

CEU	Class Name	Class Summary
NV18-312	WORKSHOP - NASSCO PACP Re-Certification	NASSCO's PACP (Pipeline Assessment and Certification Program) requires re-certification every three years. MACP/LACP do not require re-certification. The coding system and procedures are easily transferred to these applications. Re-certification ensures PACP protocol and procedures continue to be applied in accordance with the PACP manual. This assures that while conducting condition assessment on infrastructure components, standards are maintained. Version 7.0 released in May 2015 includes updates to several codes and the Condition Grading system, and clarification on proper application.
NV18-313	WORKSHOP - MS4 CCEI Re-Certification	The NPDES Stormwater Training Institutes MS4CCEI Certification Program requires ½ day re-certification every three years. Re-certification ensures MS4 Compliance and Code Enforcement certified personnel continue to be knowledgeable of the most recent changes to federal and state stormwater permits and regulations, as well as the most recent advancements regarding administrative and structural best management practice installation and maintenance procedures. This assures that while conducting watershed assessments, illicit discharge detection and elimination (IDDE) outfall reconnaissance, industrial facility and construction site inspections, that standards and effective watershed protection methods are implemented.
NV18-314	WORKSHOP - NASSCO PIPES Certification Assessment Program (2 days)	NASSCO's Infrastructure Condition Assessment programs, PACP, MACP, and LACP (Access Structures and Laterals) is instruction on the proper procedures used to conduct condition assessment on infrastructure components using a standardized code set, procedures for applying the codes, and methods for do so. PACP assures all Operators and Engineers work to the same scope; the PACP coding system. The PACP Operator defines and records each defect observed using the standardized codes. The observation is recorded using the proper standard codes. Condition grades are assigned to help with prioritization for repair or rehab.
NV18-315	WORKSHOP - OSHA 10-Hour Construction Course (1.5 days)	The 10 hour Construction course will promote workplace safety and health and to make workers more knowledgeable about workplace hazards and their rights. This training does not fulfill the training requirements found in OSHA standards. This course provides training on the recognition, avoidance, abatement, and prevention of workplace hazards. This workshop will provide overview information regarding OSHA, including workers' rights, employer responsibilities, and how to file a complaint. This workshop emphasizes the value of safety and health to workers, including young workers.
NV18-316	WORKSHOP - MS4 Compliance and Code Enforcement Inspector (MS4CCEI)	This certification course designed for municipal public works employees, wastewater treatment and water treatment personnel, Municipal Separate Storm Sewer (MS4) staff and stormwater consultants. The course presentation includes: Clean Water Act History, Urban Stormwater Impacts, Point Source and Non-Point Source Management, Role of the MS4 Inspector, IDDE Inspections , Watershed Assessments, Industrial Facility Inspections, Construction Site Inspections Green Infrastructure in the Dry Desert, Green Infrastructure (GI) techniques for urban growth and stormwater management have become the norm throughout the United States, yet many MS4 stormwater inspectors are unaware or misguided about its role in maintaining or improving America's quality of life. The GI module will explore the benefits as well as the challenges of using implementing GI and Low Impact Development (LID) techniques in the planning, installation and maintenance phases in today's rapidly expanding urban environment.
NV18-317	WORKSHOP - NASSCO MACP CERTIFICATION	This course uses the PACP codes learned in the re-certification class or the 2-day certification assessment program. MACP takes these codes and applies them to condition assessment of manholes, junction boxes, and other related structures, which allow access to the buried infrastructure.
NV18-318	WORKSHOP - NASSCO LACP CERTIFICATION	This course uses the PACP codes learned in the re-certification class or the 2-day certification assessment program. LACP is an extension of PACP in that the laterals are simply smaller, slightly more complicated piping systems with various fittings and access points not traditional in a mainline pipe.

NV18-319	WORKSHOP - NEVADA WATER & WW OPERATOR CERTIFICATION PROGRAM REVIEW UPDATES	Participants in this session will stay current with the Certification Program Review updates to the Operator Certification Program. The Drinking Water Operator Certification Program’s regulations NAC 445A.6285 to NAC 445A.651 were reviewed and updated by the Water and Wastewater Operators Forum’s Program Review Subcommittee. The purposes for the Subcommittee review were to: 1) Ensure that Nevada’s drinking water operators have the appropriate levels of education, skill sets, and experience in operations and maintenance of public water systems; 2) To ensure that the Nevada Drinking Water Program has sufficient funds to address the needs of the regulated community; 3) To promote professional development and growth for Nevada Drinking Water operators; 4) And to offer clarifications and ensure consistency in existing regulations. The new revisions include: 1) The passing exam score set by the testing organization to pass a certification exam; 2) The number of hours of continuing education required to renew a certification; 3) Requirements regarding the amount of experience required to obtain a certification; 4) New fees for issuing and renewing certifications. The right answers to all these questions and more will be provided to help you "navigate" the regulation review changes and "stay the course" as a Professional Operator.
NV18-320	TOUR - HOOVER DAM	The entire tour of the dam and power plant are centered on the importance of water - quantity, quality, and utility. A look into the waste- water facilities will emphasize the challenges faced by operating high volume but very seasonal facilities with significant variations in flows and demand while highlighting the legal challenges for compliance with those facilities because they share a common border between two states.
NV18-321	TOUR - SPRINGS PRESERVE	The Springs Preserve is commonly known as the “birthplace of Las Vegas”, and since 1978, has held a spot on the National Register of Historic Places. Thousands of years ago, the site served as the original source of water for Native Americans living in the area. Today, the site is marked by a 180-acre cultural institution that is designed to commemorate the dynamic history of Las Vegas and provide a vision for a sustainable future. First, attendees will take a guided tour to get an overview of the Springs Preserve. The tour will discuss the origins and history of the springs as well as the vision and collaboration to create the institute that resides on the site today. From there, attendees will visit the Water Works Well inside the Charleston Heights Pumping Station. The well is an operational water pumping facility that is owned and operated by the Las Vegas Valley Water District. The Water Works Exhibit contains a display of the hydrodynamic system of pipes and pumping stations that provide water throughout the sprawling Las Vegas Valley. In the exhibit, attendees will have an opportunity to view and handle equipment, such as zooplankton nets, used by researchers to monitor Lake Mead, the source for the majority of the potable water supplied to the thirsty Las Vegas Valley. They will also view simulated models of microbes under a microscope and learn to detect the odor of ozone that is used in the disinfection process. Attendees will be able to take charge and manage a simulated model of the computer system that controls all of the treatment and distribution of potable water throughout the greater Las Vegas Valley. A great reminder of how fortunate we are to live in a country that provides safe, clean and reliable drinking water to all of its residents. Attendees will then be treated to a guided tour on the other end of the spectrum – a bio-filtration wetland area that recycles water from the Springs Preserve to irrigate plants and flush toilets. Wetlands have long been a low cost, low energy way to treat wastewater and provide a natural aquatic habitat for a wide variety of plants, animals and other wildlife
NV18-322	TOUR - VENETIAN HOTEL AND CASINO TOUR - ROBUST RECYCLING PROGRAM	The Las Vegas master-planned development, which combines The Venetian, The Palazzo and Sands Expo and Convention Center, all under one roof, is the largest ‘green’ building on the planet. From the shower heads and automated heating and lighting systems in the all-suite resort, to water recycling for the gardens and the largest solar-thermal system in the U.S.; their efforts are revolutionary. The Sands Eco 360° Global Sustainable Development program has several key elements: operational maintenance policies; construction and development strategy; and ultimately, their commitment to the communities in which they operate.

BACKFLOW PREVENTION

NV18-323	Operating Principles of Cross Connection Control	This presentation will present the principles of how backflow happens and the assemblies we have to prevent a backflow incident.
NV18-324	Troubleshooting Backflow Prevention Assemblies	This presentation will present the reason we field test backflow prevention assemblies and how to do it properly.
NV18-325	Repair or Replace? The Why & When	This presentation will take us through the repair process and when we repair assemblies and when they need to be replaced to properly protect water quality.
NV18-326	Common Field Modifications & Their Effect On Approval	This presentation will detail the laboratory and field evaluation process conducted on backflow prevention assemblies by the USC Foundation for Cross-Connection Control and Hydraulic Research. Common field modifications made by field personnel will be reviewed to explain how they may affect the performance of these products.
NV18-327	Detector Assemblies on Fire Sprinkler Systems	This presentation will discuss the operation and field testing of backflow prevention assembly detector assemblies, including the newer Type-II products (DCDA-II and RPDA-II). These types of assemblies are designed to provide backflow protection as well as detect unauthorized use of water from a fire sprinkler system.
NV18-328	Las Vegas Water District Backflow Retrofit Program	In this session, attendees will learn about Las Vegas Valley Water District's ten-year Backflow Retrofit program, which includes more than 11,000 services throughout the City of Las Vegas and Clark County, Nevada. The presentation will focus on the design, right-of-way acquisition, and installation of backflow prevention devices, as well as examine the challenges encountered by the program.
NV18-329	Managing the monster of the Backflow Prevention Program	Cities are required to monitor and track the backflow prevention devices in their service area. In the Phoenix Metropolitan area, the different cities and towns melt almost into one, sometimes making it difficult to discern one city border from another. This also applies to the backflow prevention program each City manages, somewhat independently. Due to the close proximity of the cities, the cities have begun working together to streamline the workflow and process of the backflow program, the backflow device annual testing and certification of the testers.
DISTRIBUTION		
NV18-330	Understanding Your Water Tank and It's Condition	We all have tanks, seen them and know what they do for our systems. Now know what the differences are for each of the various types. In this class you will become familiar with what the parts of the water storage tanks are, how to inspect these structures and the care/prevention. The class will provide those who attend with a clear visual of what they need to do during an inspection, learn the visual signs of issues and how to plan for the short/long-term care.

