and environmental health and safety in pharmaceutical research laboratories.

Strategic Selection of Sewer Installation and Rehabilitation Methods on a Complex Utility Project

Description:

Successful sewer infrastructure projects demand a strategic approach to selecting installation and rehabilitation technologies that balance constructability, cost, environmental constraints, and long-term system performance. This presentation examines a multifaceted project that employed three distinct methods, open trench construction, jack and bore installation, and Cured In Place Pipe (CIPP) lining, to address varying site conditions and operational requirements across the alignment. The discussion highlights the decision-making framework used to match each technology to specific challenges, including surface disruption limitations, subsurface obstructions, hydraulic capacity needs, existing pipe condition, and project cost considerations.

A key component of the discussion is a detailed review of a 90-foot deep pipe segment and how a rehabilitation technology was selected to balance cost, resistance to earth and groundwater pressures, future operations and maintenance, constructability, and community impacts.

Lessons learned from design coordination will be shared, emphasizing how integrating multiple construction techniques can optimize outcomes on complex sewer projects. Attendees will gain practical insights into evaluating installation alternatives, mitigating risks, and tailoring rehabilitation strategies to diverse urban and environmental contexts.

Speaker(s):

Jacob Korsness, jacob.korsness@wsp.com, WSP USA, Portland, Oregon

Jacob Korsness leads WSP's West Conveyance Practice and works primarily on gravity conveyance, force main, and pump station projects. Sewer rehabilitation is an area of interest for Jacob, helping clients leverage existing infrastructure to create resilient conveyance systems.

Study of a Montana Waterbody - The Ashley Creek Use Attainability Analysis (UAA)

Description:

Background:

State-wide numeric nutrient standards in Montana were pushing The City of Kalispell, Montana (City) to consider implementing costly wastewater treatment facility improvements. Despite the high level of nutrient removal achieved by a sophisticated treatment facility, the City faced ever-present demands to achieve higher levels of treatment based on a widespread application of ecoregional values by regulatory agencies.

Methodology:

To better understand the site-specific conditions of their receiving water body, the City conducted a five-year study of Ashley Creek. Sampling analysis plans were developed prior to field investigations. Sampling sites extended upstream of the City's outfall down to the confluence of Ashley Creek with the Flathead River. The monitoring was performed during low flows and warm summer conditions. Field sampling methods included a combination of in situ measurements using field instruments and collection of water quality samples.

Findings:

Results from the study indicated that nutrient-driven algal productivity was limited by a lack of coarse streambed substrate downstream of the treatment facility outfall. The lack of gravel constrained benthic algal productivity and the eutrophic water quality conditions associated with the limited algal growth. The natural characteristics of lower Ashley Creek do not support currently defined aquatic life uses and associated water quality standards.

Based on the findings from this study, the City is pursuing a use attainability analysis (UAA) which used the study findings to propose a new site-specific aquatic life use classification for Ashley Creek. New site-specific standards for nitrogen and phosphorous were also proposed in the UAA and approved by the MDEQ in April 2025. EPA approval and state rulemaking are pending.

Summary & Significance:

The impact of this UAA to the City was to establish nutrient standards that are achievable, science-based, and protect water quality in the watershed. Other municipalities may benefit from a similar approach of a science-based evaluation of site-specific conditions within their watershed prior to implementing costly wastewater treatment improvement projects that are based on unsuitable and stringent regulatory requirements. Understanding local water quality allows for more strategic capital improvement project planning.

Speaker(s):

Rickey Schultz, rickey.schultz@hdrinc.com, HDR Engineering, Inc., Missoula, Montana

Rickey Schultz has been a professional associate and project manager with HDR in Missoula, Montana for 19 years. His experience includes design of water resource recovery facilities, developing engineering reports and facility plans, and providing construction management services. He has a Bachelors degree in Biological Engineering from Mississippi State University and a Masters degree in Environmental Engineering from Montana State University.

Chad Wiseman, Chad.Wiseman@hdrinc.com, HDR Engineering, Inc., Olympia, Washington

Chad is an aquatic ecologist with 27 years of experience conducting physical habitat, water quality, bioassessment studies in streams and rivers for a variety of resource management objectives.

Sweating the Assets Low Build Intensification for Total Inorganic Nitrogen Removal with the Mobile Organic Biofilm™ (MOB) Process Installation in Reno, Nevada

Description:

The Truckee Meadows Water Reclamation Facility (TMWRF) in Reno, Nevada, is a 30 MGD plant with stringent nutrient limits. Historically, TMWRF has relied on enhanced biological phosphorus removal (EBPR) in three anaerobic/oxic (A/O) trains, nitrifying trickling filters (NTFs), and fluidized bed reactors (FBRs). While NTFs provide nitrification, they require significant land and energy and often suffer from snail infestation. FBRs achieve denitrification, but consume up to $2.5 million in methanol annually. As regional growth increases flows and loads, this tertiary nitrogen removal strategy has become unsustainable.

In 2023, TMWRF retrofitted one A/O train with a Mobile Organic Biofilm™ (MOB) Process, a low build, intensification technology designed to enhance existing assets. The MOB Process introduces freely circulating media into the secondary treatment process and uses a retention drum screen to return media with the RAS, creating a closed loop system. By allowing media to move between bioreactors and clarifiers, the process benefits both the nutrient removal and clarification phases of treatment.

EBPR at TMWRF requires a solids retention time (SRT) of just 1.5 days. These conditions are favorable for EBPR, but too low to sustain nitrifiers. The MOB Process decouples SRT by supporting biofilm growth on the media, enabling slow growing organisms to thrive in the attached phase while maintaining a short SRT in the suspended phase. This hybrid configuration achieves nitrification without overloading clarifiers.

The MOB train consistently achieved non detect ammonia, even in winter. Success with short SRT nitrification pushed the trial to focus on secondary total nitrogen treatment. A portion of the aerobic zone was converted to anoxic conditions made possible by the MOB Process's retrofit flexibility, creating a pseudo A2O configuration and enabling significant denitrification upstream of the FBRs. Following anoxic conversion, TIN removal averaged 70% compared to 24% in the control trains. Deployment of the MOB Process to the control trains would reduce pumping costs, save on methanol expenses, and decommission multiple NTFs all without expanding the secondary treatment footprint.

Attendees will learn how retrofit strategies can expand treatment capacity without new concrete construction, review operational lessons learned, and explore how utilities can meet growing nutrient challenges while preserving limited resources.

Speaker(s):

Graig Rosenberger, graigrosenberger@nuvodaus.com, Nuvoda, Raleigh, North Carolina

Graig has over 25 years of experience in the water and wastewater industry, with a background in process engineering, project management, and executive leadership. He has held senior roles at Veolia and Ovivo, where he specialized in biological treatment technologies and drove record growth across multiple market sectors. He holds a degree in chemical engineering from Penn State with a minor in environmental engineering. Graig joined the Nuvoda team in 2024 as President and now leads business operations across sales, engineering, technology development, and project execution.

Taking the Stink Out of Wet Well Maintenance

Description:

Everyone knows that smell. In lift stations wet wells, stagnant water causes the buildup hydrogen sulfide (H_2S) gas. The pungent smell is the least of one's concern. The gas can accelerate equipment corrosion and poses serious health hazards for operators. These issues, and the smells, are compounded by the excessive amount of fats, oils, and grease that make their way into our sewer systems. The resulting FOG caps can interfere with float switches and impellers, creating even more operational headaches.

This problem is one actively faced by hundreds of utilities in the Pacific Northwest, including Silver Lake Water and Sewer. Confronted with persistent H_2S and FOG challenges, the team chose to look beyond complicated chemical treatments and instead focused on the biological environment within the wet well.

In stagnant, oxygen-deprived conditions, wet wells become home to trillions of anaerobic microbes. These microbes consume organic material in wastewater and release H_2S as a byproduct. The solution for Silver Lake was straightforward in concept: eliminate the anaerobic conditions and you eliminate the gas production.

In partnership with InfoSense and Reliant Water, Silver Lake deployed a system called the Wet Well Wizard. Using an air compressor mounted outside the lift station, the system forces oxygen into the stagnant water. This promotes the growth of aerobic microbes, which do not produce H_2S when breaking down organic matter. The results were significant. The aerated environment reduced H_2S generation, while the added mixing emulsified existing fats, oils, and grease. The benefits extended beyond the lift station itself. As the treated water moved downstream, the aerobic microbial population continued working, providing additional systemwide advantages.

This presentation will walk through Silver Lake's case study, focusing on the science behind wet well aeration and outlining a practical process that a utility can follow to improve performance in their own systems.

Speaker(s):

Sam Taaffe, staaffe@infosense.com, InfoSense, Auburn, Washington

Sam Taaffe is the Northwest Territory Manager for InfoSense, a company helping wastewater utilities optimize their maintenance programs. Helping implement the Sewer Line Rapid Assessment Tool (SL-RAT) and the Wet Well Wizard, Sam assists utilities in Washington, Oregon, Montana, and Alaska. He attended Cal Poly for a bachelor's degree in business and currently resides in the Tacoma area.

Technologies for Climate Resiliency in Sewer System

Description:

Increasing rainfall intensity across the Pacific Northwest is placing significant stress on aging municipal infrastructure, including sanitary sewer systems. To better anticipate these impacts, the City of Vancouver, Washington adopted an innovative approach to forecasting rainfall and related infiltration and inflow (I/I).

The City operates approximately 62 square miles of sewer collection and conveyance infrastructure that discharges to two wastewater treatment facilities. In 2023, Vancouver collected flow data along with concurrent rainfall data to support an update of the City's sewer model. Due to the variability of rainfall across the City, the City employed Gauge Adjusted Radar Rainfall (GARR) to calculate a rainfall time series for each model catchment.

This advanced method integrates Doppler dual polarization radar with ground based gauge data to produce five minute precipitation estimates at a 0.5 km × 0.5 km resolution—effectively increasing spatial coverage equivalent to 50 additional gauges. The high resolution output provides continuous, spatially refined rainfall characterization across the watershed.

The resulting GARR analysis showed patterns consistent with long term climatological trends, including Vancouver's expected orographic gradient: western catchments average roughly 39 inches annually, while eastern catchments receive closer to 50 inches at higher elevations. Rainfall during the nine month study period approached levels typical of a full year, driven in part by an El Niño influenced winter and spring that tend to produce above average precipitation in western Washington. The largest storm, occurring in December 2023, approached a 25 year recurrence event.

The City will use this data to calibrate its updated sewer model. Along with physical system updates, the City refined the model catchments and updated the I/I model calibration. A sophisticated rainfall-runoff model was used to simulate surface runoff, topsoil infiltration, and deeper groundwater contributions to the system flows. This flow prediction in combination with daily sewer flows will be used to assess system capacity under current and future population scenarios and identify capital improvement needs. Future scenario analyses will incorporate increased rainfall projections developed by the University of Washington Climate Impacts Group to support long term infrastructure resiliency.

Speaker(s):

Ann Quenzer, ann.quenzer@consoreng.com, Consor, Portland, Oregon

Ann brings 30 years of experience leading and participating in water and sewer projects, from completing field work to design and modeling. These efforts aim to provide regulatory compliance, increase resiliency, and identify CIP projects for future increased population projections and proposed developments. She leverages her diverse combination of field experience and operational understanding to provide clients with hydrology and hydraulic models optimized to best fit their systems. The models allow clients to run realistic scenarios and focus their repairs and replacements in cost-effective locations. Her effective communication style and understanding of how the real world works along with analyzing the model results allows for capital improvement projects that fit utility's needs considering budget, schedule, and constructability.
Ann has developed and maintained client relationships with clients across the West, including the Cities of Portland, Seattle, Los Angeles, San Francisco, East Bay Municipal Utilities District in Oakland and the Metropolitan Water District in Los Angeles. She is currently Consor's national utility planning leader responsible for staff career development, technology implementation, quality control, and growing the program in new market areas.

