1. James T. Nurmi, CCC, Fundamentals of Surface and Groundwater Contaminants
   This presentation will go over the basics of water contamination focused on surface and groundwater systems and their differences. We will also look at new contaminants that might impact water treatment in the future.

2. Eric Fullan, Tigard, Basics of Water Distribution Excavation and Safety
   This presentation will cover the fundamentals of excavation and safety protocols needed in water distribution. Standard operating procedures and protocols will be covered and the future of excavation will be introduced.

3. Engineer, Portland Water Bureau, Water Filtration Pilot Project
   This presentation will cover the history of why Cryptosporidium has caused Portland Water Bureau to engage in large scale water filtration project. This session will give details of how/why and what has been learned from the pilot filtration project.

4. Engineer, Portland Water Bureau, PWB Large Scale Water Filtration Project
   This presentation will cover the history of why Cryptosporidium has caused Portland Water Bureau to engage in large scale water filtration project. This session will follow the previous session about the pilot filter project and will present what the large scale filter project has developed and what the current status is.

5. James T. Nurmi, CCC, Water Treatment and Distribution Operator 1/2 Exam Review
   This session is a general review of topics found in the Water Treatment and Water Distribution Operator exams. Focus will be on topics and material needed to pass the Op# 1-2 exams.

6. Mike Uhe, Mueller, Water Quality
   Water quality topics will be presented. The topics will include everything from organics, inorganics, microbials, radionuclides, and disinfectant byproducts.

7. Kimberly Gupta, Portland Water Bureau, Basics of Corrosion in your Distribution System
   What does corrosive water mean? Join us to learn about the different aspects of what corrosive water is and how it impacts our water infrastructure and learn what to do about it.

8. Kimberly Gupta, Portland Water Bureau, Basics of Nitrification and the Effects on Treatment
   Since the discovery of the Haber process which enabled us to take nitrogen gas and make fertilizer out of it, we now find ourselves with too much nitrogen in our waters. Learn about the nitrification cycle and how it impacts our water treatment systems.

9. Chris Wilson, Joint Water Commision, JWC Water Treatment Plant Expansion Project

This session will give an update on the very large JWC water treatment expansion project. The history and timeline leading up to this project will be focused on.

10. Chris Wilson, Joint Water Commision, JWC Water Treatment Plant Design and Planning
    This session follows the above and will provide details on the water treatment expansion design and planning components.

11. James T. Nurmi, CCC, Calculating Contact Times for your Water System
    CT's, what are they good for? It is critically important to understand why contact times are important, what water chemistry variables change CT's, how to calculate CT's, and what to do if you are below the required CT's. We will cover all of these topics and look at monitoring CT and CT trends.

12. Dennis Grieves, INTEL, From WET Student to Ultra High Purity Water Technician
    This session will focus on the pathway and lessons learned from someone with no knowledge of water treatment through becoming a ultra high purity water treatment technician. Lessons learned, educational pathways, technical knowledge and suggestions will be presented.

13. James T. Nurmi, CCC, Water Distribution Design and Planning
    This session will be about the basics of what a water distribution system is and how design and planning is critically important to the water industry in the next 10 years.

14. Greg Carr, CCC, Fundamentals of Producing Ultra High Purity Water
    This session will discuss what high purity water is, why it is needed and for what purposes, who uses it, and how you can achieve ultra high pure water using various techniques including reverse osmosis.

15. Greg Carr, CCC, Basics of SCADA for Water Utilities
    This session will go over the basics of supervisory control and data acquisition (SCADA) and how it is becoming increasingly important for operators to understand how SCADA works and how to program PLC's.

16. Martino Rabaioli, CIMCO, Locating 101 - The why's, how's, do's and don'ts of locating underground utilities
    In this class we will explore the reasons behind locating underground utilities, the basic principles of underground locating and the best (and worst) practices."

17. James T. Nurmi, CCC, Math Review for Op# 1-4
    This session will focus on that dreaded 10% of all water exams = math! We will review common math topics, equations and solutions to problems that you might encounter in the Op# 1-4 exams. I will even show you how to solve a problem without knowing the equation.