NV18-331	Water Distribution Field Management Optimization	Water quality is assessed via a combination of chemical, physical, and microbiological tests. Over time, instruments for chemical and physical parameters have become faster and more portable but microbial tests still require ~2 days to obtain results in a controlled laboratory environment, therefore making it more reactive than proactive to water quality problems. An alternative test method has emerged in the form of ATP analyses. Adenosine Triphosphate (ATP) is the primary energy molecule in all living cells and therefore serves as a true representation of total microbial content. While ATP tests have traditionally focused on surface hygiene testing, 2nd Generation ATP technology provides quantitative microbial measurements in water, wastewater, and other challenging samples within 5 minutes in the field. This paper will introduce ATP monitoring as a microbial management tool in water distribution. Through the ATP and chlorine monitoring at key points, hotspots were located and flushing was initiated to purge accumulated biofilm, reinstate disinfectant residuals, and lower microbiological content while avoiding unnecessary water wasting and preventing premature completion.
NV18-332	Utility CIP Management	Water utilities are faced with the challenge of maintaining aging infrastructure. Effectively managed assets will last the expected lifespan if maintained properly. The key is to evaluate assets above and below ground. Involvement with Capital Improvement Projects from inception to completion is critical, resulting in high quality finished projects. By effectively managing the Capital Improvement Projects, the Town of Gilbert optimizes underground utilities and road longevity, minimizing resident impacts.
NV18-333	Pressure Pipeline Rehabilitation Technology	The advancement of technology in the world has translated to the water and wastewater industry over the past decade that has resulted in a variety of application and technologies for the rehabilitation of pressure pipes, both water and wastewater. With the aging infrastructure challenges and O&M budgets that utilities are faced with, using rehabilitation to extend the life and renew pressure pipelines is a great alternative. However, with new technologies emerging as fast as smartphones and digital-assistant devices. While some pipe rehab techniques and technologies utilize longstanding materials and construction methods, there are considerations that need to be taken when evaluating and selecting pressure pipeline rehabilitation alternatives. This presentation will discuss, compare, and provide insight on where the right the pressure pipeline technologies that are being used in the water and wastewater industry today.
NV18-334	Connect and Operationalize Enterprise Data	Phelan Pinon Hills Community Service District (PPHCSD) was founded in 2012. We currently serve 6,800 connections over 128 sq. miles. Given the amount of infrastructure needed to serve that size territory, the District quickly recognized the need to implement leading-edge technology to help manage their distribution system. In 2013, PPHCSD turned to Sedaru to deliver one platform to unify and operationalize data from CIS, GIS, and hydraulic modeling analysis. The Sedaru platform was integrated with Tyler Incode CIS, enabling field staff to see and complete service orders, and access relevant customer information from Sedaru. The District is also using Sedaru to manage facility inspections, hydrant flushing and flow tests, and valve exercising. In the office, District staff are now able to automatically generate water production reports, helping them better identify and react to trends, as well as support state regulatory reporting requirements. PPHCSD also uses Sedaru to analyze their hydraulic model. The District performs fire flows, size pipelines, and quickly respond to developer requests without the need for dedicated modeling staff or an outside consultant.
NV18-335	Less Paper, More Insights	The City of Victorville has recently embarked on a digital transformation journey. The City recognized the need to build their water GIS data and deliver solutions to improve efficiency in the field. Sedaru has supported the City's efforts, helping to enhance their GIS and transforming how work is assigned and completed. Using Sedaru, field workers access their work along with GIS data, so they understand how the assets they are working on are connected to the rest of the water network.

NV18-336	Improving water system operations & customer service	The session will begin with a focus on water and on available technologies and the pros and cons of technology and deployment strategies. Then a panel of two actual customers will talk about their experience with the process of bidding, selection of a vendor and deployment obstacles. The two utilities will address their findings from having these systems installed for a number of years and what benefits the utility gained from this technology. From balancing the load on an electrical grid to managing water supplies, minimizing labor costs and maximizing ROI on infrastructure investments, utilities are actively seeking a smarter approach. A Customer Portal Solution for utilities is an affordable Web-based solution that helps water utilities improve customer service and build stronger client relationships. By presenting useful data and actionable information, providers can reduce routine support calls, easily resolve high bill complaints, and give customers more control over how they use utilities.
NV18-337	Chloramine Residual Optimization and Management	Chloramination as a disinfectant strategy in potable water systems provides benefits such as a lower potential for disinfection byproduct formation and improved disinfectant longevity in distribution systems. The significant challenge, however, relates to the shifting chemical equilibrium between ammonia, chlorine and chloramines in utility water distribution systems. Premature decay of chloramine compounds can release free ammonia into distribution systems and lead to nitrification, taste and odor issues as well as other complications as ammonia is consumed as a nutrient. Over chlorination, on the other hand, results in undesirable chloramine species that also result in taste and odor issues. Operational activities such as tank dumping, frequent tank cycling, chlorine burns in distribution systems and inefficient chlorine boosting in tanks and reservoirs cost utilities in manpower and resources as they struggle to meet water quality levels particularly in warm weather months. Most chloramine decay occurs post treatment plant as water ages in pipes, reservoirs and tanks, hence arresting chloramine degradation in distribution storage proves to be the efficient strategy.
NV18-338	Active Control of THM Levels in Drinking Water & Distribution Systems	Elevated trihalomethane (THM) levels are the most common violations of the Stage 2 DBP Rule in the United States. Municipalities across the country have employed a variety of methods to reduce THM formation rates, often incurring costly and lengthy treatment plant upgrades, which often provide dismal reduction levels. Active tank mixing, in-tank aeration, and head-space ventilation systems are three tools that, used thoughtful combination, can yield significant reductions in distribution system THM levels. These technologies make storage tanks a smart and active agent in the management and improvement of water quality instead of a passive vessel holding water of uncertain quality. In 2014, the San Jose Water Company installed a large-scale THM reduction system in a 12 MG reservoir. The combination of an energy-optimized aeration system design with active feedback control based on real-time measurements has allowed San Jose Water to maximize energy efficiency for their THM removal system. By modulating aeration as a function of THM concentration, and optimizing power usage, the utility will potentially save about \$100K annually in energy while still achieving compliance goals.
NV18-339	Water System Resiliency During System Upset	This presentation will talk about resiliency of Gilbert's water system during a system upset. It will cover the key components of making a water system resilient, reliable and dependable. Gilbert had a five alarm fire on the 23rd of April 2016 at 5:54 pm location was 166 E. Civic Center Drive in Gilbert. Learn how Gilbert's water system handled the fire demand and aftermath.
NV18-340	WATER LOSS: Saving Water & Saving Capital: It's Worth It	This presentation will discuss the basic principles and technologies of DMAs. It will compare and contrast the implementation and methodology behind the rural DMAs of WHUD, and the urban application at KUB. We will discuss the current status, challenges, successes of each project, and the risks reduced through implementation of DMAs.
NV18-341	Pre-Maintenance Evaluations - The First Step	This presentation will explain to attendees the importance of Pre-Maintenance Evaluations of water storage tanks and give them insight into the various factors that will allow them to make informed decisions about their tank maintenance needs. Decisions that can save money and provide them with a structure that can serve their water system for many years to come.