Tertiary Filtration 101

Description:

As nutrient regulations evolve across the Pacific Northwest, wastewater treatment plants that currently operate without low BOD and TSS limits or nutrient limits may soon need to adapt. This introductory session is designed for individuals looking to understand the fundamentals of tertiary filtration technologies and how the technologies can help prepare for future compliance requirements. Filtration is a physical separation process, removing suspended solids, debris and microorganisms from the water, and typically follows secondary clarification. This presentation will begin with an overview of when tertiary filtration is required for wastewater treatment. Next, we will explore the main particulate removal mechanisms such as direct interception, Brownian motion, and adsorption. Attendees will learn about four types of filtration methods: monomedia sand filters, deep bed denitrification filters, disk filters, and membranes. For each filtration type, where applicable, filter medium properties, removal rates, backwash requirements, hydraulic requirements, design considerations, ancillary equipment requirements, and operation and maintenance requirements will be discussed. Manufacturer differences for each type of filter will also be presented, where applicable. The session will conclude with a final review of key takeaways, ensuring participants leave with a solid foundation in tertiary filtration principles and the best use cases for each filtration technology. This session is ideal for wastewater operators, engineers, and utility managers who want to get ahead of regulatory changes, improve treatment performance, and ensure long-term compliance in a fun and engaging learning environment.

Speaker(s):

Michael Bundy, mbundy@hazenandsawyer.com, Hazen and Sawyer, Meridian, ID

Michael is a consulting engineer with Hazen and Sawyer based in Boise, Idaho. He holds bachelor's and master's degrees in civil engineering. He has over 20 years of experience in treatment facility planning, design, and construction. Over the course of his career, Michael has helped clients navigate complex projects from early planning all the way through construction.

The Good, the Bad, and the Plugged: A Beginner's Guide to Screening

Description:

Screening is the first and one of the most important processes in wastewater treatment. A properly selected and well-designed screening system protects downstream equipment, reduces ragging, minimizes grit related wear, and lowers overall maintenance demands throughout the plant. In contrast, inadequate screening can lead to chronic pump clogging, excessive solids accumulation, unsafe conditions for operators, and challenges in meeting downstream process requirements.

This introductory presentation, "Screenings 101," provides a clear foundation for understanding how screens work, how they are classified, and how to select the right type for a particular facility. The session will review coarse and fine screening technologies, including bar racks, step screens, band screens, perforated plate screens, externally and internally fed drum screens, and self-contained units for advanced applications.

Participants will learn how opening size, screen geometry, hydraulics, screenings handling, and operational constraints all influence the performance and reliability of a screening system. The presentation will highlight common design oversights, installation pitfalls, and maintenance challenges, along with practical guidance from operator experience. Key questions for both engineers and operators will be outlined to help attendees make informed decisions when planning new facilities, replacing equipment, or retrofitting existing headworks systems.

Attendees will leave with a solid understanding of screening fundamentals and a practical framework for evaluating screening options in real world applications.

Speaker(s):

Kylie Cutler, kcutler@jub.com, J-U-B Engineers, Coeur D'Alene, Idaho

Kylie is a design engineer for J-U-B's Wastewater Treatment Group. She has five years of experience in the design, implementation and management of complex projects, specifically in wastewater engineering, treatment design, biological modeling, hydraulic modeling, and remote facility design. Recent projects have included master planning, process and mechanical design, process troubleshooting, and construction oversight for biological nutrient removal of nitrogen and phosphorus using oxidation ditches or membrane bioreactors. Tertiary treatment experience includes chemical addition followed by membrane bioreactors.

The Impacts of Heating Biosolids on the Fate of PFAS: Drying, Pyrolysis, and Gasification

Description:

Per- and polyfluoroalkyl substances (PFAS) in biosolids have become a major issue for the water reclamation industry. PFAS are ubiquitous due to their extensive use in consumer products. They are also designed to be robust and difficult to degrade which makes them perpetuate through the urban water cycle. In some states, regulations on PFAS are advancing faster than federal regulations, which is compelling utilities to explore new approaches to manage biosolids. This issue has generated more interest in thermal processes including pyrolysis and gasification. Drying is required prior to pyrolysis and gasification. This presentation will report on findings from the Water Research Foundation (WRF) Project 5211 "Understanding the Value Proposition for Thermal Processes to Mitigate PFAS in Biosolids". Surprisingly, lab-scale drying experiments revealed that PFAS concentrations were reduced. A sampling campaign at a full-scale dryer confirmed that PFAS were removed during drying. Follow-up experiments indicated that a portion of PFAS were removed during drying with the evaporated water. Pyrolysis was shown to remove PFAS from the biosolids. However, the temperature of pyrolysis and the initial PFAS concentration in the biosolids affected removal during pyrolysis. For example, pyrolysis at 500°C on industrially-impacted biosolids did not completely remove PFAS from the biochar. Gasification also removed the majority of PFAS form the solid phase. This presentation will conclude by showing the overall percent removal of PFAS across sequential drying and thermal processes to understand the overall contribution of each unit operation towards total PFAS removal.

Speaker(s):

Francesca Cecconi, cecconif@bv.com, Black & Veatch, ,

Dr. Cecconi earned her PhD in environmental engineering from UC Irvine. At Black & Veatch, she specializes in nutrient removal design and research, process optimization, implications of PFAS on energy and cost analysis, and carbon accounting.

The Next Generation of Biological Nutrient Removal: how the results from three Water Research Foundation projects will influence the future of nutrient removal design and operation

Description:

What will the next generation of biological nutrient removal (BNR) look like for water resource recovery facilities (WRRFs)? While this can be a healthy debate at any conference happy hour, there were a few principles that are typical for any discussion: smaller footprint, less energy, and less reliance on external chemicals. This presentation will provide an update to audience participants on three key areas of BNR innovation: biomass fermentation, low dissolved oxygen (DO) operation, and granulation and densification. Results will be presented from several case studies and three Water Research Foundation Projects (WRF 4975, 5083, and 5271). Attendees will be provided information related to:

- Biomass fermentation: sidestream enhanced biological phosphorus removal (S2EBPR) has been shown to generate BOD from biomass fermentation in a sidestream anaerobic zone, and rate of fermentation is a critical consideration. A discussion around this rate, how to utilize the rate in BNR calculations, measurement approaches, and the correlation to sludge retention time will be discussed.

- Low DO operation: nitrification can be maintained at DO concentrations as low as 0.25 mg/L with no impact on nitrification rates while maintaining good settling. Rate testing from three facilities to show the potential implementation and limitations of low DO operation will be discussed for nitrification and denitrification.

- Granulation and densification: When granules can be formed in a continuous flow activated sludge system, the densified activated sludge process has been demonstrated to: (1) increase capacity by improving sludge settleability without the need for costly system modification or expansion; (2) increase biomass inventory, thus increasing the ability to handle higher loads and operate at higher SRTs; and (3) improve biological nitrogen and phosphorus removal and improve solids removal.

- Nitrous oxide production: A focus on control strategies to further reduce net anthropogenic emissions from nitrogen from nitrous oxide (N2O) is an important research topic. Research from pilot and full-scale testing will be presented with a focus on how to minimize N2O.

Speaker(s):

Leon Downing, downingl@bv.com, Black & Veatch, Madison, Wisconsin

Dr. Leon Downing is a globally recognized leader in nutrient removal and recovery, with over 20 years of experience in environmental engineering. As the Director of Innovation for Treatment Solutions and Global Practice Leader for Nutrient Removal & Recovery at Black & Veatch, Dr. Downing has dedicated his career to advancing sustainable wastewater treatment technologies. His work spans the full project lifecycle, from research and development to facility design, startup, and optimization. He has contributed to over 50 water resource recovery facilities (WRRFs) and has led multiple high-impact research initiatives, including five Water Research Foundation (WRF) projects and two Department of Energy (DOE) projects. Dr. Downing has authored 24 peer-reviewed journal articles and has provided technical leadership on innovative wastewater treatment solutions worldwide.

The Same…But Completely Different: Thermophilic Aerobic Digestion Overhaul(s) in the Pacific Northwest

Description:

The McMinnville Water Reclamation Facility (WRF) in Oregon's Willamette Valley has a long history of innovation in biosolids management, reflecting the community's strong environmental and agricultural values. Since 1996, McMinnville operated a first-generation Autothermal Thermophilic Aerobic Digestion (ATAD) system—three steel reactors with proprietary aeration and foam control equipment—that produced Class A biosolids but faced persistent challenges, including limited oxygen transfer, incomplete digestion, odor generation, and temperature instability, particularly during seasonal peaks. Despite these constraints, the facility's operators maintained reliable performance for nearly three decades through adaptation and ingenuity.

To address aging infrastructure and performance limitations, McMinnville selected a second-generation ThermAer ATAD for replacement. The new system combines jet aeration, advanced process controls, and continuous monitoring of oxidation-reduction potential (ORP), pH, and temperature to optimize oxygen delivery, energy efficiency, and solids reduction. Startup in spring 2025 demonstrated the robustness of the aerobic process: thermophilic conditions (59–63°C) were achieved within a week without supplemental heating. The upgrade increased biosolids throughput by roughly 20%, achieved total solids reductions of 48–55%, volatile solids destruction of 60–65%, and consistently meets USEPA Part 503 Class A requirements, enabling broader reuse options and reduced hauling costs.

Integration with a downstream Storage Nitrification Denitrification Reactor (SNDR) effectively manages ammonia generated during thermophilic digestion. Through realtime monitoring of pH, temperature, and ORP, the SNDR converts ammonia to nitrogen gas without supplemental alkalinity. ATAD off-gas is routed through the SNDR headspace: cooling the air, enhancing ammonia capture and upstream of the biofilter. Final polishing via natural-media biofilters ensures near-zero odor emissions—a critical objective for a community adjacent to residential and commercial areas.

The McMinnville experience parallels successful ThermAer installations in Douglas County, Washington that has been operational for over 15 years. Together, these projects illustrate the evolution of thermophilic aerobic digestion technology into a reliable, odor-free, and sustainable approach to Class A biosolids production, offering valuable insights for municipalities seeking resilient, efficient solids management solutions.

Speaker(s):

Matthew J. Williams, mwilliams@thermalprocess.net, Thermal Process Systems, Heber City, UT

Matt Williams is the Business Development Manager at TPS and has over 20 years experience with digestion and biosolids. Most recently, he served as lead author for the stabilization chapter of the latest WEF Manual of Practice #8- Design of WRRFs. An avid birdwatcher, Nordic ski- & runner-Dad, he lives in the mountains of Utah with his wife and kids.

Thermal Processes: Fundamentals and Next Steps

Description:

Demonstrated and emerging thermal processes presented as solutions to growing biosolids management challenges have proven capital intensive and operationally complex. While there are currently less than 100 water resource recovery facilities (WRRFs) that dry compared to thousands that digest and dewater, thermal drying installations are expected to increase substantially, especially in regions facing regulatory action for PFAS.

In 2025 the Biosolids Drying Workshop at WEFTEC and RBITT represented the first step in assembling a working community of dryer professionals to advance the industry. Through interactive sessions informed by case studies and lessons learned from peer utilities, a key need for the industry rose to the top: developing a more rigorous, and universally understood, framework for assessing the thermal drying process.

This presentation synthesizes insights from peer utilities, case studies, and state of the science in biosolids and thermal processing to establish a starting framework for organizing and evaluating critical success factors for biosolids drying. Key insights are synthesized into three areas:

- Reassessment of Drying Process Fundamentals: a review of the classic drying curve against real-world applications and highlights the risks of under- and over-drying biosolids from a product quality and safety perspective.
- Impact of Feedstock Characteristics: a proactive and comprehensive approach to defining and evaluating the larger range of feed solids quality metrics that have a key impact on a dryer to appropriately design and support successful dryer installations.
- Holistic Scope Assessment of Drying Facilities: insights and best practices from utility case studies relevant to support system design, integration into existing WRRFs, and robustness to environmental and process conditions.