18-20. Panel, Water Industry Workforce Challenges – Drinking Water Regional Internship Program (DRIP)

This will be a panel session led by 4 people in the water industry. The topic will be about the challenges we are facing in regards to a diminishing water workforce. Session one will be about the challenges we are seeing across the country and why this has come to be. Session two and three will be about some of the possible solutions to create guided pathways and bridges for un-employed, under-employed and incumbent workers looking to get into the water industry or those that are looking to advance in their current position. We will present one idea that we are calling the Drinking Water Regional Internship Program (DRIP) aimed at increasing awareness of water related education and careers.

21. Life After YP – An Elder Millennial Taking the Next Steps
Andrew Nishihara
Stantec
As more and more people from generation z (zoomers) start to enter the workforce it also means that elder millennials are wrapping up their transition from being young professionals to the next phase in their careers. Not quite seasoned professionals like baby boomers and gen x mentors, some are on the fast-track to being supervisors or leaders of their companies or utilities. This presentation will provide some stories and experiences from elder millennials who have made the transition and things they wish they knew when they were YPs. It will also cover some of the differences in communication styles and challenges presented from having four generations in the workforce.

22. Building a UDF Program
Christy Suto
Portland Water Bureau
The Portland Water Bureau (PWB) operates 2,500 miles of distribution system which consists of a variety of pipe materials, pipe ages, and conditions. Additionally, as an unfiltered system, the distribution system has continuously received sediment loading during the more than 100 years of operation. Over the next eight years PWB plans to clean the distribution system with a variety of tools including unidirectional flushing (UDF), in preparation of the new filtration treatment facility. This presentation will discuss the challenges related to expanding a small UDF program to a large-scale program including purchasing/incorporating a UDF module for hydraulic modeling, implementing new BMPs learned in a WaterRF project to revise flushing methods and benchmarks, hiring new staff and developing new program goals all while operating a complex distribution system which serves drinking water to close to one million customers.

23. Emerging Contaminants in Drinking Water
Gregg Baird

Oregon Health Authority
This presentation will provide an overview of emerging contaminants in drinking water including those that are of particular concern in Oregon.

24. Ozone 101
Kari Duncan
City of Lake Oswego
This presentation is an overview of the use of Ozone for water treatment from an operations and maintenance perspective. Typical operating parameters including goals and reporting, operating costs for an ozone system in the pacific northwest, maintenance procedures and repairs, and design considerations will be covered.

25. Coagulation Explained, How to Monitor your Process and Case Studies from Canada (eh?)
Mark Carey
Waterhouse
In this presentation we'll go through how water chemistry and raw water sources can help or hinder the coagulation process, how your commodity chemicals may be affecting your process, and what new measurement parameters are being used to optimize water treatment processes.

26. Fluoride for Community Systems
James Nurala
Oregon Health Authority
James will discuss the health benefits of community water fluoridation, fluoride facts and myths, and safety concerns. The presentation will cover the different options of fluoridation chemicals and feed equipment and pros and cons of each. She will also review the regulatory requirements in terms of maximum levels, monitoring, and reporting.

27. Biological Filtration
Kari Duncan
Rockwood PUD
The Lake Oswego-Tigard WTP is a 38 MGD high rate conventional treatment plant using ballasted sedimentation (Actiflo), ozone treatment and biologically active, granular activated carbon filters. The plant was completed in 2017 and LO-Tigard Staff, along with Stantec Engineers have conducted ongoing filter testing to measure biofilter performance. This presentation will cover the results of the filter testing, and general performance measurements for the filters.

28. Features and Benefits of Reinforced Epoxies for Water and Waste Water Applications
Jamie Laird
Induron

The presentation will cover the basics of preparation for steel and concrete in the water and waste water industry prior to application of coatings. I will review the various materials used for reinforcing high performance protective coatings as well as the benefits these reinforcing materials impart on the coating system. Factors to be considered will include permeability, abrasion resistance, flexibility as well as adhesive and cohesive strengths. Common uses and limitations will be discussed as well.

29. Oregon OSHA Regulatory Overview of Common Hazards in Water Treatment
Russ Reasoner, Randy Westmoreland
OSHA
This brief presentation will discuss common hazards and rules in the water treatment industry. Additionally, reference to Oregon OSHA rules will be given as well as a Q & A section at the end of the course.