NV18-342	Life Cycle Cost Economics for Small Water Meter Replacement	The basis for the life cycle cost analysis performed for this water meter assessment incorporates the evolving body of knowledge gained from recent and ongoing investigations of meter performance at low and ultra-low flows plus other relevant factors necessary for calculating net present cost (NPC) of a water meter over its expected life. Interest in these low flow performance capabilities has increased recently with the increasing use of more efficient low-flow fixtures, particularly in single family residential dwellings, as further described herein.
NV18-343	Technology out of this world: Geospatial data	The session will include use cases of how this exciting technology has been used by water companies all over the world to achieve substantial improvements in infrastructure management and cost reduction. This technology paired with DMA Management are vital assets to any risk management program. Attending this presentation will provide delegates with the latest developments in satellite data analytics for water infrastructure monitoring and what they might mean for water utilities.
NV18-344	Understanding Water System Disinfection	The following topics will be covered during the 6-hour course: Disinfection basics: reasons to disinfect, disinfection chemistry, and important operational considerations; Operations and maintenance of disinfection systems; Dechlorination of wastewater; Disinfection by-products: formation chemistry, regulation, and management; Concentration-time (CT) assessment: chlorine dosing theory and examples; Group activities: opportunities to practice evaluating disinfection requirements; Chemical feed pump troubleshooting: bringing your system back online
NV18-345	What is Happening in the world of AMI?	During this session the attendees will learn what is happening with the current status of the AMI solutions. As technology continues to advance so do the features of the AMI solutions. So don't get left behind or make the wrong selection for your meter reading solution. Also understand how a system can become a smart district, utility, or city.
NV18-346	How the City of Elmhurst Attacked UFW	City of Elmhurst has a UFW of nearly 20% for many years. The City is combining a water meter change out program of all city meters with an on-line acoustical water distribution leak detection system to reduce UFW. The goal is to decrease UFW to under 12% by September 2018 as required by Department of Natural Resources. Leak detection will be the largest full city system in the United States at the time of installation. New leak detection system will be monitoring nightly for distribution main line leaks and a report will be generated each morning on all leaks. The software will narrow leak down to a 3' area for repair to be made. The water meter change out project was done in such a way that we are not held to one meter company for next 20 years and new AMI system will also be fixed network for leak detection devices. The project was done with a team approach of many City departments and had an extensive public out-reach program to all customers. The project will include a summary of how City team was put together, decided on method of procurement, chose installation method and if goal of reducing UFW was reached.
NV18-347	The Role of "Smart Tanks" in Distribution Water Quality Management	With the promulgation of the EPA's Stage 1 and Stage 2 Disinfection Byproduct Rules, water treatment operators and utilities scrambled to ensure their plants were in compliance with THM limits and more carefully monitored chlorine dosing, or switched to the more persistent (long-lived) chloramine as a secondary disinfectant which had a much lower propensity to form THM's. However, a new problem then became more apparent - residual chlorine (and other disinfectants) may also react further within the distribution network forming DBP's, both by further reactions with dissolved naturally occurring organic matter and with biofilms present in pipes and tanks. In addition to being highly influenced by the types of organic matter in source water, species and concentrations of DBPs vary according to the type of disinfectant used, the dose of disinfectant, the concentration of natural organic matter and bromide/iodide, the time since dosing (i.e. water age) and temperature. The emergence of smart tank design and operations now provides utilities with the ability to utilize water storage tanks as water quality intervention points.

NV18-348	Distribution System Maintenance	The following topics will be covered: What are the primary components of your distribution system?; How to identify and fix problems in your system?; Understanding the function of meters in your system, methods for leak detection; The roll of hydrants and flushing; Cross-connections and the importance of back-flow prevention.
NV18-349	Ice PIGGING: Cleaning Mains with Ice	Increasing regulatory pressure represented by the Stage 2 Disinfectants and Disinfection By-Product Rule and the proposed revisions to the Total Coliform Rule present complex challenges for maintaining water quality within aging distribution systems. Problems typically caused by sediment and biofilm build-up that accumulate over time within the distribution system mains can eventually manifest in consumer and regulatory issues. To the consumer the problem may be aesthetic, such as red water or as unpleasant taste or odor. For the water operator it could mean water quality compliance issues such as residual loss, elevated disinfection by-products or positive coliform tests. Current approaches to manage these issues such as flushing, mechanical and soft pigging no longer represent the sustainable best practice.
NV18-350	Air In Pipes: Case Studies	Removal of air in pipes is critical to the health of a pressurized piping system. Developing programs to effectively maintain critical infrastructure to eliminate air from the pipe systems is critical in system efficiency. Sharing knowledge of these type programs is essential in improving the operations of other systems through lessons learned. The presentation will discuss some of the issues created by and solutions for reducing or eliminating harmful air in pipes.
NV18-351	EBMUD's Operational, Digital Transformation	EBMUD has embarked on a digital transformation strategy to advance its water business operations and realize new levels of efficiency. Join this session to see how EBMUD is bringing together network sensors, field mobility, integrations, and GIS to improve operational management with increased network awareness, enhanced customer response, and reduced paper in the field. See how this strategy empowers efficiency, improves data access, and delivers key performance metrics across the organization. If selected, there will be a co-presenter from EBMUD.
NV18-352	The Big Payback: The Importance of Large Meter Analytics	Water utility managers are always looking for ways to find efficiency while optimizing and protecting the utility's bottom line. This presentation will present a case study which analyzes how a number of water utilities effectively used the power of advanced metering analytics along with strategically deployed AMI networks to successfully improve the management of their commercial and industrial accounts. Secondly, we will discuss the new technology options available today which drastically simplify the deployment of these solutions.
NV18-353	Air Valves: critical for proper system performance	Air valves are located throughout our potable and reclaimed systems. Many Agencies struggle to find the time for staff to properly maintain them. This class will discuss what air valves do for us in properly operating systems and the importance of a regular service program to make sure they do their job.
NV18-354	Pipeline Condition Assessment and Cleaning; Devil is in the Details City of De Soto, Kansas Raw Water Main	DeSoto owns and maintains a raw water transmission main from ground water wells north of the River terminating at the river's south side and eventually to the treatment facility. This main is high priority. It had been in continuous operation since 1960 and has no redundancy. Due to a significant pressure drop an internal inspection was performed with an internal live inspection tool, indicating sediment buildup/blockages. To clean the main a specialized water jetter with blades and pigging were used. Then acoustic leak and video inspections were performed to evaluate the condition of the pipeline.

ENVIRONMENTAL COMPLIANCE / PRE-TREATMENT

NV18-355	Industrial Bakeries, Cottage Food & Pretreatment : City of Phoenix	Many municipalities may not be aware of the importance of monitoring industrial bakeries that discharge to the POTW. The City of Phoenix will explain the breakdown of baked goods and why they present more of a hazard than previously understood. The Industrial Pretreatment Program (IPP) will also share case studies on potential concerns and issues with industrial bakeries including pretreatment options and regulatory input for protection of the POTW. Similarly, there are potential concerns with the creation and maintenance of the Home Baked and Confectionery Goods Program by the Arizona Department of Health Services (ADHS) including how it relates to management of Fats, Oils & Grease (FOG) in the City of Phoenix and why outreach is invaluable.
NV18-356	The Building Blocks of FOG, How to Implement a FOG Control Program	Based on the trials and tribulations experienced with the FOG control programs EEC has developed and implemented, EEC has developed key FOG control program elements (The Building Blocks of FOG) essential to address for any program. This presentation will discuss these important elements of a FOG control program, and how to implement those elements as effectively and efficiently as possible. The base building blocks include the FOG ordinance, education and outreach, FSE inventory development, sewer system characterization, and monitoring and enforcement. The presentation will also discuss common questions FOG control programs encounter, and potential solutions to those questions. Examples include types of grease control devices available for installation, sizing grease interceptors, inspecting grease interceptors and potential issues that can be encountered, how to develop and FSE inventory, and enforcement procedures for noncompliance.
NV18-357	What's That Smell? Managing H2S	Attendees will learn why H2S is a growing concern for all utility works, including Pre-Treatment and FOG inspectors. During this session, Rick Allen, will be covering, why H2S occurs and where, along with new observations and insights. How do you make efforts to protect yourself and other team members, along with some methods for detecting and working in environments which may contain H2S? H2S related to Pretreatment is an often-overlooked hazard. Rick will be helping Pretreatment Inspectors to understand why, they need to be aware of the issues related to H2S.
NV18-358	Stone Brewery - An industrial brewing treatment plant overview	Stone Brewing is the 9th largest craft brewery in the United States, with locations in Escondido CA, Richmond VA, Napa CA, San Diego CA, and Berlin Germany. We employ over 1,100 employees and produced almost 12 million gallons of beer last year. The brewing and packaging facilities in Escondido are home to an award winning wastewater treatment facility that saw about 25,000,000 million gallons of beer waste in 2017. We use an aerobic treatment process with MBR (Membrane Bio-Reactor) ultrafiltration. Over the years, Stone has identified several unique problems with brewing waste that require unique innovation and process. Among other things discussed will be solids management as it relates to brewing waste and ultra-high BOD destruction. The presentation will also touch on storm water pollution prevention and gas/electric utilities practices.
NV18-359	"2017-A Vintage Year for Field Investigations"	The presentation will review some of the more interesting investigations conducted by members of the Los Angeles County Sanitation Districts Industrial Waste Inspection staff during the 2017 calendar year. The presentation will begin with a short review of the LACSD s service area which includes about 4.5 million residents, 11 wastewater treatment plants, and approximately 870 Significant Industrial Users (SIUs) that are regulated by the agency. The presentation will then provide quick reviews of approximately eight interesting, entertaining or educational, at least to the Environmental Compliance Inspection crowd, industrial wastewater related incidents that the 29-person strong LACSD field inspection staff investigated in 2017. Examples include unusual odors and color present in sewers or treatment plants, scaling found in sewer lines, or other unusual materials or substances found in sewer lines or coming into treatment plants that presented maintenance and/or operational problems and dangers. The findings and resolutions of these investigations, when applicable, will be presented as well.