This presentation centers the collaboration happening to advance the state of thermal drying and support the many actors considering adoption of thermal drying to meet current and future biosolids challenges. The starting framework presented will provide actionable insights and tools for designing thermal drying facilities with a higher degree of confidence and supporting their successful long-term operations. Additionally, this presentation will define opportunities for utilities to become more engaged with the growing community of dryer professionals to foster more peer-to-peer engagements and knowledge sharing.

Speaker(s):

John Ross, jross@brwncald.com, Brown and Caldwell, Detroit, Michigan

John serves as Brown and Caldwell's National Specialty Leader for thermal processing and has experience in planning and design of thermal drying and high temperature processing systems. John's experience includes research into the fate of PFAS through drying, pyrolysis, and thermal oxidation.

Threading the Needle: King County Wastewater Treatment Division's Innovative Alternatives Evaluation to Solve CSO Challenges for the Mouth of the Duwamish River

Description:

How does one reduce over 430 million gallons of storm-driven untreated stormwater and sewage overflows from entering Puget Sound? How do you do it in densely urbanized downtown Seattle, with its bustling economic activity, myriad utilities, poor soils, and affordability concerns, under a consent decree? In 2023, King County (County) Wastewater Treatment Division (WTD) set out to tackle this problem by delivering this large and complex combined sewer overflow (CSO) project to build a new wet weather treatment station in SODO District and new storage tank in West Seattle. The Mouth of Duwamish Wet Weather Facilities Program's objective is to control five WTD CSO outfalls and up to three Seattle Public Utilities CSO outfalls into the

Duwamish River to meet regulatory and permitting obligations and protect Elliott Bay and the Duwamish River. This presentation will comprehensively summarize the Program's phased alternatives evaluation process to select the best apparent system alternative. The County used an iterative alternatives evaluation process to review prior planning alternatives to see which alternatives could advance in the Program's alternatives evaluation, identify and narrow sites, formulate system alternatives, then develop evaluation criteria to score and weight the system alternatives. This process led to multiple "system alternatives" that represented a potential solution to control CSOs that integrates multiple components, including conveyance pipelines, storage tanks and/or tunnels, a wet weather treatment station, and outfalls. The audience will learn about the County's approach and next steps for a project that will provide a healthier waterway for people, fish, and orcas.

Speaker(s):

Edith Hadler, ehadler@hdrinc.com, HDR Engineering, Inc., Bellevue, WA

Edith Hadler has 34 years of experience specializing in CSO options analysis, wet weather engineering, and conveyance design. She brings a comprehensive understanding of combined sewer systems, having leading alternatives analysis for 30+ CSO basins and managing planning and design for 6 CSO storage tanks. Her work has included options screening, siting, life-cycle cost analysis, hydraulic evaluation, permitting and environmental review support, and Engineering Report development under consent decree schedules.

Shelby Hodge, Shelby.Hodge@hdrinc.com, HDR Engineering, Inc., Bellevue, WA

Shelby Hodge is an environmental engineering consultant, with most of her 14-year career spent in the municipal wastewater sector. At HDR, she is the Project Delivery Lead for the Washington Water Business Group where she leads project delivery, mentorship, and career development in the areas of program/project management, collaborative delivery, and owner's advisory services for the business group. She has supported multiple clients with planning and delivering complex wastewater projects across the PNW.

Three Plants, Three Paths: What Three Idaho Facilities Have Learned About Coagulant Optimization for UltraLow Tertiary Phosphorus Removal (Panel Discussion)

Description:

Tertiary phosphorus removal continues to evolve as one of the most challenging and operationally nuanced components of advanced wastewater treatment. The framework for achieving low level effluent phosphorus is generally understood, but long-term success and efficiency ultimately hinge on the experience, adaptability, and innovation of the plant operators. In northern Idaho, three neighboring facilities – Post Falls, Coeur d'Alene, and the Hayden Area Regional Sewer Board (HARSB) - have implemented unique secondary and tertiary treatment strategies and navigated significantly different paths to achieve ultra-low effluent phosphorus levels. Their choices have been influenced not only by their existing upstream secondary treatment process, and tertiary performance, but also by factors such as chemical cost and availability, feed system configuration, operator safety, secondary chemical interactions, residuals management, and overall impacts to plant stability.

This presentation collates lessons learned from the operators of these three facilities and a operator driven panel discussion, shifting the focus from theoretical design to real world experience. J U B Engineers will introduce the panel and will summarizing each facility's treatment history, process configuration, effluent phosphorus treatment requirements and historical performance. Operations staff from the three facilities will participate in an interactive Q&A session. The presentation and ensuing Q&A is expected to explore each facility's coagulant use history, lessons learned, piloting, and full-scale implementation, as well as perceptions on current chemicals, storage and feed systems, and operational tradeoffs. The session will then open to audience questions to encourage broader regional dialogue.

The presentation will conclude with a comparative summary of coagulants trialed at all three plants, including performance observations, optimization strategies, dosing considerations, and cost implications. By exploring the collective operational knowledge of gained at Post Falls, Coeur d'Alene, and HARSB, this panel aims to provide meaningful, real-world insights and data to guide other facilities facing phosphorus limits. Ultimately, these shared experiences have the potential to inform optimization efforts across the industry and support more resilient, cost-effective approaches to achieving stringent phosphorus limits.

Speaker(s):

Kylie Cutler, kcutler@jub.com, J-U-B Engineers, Coeur D'Alene, Idaho

Kylie is a design engineer for J-U-B's Wastewater Treatment Group. She has five years of experience in the design, implementation and management of complex projects, specifically in wastewater engineering, treatment design, biological modeling, hydraulic modeling, and remote facility design.

Andrew Ruiz, aruiz@cdaid.org, , ,

City of Coeur D'Alene Wastewater Department - Chief Wastewater Operator.

Craig Borrenpohl, cborrenpohl@postfalls.gov, , ,

City of Post Falls Utility Manager.

Tracking Puget Sound Nutrient Loading Trends and Water Quality Response

Description:

The Puget Sound region has long been recognized for its ecological significance, serving as a vital marine ecosystem and supporting diverse aquatic life. This paper focuses on trends in wastewater nitrogen loadings and the resulting water quality response in Puget Sound. The objective is to quantify the extent of nitrogen inputs from wastewater sources and their subsequent effects on measures of water quality.

In this presentation, trends in the cumulative point source loadings from wastewater dischargers will be compared with receiving water quality measures in Puget Sound. Annual performance reports for 58 marine wastewater dischargers covered under the now set aside general permit (PSNGP) provide a 6 year data set to initiate a trends analysis of nitrogen loadings for the years 2020/21/22/23/24/25. To extend the record for

wastewater nitrogen discharges to Puget Sound to a 25 year period, data has been mined from the discharge monitoring database and data used in Salish Sea Model simulations. Historical flows and ammonia, NOx, and TIN loads were estimated using data obtained from the Washington Department of Ecology's (Ecology) Water Quality Permitting and Reporting Information System.

A defining characteristic of the Puget Sound estuary is the large tidally-driven exchange with Northeastern Pacific water. This relatively cold and salty water moves in and out of the deeper channels of Puget Sound twice per day, delivering ocean-derived nutrients, dissolved oxygen, and plankton while sweeping materials that enter Puget Sound bottom waters out to the ocean.

Nitrogen loading carried by tributaries into Puget Sound reflect both natural and anthropogenic sources (which include agriculture, forestry practices, upstream septic and wastewater discharges, etc.). Understanding the relative importance of any individual nitrogen source type requires a complete inventory of all nitrogen sources to the watershed. Recent advances in watershed scale modeling are improving the understanding of current nitrogen sources in the Puget Sound waters and allow for evaluation of possible management actions to control nitrogen as well as potential impacts of population growth and climate change. Overall, nutrient budgets suggest that currently 9% of the nitrogen entering Puget Sound results from human activities and about 7% from marine wastewater discharges.

Speaker(s):

David Clark, dclark@hdrinc.com, HDR, Boise, Idaho

David Clark is Senior Vice President and serves as HDR Engineering, Inc.'s Integrated Watershed Management Director for Wastewater.

Joel Baker, jebaker@uw.edu, University of Washington Puget Sound Institute, Tacoma, Washington

Professor Joel Baker holds the Port of Tacoma Chair in Civil Engineering and directs the University of Washington Puget Sound Institute at the Center for Urban Waters.

Stefan Mazzilli, mazzilli@uw.edu, University of Washington Puget Sound Institute, Tacoma, Washington

Stefano Mazzilli is a research scientist at Puget Sound Institute focusing on issues related to water quality management, and is supporting the formation and development of the Salish Sea Modeling Center.

Transforming Waste Into Value Through Advanced Water Reuse Technologies

Description:

Water scarcity is a growing global concern, necessitating transformative solutions like water reuse. This approach, which involves treating wastewater for beneficial purposes, enhances water security, protects ecosystems, improves downstream water quality, and promotes a circular water economy. Expanding water reuse is crucial for a more resilient and responsible global water management strategy.

This presentation explores advanced techniques, real-world case studies, and modeling approaches for water reuse systems, focusing on enhancing treatment efficiency, operational performance, and scalability. It

highlights cutting-edge developments in carbon-based and membrane-based treatments for both indirect potable reuse (IPR) and direct potable reuse (DPR) applications. Advanced treatment technologies such as reverse osmosis and activated carbon are prominent, with emerging alternatives like forward osmosis and ion exchange gaining traction. The presentation will detail the differences between IPR and DPR, emphasizing the role of membrane-based and carbon-based methods in contaminant removal and purification. Case studies, including the SWIFT program in Virginia and the Fargo, North Dakota Effluent Reuse Facility, illustrate successful implementations and address challenges such as PFAS removal and membrane fouling. Advanced modeling approaches are also discussed as crucial tools for optimizing treatment processes, predicting operational costs, and ensuring long-term system integrity.

Attendees will gain insights into how modeling supports decision-making, design validation, and operational flexibility. The session will conclude with a synthesis of lessons learned from implementation and operation, including technical, regulatory, and operational takeaways that can inform future reuse projects.

Speaker(s):

Murthy Kasi, mkasi@ardurra.com, Ardurra, Las Vegas, Nevada

Murthy Kasi is a Water Technology Leader with Ardurra in Las Vegas, NV. Murthy has provided technical support to several water reuse applications. He has organized workshops and presented on water reuse in various conferences.

Raj Chavan, rchavan@ardurra.com, , ,

Raj Chavan is a National One Water Director. Raj has managed several water reuse projects and has published several articles on water reuse.

Ultraviolet (UV) Disinfection Procurement Selection Process Aiding the Design Development of the 210 mgd Elliott West Wet Weather Treatment Facility

Description:

The Elliott West Wet Weather Treatment Station (EWWTS) provides a Combined Sewage Overflow (CSO) controlled discharge point just north of downtown Seattle. The existing EWWTS provides pumping, screening, chorine disinfection, and discharges to Puget Sound. Since King County Wastewater Treatment Division (WTD) began operation in 2005, EWWTS has substantially reduced pollution entering Elliott Bay. Although not all effluent limits at this location have been met, the system remains in compliance with the overall West Point Treatment Plant's National Pollutant Discharge Elimination System (NPDES) permit requirements.

Between 2020 and 2023, WTD assessed potential upgrades for key EWWTS processes including pumping, screening and ballasted sedimentation. Subsequently, Ecology issued an NPDES permit with reduced total residual chlorine limits at EWWTS prompting WTD to further evaluate alternative disinfection technologies to reduce the long-term permit compliance risk. This prompted the development of a UV disinfection alternative to eliminate the use of chlorine.

During predesign, WTD embarked on a low pressure, high intensity UV disinfection vendor selection process tailored to address the unique operation for the wet weather station including:

- Intermittent reliable operation with 24/7 standby capability
- Retrofit constraints associated with available footprint and hydraulic headloss
- Extended support for wet weather startup and commissioning
- Handling combined sewage water quality for flows between 25 mgd and 210 mgd
- Fully isolated trains capable of independent discharge and flow return to allow the ballasted sedimentation process to startup

The UV disinfection system selection process was intentionally developed to facilitate best-value based on an acceptable combination of capital costs and noneconomic factors. Two UV equipment manufacturers provided proposals for their systems in June 2025 and the County selected to proceed with the Trojan Technologies' UVSigna 2-Row system.