30. Extending the Life of Your Concrete Tank
Nick Belmont
DN Tanks
This presentation will walk you through the many ways in which you can extend the useful life of existing concrete tanks in your system, through the processes of condition assessment, repairs and retrofits.

31. Using control valves to improve water quality in the distribution system
Robert Velasquez
Cimco-GC Systems
Three ways control valves can help improve water quality; promoting tank turnover, identifying and eliminating stagnant zones, and providing flushing to keep water fresh and scour pipelines.

32. When None of Your Planning Prepares You for This! Dallas Water Utilities' Response to Storm Uri
Sally U. Mills-Wright
Dallas Water Utilities
In February 2021, water utilities throughout Texas faced a crisis of ultimate proportions. Due to extreme freezing temperatures the Texas Electrical Grid was failing resulting in numerous power outages throughout the state. As temperatures remained low, water demands continued to climb. This presentation will showcase the efforts of the Dallas Water Utility's efforts to sustain the continuous provision of safe, clean drinking water.

33. Impact of Wildfires on Drinking Water Systems
Evan Hofeld
Oregon Health Authority

This presentation will illustrate the impacts of the wildfires in Oregon to drinking water systems in 2020. Along with specific impacts; response, mitigation, and planning strategies will be presented to help water system providers prepare for future wildfire events. This presentation will also provide an overview of available internet resources for wildfire response and planning.

34. Harmful Algal Blooms (HABs) and Emergency Preparedness: How the Joint Water Commission leveraged a HAB to identify strengths and weaknesses of an emergency response plan

Sarah Stalder and Jessica Dorsey

City of Hillsboro

The increasing frequency and intensity of Harmful Algal Blooms (HABs) globally is a serious concern for managers of freshwater systems, especially in regards to public health. Given the rise in occurrences of Cyanobacterial HABs, managers of drinking water sources, such as the Joint Water Commission (JWC), are tasked with implementing HAB response plans to protect public health. Following the Cyanobacterial HAB in Salem, OR in 2018 the JWC revised their algal response plan for their source water supplies. This plan was put into action during a bloom of toxin-producing cyanobacteria, Aphanazomenon flos-aquae, in Scoggins Reservoir in April 2019. Although toxins were never detected at the JWC water treatment plant (WTP) raw water intake, the plan was a valuable tool for monitoring and assessing risks to the treatment process and public safety. The results from this investigation also identified gaps in the WTPs ability to properly remove any toxins that may enter the plant which prompted a study to determine the impacts of powdered activated carbon on cyanotoxin removal from the JWC's raw surface water supply. Overall, the 2019 cyanobacterial HAB in Scoggins Reservoir proved to be an important but successful test of the JWC's overall preparedness for protecting public health during future HABs.

35. Tank Asset Management & Maintenance: a viable alternative to traditional run-to-fail maintenance

Jeff Austin

Suez

AWWA M42 "Steel Water Storage Tanks" offers support for this approach stating: "A good, comprehensive preventive maintenance program can extend the life of an existing tank indefinitely." Preventive maintenance programs can substantially delay or eliminate the need to replace a utilities large capital investment and often result in lower life-cycle maintenance costs and improved water quality compared to the traditional approach to tank maintenance. This presentation will discuss different aspects of preventative maintenance for tank owners and how they differ from the traditional run to fail method. Topics covered will include: safety, sanitary, structural, security and coatings conditions, as wells as applicable industry standards.

36. Concrete Tank Rehabilitation: Why Coat Concrete Structures in Water and Wastewater Systems

Jeff Austin

Suez
Often has a variety of inherent defects including porosity, drying-shrinkage cracks, bug holes, honeycombing, and cracks. Over time, spalling and additional crack formation may lead to structural issues potentially endangering the asset. The very nature of uncoated concrete creates an environment where significant water quality and compliance issues associated with biological fouling may exist. Though frequently assumed to be “maintenance-free” concrete assets need to be a part of an ongoing asset management approach, of which coatings are an integral part. Advanced coatings systems allow concrete tanks to be rehabilitated and maintained improving water quality, protecting the asset, reducing non revenue water, and extending the asset life. This presentation provides a discussion on maintenance to protect the asset, NSF approval of materials, and improved water quality will allow the Owner to easily see the benefits of coating existing and new concrete structures. Lastly, several examples of ‘before and after’ projects will be discussed.