NV18-360	Compliance Issue for Cannabis Cultivation	With the legalization of cannabis in many states, the task of integrating land use policy and specifically regulating wastewater management is in the hands of local municipalities. The goal of our presentation is to clear the fog by examining the solid and liquid waste streams of various cannabis cultivation methodologies. By breaking down the earned prejudices from the bad actors of the un-permitted cannabis industry we hope to bring new light to this newly permitted industry and make certain the waste of this industry is handled in the most environmentally safe methods. Through extensive experience in industries other than cannabis comparisons will be made to aid inspectors and regulators in establishing design criteria to ensure success within their communities.
NV18-361	EPA Pretreatment Update	Industrial pretreatment programs operated by municipal agencies continue to be one of the most effective efforts for controlling toxic pollutants under the Clean Water Act. This presentation will review National and Regional current events and issues regarding the pretreatment program.
GROUNDWATER / RECHARGE		
NV18-362	A Broken Recharge Facility, Angry Customers & A Constructed Solution	This abstract focuses on a case study of a Gilbert, Arizona reclaimed water recharge site that wasn't working as intended. Lower than designed percolation rates produced standing water and an insect infestation. New homes built adjacent to the facility many years later began producing complaints, and recruited the media to take up the residents' side. Gilbert quickly responded with listening sessions, short term remedies and a site enhancement project to hopefully fix the long term problem of the low percolation rate. The project results are discussed, as well as the staff response to media and customers. The calculated risk of performing the enhancements will be useful for management, as will the technical design and results for operators.
NV18-363	How to Write the Perfect Water Well Redevelopment Specification	AirBurst, wire brush, nylon brush, chemical treatment, dual swabs, single swabs, airlifting, bailers, jetting, liners, video logs, test pump, spinner logs, and dye testing are just some of the tools to consider. Which ones work and how do you write a specification to cover all of your redevelopment needs? Don't get fooled in a cook book style process that causes you high risk with minimal chances of results.
NV18-364	Three Ps For Effective & Resilient Water Well Rehabilitation Part 1	A presentation of scientific techniques and best practices that have been accrued over 4 years and 530 water well rehabilitations throughout the Western USA, targeted for predictable and longer lasting results. What we need to now, why we need to know it, what impact it can have on the outcome and longevity
NV18-365	Three Ps For Effective & Resilient Water Well Rehabilitation Part 2	A presentation of scientific techniques and best practices that have been accrued over 4 years and 530 water well rehabilitations throughout the Western USA, targeted for predictable and longer lasting results. What we need to now, why we need to know it, what impact it can have on the outcome and longevity

NV18-366	Operating Data & Lessons Learned from Microvi Nitrate Removal System	Sunny Slope Water Company has installed a 300 gpm biological treatment system for removal of nitrate developed by Microvi Biotechnologies. The nitrate removal system uses a single species of a specifically selected, naturally occurring organism to convert nitrate to nitrogen gas. The organisms are irreversibly retained in polymeric composite structures, called biocatalysts, which are designed to create an ideal microenvironment for the organism. This results in a high density of very efficient denitrifying organisms within the reactor, providing fast start-up time, high rates of reaction and process resilience to process conditions that upset conventional biological processes. Further, the organisms are in a metabolically active, non-growing state which means they produce no excess biomass. Therefore, there is no waste biological sludge stream to be managed. The system was installed later in 2016 and a permit was issued by California Division of Drinking Water in May 2017. This presentation will describe the lessons learned and present performance data from the system.
NV18-367	Slug Tests to Optimize Groundwater Well Design	Southwest and drought. Those two words are driving a frenzy of well installation projects across the "Tri-State" region. Unfortunately, many unsuspecting buyers are ending up with supply wells that do not meet expectations from either a production standpoint, water quality needs or both and there is little a buyer can do once the well installed. In today's world of ever tighter budgets, entities must utilize the latest groundwater exploration techniques to minimize risk. One technique, slug or falling head tests can be used to predict both water quality and production before the well is actually installed. This presentation provides an overview of the data needs, analysis, and will present several case history examples comparing predicted vs. actual results.
NV18-368	Monitoring & Reporting for Recharge Facilities in New Mexico	Managed Aquifer Recharge projects in New Mexico are subject to permitting from the New Mexico Office of the State Engineer (OSE) and the New Mexico Environment Department (NMED). Underground Storage and Recovery (USR) are issued by the OSE and allow opening an account for banking water. NMED discharge permits provide for water quality monitoring to protect against degradation of water quality in the aquifer. Daniel B. Stephens and Associates currently provides services for monitoring and reporting of the three operational recharge facilities in New Mexico, two which are owned and operated by the City of Rio Rancho and one which is owned and operated by the Albuquerque Bernalillo County Water Utility Authority (ABCWUA). Two of the facilities are infiltration galleries that recharge treated wastewater, and the third one is a direct injection facility which is equipped with advanced treatment and an aquifer storage and recovery (ASR) well. This presentation will discuss requirements for monitoring and reporting, and results from the operation of these facilities.
INSTRUMENTATION / ELECTRICAL & CONTROL		
NV18-369	Calibration of Process Automation Instruments	Calibration of process instruments used in water systems requires engineering specifications, standards and records which are used in the instrument calibration process and is paramount to the maintenance of any control system regardless of size. This discussion will cover equipment, standards and records available to allow historical tracking of the calibrations, as a process, and what is essential to accomplish some of these tasks.
NV18-370	Form-Wound Motor Repair	Repair or refurbishment of medium voltage motors can be expensive, time consuming, and fraught with uncertainty. Join this session to review some of the most common types of motor failures, recommended inspection and testing protocols, as well as repair techniques for major system components of electrical machinery. The session will also discuss how to scope a motor repair project to minimize change orders once your motor is the shop.
NV18-371	Putting Thermal Imaging to Work for You	This presentation is geared towards the practical aspect of Thermal Imaging and will briefly touch on the importance of planning, implementation, and utilization of the DATA captured. Subject matter is focused on Electrical/Control systems but can be readily applied to HVAC and Mechanical systems. This presentation will show the use of Thermal Imaging to detect issues before they become serious problems and highlight key elements to look for regarding reliability and safely utilizing this technology. Thermal imaging is a tool to be used in your electrical safety program as well as electrical maintenance but, like all tools, it needs to be used correctly to ensure personnel safety and effective results.

NV18-372	Electrical Safety, Preventive Maintenance & NFPA 70E	This presentation is geared toward all personnel involved in a facility's Electrical Maintenance Team, and those involved in setting or following the site's Electrical Safety Program. Recent evolutions of electrical safety standards (like NFPA 70E) have placed the topics of electrical safety and electrical reliability front-and-center. What steps can your facility take to improve worker safety, automatically reduce arc flash risk, improve asset reliability and performance while also reducing costs? This presentation will address the following topics: Risk Mitigation Strategies: Elimination of the hazard and hazardous tasks is now the focus of Risk Mitigation & not just defaulting to PPE. Equipment Maintenance & Condition: Condition of maintenance is an integral part of any facility's safety program. What does this mean to you? Preventive Maintenance Standards: What role do infrared thermography and other PdM technologies play? Inspection Windows: What role can inspection windows play in safety compliance? Where should they be used & and where not? Rising Trends: Where are the standards leading us? What technologies are emerging to help us?
NV18-373	Power Distribution System Design Concepts for Arc Flash Hazard Reduction	This presentation includes a discussion of electrical safety factors that can be reviewed and implemented in the design phase. Implementation of these concepts can reduce the hazards that electricians are exposed to during equipment maintenance and operations. This presentation will review applicable codes and standards, electrical safety information, and design concepts that contribute to improved electrical safety.
NV18-374	Electrical Power Quality Monitoring and Sub-Metering	The concept of Electrical Power Quality Monitoring and sub metering has existed ever since the usage of electricity. By monitoring Power Quality and by sub metering, a lot of electrical bills can be lowered at a facility and the potential power quality issues may be avoided. In this presentation, various different concepts of Electrical Metering will be covered. Concept of bringing other commodity meters, such as water meter, gas meters will be covered. Harmonics, Sags, Surges, and Transients will be covered on the Power Quality side. LEED Buildings, Title-24, Sub Metering will be covered on the sub metering side.
NV18-375	Today's Critical Power Systems In Your Plant	Presentation will discuss the every changing world of critical power systems, primarily UPS Systems, in today's critical power infrastructure. We will touch on common and future UPS topologies, battery systems, and efficiency solutions. With increased pressures from businesses and public entities to utilize green energy we will show how manufactures are looking at implementing alternate energy solutions such as solar, energy storage, fuel cells, and generators into existing or new power distribution systems to improve reliability, lower greenhouse gases and ultimately lower total cost of operation.
NV18-376	Programmable Logic Controllers vs Dedicated Configurable Controllers in Water / WW Industry	Programmable Logic Controllers (PLCs) have been around since the 1980s. Today they are used in more than 80% of all W/WW applications. So why is the W/WW industry starting to lean back away from PLCs and back towards Dedicated Configurable Controllers (DCCs)? PLCs functionality has come a long way, but their operation and user friendliness remains complicated. The lack of on board diagnostics/troubleshooting tools, forces deployment of specialized diagnostic software from the PLC manufacture requiring operators to have additional equipment and skills. Unfortunately, many smaller communities do not have such people on staff and are forced to obtain and pay for specialized 3rd party technical support services. There continues to be a diverse supply of DCCs for common W/WW applications. The manufactures of these DCCs continue to build on the DCC's strengths including, versatility, lower cost, simplicity, user friendliness, and advanced on board diagnostics / troubleshooting tools. We will go through the differences of PLCs versus DCCs and when and where they are a best fit
NV18-377	Modelling Ammonia Based Aeration Control in Real Time with Online Instrumentation	Traditional forms of modelling and their commercially available systems have been tremendous tools for engineers and utility planners to plan large scale projects such as new plant designs or expansions. Extending the benefits of these models, plant staff are adopting "real time modelling" as a means to determine the potential benefits of upgrading and optimizing processes such as nitrification using online instrumentation.