This presentation will summarize the UV disinfection selection process along with the findings from various inquiries regarding UV O&M at existing facilities for refinement of selection criteria scoring and the leveraging of early selection for productive design development.

Speaker(s):

Michael Borrero, mborrero@carollo.com, Carollo Engineers, Seattle, WA

Mr. Borrero has 28 years' experience in the design and construction of wastewater treatment facilities. He is a graduate from Carnegie Mellon.

Meghna Prasad, mprasad@carollo.com, Carollo Engineers, Seattle, WA

Meghna Prasad has 7 years of experience. She has a master's degree from the University of Michigan and is doing the ultraviolet disinfection design for the Elliott West Wet Weather Treatment Facility. She works in Carollo's Seattle office.

Unlocking Hidden Solids Capacity Through Holistic, Data-Driven Planning and Optimization

Description:

ISSUE

Rapid growth in the City of Boise, combined with decades of rate-restricted budgets and capital diversion toward nutrient treatment, resulted in approximately 20 years of under-investment in solids infrastructure. Increasing solids loads, aging assets, and constrained funding required a strategic, data-informed approach to

address systemwide solids constraints. This session presents a planning framework for identifying innovative, cost-effective solutions under restricted budgets applicable to municipalities of all sizes.

BACKGROUND

The City initiated the Solids Handling Plan (SHP) and subsequent Solids Handling Improvement Program (SHIP) to evaluate solids system performance and improvement needs. Condition, capacity, and redundancy challenges exist across two interdependent but operationally distinct systems at the Lander Street Water Renewal Facility (LSWRF) and West Boise Water Renewal Facility (WBWRF). Solids are thickened and digested independently, with LSWRF solids conveyed approximately seven miles to WBWRF for centralized dewatering prior to land application. Systemwide evaluation identified increased digester influent total solids (TS) as an opportunity to recover capacity if operational risks and interdependencies could be defensibly evaluated.

METHODS

SHIP emphasized optimization and lower-cost capital improvements through collaboration with operations staff, rheology testing, vendor engagement, and condition assessment. Rheology testing characterized non-Newtonian sludge behavior to estimate capacity limits for pumps, pipelines, heat exchangers, and mixers using manually thickened digested and blended sludges. Rheology-informed hydraulic modeling identified previously unrecognized bottlenecks, including the digested sludge pipeline. Vendor collaboration validated equipment capacity, reuse, and upgrade pathways. Structural integrity of concrete tanks was assessed using surface-penetrating radar, aural sounding, half-cell potential testing, and laboratory analysis of concrete cores.

RESULTS

Initial SHP planning estimated $215M in capital investment. Detailed SHIP analyses identified optimization opportunities that reduced estimated costs by approximately 45% and prioritized $115M in bundled, co-beneficial solids and liquids projects. Higher-TS operation was identified as viable and more cost-effective than new digestion or thickening volume, supported by asset reuse, optimized digester mixing, fermenter performance validation, and condition-based structural reuse. Gravity thickeners were capable of higher TS but constrained by downstream pumping; targeted pump improvements could recover up to five days of digester SRT and defer major capital investment. Liquid-stream grit removal improvements unlocked substantial upstream redundancy benefits.

CONCLUSIONS AND APPLICABILITY

Rheology testing and condition assessment were critical to estimating system capacity, enabling asset reuse, and mitigating high-cost surprises. Evaluating liquid-solids interactions revealed co-beneficial improvements not identified through a solids-only lens. The SHIP framework demonstrates a replicable, data-driven approach for managing growth, risk, and capital costs while deferring large-scale expansion, particularly for space-constrained and under-invested facilities.

Speaker(s):

Alli Hornak, ahornak@cityofboise.org, City of Boise, Boise, ID

Allison Hornak has a passion for supporting utilities in strategic planning through making value driven decisions. Allison is an environmental engineer with the City of Boise with experience delivering both industrial and municipal wastewater projects. In recent years, Allison has focused on utility and capital planning and permitting; however, she spent the first portion of her water career as a design engineer working on various

projects within the fence of wastewater treatment plants. When not at work, Allison can be found enjoying the outdoors with her family on the numerous sunny days in Boise or curled up with a book on the few rainy ones.

Luke Pinto, lpinto@hdrinc.com, HDR, Seattle, WA

Luke Pinto is a PE with eight years of experience in wastewater treatment, nutrient optimization, and project delivery across the Northwest. He serves on the Engineers Without Borders Board of Directors, reflecting a ten-year commitment to humanitarian engineering. Outside work, Luke can be found adventuring around the PNW with his wife and their two dogs.

Upgrading Clean Water Services' Temperature Compliance Strategy – A Holistic, Watershed, and Value-Based Approach

Description:

The Tualatin River Watershed is home to more than 610,000 people and many large industries, but the Tualatin River is a small, sensitive river that contains salmon and steelhead. This makes complying with temperature requirements challenging for Clean Water Services (CWS) who manages the NPDES permitted discharges from four WRRFs and the MS4 into the Tualatin River Watershed. Since 2004, CWS has met temperature requirements by decreasing thermal loads to the extent practicable and offsetting the remaining thermal load through restoring riparian shade and releasing water from reservoirs to enhance flow. As the population in the watershed grows and the climate changes, complying with temperature regulations becomes increasingly difficult, and a comprehensive long-term strategy is needed.

In 2020-2021, CWS updated its Temperature Compliance Strategy (TCS) to evaluate a wide range of potential actions it could take to improve temperature in the Tualatin River, run thousands of combinations of these, and see which combinations provided the most benefit at the least cost. This novel approach allowed us to make several major decisions about investments in long-term thermal management. The adaptive management plan calls for an updated TCS every 5 years to account for new developments. In the 2026 update to the TCS, CWS made many improvements on the previous version from 2021 including 1) better representation of thermal plumes, 2) additional potential actions not included in 2021 due to a lack of data/methods to quantify them, 3) updated future predictions from recent master plans, 4) expanded and refined reuse options, 5) better representation of costs, and 6) a more quantitative and objective method for determining the value of thermal benefits and triple-bottom-line benefits. The new method calculated a monetary value of thermal load reductions, thermal credits, and thermal plume benefits for each action. In addition, CWS worked with an environmental economist to develop a valuation system for FEMA ecosystem services and assign value to carbon footprint reductions for various actions and strategic values. We again ran thousands of combinations of different strategies and determined those with the highest overall value. This has provided a more robust strategy for ongoing compliance.

Speaker(s):

Scott Mansell, mansells@cleanwaterservices.org, Clean Water Services, Hillsboro, Oregon

R&I Division Manager at Clean Water Services and project manager for this project. Been with CWS for 9 years. Was in consulting for 7 years before that.

Lauren Roof, roofl@cleanwaterservices.org, Clean Water Services, Hillsboro, Oregon

Water Resources Analyst at Clean Water Services and main model and tool developer for this project. Been at CWS for 1 year, in consulting for 5 years before that.

Utility as Connector: Building Regional Resilience Through Industrial Symbiosis

Description:

What if a wastewater treatment plant were not the end of a pipe, but the starting point for regional collaboration and economic resilience? In the Wenatchee Valley, the City of Wenatchee's Public Works Department is demonstrating how wastewater utilities are uniquely positioned to catalyze Industrial Symbiosis (IS)—the intentional use of one organization's waste stream as another's revenue.

Utilities have practiced resource recovery for decades, producing clean water, biosolids for beneficial reuse, renewable energy, and in some cases harvested nutrients. However, a successful regional IS program requires a broader charter and diverse coalition of public and private partners. This session explores how the City of Wenatchee's Public Works Department served as the initial spark for a regional IS effort and then deliberately transitioned into a long-term supporting role that empowers other regional partners to lead.

Grounded in the City's wastewater facility planning process, this 101-level session highlights a practical, two-pronged approach that is transferable to utilities of any size:

CATALYZING THE NETWORK: Leveraging the utility's technical credibility and convening power to bring together ports, chambers of commerce, utilities, and private industry to establish governance and shared purpose outside the treatment plant.

PLANNING FOR CONNECTION: Integrating Industrial Symbiosis thinking into facility planning so near-term infrastructure investments are flexible and capable of supporting future regional resource exchanges.

By sharing the City of Wenatchee's evolving initiative, the presentation demonstrates how a utility-led effort can grow from internal resource recovery to a valley-wide coalition supporting regional resilience. Attendees will gain:

- Strategies for using facility planning as a springboard for regional IS conversations
- A roadmap for transitioning from "instigator" to "supporting partner" to ensure program longevity
- Practical lessons for building trust and collaboration across public works and private industry

This session provides realistic, accessible guidance for agencies interested in moving Industrial Symbiosis from concept to action in the Pacific Northwest.

Speaker(s):

Jessica Shaw, jshaw@wenatcheewa.gov, City of Wenatchee Public Works, Wenatchee, WA

Ms. Shaw has worked for the City of Wenatchee since 2002 in the water, wastewater, and stormwater utilities. In 2024, she attended the Wastewater Symbiosis Study Tour in Denmark with the Center for Sustainable Infrastructure and is now working on implementing industrial symbiosis for the City's utilities. She is a Washington State certified Group III wastewater operator.

Matt Noesen, P.E., Matt.Noesen@jacobs.com, Jacobs Engineering, Portland, OR

Mr. Noesen is a principal project manager and water resource recovery technologist for Jacobs. Matt serves as U.S. West Regional Market Solutions Leader for water resources recovery.

Mike Hodgson, mhodgson@wenatcheewa.gov, City of Wenatchee Public Works, Wenatchee, WA

Mr. Hodgson has worked for the City of Wenatchee wastewater utility since 2021. Prior to that he was a construction project manager at multiple wastewater treatment plants throughout the Pacific Northwest. He is a Washington State certified Group III wa

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UV CIPP Lining of Center Street Trunk, a Large Diameter Eggshaped Brick Sewer in the Downtown area

Description:

The City of Salem owns and operates the Center Street Trunk, a sanitary sewer trunkline which runs along Center Street in Salem, Oregon. The Center Street Trunk is approximately 2,000 LF of 29-inch x 36-inch diameter egg-shaped brick gravity sanitary sewer that was determined to be structurally deteriorating and in need of rehabilitation, along with adjacent manholes and lateral connections.

Because the trunk runs along Center Street in the downtown area, it connects directly to multiple state buildings and runs in front of the State Capital building. There was also an existing fiber optic cross bore that serves the majority of the downtown area. During the presentation we will discuss the options that were considered to protect the existing cross bore while also lining the existing main and how it changed from Pre-design to Design.

Due to the trunk's location and shape LIDAR was obtained during design to determine the exact geometry of the existing trunk to be able to calculate the CIPP thicknesses using ASCE MOP 145. Manholes and lateral connections were also structurally rehabilitated using trenchless technologies. Construction is anticipated to be completed by August 2026.

This presentation will present the evaluation of feasible technologies, how the City decided that UV-CIPP was the best solution for mainline rehabilitation, the site-specific design challenges of the project, the management of the existing fiber optic cross bore, challenges performing LIDAR on an egg-shaped sewer with no flow vs high flow, and the presentation of the construction activities.

Speaker(s):

Zach Swartzendruber, Zach.Swartzendruber@Leewayengineeringsolutions.com, Leeway Engineering Solutions, Portland, Oregon

Zach Swartzendruber has 14 years of experience in trenchless rehabilitation design in wastewater conveyance.

Wastewater Surveillance Reveals Geographic and Sociodemographic Patterns of Antimicrobial Resistance

Description:

Antimicrobial resistance (AMR) is an escalating global health challenge with profound implications for both environmental and public health stewardship. Municipal wastewater treatment plants (WWTPs) serve as critical nodes in the surveillance of antibiotic-resistant bacteria (ARB) and antibiotic resistance genes (ARGs), offering a valuable opportunity to monitor and mitigate their spread. However, the influence of regional variability and community sociodemographic characteristics on AMR trends in wastewater remains poorly understood, limiting the ability to design targeted interventions. Addressing this knowledge gap is essential for advancing data-driven environmental management and equitable public health strategies.