37. Reagentless Free Chlorine Analysis
Frank Spevak
Emerson Automation Solutions
This session of “Reagentless Free Chlorine Analysis” will introduce to those in attendance a fundamental understanding of the different types of chlorine, the different methods to measure each and the effects to each from other variables such as temperature, pH, flow, pressure, low ionic strength water and other contaminants.

38. Online pH 101 Monitoring and Reporting
Frank Spevak
Emerson Automation Solutions
The session of “pH 101” will introduce to those in attendance to a better understanding how in-process type sensors work, the different components in a combination sensor, process conditions that effect a sensor, how to properly calibrate and the effects of different buffer solutions. The calibration “slope” and “offset” relationship and how to determine when a sensor is failing before it actually fails. I will also comment regarding the new EPA approval 150.3 for pH monitoring and what impact it has on water utilities.

39. THM Mitigation in Water Distribution Systems through Water Storage Tank Mixing and Aeration
Ethan Brooke
UGSI Solutions, Inc.
This 60-minute seminar will provide water system managers, operators and engineers a practical understanding of the conditions, chemistry and science behind trihalomethane (THMs) generation in water distribution systems. Importantly, the second half of the seminar will present a suite of proven technologies that can be employed to reduce THM levels in real world water distribution systems.

40. On-Site Sodium Hypochlorite Generation as a Safe and Efficient Alternative to Chlorine Gas or Commercial Strength Bulk Hypochlorite for Water Disinfection
Ethan Brooke
UGSI Solutions, Inc.
This 60-minute seminar will provide water system managers, operators and engineers a practical understanding of the science and implementation behind on-site sodium hypochlorite generation (OSHG) as a source of chlorine disinfection capacity for water and wastewater plants as well as distributed well systems.

41. Where Drinking Water Meets Stormwater
Kim Swan
Clackamas River Water Providers
The Clackamas River Water Providers (CRWP) is a coalition of water providers that get their drinking water from the Clackamas River, which combined provide drinking water to over 300,000 people in Clackamas and Washington Counties. The organization is made up of representatives from the City of Estacada, City of Lake Oswego, City of Tigard, Clackamas River Water (District), the North Clackamas County Water Commission (Oak Lodge Water Services, City of Gladstone), South Fork Water Board (City of Oregon City, City of West Linn), and Sunrise Water Authority (City of Happy Valley and the Damascus area). The purpose of the CRWP is to collectively fund and coordinate source water protection and public outreach and education efforts around watershed issues, drinking water, and water conservation to preserve the Clackamas River as a high quality drinking water source and to minimize future drinking water treatment costs. The Clackamas River watershed is very large with multiple stakeholders and jurisdictional boundaries (federal vs. state lands, County boundaries etc.). Human activities in the watershed such as construction, timber harvesting, live stock management, fertilizer and pesticide use if not performed responsibly can degrade water quality. In addition impervious surfaces such as parking lots, roads, and roofs carry pollutants directly to the Clackamas. Therefore, the combination of cars, homes, people, and animals in the watershed makes pollution from stormwater a serious threat to our drinking water sources water quality. Establishment of Wellhead Protection Programs and Source Water Protection Program are outlined in the Safe Drinking Water Act (SDWA) as a means to protect valuable drinking water resources whether they are derived from surface water sources, from groundwater sources. In Oregon, implementation of both of these kinds of programs by public water systems is completely voluntary. Because of the impacts nonpoint source pollution/ stormwater pollution can have our on drinking water source it create opportunities for us as water providers to work with our stormwater utilities within the watershed to look at ways to reduce stormwater pollution.

This presentation will look at how the CRWP has been working with Clackamas County's Water Environment Services (our stormwater utility) on stormwater related issues and how this these efforts have been beneficial for both parties by working to reduce stormwater pollution for downstream water providers and in return helping WES meet some of their MS4 Permit requirements.