NV18-378	The Value of Hybrid Sensors for Water / Wastewater Management	Wastewater systems are complex structures to measure, manage and control. Wastewater systems are notoriously difficult to model - conditions are uncontrolled and changing continuously, making accurate hydraulic modelling difficult. A variety of sensor types, communications systems and analytical models can be used to assess the quality and capacity of wastewater systems under normal, abnormal, and highly stressed conditions. A hybrid sensor can be defined as a system with at least two parameters that provide independent data that can be measured and telemetered together. Examples could be: water level and temperature; gas sensing, pH and flow; rainfall and water levels: or any combination of multiple measurements. The advantages are lower costs, shared communication, more compact installations, more detailed data, and insights following from looking at the collection system from different data views. Data fusion can also provide synergy between real time remote sensing by client owned instruments in concert with government owned data acquisition, such as radar and more. A series of California case studies will be discussed showing the value of hybrid data streams.
LABORATORY		
NV18-379	Legally Defensible Laboratory Data	The first thought when planning sampling and testing of environmental samples is not generally whether the data is legally defensible, but often is about meeting the frequency and limits of our permit or project requirements. 99% of the time environmental data is never called into question. However; that 1% chance that your environmental data may be utilized in court should be taken into consideration on a regular basis. The key components to having legally defensible data are: having good samples, having trained staff, proper testing technique, traceability, and good reporting of the results.
NV18-380	Laboratory Turbidity: How to ensure accuracy and repeatability	Turbidity measurement has evolved over the last five years to include new methods and technologies as our ability to produce ever lower turbidity readings from improved treatment technologies. Oftentimes we struggle with lab measurement as a verification/validation of process instrument readings. Discussion will focus on understanding the science of turbidity, examining the major accepted regulatory methods, and a thorough discussion of best practice when it comes to ensuring accuracy and repeatability of laboratory samples.
NV18-381	QC & Troubleshooting for pH, DO, Chlorine & Turbidity Analyses	Proper analysis of pH, DO, chlorine, and turbidity requires good QC procedures and troubleshooting techniques. Standard QC procedures should include check standards, duplicate samples, demonstrations of capability, and annual proficiency testing. Troubleshooting should include the following: 1) pH: evaluating calibration buffers, assessing electrode type/condition, removal of air bubbles in electrode, and using slope to evaluate probe efficacy; 2) DO: verifying meter's internal barometer (if applicable), assessing calibration, evaluating probe condition, and checking for proper installation and condition of membrane/sensing cap; 3) TRC (DPD method): using secondary check standards to assess instrument performance, verifying calibration against primary standards, thoroughly cleaning sample cells, and using the correct, unexpired DPD reagent; and 4) Turbidity: ensuring that turbidimeter meets specific requirements (i.e., Standard Methods 2130 B), performing instrument maintenance, using scrupulously-cleaned sample cell (or matched cells) and sample bottles, performing quarterly calibrations, verifying calibrations with check standards, and indexing sample cells.
NV18-382	Online amperometric chlorine analyzers - Do they work?	Online amperometric chlorine analyzers have been around since the 1960s, but it wasn't until the 90s that more reliable designs (with no moving parts) started to appear. The relatively recent increase of WTPs using online amperometric probes was a major factor in the EPA's decision to more closely study the technology, which helped usher in EPA Method 334 in 2009. This method allows the use of online instrumentation, like amperometric probes, to determine residual chlorine levels for regulatory reporting purposes as long as the instrument meets the proof of performance requirement and quality controls are followed and documented. Meeting these requirements is where many users of amperometric probes run into problems. A failure of amperometric technology to meet the requirements is sometimes due to improper installation of the technology, but it's just as often due to using older amperometric designs that lack certain key features of newer generation probes. In this presentation, we will present data supporting the use of amperometric technology and explain what design features to look for in order to ensure accurate measurements of chlorine residual.

NV18-383	Microscopic Biological Surveys (MBS) And Why They Always Matter	This presentation reviews the importance of the Microscopic Biological Survey (MBS) and why they matter. If MBS s always matter, why don t my Surveys add up and correlate to my plant data? What you see under the microscope should always correlate to the physical and biological data derived from the laboratory. When it doesn t what should we do? Applying microscope data to plant data is more difficult than one might imagine, because you may not be looking at the same picture. Also, Cyanobacteria may be more significant in your process than you think. How Protists and Metazoans may play a more significant role in its control than previously thought.
NV18-384	Legiolert: A Tool To Understand The Risk Of Legionnaires' In Water Systems	Legionella pneumophila is commonly found in potable and nonpotable water systems. This species is the primary cause of an often deadly form of pneumonia, Legionnaires' disease, which the CDC has found to be preventable in 9 out of 10 cases by more effective water management. As of June 2017, healthcare facilities with Medicare or Medicaid funding must have a Water Management Plan to reduce their Legionella risk. Routine testing for L. pneumophila is the only way to ensure these plans are effective. Recognized for causing disease when present in building and cooling tower water, L. pneumophila is also in environmental and source water. A recent study of reuse water in six distribution systems found 50% of samples contained Legionella, with 96% identified as L. pneumophila. A key step in mitigating risk is to perform routine monitoring to quantify the presence of L. pneumophila. Traditional culture methods require a high degree of skill for interpretation and can take up to two weeks for confirmed results. Legiolert is a new method for the detection of L. pneumophila that is very simple to use and requires minimal hands-on time. Legiolert provides confirmed results in 7 days.
NV18-385	Correlations between BOD5 and TOC in Wastewater	BOD5, is a costly and labor intensive test that is insensitive to measuring the effects of toxic substances and is imprecise at low concentrations. In addition it cannot be used for process control or real-time monitoring due to the time it takes to receive test results, at least five days. Alternative test such as TOC could provide results within minutes. TOC analysis is fast and more accurate than oxygen demand method and is a direct measurement of the organic load. This presentation will show all the steps the City of Henderson Water Quality Laboratory has taken to develop the site specific BOD5:TOC correlation for their Water Reclamation Facilities influents and effluents. The discussion will also cover the NDEP approval process to allow TOC test results to be converted to BOD5 concentrations and eliminate labor demanding and expensive daily BOD5 testing.
NV18-386	Understanding Common Laboratory Acronyms	Acronyms are common place in environmental laboratories. Being able to understand common acronyms in the industry is difficult at best for a seasoned professional let alone a newly hired analyst. This presentation will help define some of the more common acronyms utilized regarding laboratory data and sampling.
MAINTENANCE		
NV18-387	Basic Pumps	One of our biggest challenges in water and waste water is to move the water from source through treatment, storage, and use. This is followed by collection, additional treatment, treatment, and disbursement into the environment. All of this movement is energy intensive and a large capital investment for our utilities. Let's review the Theory of operations of pumps and the proper maintenance to ensure longevity of them. Enjoy this session with some discussion of energy, energy conversions with in a pump, temperature, pressures flows and boiling (cavitation).