In this study, we conducted a nationwide U.S. wastewater surveillance campaign to evaluate how geographic region, season, community size, and sociodemographics shape the distribution of ARB and ARGs. This study included 40 WWTPs across the contiguous United States, representing large (>10 million gallons per day (MGD) average daily flow), medium (1–10 MGD), and small (<1 MGD) systems. Using 24-hour composite influent samples, we quantified antibiotic-resistant E. coli and enterococci alongside key ARGs to assess AMR patterns across diverse sociodemographic and environmental contexts.

Preliminary findings indicate that geographic region, community size, and county-level sociodemographic factors are associated with the abundance of ARB and ARGs in untreated wastewater influent. Also, composite measures of sociodemographic vulnerability, such as the CDC's Social Vulnerability Index (SVI), may serve as an indicator of AMR burden across communities. Collectively, these findings highlight wastewater surveillance as a promising tool that could be implemented to support data-driven public health decision-making in identifying and mitigating AMR in communities. By integrating community-level sociodemographic data into wastewater surveillance, this research grounds the method in environmental justice, advancing equity-centered public health and extending environmental justice principles into the realms of engineering and public policy.

Speaker(s):

Matthew Latham, lathamma@oregonstate.edu, Oregon State University, Corvallis, Oregon

Matthew Latham, 4th Year PhD Student in Environmental Engineering at Oregon State University

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Wastewater Treatment 101

Description:

The world of wastewater treatment can be intimidating at first – it's so much more complicated than it seems from the outside! If you're new to wastewater and working at a wastewater or water reclamation facility you are probably familiar with the treatment that your facility does. But what about all the other facilities? Are they all using the same system that you know (and love)? There are a vast array of treatment types that have different economic, energy, staffing, and footprint needs!

This talk will discuss the basic components of wastewater treatment – everything from primary clarifiers to membrane filtration - and some of the common wastewater treatment systems, including Lagoon/Pond Treatment, Conventional, Membrane Bioreactor (MBR), Moving Bed Bioreactor (MBBR), and Sequencing Batch Reactor (SBR). The components of each treatment type will be described along with pros and cons that will help you understand where each fit in the wastewater treatment world.

Speaker(s):

Hannah Thomascall, hthomascall@spokanecounty.org, Spokane County, Spokane, WA

Hannah has worked at the Spokane County Regional Water Reclamation Facility for the past five years and is the current Water Reclamation Project Manager. She oversees the operations contract as well as the NPDES permit and related studies. Hannah has a degree in Biosystems Engineering from Auburn University.

Wastewater Treatment for Watershed Protection: Understanding the Three Basin Rule

Description:

Following on the heels of the Clean Water Act of 1972, Oregon adopted administrative rule OAR 340-041-0350, also known as the "Three Basin Rule," in 1976. The rule provides additional protections for water quality in three critical watersheds that serve as major drinking water sources in Oregon—the Clackamas River, a portion of the McKenzie River, and the North Santiam River. For nearly 50 years, the rule prohibited the issuance of discharge permits under the Clean Water Act, impacting long-term development and recent post-wildfire rebuilding efforts in the North Santiam Canyon communities.

The Supreme Court's landmark decision in Maui v. Hawaii Wildlife Fund in 2020 held that the Clean Water Act's National Pollution Discharge Elimination System (NPDES) jurisdiction extended to groundwater discharges if those discharges are determined to be the "functional equivalent of direct discharges" into surface water. Due to prohibitions on obtaining a new NPDES Permit in the Three Basins, any discharge that the Oregon Department of Environmental Quality (DEQ) determines is functionally equivalent does not have a pathway to obtaining an NPDES Permit, impeding efforts to upgrade or replace aging wastewater treatment systems. Without a viable permitting pathway, Oregon had to re-evaluate the outdated Three Basin Rule and adopt changes that reflect the advancements in wastewater treatment technology since the 1970s and resolve the conflict between state and federal regulations.

This case study will focus on the history of the Three Basin Rule, Maui Decision, and recent Rule Change through the lens of the Mill City and Gates Municipal Wastewater Treatment Facility. It will also discuss how changes in the regulatory landscape will present opportunities for other communities to grow, develop, and modernize their approach to wastewater treatment.

Speaker(s):

Peter Olsen, polsen@kellerassociates.com, Keller Associates, Inc., Salem, Oregon

Peter Olsen manages Keller Associates' Salem Office and is the project manager for Marion County's North Santiam Joint Sewer Master Plan. He has a master's degree in civil engineering with a water resources emphasis and has a breadth of experience managing many projects, including stormwater, water, and wastewater master planning.

Pam Villarreal, pvillarreal@kellerassociates.com, Keller Associates, Inc., Beaverton, Oregon

Pamela has 14 years of experience with various aspects of environmental remediation, stormwater, water, and wastewater treatment from the preliminary planning and development stages through design and construction management. She holds a bachelor's degree in civil engineering from the University of California Los Angeles and is a licensed Professional Engineer. Pamela has lived and worked in California, New York, Idaho, and Oregon.

Water Quality Trading 101: Watershed-based Clean Water Act Compliance Strategies

Description:

As communities work to meet clean water goals, the costs of compliance are rising. Increasingly, permit limits are driven by pollutant loading from sources that are not regulated by the Clean Water Act (CWA), requiring utilities to construct treatment technologies to address watershed-scale issues. For many communities facing this dilemma, Water Quality Trading (WQT) can offer a practical and cost-effective solution. WQT is a watershed-based CWA compliance strategy that enables a regulated entity to satisfy its permit requirements by supporting pollutant reduction practices outside its treatment facility.

WQT is a way to achieve equal or greater environmental outcomes at lower cost and with ancillary benefits for the watershed. The approach is grounded in the simple principle that where pollution reductions happen can matter just as much as how they happen. While trading does not replace traditional regulation, it has become a powerful complement, unlocking new opportunities to reduce pollution where it's most cost-effective. Additionally, WQT can encourage private investment capital, provide additional resources for conservation, and serve as a catalyst for developing innovative, integrated solutions for improving water quality by aligning compliance efforts and voluntary watershed improvement programs.

Water Quality Trading 101 introduces the fundamentals of trading as a practical, watershed-scale approach to meeting obligations. This session explains how trading works by enabling regulated point sources to achieve permit limits by financing verified pollutant reductions from other sources within a defined watershed, often

including agricultural and urban stormwater practices. Attendees will review example use cases and decision criteria for when WQT may be cost-effective compared to traditional treatment upgrades, and how trading can be combined with other watershed-based efforts to develop effective, economical compliance strategies. By the end of the presentation, participants should have a better sense of whether WQT is a potential fit for their circumstances.

Speaker(s):

Chris Thomas, cthomas@thefreshwatertrust.org, The Freshwater Trust, Portland, Oregon

Chris Thomas is a Policy Specialist & Senior Attorney with The Freshwater Trust. In more than 10 years with The Freshwater Trust, Chris has evaluated, developed and implemented many watershed-based Clean Water Act compliance programs, including several water quality trading programs.

Jessica Fox, jessica.fox@thefreshwatertrust.org, , ,

Jessica Fox is Director of Integrated Solutions at The Freshwater Trust and supports development of novel compliance solutions that protect people and water. Recognized for pioneering work in water quality trading, species credit trading, pollinator conservation and corporate sustainability, her projects have been covered by the Wall Street Journal, The Economist, National Public Radio, Bloomberg, and others. She is a Certified Ecologist with a Bachelor's of Science from University of California at Davis, and a Master's of Science from Stanford University.

Water Reuse Projects: Where Innovation and Dreams Meets Operational Realities

Description:

Water reuse projects capture the imagination because they promise to turn a limited resource into a resilient one. They represent innovation, sustainability, and discharge opportunities for growing communities and industries. But between the dream and the reality lies a difficult path—one shaped by capital and operational costs, regulatory complexity, and the day-to-day challenge of operating reuse water systems. The success of water reuse depends not just on technical capability, but on whether a project is practical, affordable, and long-term goals. This presentation will discuss several water reuse projects, their initial goals and long-term realities.

Speaker(s):

Ken Windram, kwind@harsb.org, Hayden Area Regional Sewer Board, Hayden, ID

40+ years' experience in wastewater operations and management working at over 50 wastewater treatment facilities from 50,000 gallons per day to 450 million gallons per day capacity. Wastewater licenses: New York Grade 2, Massachusetts Grade 7, Indiana Grade 4, Hawaii Grade 4, Washington Grade 4, Idaho Grade 4. I have worked for Envirotech Operating Service, Metcalf & Eddy, USFilter, and Veolia Water. I was the USFilter project manager for the design, build, own and operate 13 MGD Honouliuli Water Recycling Facility (largest water recycling project in Hawaii (2000)). My current position is administrator, Responsible Charge Operator at the

Hayden Area Regional Sewer Board (HARSB). HARSB has a reuse farm for irrigation season discharge. Degree in Environmental Technology from the State University of New York.

We Can't Do it Alone: Building a Strategy for Community Partnerships

Description:

Successful water reuse infrastructure projects depend not only on technical design but also on strong, trust-based community partnerships. This presentation explores strategies for building and sustaining collaborative relationships with stakeholders, including utilities, local governments, community organizations, regulators, and end users. Attendees will learn how to identify key partners, navigate institutional and social barriers, and incorporate community input into project planning and implementation. The session also examines tools for fostering long-term support and shared ownership, including education initiatives, participatory decision-making processes, and equitable benefit distribution. By integrating technical innovation with inclusive engagement practices, water reuse projects can achieve greater public acceptance, reduce risk, and deliver lasting regional value.

Speaker(s):

Natalie Monro, Natalie.Monro@jacobs.com, Jacobs, Bellingham, WA

Natalie is an experienced professional with over ten years of communications experience, with a focus on wastewater, water resources and water reuse projects. She is currently the Chair of the Communications Committee for the WateReuse Association, and is involved with the PNW WateReuse communications group as well. She works for Jacobs, focusing on regional and national reuse projects.

What to do in the face of regulatory uncertainty? The City of Spokane's journey to provide adaptive pathway management during Facility Planning

Description:

The City of Spokane is at a critical inflection point in planning for the future of its wastewater system. For decades, the City has reliably provided wastewater collection and treatment services through an extensive system—including more than 870 miles of combined and sanitary sewer lines, 29 lift stations, 19 CSO tanks, and the Riverside Park Water Reclamation Facility (RPWRF), which has operated as a membrane tertiary treatment facility since 2021. This system conveys and treats an average of approximately 30 MGD of wastewater daily and discharges high-quality effluent to the Spokane River, providing clean water for the community and downstream users.

Today, in a rapidly changing and accelerating world, the City faces growing uncertainty and complexity in providing wastewater services. Assumptions that guided past facility investments are being tested by increasingly stringent regulatory requirements, emerging contaminants, growth pressures, aging infrastructure,

and fiscal constraints. In addition, the RPWRF site is significantly space-constrained, limiting future on-site expansion opportunities.

Rather than planning toward a single forecasted regulatory outcome, Spokane is developing a Wastewater Facilities Plan that applies an adaptive pathway management framework. The Plan evaluates both a 20-year planning horizon and a 50-year visioning horizon, recognizing that wastewater infrastructure must remain flexible across multiple possible futures.

The Plan will assess a range of programmatic alternatives, including collection, treatment, effluent management, and funding strategies—ranging from maintaining Spokane River discharge to alternative approaches such as groundwater recharge and land application. These alternatives will be organized into an if/then decision matrix that links potential regulatory triggers to phased investments, enabling the City to respond as conditions evolve while minimizing the risk of stranded assets.