42. Unleashing the Power of Technology for Effective Communication and Organization
Laura Oxsen
3J-Consulting
Technology is a powerful tool that can be used to aid in organization and communication. The need for effective communication and organization grows as retiree roles are filled by younger generations. In today's society where information is shared quickly, clear and concise public outreach is essential to maintain trust. Shared folders, project management applications, curated templates, and social media applications can be used to both improve the organization of ideas and enhance the productivity of communication.

43. Cross Connection for Specialist
Molly Keller
Oregon health Authority
Cross Connection for Specialists: A review of State requirements for Cross Connection and Backflow prevention geared towards Specialists

44. Lake Oswego water Conservation: Conception, Birth, adolescence and Maturity (2007-)
Kevin McCaleb
City of Lake Oswego
Lake Oswego water Conservation: Conception, Birth, adolescence and Maturity (2007-) This is a presentation on the implementation of a comprehensive Water Management program; its conception and growth through 13 years of indifference, drought, tiered water rates, infrastructure upgrades and growth. We will touch on the good and the bad; successes and failures. A quick look at the making of a comprehensive water management program that has been recognized as a top performer in the state of Oregon. We'll look at influences and involvement with other water programs throughout the state; what worked and what didn't work. The presentation will also touch on the design and the "built-in" fluidity of the program as it accommodates the ever changing environmental, political and demographical dynamics within the City.

45. Personal Preparedness
Greg Ramirez
Clackamas Fire District #1

Preparedness for Water Providers - Emergency Planning, NIMS Compliance and Integration of ICS into our day jobs, Grant Funding, Emergency Communications, and practical preparedness at home.

46. AWIA (2018) - What we learned and what's next
Donn Bunyard
Clackamas River Water
There are two primary tasks in meeting the requirements of AWIA (2018). Task 1 is an "All Hazards" "Risk & Resilience Assessment". Task 2 is the development or update of the agency Emergency Response/Operations Plan. The presentation will outline the steps taken to complete both tasks, the lessons learned from the effort, and the follow up to implement the results in order to become a resilient water provider.

47. Improve Your Public Speaking Without Saying a Word
Brian Murphy
Tetra Tech
The ability to speak publicly is a skill that can set you apart from peers and open professional possibilities that will launch a career. Much of the message we deliver while speaking has nothing to do with our words. If we aren't in control of the unspoken factors the impact of our words is lost. Effective public speaking begins with the Communication Triad of breath, posture, and voice. Understanding and mastering these three factors will improve your message before you ever utter a word. Attendees will learn how to control breathing and the impact that breathing has on the message; how posture establishes credibility or approachability; and; and how voice pattern strengthens conviction and encourages interaction. This presentation will give attendees the tools, knowledge, and understanding to become a better presenter as soon as you leave the room.

48. Building on Granite: A New Water Treatment Plant for the City of Ashland
Jeff Semigran
HDR
The City of Ashland has an existing water treatment plant that is in need of significant rehabilitation, but also located in a flood zone with limited space for expansion, susceptible to wildfire and landslides, and not seismically capable. Due to its proximity to existing infrastructure, the City elected to build a new WTP at an alternate site. This presentation will cover the challenges and opportunities for building a new WTP on a granite mountainside including taking advantage of grade, minimizing site work, and crossing a creek.

49-50. Communicating with Engineers – Getting Non-Communicators to Understand the Real World Part 1, 2
Mike Grimm
West Slope Water District

How can engineers help operators and operators help engineers without stumbling over each other? This session will explore helpful ways operators can select and work with engineers to achieve a common goal and bring value and optimized efficiency to a water system.

51. How Emerging Leaders Can Lead the Way
Michael Lubovich
Kennedy Jenks Consultants
It's been over 10 years since the first wave of millennials have hit the job market. Now, industries are turning to this mis-labeled, purpose-driven generation to help reinvent and lead their organizations for long term sustainability. In this presentation, we will discuss how this next wave of emerging industry leaders can use their unique strengths to help shape and grow organizations like never seen before.