NV18-388	Basics of Motor Testing: Cuz the Job You Save Could Be Your Own!	For more than 50 years the generally accepted method for troubleshooting a motor that has failed is to do an Insulation-to-Ground test (megger) and Resistance test (multi-meter). If your motor passed both tests, the problem has to be with the VFD, right? There are nearly 100 things that can fail in motor and those two instruments can find two of them. It s like going to a doctor who s only diagnostic tool is a stethoscope: handy for checking your heart and lungs but what if you have a broken arm or high cholesterol? This presentation will show you why doctors use x-ray machines, blood tests and a full battery of other tests (Motor Circuit Analysis) to get to the root cause of what ails you (or your motor). We re going to look at why Electricians and Reliability Professionals constantly misdiagnose symptoms and illnesses in their Motor Systems (and get blamed for their failure) and how to employ Motor Circuit Analysis to fully diagnose the entire Motor SYSTEM. A unexpected motor failure, lost production and the throwing away of perfectly good motors can all be avoided by employing this simple technique.
NV18-389	Submersible Lift Station Troubleshooting - Optimizing Run Time	Submersible Lift Station Troubleshooting - Optimizing Run Time will be a session on increasing the life of pumps through correct selection, verification of working conditions and proper installation. It will focus on different types of pumps available in the municipal market place and the correct application of these differences to enhance the performance and life time of the product. This discussion will lien toward wastewater pumps because of the greater differences in design and product handling capabilities.
NV18-390	Who's In Control? Control Strategy & Maintenance Of Lift Stations	Control panel maintenance and troubleshooting starts with good system design and extends through follow through on developing and maintaining a good maintenance program throughout the life of the control system(s). A good maintenance program will extend the life, increase reliability, maintain process efficiency, improve safety, ultimately save money and males sure your manufacture warranty maintenance requirements are satisfied. With the goal of achieving the above, it is important to get a good start including good design, equipment, integration and installation and having the proper O & M manuals from the supplier. The maintenance should be done in a safe manner by qualified technicians with the proper equipment and skills. Ideally, key/crucial components to the control system will be available to be used for repair and troubleshooting. A good working knowledge of the control system operation and understanding of the control panel primary and secondary control functions including bypass interlocks and alarm systems is helpful when verifying operation and or troubleshooting the system. Often there are built in diagnostic indicators that are available.
NV18-391	Building an In-House RCM Program: Lessons Learned	This session will discuss lessons learned from two in-house RCM Implementations at small private facilities in CA. Concrete tools and suggestions will be provided to improve overall O&M reliability, begin an RCM program at a small facility, and meet these challenges.
NV18-392	O&M Manual Updates: How to optimize operations & maintenance	O&M Manuals contain vital information for system operators to easily reference to ensure that facilities and equipment are operated and maintained in accordance with best practices and regulatory requirements. In many cases, O&M manuals are not treated as living documents and can sit on a shelf until the information in them is needed. Unfortunately, without valid and up to date information an O&M manual will not be useful especially to new staff who need to learn about the utility specific protocols and procedures. Regularly updated O&M manuals will provide many benefits to both current and future staff.
NV18-393	The Best Tool In Your Tool Belt Is Your Cell Phone	Disruptive Technology has impacted businesses since the Internet inception in the 1990's. Municipalities and companies need to adapt to survive. This presentation touches on this impact and shows how cost effective inventory management solutions can not only help municipals and companies avoid being left behind, but can help to become more cost and time effective. Datalinqr/Slate Pages has developed a cost effective inventory/maintenance management system. The system consists of a 2.5 x 3" anodized aluminum tag "Slate" that is mounted on an asset(valves; hydrants, grease traps, etc.) and scanned with a smartphone. A template can be configured based upon the current and future information needs for that particular asset. Once scanned, it gives the ability to document cleaning, damage, add photos, create and add to a record journal, capture a GPS coordinate, etc. Tech support is provided at no cost. There is a small one time fee per slate, no monthly subscription

NV18-394	Cathodic Protection Of Multiple Interconnected Pipelines	The Las Vegas Valley Water District recently completed a multi-year project to install impressed current cathodic protection on 10 pipelines. The pipelines ranged in diameter from 24-inches to 66-inches, and were constructed from a combination of SCCP, MLCP, and di-electric coated steel cylinder. All the pipelines were electrically continuous along their length and with each other. Adding to the challenges were that the pipelines were electrically shorted to a pumping station, an uncooperative flowing artesian aquifer, and that the pipelines were located in developed areas where foreign utilities were in close proximity. The completed project includes five deep anode beds and one distributed anode bed to protect over 16 miles of transmission and distribution water pipelines.
NV18-395	Overview of Classic & New State Of The Art Pipeline Rehabilitation Technologies	Collection & distribution systems are the wastewater & water utilities largest investment. They have a replacement value greater than that of a wastewater or water treatment plant. Sixty to ninety billion dollars per year are spent on pipeline replacement in the United States. The congressional budget office estimates that an average of 71 to 98 billion dollars will need to be spent on water and wastewater systems through 2019. Trenchless technologies have become a major alternative to traditional digging for replacement of these lines. This session will discuss the following: 1. Problems such as: infiltration, exfiltration, roots, corrosion, leaks, and structural defects. 2. The four basic styles of technology used for mainline replacement and rehabilitation of pipelines and lateral connections. • Traditional Dig & Replace • Cured-in-Place pipe liners • Folded and Re-formed pipe liners • Pressure Pipe Liners 3. Bid specifications, including ASTM & "GREENBOOK Standard Specifications for Public Works Construction" developed and used in Southern California. 4. Case histories of sewer, water, storm drain, and road culvert, rehabilitation projects.
NV18-396	Condition Assessment of Reinforced Concrete Structures	This presentation will be directed toward the condition assessment of reinforced concrete in regard to safety, asset management and life expectancy of a structure. Industrial facilities and water retaining structures will be the primary focus of the presentation. Also covered will be preliminary visual inspections, basic preliminary testing, laboratory testing, nondestructive testing as well as destructive testing. Recommendations and requirements for condition assessments will be discussed as well as the appropriate means to document and report conclusions, recommendations, and findings. The presentation will address real life situations of concrete deterioration, reinforcement corrosion, contaminants, and means of mitigation.
NV18-397	We Come From Down Under (Australia) With Solutions For Odor & Corrosion Problems Structures	Concrete sewer assets are corroded in situ by acid produced in the sewer. Stricter pollution norms and changes in our dietary habits has increased rate of corrosion substantially over the last 2 decades. Over 15 Trillion of dollar's worth of sewer assets in the USA are today under threat due to corrosion. Rehabilitation of these sewer assets will not only cost billions of dollars but will also result in immense operational challenges. One of the solutions to stop corrosion is by spraying Magnesium Hydroxide Liquid (MHL) on the surface of concrete sewers. Compared to existing corrosion protection technologies, MHL spray coating is 3 - 7 times cheaper over the life cycle of the asset and does not require flow diversion or man entry for application. This technology has been tested and used as a mainstream corrosion protection mechanism over the last 12 yrs. in the USA, Australia and New Zealand.
NV18-398	Confusions and Solutions with Specialty Coatings	This presentation offers a detailed explanation of the mechanism of corrosion specifically found in water and wastewater environments along with real field experiences, supported with photos of before and after installations, with an explanation of why the coating failed. As the owners and operators realize they need to address biogenic corrosion in their own collections systems and leak mitigation in water structures, well directed questions need to be answered with technically supported experience and data in an effort to wade through the available options for future structure protection. This presentation will enhance the knowledge of the operator/designer/engineer and allow them to make an educated decision for their next project. Real field practices are discussed.

NV18-399	Novel Corrosion-Resistant Manhole Construction Methods	Today's durable corrosion resistance in collection, conveyance and treatment systems relies on different existing technologies involving reinforced or unreinforced thermoplastics. While corrosion resistance penetrated the conveyance market, difficulty of installation and cost are still common barriers to adopting these technologies for corrosion-resistant manhole construction. Additionally, in remote, hard to access areas, these technologies are out of reach because of extensive machinery requirements. A first, patent-pending manhole construction approach combines existing proven technologies in wastewater collection and conveyance to make corrosion-resistant manholes readily accessible, both from the ease of construction and the cost perspective. A second alternative manhole construction technique, applicable both to new construction and retrofitting scenarios, allows for durable corrosion-resistant manhole construction in remote areas, with limited mechanized resources, where brick manholes were the only alternative up to this point.
NV18-400	Reducing Inflow & Infiltration in Manholes & Vaults	Sanitary sewer manholes and other underground utility vaults have been shown to be one of the most vulnerable and leakage prone structures in the entire collection system. The costs associated with the leakage into these structures are numerous. Attendees will learn about the significance of manhole frame-chimney leakage, other manhole leakage sources and a variety of ways to identify the leaks. Costs associated with the conveyance and treatment of the excess flow will be discussed as well as a range of repair and renewal technologies available to assist the owner, utility and engineer develop a cost effective rehabilitation program.
NV18-401	GIS Utility Management for Local Governments	The City of Hesperia utilizes GIS data for city owned utilities for water, sewer, storm, and street signs. The City has integrated several GIS enabled applications such as; Asset Management (Azteca, Cityworks), PLL (Trakit), Dig-Alert Mobile app for line locating (Nobel), and a Public Viewer for GIS data (Nobel). The City has also incorporated hydraulic modeling data for water and sewer assets into GIS. We use our GIS to make informed decisions for CIP s and land use for commercial and residential projects.
NV18-402	What Owners & Engineers Should Know To Eliminate Corrosion Above The Water Line	Steel water tanks are critical assets to their respective Towns and Cities. They provide drinking water and fire protection. Most steel tanks are designed to AWWA minimum standards that allow un-paintable areas to exist inside water tanks, this is especially important above the water line as vapor creates a corrosive environment. This presentation will discuss different methods that can be utilized to stop this process from happening. We will also discuss ways to improve the life-span of coatings.
NV18-403	Managing Water Storage in Extreme Environments	Like many assets, water storage tanks are prone to corrosion. In high temperatures over an extended period of time, this is often exacerbated. The space above the high-water line heats up and evaporated water fills the space. Corrosive activity can begin in the tiniest coating imperfection (holiday) or exposed metal surface (surfaces deemed inaccessible by coating experts, such as joints and other tight areas). Maintaining these storage tanks requires a well-organized, disciplined management program.
NV18-404	Condition Assessment & Asset Mgmt. Alternatives For Smaller Agencies	An effective asset management program can provide critical planning guidance for both capital and O&M efforts, and can help to keep costs on track. Further, an organized condition assessment effort is the foundation of any effective asset management program. This can be complex, and especially for smaller agencies, expensive relative to available funding. This talk will discuss some cost-effective alternatives in tackling such an effort, including (1) building an asset inventory and GIS model, (2) systematic condition assessment, defect identification, and prioritization of repairs, and (3) budgeting for annual maintenance projects as well as remaining life/capital recovery requirements.