This case study illustrates how adaptive pathway management can provide utilities with a defensible, values-based roadmap in the face of regulatory uncertainty. By linking decisions to observable regulatory triggers and embedding adaptability into long-term planning, Spokane is reframing its Wastewater Facilities Plan not as a fixed blueprint, but as a living strategy for long-term compliance and service reliability.

Speaker(s):

Amanda McInnis, Amanda.McInnis@jacobs.com, Jacobs, Missoula, MT

Amanda is an experienced principal project manager with a broad range of water, wastewater, effluent mangement and stormwater experience, including project management, planning, permit assistance, funding assistance, design, and construction. With over 26 years of experience she completed multiple facilities plans and is the Senior project manager on the City of Spokane Riverside Park Water Reclamation Facility Facilities Plan.

Lorena Croucher, lcroucher@spokanecity.org, City of Spokane, Spokane, WA

Lorena is a professional engineer in the City of Spokane's Integrated Capital Management Department, which provides long-range and budgetary planning for utility and street capital facilities. She has 12 years of industry experience in both consulting and public service. Over the course of her career, Lorena has contributed to several comprehensive wastewater master plans and is the City's project manager for the Riverside Park Water Reclamation Facility Facilities Plan.

What's just happened? Why can't we have the right data when we need it?

Description:

The subject of data and how we can use them to achieve better outcomes has gotten a lot of attention. But one important step is consistently omitted. Selecting the necessary signals, sample locations, and analysis to make informed decisions, especially when something fails or underperforms.

When for instance phosphorus goes up in the effluent, what information is needed to pinpoint the root cause. Lab turnaround time is three to seven days. Operation experience can bridge the gap and this approach worked

at least satisfactory. However, that approach is losing its practicality when we introduce intensification, high rates, short residence times, low effluent nutrient limits, and a silver tsunami washing away said operation experience.

Embedded in the aforementioned predicament are two issues, balancing the cost of collecting water quality data through laboratory analysis and analyzers, and the lack of performance tracking and benchmarking.

We cannot measure everything everywhere and while online analyzers can provide a lot of value, they can be costly and maintenance intensive. Do we learn anything from effluent BOD in a nitrifying plant 5 – 10 days after the fact? Does it make sense to replace BOD with COD or TOC that have a faster turnaround and provide comparable information.

One way to approach this is to focus on performance and key process indicators (kpi) tracking. For example, flow to a clarifier is a signal of little value to assess performance. Rather, calculated values solids load, hydraulic load, RAS rate, and blanket depth. Not all are always needed but each one provides more information than flow.

This presentation will explore how to approach sampling and monitoring to collect the information needed to assess performance and enable benchmarking. That is comparing current performance to past or peers. Real world examples will include cases where key information was missing and hampered resolving an issue, as well cases that illustrate the value of having the right information at the right time.

Speaker(s):

Mario Benisch, mbenisch@hdrin.com, HDR, Portland, OR

- 1998: Graduated from University of Stuttgart, Germany with MS in Environmental Engineering
- Since 1998 with HDR in Portland OR
- Now senior wastewater process engineer with focus on nutrient removal and recovery, emerging technologies, process intensification, dewaterability, and plant data visualization.

Austin Carnes, , City of Boise, Boise, ID

When do Digital Tools Actually Help Operators?

Description:

Digital tools are playing an increasingly important role in wastewater operations, supporting activities ranging from monitoring and visualization to forecasting and decision support. When thoughtfully applied, these tools can enhance situational awareness, improve consistency, and support confident decision making during day to day operations. Their effectiveness, however, depends strongly on how well they align with operational needs, workflows, and facility specific context.

This presentation shares lessons learned from several real world wastewater case studies where digital tools were introduced and refined to support operations. Rather than advocating for a single solution or level of sophistication, the session highlights how different facilities made different choices, and how those choices reflected staffing models, process complexity, data availability, and operational culture. Across all cases, the objective was the same: provide operators with information that is timely, reliable, and easy to act upon.

Using practical examples, the presentation explores key considerations such as how much automation is appropriate, where operator judgment remains essential, and how information should be presented to support plant operations without adding unnecessary complexity. The case studies reflect facilities managing variable flows, staffing constraints, and changing operational demands: factors that strongly influence how digital tools are adopted and trusted. Several examples demonstrate how incremental adjustments, such as refining data inputs, simplifying outputs, or modifying how tools are introduced, contribute to stronger adoption and use over time.

The session emphasizes that there is no universal approach to digital tools in wastewater operations. What works well at one facility may require adjustment at another, and success often comes from understanding operational priorities before selecting or configuring the digital fabric for these tools. Operators and engineers attending this session will gain practical insights they can apply immediately, including how to evaluate new digital tools, set realistic expectations, and ensure that technology genuinely supports daily operational decisions.

Speaker(s):

Chinmay Gaidhani, gaidhanicn@bv.com, Black & Veatch, Overland Park, Kansas

Chinmay Gaidhani is a wastewater process engineer at Black and Veatch with a focus on modeling, digital water and data architecture.

When Everything Changed Overnight: The Story of Lahaina WWTF Resilience

Description:

Maintaining reliable total nitrogen (TN) removal can be challenging even under stable conditions. When influent flow, loading, and wastewater characteristics change rapidly, sustaining performance becomes significantly more complex. The Lahaina Wastewater Treatment Facility (WWTF), operated by the County of Maui, provides an example of how operational flexibility and staff expertise can maintain compliance through extraordinary change.

The Lahaina WWTF is a 9-mgd facility designed to meet an effluent TN limit of 10-mg N/L using a step-feed activated sludge process. The secondary treatment system includes anoxic and aerobic zones with mixed-liquor recycle systems to support biological nutrient removal. Historically, the facility treated an average influent flow of 4 mgd, with peak daily flows approaching 6 mgd during major holidays.

In August 2023, the Lahaina wildfire dramatically altered conditions across the service area. Although the fire did not reach the WWTF, power outages, access limitations, and widespread community impacts resulted in an abrupt reduction in influent flow—from 4 mgd to 2 mgd overnight. Influent wastewater characteristics also

shifted significantly, including a reduction in the carbon-to-total Kjeldahl nitrogen (TKN) ratio, presenting new challenges for biological nutrient removal.

Despite these disruptions, County staff successfully adapted operations to maintain TN compliance. This presentation will share lessons learned from managing sustained low-flow conditions, altered influent characteristics, and periodic increases in organic nitrogen as the service area continues its recovery. The facility continues to operate under evolving conditions, with influent flows increasing gradually but remaining below pre-2023 levels.

This presentation will highlight practical, operator-driven strategies for maintaining reliable TN removal under changing conditions, offering insights applicable to utilities facing growth fluctuations, emergency disruptions, or long-term shifts in influent characteristics.

Speaker(s):

William Leaf, william.leaf@jacobs.com, Jacobs, Boise, Idaho

William is a principal technologist at Jacobs, with over 30 years in the industry. He has worked in all aspects of water resource recovery facilities and focuses on nutrient removal an plant optimization.

When It Rains, It Pours: Risk-Based Winter Reuse Management in a Groundwater Management Area

Description:

The Port of Morrow (Port) operates one of the largest industrial wastewater reuse programs in Oregon, where it collects, treats, and land applies just under 3 billion gallons of process wastewater annually from food processors, data centers, and other industries over 13,000 acres of productive farmland under a Water Pollutions Control Facility (WPCF) Permit.

In November of 2025, the Port commissioned two reuse water storage ponds which provide approximately 1.5 billion gallons of winter storage capacity. The preceding winter, however, marked the Port's final year of winter land application—one which posed unprecedented operational challenges of record-high precipitation and limited nongrowing season land application capacity, all while being located within the Lower Umatilla Basin Groundwater Management Area, which was established by the State of Oregon to reduce concentrations of nitrate in the groundwater to below 7 milligrams per liter (mg/L).

Parametrix will discuss their role in supporting the Port with irrigation operations, capacity planning, and stakeholder communication during this final non-growing season application period. Specifically, this support included:

1. Developing a comprehensive Nongrowing Season Management Plan, which applied a risk-based framework for selecting fields eligible to receive non-growing season irrigation.

2. Building a probabilistic system capacity model using GoldSim software to predict when nongrowing season capacity would run out based on influent flows, soil water holding capacity, precipitation, and existing pond storage.

3. Communicating weekly capacity modeling results to the Port's stakeholders, including industrial dischargers, participating farmers, and state regulatory agencies, to inform field and policy-level decision making.

In general, this presentation will show how coordinated stakeholder engagement, near real-time system analysis, and adaptive management reduced winter reuse applications while prioritizing groundwater protection in a nitrate-sensitive basin, even under above-average precipitation conditions that heightened risk and operational constraints. The experience offers a practical case study for managing reuse programs as they transition away from legacy winter irrigation practices.

Speaker(s):

Lauryn Guerrissi, guerrissil@gmail.com, Parametrix, Seattle, WA

Lauryn Guerrissi: Environmental Engineer with 4 years of experience in recycled water management, including permitting, planning, and process modeling/design.

Joe Mitzel, mitzeljoseph@gmail.com, Parametrix, Spokane, WA

When Water Quality Standards Can't Reasonably Be Attained: Clean Act Water Options and Precedents

Description:

Water quality standards are central to the Clean Water Act (CWA), driving assessment, permitting, and total maximum daily loads (TMDLs). Unfortunately, water quality standards cannot always be attained even with major investments in pollution controls. This presentation will outline why attainment may be infeasible, who decides what is infeasible, and review regulatory mechanisms that recognize these challenges. Mechanisms will be illustrated through both successful and unsuccessful case studies.

Federal regulations define six factors that can justify the conclusion that attaining a water quality standard is infeasible, including natural conditions, unalterable human-caused conditions, and socioeconomic impacts. Depending on the setting, either a regulatory agency or the regulatory community might take the lead in the technical and affordability analysis to demonstrate which factors apply. But given the high-profile nature of feasibility questions, the process can benefit from involvement by technical advisory groups and broad-based stakeholders. Final decisions on feasibility usually rest with regulatory agencies and their oversight boards. CWA mechanisms for dealing with unattainable standards include:

- Water quality standards refinement can involve altering the criteria or the use definition to better reflect both natural conditions and actual use by aquatic life. Examples: Chesapeake Bay (MD/VA) and Clarks Creek (WA).

- Water quality variances are time-limited suspensions of water quality standards that still target the highest attainable condition. Examples: Jamaica Bay (NY) bacteria and dissolved oxygen standards and Spokane River (WA) PCBs.

- Wet weather standards: If a standard is unattainable in only wet conditions, they may be potentially suspended under that condition. Example: Los Angeles Channels (CA) wet weather bacteria standards.

- Permanent use removal is the most drastic and rarest option. Example: New York Harbor

Together, these examples illustrate that when conventional pathways to meeting water quality standards fall short, the Clean Water Act provides a flexible suite of tools for charting a realistic and scientifically defensible path forward. However, none of these tools are easy to implement in practice. Successful outcomes depend on a strong technical foundation and cooperation among stakeholders.

Speaker(s):

Clifton Bell, cbell@brwncald.com, Brown and Caldwell, Richmond, Virginia

Clifton Bell is Brown and Caldwell's Technical Leader for Water Quality. A former hydrologist with the U.S. Geological Survey, he has 34 years of experience in surface water quality modeling and management.

Who's afraid of Serial #1? First Installations of New Processes or Equipment.

Description:

Adopting new technology or equipment at a public utility comes with unique challenges, risks, and rewards. Most utilities will shy away from the risks for justifiable reasons, yet the adoption of new technologies has accelerated. That is driven both by necessity and improved perception as there are more successful examples than failures. The risk of failure remains but less on the technology and more on the implementation side. The good news is that we have control over implementation. This presentation draws from experience of many US first installations in the past 20 years. When doing something for the first time there are going to be unknown unknowns.