52. Water loss reduction covering non-revenue water, the role of pressure management & metering, and leak reduction measures
Mike Uthe, M. Eng.
Mueller
I will discuss how to manage water loss with four main points. First will be on pressure management and how using control valves, demand-based set points, and DMAs can reduce water loss. The next will be on active leakage control and how monitoring systems can help remotely catch leaks before they become catastrophic. The third will be on the speed and quality of repairs to existing leaks. Lastly, I'll briefly cover the pipeline and asset management process and how to best plan a replacement program.

53.GET READY. GET WATER. Public Outreach Campaign and other projects of the Regional Water Providers Consortium
Bonny Cushman
Regional Water Providers Consortium
GET READY. GET WATER. Public Outreach Campaign and other projects of the Regional Water Providers Consortium The Regional Water Providers Consortium provides leadership in the planning, management, stewardship, and resiliency of drinking water in the Portland, OR metropolitan region. The Consortium is comprised of 24 water provider members which provide most of the Portland metropolitan area's drinking water. Find out more about the Consortium and its work to increase the resiliency of the regions water supplies through public outreach, drills and exercises, obtaining equipment, resource sharing, regional partnerships, and more.

54. "Apples and Oranges, or Just Different Apples?- Building Bridges Between Engineering and Operations"
Adam Bjornstedt, P.E., Chief Engineer
Clackamas River Water

This session will draw from the presenter's own experience from a career working among engineers, technicians, system operators, and contractors. While there can be obstacles in communicating and establishing common ground, the presentation will share examples, tips, and steps to bridge gaps among professions to reach shared goals.

55. ShakeAlert Earthquake Early Warning - Beyond the Basics (Optimization and Enhancements)
Dan Ervin
Varius Inc.
The ShakeAlert earthquake early warning system is now in use in several northwest water systems and is being used to protect lives and millions of dollars of facility assets. This presentation will describe how the ShakeAlert earthquake early warning system can be optimized to provide even more benefits and to improve system operation after a damaging quake. Topics include; filtering and preventing false alarms, improving SCADA security and air-gap protection, automated damage assessment and return to normal protocols, post-quake triage and automated response plan integration and control optimization in a compromised water system and others.

56. Growing a Water Conservation Program -- City of Redmond, OR
Suzanne de Szoeke
GSI Water Solutions, Inc. Suzanne de Szoeke, Water Resources Consultant, GSI Water Solutions, Inc. Suzanne specializes in water management and conservation planning, water rights issues, and water conservation program support. She has developed water management and conservation plans (WMCPs) and WMCP progress reports for numerous municipalities and several ports. She has helped cities inventory their water rights and develop source water protection plans. Suzanne leads GSI's efforts to help clients develop, implement, and manage water conservation program measures. This work includes producing consumer-friendly outreach materials that promote indoor and outdoor water conservation, developing website content, conducting cost-effectiveness analyses of water conservation measures, developing rebate programs, creating booth presentations for public events, and designing elementary school classroom lessons.

57. General Emergency Preparedness & Planning and Some Considerations (Notification Procedures, BMPs, etc.)
Chantal Tea Wikstrom
Drinking Water Services Oregon Health Authority
Flooding, global pandemic, wildfires, earthquakes, what's next for Oregon? As the number of hazards increase, both natural and man-made, Oregon drinking water providers have an extraordinary responsibility to provide safe drinking water to the public during an emergency.

Water system emergencies include any situation that could potentially cause water contamination, outage, or threat to public health. Do you have a written response plan? Do you have mutual aid agreements in place? Do you have an emergency or alternative water source?

Participants will learn how to conduct a risk and resilience assessment, ways to protect your system before an emergency occurs, lessons from past emergencies, how to develop an emergency response plan and other considerations. This presentation is recommended for managers, operators, administrative staff, water quality staff and board members.

58. ATP Testing for Improved Water Quality
Adam Ganong
LuminUltra
The limitations in the ability for water managers to maintain water cleanliness can, in many ways, be due to limitations of traditional microbiological tests. While physical (e.g. turbidity, colour) and chemical (e.g. pH, alkalinity, chlorine residual) parameters can be assessed in minutes via field instruments or potentially in real-time via online instrumentation, microbiological testing has historically required days for results to be known. This session will discuss advancements in rapid methods for microbiological testing including ATP and DNA-based techniques that not only reduce turnaround time from days to minutes but also enables microbiological testing to be deployed in the field so that on-the-spot assessments can be performed to immediately drive corrective action.