NV18-405	Hydraulic Aeration And Odor Control	Hydraulic aeration and odor control is a new method of dealing with the problem of low levels of dissolved oxygen (DO) in sewage collection systems, pumping station wet wells, water reservoirs, and irrigation ponds. By using the energy of the flowing liquid, specially designed fittings are able to effectively mix air into the liquid stream and powerfully mix DO into the flow. Hydraulic Aeration was previously limited to drop structures in sewage collection systems, however a new development has extended the range of applications to wet wells, fresh water reservoirs, irrigation ponds and other applications where maintaining high levels of DO is beneficial. The presentation will describe the theory surrounding Hydraulic Aeration and the principles it is based upon. Design guidelines and conceptual installations will be presented as well as results from field applications. Finally, installation considerations and design limitations will be outlined. This presentation will be of interest to design engineers, operations staff as well as senior municipal staff who oversee the operation of water and wastewater systems.
NV18-406	Ladder Safety: One Wrong Step Can Kill	This class is intended to educate workers and supervisors on OSHA Regulations and Best Practices of Ladder Useage in order to prevent unnecessary and costly accidents. The cost for ladder injuries can be in the millions for a fatality. This class covers selection, inspection, set-up, useage aand maintainance of stepladders, extension ladders and articulating ladders
NV18-407	Electrical Safety & Maintenance Per NFPA 70E	Much of the focus of NFPA 70E is on Chapter 1 for worker safety. How do the contents of chapter 2 General Maintenance Requirements enhance the requirements of chapter 1? The presentation will review the General Maintenance requirements and how they direrctly impact the safety of your workers in your plants.
NV18-408	Repairing, Joining and Tapping Pipe	The repairing, joining and tapping pipe are some of the basic operations conducted by field crews on pipelines. There are basic materials, gaskets and configurations to choose from in the market. Determining the correct product for the application is critical in making a correct repair and or installation. The questions to ask before repairs or joining begin. Proper installation of repair products will be presented. Basic installations of repair products are reviewed along with information on various types and styles of products available in the market place. An examination of traditional couplings and introduction to some new coupling products designed for future ease of repair applications. A review of the different styles of service saddles and tapping sleeves along with the various types of pipe they are best suited for.
NV18-409	Overview Of Trench Safety & Advancements In New Technology	Trenches 5 feet deep or greater require a protective system unless the excavation is made entirely of rock. Utility workers die every year in unshored trench collapses. We will review some new advances in shoring technology from Europe that have been approved for OSHA compliance and provide a safe, lighter weight, worker friendly option that is easier to use for the water & sewer utility workers.
NV18-410	Odor Control Scrubbers And Aeration Technologies For Sewer & Water Applications	This presentation will discuss methods and techniques to reduce H2S odors generated from water retention ponds, tanks, sewer manholes pump stations, and sewer collection systems. We will cover sources of H2S gas and control techniques and equipment for odor, grease, and rag matting. Also in this presentation, the evolution of odor control media and techniques of how to determine the correct odor scrubber unit size for typical applications; how an odor control scrubber's units, dosing, aeration, and Vortex drop manhole odor control work. Before and after installations H2S gas measurements and the benefits of venting pipelines with odor control. Case Histories.

NV18-411	Reducing Corrosion, Infiltration, Inflow, & Odors in Manholes Using Advanced Techniques & Materials	This session will cover the evaluation of maintenance holes and access structures. Discussion regarding design problems & solutions, how to design new manholes & structures for easier maintenance, and how to use modern techniques to extend the life of the manholes and the streets around them. Finally we will look at parts of the sewer system maintenance hole & access structure problems, solutions to common problems, raising manholes to grade (the worst job in maintenance), and drop manholes odors & solutions, and advanced trenchless rehabilitation manholes & techniques.
NV18-412	Trenchless Pipeline Rehabilitation Spot & Joint Repairs for Sewer, Water & Storm Drain Applications	EPA Water Loss Audits & Water Loss control estimates that an average water system has a loss is 16% and that 75% of that could be recovered and saved. Infiltration from high ground water leaking in to a sewer or storm drain systems can increase treatment and transportation cost and also cause loss of bedding from around the pipeline which can cause sinkholes in the streets. Overview of three different methods and techniques to internally and externally repair exposed damaged pipelines and structures without excavation. The methods include: Internal joint seals for large diameter water and sewer pressure and gravity pipelines from 18 to 216 inches in diameter. Internal robotic installation of small diameter 6 - 24 inch sectional seals for gravity, pressure pipeline and pipe liner end seals including video of installation. Internal joint seals for manholes & water and sewer structures.
MATH		
NV18-413	Math Made Easy And Other Lies - Part 1 (Areas)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
NV18-414	Math Made Easy and Other Lies - Part 2 (Volumes)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
NV18-415	Math Made Easy And Other Lies - Part 3 (Flow Rates)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
NV18-416	Math Made Easy And Other Lies - Part 4 (Detention Times)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
NV18-417	Math Made Easy And Other Lies - Part 5 (Pumping Horsepower)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.

NV18-418	Math Made Easy And Other Lies - Part 6 (Dosing)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
NV18-419	Math Made Easy And Other Lies - Part 7 (Putting It All Together)	Everyone hates math, ok not everyone but most. Mainly most of us didn't like the way it was taught. Didn't like in elementary school and the method didn't change for the next 10 years of your life. Before you dismiss this as another math class, come see how the new graphic method is used to solve most math questions faced by operators sitting for the exam.
RECLAIM / REUSE		
NV18-420	The Framework for Potable Reuse in Arizona	Arizona, like several other states, is developing a regulatory framework to support potable reuse as a viable option to meet water supply challenges. Over the past five years, Arizona interests held a series of technical workshops on issues related to potable reuse, opened a rulemaking process, and developed a guidance document to support the framework development. In January 2018, the guidance document was provided to the Arizona Department of Environmental Quality (ADEQ) for their use in advancing the rulemaking. Further, two ADEQ technical work groups met throughout 2017 to provide specific recommendations for the regulatory framework, based on information provided in the guidance document, which were also provided to ADEQ in January 2018. This presentation will describe the process that brought Arizona to the cusp of a potable reuse framework, the recommendations provided to ADEQ to develop the regulations, and the outlook for implementing the framework in early 2019.
NV18-421	Pipeline Challenges in Environmental Areas of Concern	Permitting and Regulatory requirements are a key component of every project, having an understanding of the types of permits required, length of time to obtain them, and the potential impact to the construction schedule is an essential step to starting a project on the right foot. The proposed presentation will review a case study project completed with the City of North Las Vegas that crossed several jurisdictions and required an extended permitting effort. The City of North Las Vegas (CNLV) finished construction of the Water Reclamation Facility (WRF) in 2011 with a 25 MGD treatment capacity, expandable to 50 MGD. This treatment facility is located on a 40 acre site leased to CNLV by Nellis Air Force Base (NAFB). The treated effluent is currently discharged to the Las Vegas Wash, but through this project a portion of the treated effluent will be used to water the base's existing golf course. The golf course is currently watered with local groundwater supplies.
NV18-422	Keep Calm & Conserve: Water conservation in an arid environment	The Combat Center's mission is training military personnel under live-fire conditions. The training and support of 45,000 Marines annually in austere desert environment relies on finite groundwater resources, and poses unique challenges. This reliance has resulted in 200 feet of groundwater level subsidence in 75 years. Availability of water resources continues to challenge Southern California. The Combat Center is committed to meeting and where possible, exceeding conservation requirements ensuring water sustainability. Water conservation, reclaim and reuse, and efficient water use are fundamental to ensuring water availability for the Combat Center's future. The water conservation program has achieved significant reductions despite housing residents and military commands not paying for water, requiring our program to operate without the behavioral driver of cost avoidance municipalities typically have. With these challenges the Combat Center reduced annual water consumption by over 130 million gallons and achieved a 69 gallon per capita-day usage. The Combat Center exceeded Executive Order 13693 water reduction requirements with an unprecedented 54% reduction in water intensity.