Problems will come up, but they can be solved. Successful implementation starts with expecting, scheduling, budgeting for problems to occur so that time and resources are available, especially in a remote and expensive market like Hawaii. Further, one must anticipate that foreign manufacturers may not be familiar with US delivery practices and design standards, and the US vendors may not fully understand a recently licensed technology. Both may need help and that is best facilitated with contractual framework that provides room for collaboration. The presentation will provide examples of the type of issues encountered during first installations of processes of equipment, from disputes over IP protection to solving performance related problems. Finally, implementing new technology often follows a trusted companion, pilot testing.

Pilot testing can verify performance or functionality. It can also inform design parameters, operation and maintenance requirements, level of vendor support, and the nature of the work environment (noise, moisture, odor etc.). The success of a pilot depends on its duration, the environment that it is exposed to (i.e. constant vs diurnal flow), staff involvement, measuring and recording the necessary parameters, and understanding that failure is a valid outcome of a pilot.

Speaker(s):

Mario Benisch, mbenisch@hdrinc.com, HDR, Portland, OR

- 1998: Graduated from University of Stuttgart, Germany with MS in Environmental Engineering
- Since 1998 with HDR in Portland OR
- Now senior wastewater process engineer with focus on nutrient removal and recovery, emerging technologies, process intensification, dewaterability, and plant data visualization.

Witchy Brew: New Empirical Insights into the Dark Art of Primary Sludge Fermentation

Description:

Carbon supplementation is essential for enhanced biological nutrient removal (BNR) at many WRRFs. While purchased carbon is often costly and environmentally burdensome, primary sludge fermenters (PSFs) offer a sustainable alternative by generating volatile fatty acids (VFAs) and bioavailable COD onsite. However, their performance is variable, and design guidance remains limited. Poorly optimized fermenters can fail to deliver expected benefits and, in some cases, introduce internal nutrient loads that offset carbon gains. Utilities need a deeper understanding of PSF behavior to ensure these systems provide net-positive outcomes.

This study analyzed operational and performance data from six full-scale PSF systems in Oregon, Idaho, Colorado, Minnesota and Illinois. Across all sites, temperature emerged as the dominant factor in fermenter performance. VFA yields declined sharply in colder months (Fig. 1–2), reinforcing the benefit of sludge heating to maintain carbon availability year-round.

Traditionally, PSF performance has been expressed as VFA production per solids loaded (g VFA/g TSS), a metric which favors large, long-SRT designs. We propose a volume-based metric—VFA production per fermenter volume (g VFA/m^3)—to better reflect asset utilization and capital efficiency. This approach highlights trade-offs between high-SRT and low-SRT systems: while high-SRT processes increase VFA per solids, they also tend to elevate phosphorus and nitrogen release, complicating nutrient management.

Currently, many plants do not collect nutrient data from PSFs, preventing a complete cost-benefit analysis of fermenter operation. To address this, we introduce the delta-VFA metric, which adjusts VFA production by subtracting the VFA demand associated with released orthophosphate (OP). At one plant, delta-VFA

represented only 32% of total VFA due to significant phosphorus release. Meanwhile, at one Clean Water Services plant, delta-VFA represented 90% of the total VFA. Thus, while two fermenters may demonstrate similar VFA production, they can differ greatly in the net benefit of these assets. It is important to note that OP release in PSFs may also result from non-organic sources, such as ferric-bound OP, fines from struvite harvesting, etc.

With new insights into PSF design and operation, this presentation can help utilities considering onsite carbon generation achieve cost savings, sustainability benefits, and enhanced nutrient removal.

Speaker(s):

Jon Liberzon, LiberzonJ@bv.com, Black & Veatch, Irvine, California

Jon Liberzon is a process engineer and the Emerging Technologies Process Engineering Lead at Black & Veatch. He has more than 13 years of experience in the wastewater field, with several process patents and publications focused on technologies like advanced primary filtration, sidestream deammonification and membrane separation. He is also currently a PhD candidate at University of California, Irvine.

Working Upstream: Advancing Equity-Informed Actions in Wastewater Capital Projects

Description:

Equity and social justice frameworks are an increasingly common part of clean water capital projects, but many project teams still struggle to translate these principles into recommendations that shape design and construction. This interactive session will share a practical approach for working across disciplines to translate community input into actionable recommendations. Drawing on lessons from King County's Mouth of Duwamish Wet Weather Facilities Program, attendees will explore how community knowledge can strengthen technical decision-making and how clear, transparent communication can build trust when community priorities conflict with project constraints.

Speaker(s):

Anika Tabachnick, atabachnick@prrbiz.com, PRR, Seattle, WA

Anika Tabachnick is a communications specialist with more than eight years of experience leading community engagement and strategic communications, including on high-profile wastewater capital projects. Their current work helps communities understand and engage with projects that will improve water quality in King County.

Keanna Dandridge, kdandridge@prrbiz.com, , ,

Keanna Dandridge is a professional with almost 5 years of experience advancing equity-informed approaches in wastewater capital projects. Her work focuses on integrating equitable engagement practices into infrastructure planning and project delivery to support more inclusive and community-centered outcomes.

Lynsey Burgess, lburgess@prrbiz.com, , ,

As the vice president of PRR's environment division, Lynsey drives strategy on projects that improve water quality and environmental outcomes for communities across the county. She engages all of PRR's disciplines to create comprehensive engagement soluti

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You Bought it How Many Times? Lessons in MegaProject Operator Training

Description:

Across the county, aging infrastructure is driving growth in billion-dollar, multi-year mega-construction projects, with the U.S. EPA estimating $630.1 billion in clean water needs over the next two decades. One of the inherent challenges of mega-projects is structuring bid packages that promote competition. As project scope and complexity increases, the pool of qualified contractors narrows. One strategy is to divide the scope into smaller bid-packages to increase competition, this can help manage cost but increase the total volume of subcontracts. The focus of this presentation is to share how this common procurement strategy is amplified on mega-projects and an unforeseen consequence- a mega-project Operator Training challenge.

This case study focuses on San Francisco's Southeast Treatment Plant, the City's largest wastewater facility, treating nearly 80% of combined flows. Built in 1952 and beyond its useful life, the plant is undergoing more than $3 billion in upgrades, including the $1.7B Biosolids Digester Facility Project (BDFP), which will modernize biosolids processing through new anaerobic digesters, thermal hydrolysis, and advanced dewatering.

Due to its complexity, the BDFP includes twelve second-tier trade subcontracts spanning mechanical, electrical, instrumentation and controls, plumbing, and HVAC. This buyout approach resulted in certain equipment being procured multiple times—up to four in some cases—substantially increasing operator training requirements. At buyout completion, specified training totaled 1,278 sessions and 4,529 hours, all required prior to substantial completion, exceeding the time available in the project schedule.

To address this challenge, the Contractor collaborated with project stakeholders to optimize specified training, develop a feasible training schedule, and implement an integrated training program. Efforts focused on eliminating redundant training, prioritizing and waiving sessions based on Operations and Maintenance input, aligning training durations with equipment complexity, and refining staffing constraints. A standardized, accessible training platform was then implemented to ensure consistency across numerous subcontracts and manufacturers.

This presentation will share lessons learned, highlighting the electronic tools used, starting with Excel-based analysis and advancing to AI-enabled tools. The purpose of this presentation is to help prepare project stakeholders as our industry and project approach are transformed through municipal Mega-Projects.

Speaker(s):

Kiersten Lee, kiersten.lee@mwhconstructors.com, MWH Constructors, Boise, ID

Kiersten Lee is the Director of Commissioning and Startup for MWH, with 15 years of experience in the water and wastewater industry. She specializes in the commissioning and startup of complex water and wastewater treatment facilities and leads multidisciplinary teams of process mechanical, electrical, instrumentation and controls (I&C), and treatment process specialists to successfully deliver major infrastructure projects.

PNCWA2026
Rising to the Moment: Advancing a Sustainable Water Future

Annual Conference & Exhibition
September 13–16, 2026
Spokane Convention Center
Spokane, WA

PNCWA2026 Conference Tours

Times listed include travel. All tours are 2 hours of non-travel, educational hours.

CSO Tank and Cochran Basin Stormwater Treatment Facility Tour

Date: September 14, 10:30 a.m. -12:30 p.m.

Address: 906 W Main Ave, Spokane, WA 99201 and 4444 N Riverside State Park Dr, Spokane, WA 99224

Lead: Meghan Jacobson | City of Spokane | mjacobson@spokanecity.org | 509-496-1766

Description:

Join us for a Stormwater Tour showcasing two of Spokane's most innovative stormwater facilities. Our first stop is the Downtown Combined Sewer Overflow (CSO) Tank, where City of Spokane staff will take us behind the scenes of this critical piece of infrastructure that protects local waterways during major storm events. Learn how the facility captures and treats combined stormwater and wastewater and experience a live demonstration as the tank is filled and the system is flushed into operation. Next, we'll visit the Cochran Stormwater Treatment Facility, a unique stormwater management system featuring modular treatment wetlands and swales to improve water quality of stormwater runoff. Set along the scenic Spokane River, this facility combines environmental stewardship with recreational amenities, including a world-class disc golf course. Attendees will enjoy a guided walking tour of the treatment wetlands while learning how nature-based solutions are being used to protect water resources and enhance the surrounding landscape.

Spokane County Regional Water Reclamation Facility Tour

Date: September 14, 1:30-4:00 p.m.

Address: 1004 N Freya St, Spokane, WA 99202

Lead: Hannah Thomascall | Spokane County | hthomascall@spokanecounty.org | 509-477-7575

Description:

The Spokane County Regional Water Reclamation Facility (SCRWRF) is a 7 MGD membrane bioreactor that came online in 2011 and discharges to the Spokane River. The SCRWRF has piloted multiple exciting chemicals including calcium carbonate and lathum chloride. This tour will also highlight the education program and interactive exhibits at the County facility - including a vacuum-powered model of the membranes, the Human Water Cycle, and a puzzle-based Aquifer Defender model.

Upriver Dam Tour

Date: September 15, 9:00 - 11:45 a.m.

Address: 2701 N Waterworks St, Spokane, WA 99212

Lead: Charles Deilke | City of Spokane | cdeilke@spokancity.org | 509-742-8156

Description:

This tour will cover the history of the Upriver Dam from its construction in 1894 to now - including a peak at the original features under the modern building. The tour includes the dam and the power houses as well as a view of the Spokane Valley Rathdrum Prairie Aquifer in a well from 1907. The dam generates more than 70 million kilowatts of electricity annually. Power generated at the dam is used to deliver up to 180 million gallons of clean, safe drinking water per day to more than 210,000 people.

City of Post Falls Water Reclamation Facility Tour

Date: September 15, 1:00-4:45 p.m.

Address: 2002 W. Seltice Way, Post Falls, ID 83854

Lead: Adam Tate | City of Post Falls | atate@postfalls.gov | 208-651-6884

Description:

The City of Post Falls Water Reclamation Facility (WRF) was originally built in 1984 and has gone through numerous upgrades since, the latest being the completion of Tertiary Treatment and UV disinfection in 2025. The WRF is an extended aeration BNR facility, with tertiary plate settlers followed by pressurized membrane filters. The Post Falls WRF is subject to the Spokane River Dissolved Oxygen TMDL requirements, with some of the most stringent phosphorus requirements in the nation.

Airway Heights Water Reclamation Plant Tour

Date: September 16, 8:00-11:00

Address: 12405 W. 21st Ave, Airway Heights, WA 99001

Lead: Travis Stepper | City of Airway Heights | tstepper@cawh.org | 509-724-9986

Description:

The Airway Heights Water Reclamation Plant treats wastewater and produces Class A Reclaimed Water. This reclaimed water reduces Airway Heights demand for groundwater and is beneficially used by the City for landscape irrigation at a number of parks throughout the City, as well as for groundwater recharge. The Reclamation Plant is a 1.4-mgd tertiary treatment facility designed to treat that provides: fine screening and grit removal; extended aeration activated sludge treatment; biological phosphorus and nitrogen removal; secondary clarification; coagulation and membrane filtration; UV disinfection; reliability and redundancy features required by Washington's Reclaimed Water Rule; reclaimed water storage tank and pump station; and over 8 acres of percolation basins.