59. Air Valves for Water & Wastewater Systems
Robert Velasquez
Cimco-GC Systems
This course will explore the basics function, operation, and applications of air valves in water & wastewater systems. Topics include vacuum protection, air release, combination release and vacuum protection, surge suppression, well pump service, and new high pressure multi-function air valves.

60. Check Valve Selection
Robert Velasquez
Cimco-GC Systems
This course will examine the operation of common check valves used in water and wastewater systems and compare the valves to aid in selecting the correct check valve type for a particular job.

61. Water System Surveys
Michelle Byrd
Oregon Health Authority

Water system surveys are required every three to five years to ensure safe drinking water and protect public health. This presentation reviews the essential elements of a water system survey including significant deficiencies, corrective action plans, and criteria to achieve outstanding performance.

62. Restoring Water System Confidence with CIPP
Brendan O'Sullivan, PE; Michael Linn, PE
Murray Smith, City of Salem
The City of Salem, Oregon's public works department recently completed the rehabilitation and replacement of a critical water main in their distribution system. The approximately 560-foot long section of existing 30-inch diameter welded steel water main is an important backbone of the water distribution system, providing redundancy and supply to the industrial area in the south-central neighborhood of the City. Installed in 1947, and identified for rehabilitation/replacement by the 2007 Water Master Plan, the water main is reaching the end of its design life. With a portion of the water main having been repaired to address pin hole leaks in 2012, the City has been proactive in wanting to address the water main deterioration before a failure resulted in the release of chlorinated potable water into an environmentally sensitive ecosystem. Approximately 200 feet of the water main is located in Pringle Creek, a fish habitat for listed specious of concern. Utilizing CIPP lining technology and open cut construction methods the City rehabilitated and replaced the ageing steel waterline in and adjacent to the creek, including a portion that ran beneath a 100-foot wide railroad bridge and associated easement. This presentation will review the design approach and details that returned system confidence, minimized project footprint, decreased environmental impacts, and navigated the environment and railroad permitting processes, with discussion related to challenges and lessons learned during design and construction.

63. The Willamette Water Supply Program's Approach to Project Safety and Health
Mike Jacobs
TVWD/WWSP
This presentation includes an overview of the efforts by the Willamette Water Supply Program (WWSP) to implement a comprehensive safety and health program for staff, consultants, and contractors. The WWSP developed a project-specific safety and health plan. The plan establishes common expectations and requirements for project management team, provides safety-by-design guidelines that address constructability and on-going operation of facilities and includes enforceable contract requirements for design consultants and construction contractors.

64-65. OSHA's Focus Four - Hour 1-2
Eric Fullan
City of Hillsboro
"OSHA's Focus Four" OSHA has identified and focuses attention on the four safety and health hazards that are injuring and killing workers. This four hour session will focus on those hazards as they apply to the Water and Wastewater industry. Topics include Struck by, Struck against,

Electrocution, Falls, Silica, Noise, Asbestos, Lead and the safe work practices to deal with these hazards in treatment plants, pipework, confined spaces and the shop. Water and Wastewater operators work around hazards all day. This session will focus on the most serious safety and health hazards they encounter and how to protect themselves from those hazards

66. Seismic Resiliency for WWSP
Mike Britch
Willamette Water Supply Program
The Willamette Water Supply Program (WWSP) has been working to integrate seismic resiliency into its projects in a variety of ways. Projects include both pipelines and facilities. This resiliency thinking also extends into operational planning as well that is incorporated as part of the design. These types of activities are relatively uncommon in the water industry where constructive seismic standards and guidelines are scarce. This presentation describes how planning for seismic resiliency has been spread through different aspects of a project from initial conception, to design, into construction, and ultimately considered as part of long-term operational planning.