PNCWA2026 Mobile Sessions

Collections Systems Mobile Session

Explore the technologies, tools, and best practices used to operate and maintain wastewater collection systems. Topics include sewer system monitoring, asset management, condition assessment, infiltration and inflow (I&I) reduction, hydraulic modeling, and smart network technologies that improve reliability, efficiency, and regulatory compliance.

Hosted by the Collections Systems Committee

Lead: Adam Crafts | adam.crafts@consoreng.com | Consor | Portland, OR

Adam Crafts is a principal engineer and project manager with 25 years of experience specializing in water and wastewater conveyance infrastructure.

Wastewater Solids Handling Mobile Session

Learn about the processes and equipment used to manage, treat, and reduce wastewater solids. This session highlights advancements in thickening, dewatering, stabilization, digestion, biosolids management, and resource recovery technologies that enhance operational performance and sustainability.

Hosted by the Sustainability and Biosolids Committee.

Lead: Greg Mockos **|** gmockos@brwncald.com | Brown and Caldwell | Tacoma, WA

Greg is Brown and Caldwell's NW Practice Leader for Solids and Energy and bring more than 18 years of experience in the delivery of biosolids handling projects with a focus on advanced thermal treatment technologies such as drying, pyrolysis, and gasification out of Tacoma WA. Greg has a bachelor's in environmental engineering from Montana Tech and a MS in Civil and Environmental Engineering from UC Davis as is the proud father of two daughters that help him spread Tagro and Soungro products on his lawn and garden.

Influent-to-Effluent Wastewater Technologies Mobile Session

Gain a comprehensive view of wastewater treatment processes from plant influent to final effluent. Exhibitors will showcase technologies supporting screening, primary treatment,

biological nutrient removal, filtration, disinfection, process optimization, automation, and overall treatment plant performance.

Hosted by the Students and Young Professionals Committee

Lead: Geneva Bernsten | Geneva.bernsten@hdrinc.com | HDR | Bellevue, WA

Geneva Bernsten is an engineer-in-training with experience in planning, design, and services during construction for municipal wastewater facilities in the Pacific Northwest. Her technical contributions include integrated planning, facility upgrades, alternatives analysis, and process modeling related to wastewater treatment and solids handling systems. Beyond municipal wastewater, she ventured into the Water-Energy nexus with her master's research which tackled furthering the development of a novel technology to remove organic arsenic from landfill gas condensate. Geneva supports municipal wastewater projects with strong technical rigor and hands-on construction experience, helping clients advance efficient, research-informed treatment solutions from planning through commissioning.

Wastewater Treatment Odor Control Mobile Session

Discover current approaches for identifying, preventing, and mitigating odors generated throughout wastewater collection and treatment systems. Topics include odor monitoring, source control, air treatment technologies, chemical and biological odor control methods, corrosion prevention, and community impact reduction.

Hosted by the Air and Odor Control Committee

Lead: David Kopchinski | davidk@wwengineers.com | Water Works Engineers | Puyallup, WA

Wastewater Reclamation Facility Emerging Technologies Mobile Session

Examine innovative technologies shaping the future of water resource recovery facilities. Featured topics include advanced treatment processes, digital transformation, artificial intelligence applications, real-time monitoring, energy optimization, resource recovery, water reuse, and other emerging solutions designed to improve resilience and operational effectiveness.

Hosted by the Emerging Technologies Committee

Lead: Mark Cummings | mcummings@jub.com | J-U-B Engineers | Moscow, ID

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Operations Challenge Competition

The Operations Challenge is the industry's premier professional skills competition. PNCWA's Ops Challenge competition at the Annual Conference is a qualifying event for the Water Environment Federation's Operations Challenge at the National WEFTEC Competition. The event recognizes excellence in wastewater operations. Teams are evaluated in five events that demonstrate the span of skills necessary for contemporary water quality professionals. The event exposes participants to emerging practices and products in a competitive, educational, and social atmosphere.

Ops Challenge competition events will take place simultaneously and run concurrently to technical sessions. If approved for CEUs, competitors will track time only during hands-on applications or educational activities- practice sessions, training meeting, and active competition.

Expected maximum educational hours: **14 Hours**
(Ops Challenge participants may additionally attend conference technical sessions for up to 22 possible contact hours)

Sunday, September 13th

10:00 AM – 12:00 PM	Practice Sessions – teams rotate through events for hands-on practice
1:00 PM – 4:00 PM	Pre-competition training orientation, Competition protocols are reviewed.
5:30 PM - 6:30 PM	Competition – teams rotate through events

Monday, September 14th

10:00 AM – 12:00 PM	Competition Ongoing – teams rotate through events
2:45 PM – 3:45 PM	Educational Presentation on Operations Challenge

Tuesday, September 15th

9:00 AM - 12:00 PM	Competition Ongoing - teams rotate through events
3:40 PM – 4:40 PM	Educational Presentation on Operations Challenge

Event Descriptions:

Process Control event

The Process Control event will be held Monday morning and will consist of a written test and a scored computer simulation, using the OpTool created by Hydromantis. Teams will try to earn as many points as possible in the time allowed. Points will be awarded for correct answers in the written test, and for achieving goals in the computer simulation.

The test content and layout will be essentially unchanged from previous years. Test questions

containing math or process data will have both English and metric units listed allowing teams to work a problem in whatever units they desire. The event consists of answering a number of multiple-choice questions, some short math questions with multiple choice answers, and up to five operational type scenarios that have four to six questions each that may require considerable calculations. The event is timed, with a total of 25 minutes. The team can split up the test any way it chooses during the test. The team that scores the most points for correct answers will win. The event should be viewed as an opportunity for a team to demonstrate their accumulated knowledge of wastewater treatment and skills in plant process control.

Time is an important factor in taking the test. The total time available for each team for all portions of the test event is 25 minutes. The first portion of the test is a five-minute test preview period. The second is 20 minutes to answer the questions.

Laboratory event

Laboratory results are valuable as a record of plant operations. This data lets the operator know how efficiently the plant is running and helps predict and prevent troubles that may be developing within the various processes. Laboratory results are required as a record of performance for regulatory agencies and are of value to the operators, staff and design engineers for performance optimization, troubleshooting, determination of loadings, and for determining when plant expansions are necessary. For these reasons, laboratory tests should be conducted as carefully and consistently as possible and according to appropriate analytical methods.

Reactive Phosphorus is a highly monitored nutrient for wastewater plants. Many wastewater plants have or will have total phosphorus limits in their permits. The results from the TNT tests can be used to optimize biological phosphorus removal processes and/or estimate chemicals needed to help remove the phosphorus from the final effluent before it is discharged into the receiving waters. The test can be performed at different areas of the plant to maximize the removal efficiency and optimize chemical costs at the plant. These samples are preserved with sulfuric acid and held at <6 C. The hold time is 28 days.

Total Residual chlorine is measured to optimize effluent chlorination disinfection processes, which is the most common of the disinfection processes found at facilities in the US. For facilities that use chlorination for disinfection, some states require seasonal chlorination while others require year-round chlorination. Chlorine is added to render the pathogen ineffective at reproduction, mitigate illness, and reduce E. coli that is being discharged to the receiving waters from in the final effluent. All permits require the residual chlorine to be down to a certain level before it is discharged into the receiving waters from the final effluent. This test has a 15-minute hold time and is typically done in the field.

The laboratory event will include two different chemical analyses, orthophosphate (PO_4) and total

residual chlorine. The challenge will utilize Hach's TNTplus vial chemistries and the powder pillow PermaChem style of testing. Utilizing two-stage and tensette pipets to demonstrate the operator's understanding of determining dilution calculations and performing volumetric dilutions.

The participants will need to determine the PO_4 concentration of an unknown sample to create a 2 mg/L PO_4 standard to analyze. The TNTplus TNT843 reagent set will be used for the PO_4 testing. For the total residual chlorine procedure, the operator will need to prepare a 1 mg/L chlorine standard from a known concentration provided by Hach and perform standard additions.

Collections event

Teams will remove a section of in-service 8" gravity polyvinyl chloride pipe, fabricate a replacement section with a 4 1/2" compression fitting, and install the replacement section with flexible repair couplings. They will simultaneously construct a Victaulic valve tower, using a combination of hand tools and impact guns. Following completion of the physical repair activities, the integrity of the repair will be evaluated.

Maintenance event

The purpose of this event is to test the skills of a maintenance team in response to issues at a sanitary pumping station.

This pumping station is in a district that has many restaurants and businesses. While the city has an ordinance dis-allowing industrial waste discharges, its restaurant grease trap program has been sub-par at best. This district service area has been very problematic over the years with many SSO's that were not rain related but countless ragging/debris issues creating pump clogs and line blockages. The high cost of station cleaning and line maintenance has prompted city management to act. Recently, the city has initiated a new CMOM Capital Improvement Project. A portion of the CIP is to develop a program to reduce or eliminate "rags" that are problematic to the pumping and collection system. As a result of the CMOM study, it was determined by the asset class engineer to install Vaughan Chopper conditioning pumps to help eliminate SSO's and future blockages. However, as with any wastewater application, there are many variables to operating an efficient collection system that must be addressed including but not limited to FOG (Fats, Oils and Grease), wet wipes and other various debris. The new management has just recently created a grease trap program to address these issues, however, these programs take time due to budget schedules, implementation, and training.

A pump station team has received high level alarms via telemetry in the problematic service district. The high-level alarms have been cleared and acknowledged several times. The SCADA trends show that the pumps are cycling as programmed but continue to hit the high-level set-point alarm (level sensor

activated). It is also confirmed that the station has yet to receive the high, high level back-up float so visual and audible alarms were not activated. The early morning plan was to not only mitigate the alarming issue but perform full service of the station and its control panel. All the results from the service would then be documented in CMMS.

Upon arrival at the pumping station, it was determined that there was an abnormal amount of build-up just below the level sensor in the neutral corner of the wet well. The wet well pumps and conditioning pump appeared to be operating well but adjustment/direction of the conditioning pump was going to be required. Since full service was going to be performed anyway as a preventive measure, the impeller, corroded hardware, and pump nozzle were to be replaced along with the pump re-positioning.

Teams will have a 5-minute setup time for this event. They may move things on the table as desired and set up the toolbox as desired. However, all the tools in the toolbox must start in the toolbox and all tools/equipment on the table must start on the table, the only exception are the new impeller bolt and washer and the four new volute bolts. The only items that may be moved or touched during the 5-minute setup are the toolbox, tools, and equipment on the starting table. The hoist, trolley, and gantry may be situated during the 5-minute setup however all pins must remain in. Hoist, trolley, and gantry must start and finish in the designated marked areas. All tools and equipment must start and end on the equipment/tool table. Installation of the rubber gasket for the new guide claw during the 5-minute setup time is not permitted. The pump service table and the equipment/tool table may not be moved.

Safety event

While a facility crew is working, one of the workers collapses inside a manhole. The coworker is found at the bottom of a (confined space) lift station unconscious. It is suspected that he/she has been overcome with an unknown gas or lack of oxygen due to a worn 4” check valve gasket in the station. The in-plant rescue/repair team immediately called to the scene. The Tripod (3M DBI/ Sala 3-way combo unit) unit will be assembled and placed over the manhole. The chains must be adjusted and pulled tight. The tripod must be fully assembled, over the manhole, before the entrant can be connected to the SRL, and before the cover is pulled. The entrant that is connected to the SRL must be connected via a lifeline. Lifeline must be tied off to the railing before the entrant breaks the plane. The entrant that is connected to the retrieval rope must disconnect immediately from the SRL once they have made entry (both feet on the floor). The entrant on the SRL/winch combo must remain connected to their SRL while in the manhole.

Two members of the team will enter the confined space, rescue the downed worker, and finish the repair by replacing five (5) air diffuser membranes and two retaining rings, inspect the air pipe for debris, remove all rescue equipment, returning it to the proper location, and putting everything back into operation. A bag stored in the equipment area will be used to lower tools and equipment. After rescue the victim will be revived and moved to a decontamination shower.