67. We're Running Out of Space! Where to site your new backbone facilities
Adam Blair
Murrysmith
Limited available land suitable for new storage reservoirs, in combination with expanding urban growth, is increasingly creating the need for large scale construction projects within existing neighborhoods. This presentation will explore a case study from a water district in Oregon, Clackamas River Water, who recently navigated a challenging reservoir project. Designed as a critical element in an expanding water distribution backbone infrastructure, the 6.0 million gallon 152nd Avenue Reservoir, constructed jointly with the neighboring Sunrise Water Authority, was needed for system resiliency, improved distribution, and expanded storage for the growing service areas. Located on a tight site in a residential neighborhood, the presenters will discuss lessons learned from the wide variety of site civil, system operations, geotechnical, and public relations challenges that the District/Consultant design team were able to overcome.

68. Water Quality Improvement through Water Storage Tank Mixing
Ethan Brooke
UGSI Solutions, Inc.
This 60-minute seminar will provide water system managers, operators and engineers a practical understanding of the science behind applying mixing energy to water in reservoirs or tanks as a means to improve water quality in distribution networks.

69. Disinfectant Residual Control in Distribution Systems
Ethan Brooke
UGSI Solutions, Inc.

This 60-minute seminar will provide water system managers, operators and engineers a practical understanding of the conditions, chemistry and science behind affecting positive control of both chloramine and free-chlorine levels in water distribution systems. Importantly, the second half of the seminar will present a suite of proven technologies that can be employed to automatically control disinfectant residual levels in real world water distribution systems.

70. System Water Quality Optimization Task Force
Tara Vanderwey
TVWD
TVWD formed a WQ Optimization Task Force to address problem areas and make targeted improvements on an ongoing basis. The goal of this effort is to utilize staff from multiple departments to make measurable, day-to-day improvements to the system while planning for the Willamette Water Supply System Integration (WWSSI) in 2026. This presentation will demonstrate how the Task Force has tackled a few problem areas in TVWD's distribution system and discuss some of its successes and challenges.

71. Talking to Customers about Water Quality and Pressure Issues in their Home
KT Labadie
Portland Water Bureau
Many customers do not realize that maintaining water quality and pressure is a shared responsibility between water utilities and customers. While some water quality or pressure issues are caused by changes in the distribution system, many common water quality and pressure issues are caused by a customer's home plumbing. This presentation will cover the most common water quality and pressure issues, their causes, and best practices for communicating with customers.

72. Drinking Water Program Update
Kari Salis
Oregon Health Authority
Kari will review the federal actions related to drinking water, including AWIA requirement, WIIN provisions, and Lead and Copper rule revisions. State program updates will be discussed, including the new annual fee. A brief summary of what the state is doing about emerging contaminants will also be discussed.

73. Construction of Large-Diameter Steel Waterlines
Andre Tolme
WWSP (Willamette Water Supply Project)
Hoping by Monday!!The Willamette Water Supply System (WWSS) will provide additional resiliency and redundancy to the water supplies of Tualatin Valley Water District, the City of Hillsboro, and the City of Beaverton and in Washington County, Oregon. The WWSS will

include a water treatment plant, terminal reservoir storage, and more than 30 miles of transmission pipelines.
This presentation focuses on the key elements of constructing the large diameter (48-inch and 66-inch) welded steel waterlines. Key design elements are discussed along with system components and construction techniques. Focus is placed on important considerations for welded steel waterlines of this size as compared to smaller distribution lines. A discussion of trenching, installation, backfill and trenchless techniques is included.

74-77. Control Valve Hydraulics and Fundamentals, Electronics, Maintenance and Troubleshooting: (4 Parts)
Robert Velasquez
Cimco-GC Systems
Pt. 1: Intro to Control Valves: Hydraulics, Operation, and Main Body. This class will cover the basic hydraulics, mode of operation, and examine the internal mechanism of control valves. Pt. 2: Intro to Pilot Systems and Common Control Valve Applications This class will cover the operation, components, and various applications of control valve pilots systems. Will discuss pressure reducing, pressure sustaining, pressure relief, flow control, level control, pump control, and electronic control systems. Pt. 3: Control Valve Maintenance & Troubleshooting This class will cover recommended maintenance and upkeep for control valves as well as practical troubleshooting steps for diagnosing a non-functioning control valve. Part 4: Pressure Reducing Station Design & Smart Technology This Class will cover the components of pressure reducing station, design best practices, and smart technology available that can improve station performance and versatility.