NV18-423	Yuma Desalting Plant: Past, Present, and Future	Prolonged drought conditions and rising demand for Colorado River (CR) water have increased interest in long-term measures to increase the supply, reuse, and conservation of water in the CR watershed. Water agencies have expressed interest in the operation of the Yuma Desalting Plant (YDP) as a tool to increase the water supply in the CR. The YDP, a 72 million-gallon-per-day RO desalination plant, was designed in the 1970s and 1980s using the latest technology available at the time. Since then, membrane materials and pretreatment techniques have advanced dramatically. The YDP is uniquely situated along the CR, about 1 mile from the US border with Mexico. This makes it possible for the YDP to indirectly provide water to major metropolitan areas in the Southwest including LA, Phoenix, and Las Vegas. This paper will present: the history of the YDP from its inception as a solution to the CR salinity crisis of the 1970s, through its design as a groundbreaking desalination plant, to its brief periods of operation; the present condition of the YDP and the research being conducted at the YDP s on-site research center; and an outlook for the future of the YDP, including P3 opportunities.
NV18-424	Increasing Influent Flows to GW Replenishment System - OCSD	Orange County Sanitation District (OCSD) is a public agency that provides wastewater collection, treatment, and disposal services for approximately 2.6 million people in a 479-square-mile dense populated area in Southern California. OCSD has two treatment plants Plant 1 in the City of Fountain Valley, CA and Plant 2 in Huntington Beach, CA. Plant 1 treats most flows from OCSD s north and west service areas and the remaining flows are treated at Plant 2. Historically Plants 1 and 2 have received and treated roughly equal amount of influent flows. The Groundwater Replenishment System (GWRS) is located next to Plant 1 and was built to treat Plant 1 effluent for indirect potable reuse. GWRS produces high quality water that meets or exceeds all state and federal drinking water standards. This presentation focuses on the efforts made by OCSD to increase influent flows at Plant 1 and reduce influent flows to Plant 2 to provide adequate secondary effluent to the GWRS to produce 100 Million Gallons per Day (MGD) of high quality water.
NV18-425	Orange County's Ground Water Replenishment System	Groundwater can supply up to 2/3 of the potable demand in Orange County, CA. Rapid growth in population and industry is challenging the sustainability of Orange County s water supply. To address this challenge, the Orange County Water District operates a 100 million gallon per day recycled water project- the Ground Water Replenishment System (GWRS). This discussion will explore GWRS and how it is being used to effectively replenish and protect Orange County's groundwater basin.
NV18-426	Turbidity Meters for Determining Continuous Membrane Integrity in MBRs	Turbidity meters have been used for years to determining membrane integrity in MBRs. There has been concern about how accurately did turbidity meters reflect failures in membrane integrity or how quickly did these spikes respond to possible breaks in membrane integrity. The results of this study will demonstrate that the new low-level turbidity meters can be used as an accurate representative of membrane integrity which could be used to give continuous assurance of MBR membrane integrity in both IDR and DPR situations.
SAFETY / HEALTH & SECURITY		
NV18-427	Domestic Terrorism Awareness - Part 1	This presentation will focus on tools to help operators and managers identify potential critical infrastructure risks and how they can assist in recognizing threats.
NV18-428	Domestic Terrorism Awareness - Part 2	This presentation will focus on tools to help operators and managers identify potential critical infrastructure risks and how they can assist in recognizing threats.

NV18-429	Choosing The Best Gas Detector / Calibration & Testing Requirments	The "Best Confined Space Gas Detector doesn't come from anyone manufacturer; the way in which Gas Detectors are used can vary between different confined space programs. The instrument providing the best service and value for one program may not be the best choice for another. Gas detection equipment manufacturers put a lot of emphasis on their instruments; there are numerous models to pick from with varying features, price points and capabilities. The perfect product for your application is "out there", the key is understanding which features are needed, then choosing the design that best fullfills the requirement. / Calibration and Bump Test requirments for direct reading portable gas monitors; manufacturers and regulatory agencies agree the safest approach is to perform a functional test by exposing a gas detector to test gas before each day's use. The only way to know whether an instrument is capable of proper performance is to expose it to known concentration test gas verifying the proper performance of the alarms and that the readings are accurate. Failure to periodically test and document increases liability exposure in the event of an injury or accident.
NV18-430	OSHA Silica Rule	This presenatation will review what the new silica standard is in the general industry as well as the construction industry. Also we will discuss what the rule means and how to come into compliance with it.
NV18-431	Water Utility Service General Safety	This presentation is designed to inform the water and sewer district management and employees of the, 1995, OSHA required training for employees potentially exposed Asbestos. With additional basic info on new silica rule and mold issues.
NV18-432	Safety At The Work Place: Active Shooter Part 1	This two-part presentation will begin with short briefs on the October 1, Vegas shooting and some of the various school shootings that have occurred across the country. Followed by learning the difference between shooters i.e., home grown terrorists, mad fired employees and persons with mental problems. The instructor will also explain the Active Shooter Call Out Sheet and discuss law enforcement officers' response to Active Shooters. There will be discussion about what to do to protect employees at the work place; what to do if an Active Shooter happens when you are out at the mall, church, or other public place; and what is around your office/work, home, or public place that you can use to protect yourself. A question and answer period for attendees will close out the presentation.
NV18-433	Safety At The Work Place: Active Shooter Part 2	This two-part presentation will begin with short briefs on the October 1, Vegas shooting and some of the various school shootings that have occurred across the country. Followed by learning the difference between shooters i.e., home grown terrorists, mad fired employees and persons with mental problems. The instructor will also explain the Active Shooter Call Out Sheet and discuss law enforcement officers' response to Active Shooters. There will be discussion about what to do to protect employees at the work place; what to do if an Active Shooter happens when you are out at the mall, church, or other public place; and what is around your office/work, home, or public place that you can use to protect yourself. A question and answer period for attendees will close out the presentation.
NV18-434	Safety At The Work Place: Active Shooter Part 1	This two-part presentation will begin with short briefs on the October 1, Vegas shooting and some of the various school shootings that have occurred across the country. Followed by learning the difference between shooters i.e., home grown terrorists, mad fired employees and persons with mental problems. The instructor will also explain the Active Shooter Call Out Sheet and discuss law enforcement officers' response to Active Shooters. There will be discussion about what to do to protect employees at the work place; what to do if an Active Shooter happens when you are out at the mall, church, or other public place; and what is around your office/work, home, or public place that you can use to protect yourself. A question and answer period for attendees will close out the presentation.

NV18-435	Safety At The Work Place: Active Shooter Part 2	This two-part presentation will begin with short briefs on the October 1, Vegas shooting and some of the various school shootings that have occurred across the country. Followed by learning the difference between shooters i.e., home grown terrorists, mad fired employees and persons with mental problems. The instructor will also explain the Active Shooter Call Out Sheet and discuss law enforcement officers' response to Active Shooters. There will be discussion about what to do to protect employees at the work place; what to do if an Active Shooter happens when you are out at the mall, church, or other public place; and what is around your office/work, home, or public place that you can use to protect yourself. A question and answer period for attendees will close out the presentation.
NV18-436	Arc Flash Risk Assessments & Requirements In Electrical Safety Programs	Electrical Safety is an essential component of overall safety in the water industry. Being that it takes electrical components to pump and monitor the water, electrical safety must be considered. The foundation of any Electrical Safety Program, is the identification of the electrical hazards, without it, no employer can accurately protect the electrical workers in their environment. With accurately identified and assessed hazards, safe work practices can be employed to eliminate hazards and what can not be eliminated, PPE is employed to protect the workers. In the session we will discuss the employers responsibility to protect the employee and the ways arc flash assessments can be employed to define the hazards and develop protection for the electrical workers.
NV18-437	Trenching & Shoring Awareness and Safety	Excavation and trenching are among the most hazardous construction operations. The Occupational Safety and Health Administration's (OSHA) Excavation standards, 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, contain requirements for excavation and trenching operations. This session will highlight key elements of the standards and describes safe work practices that can protect workers from cave-ins and other hazards. Topics discussed will include: 1) difference between trenches and excavations and the dangers related to each 2) soil classifications 3) competent persons 4) pre-planning 5) safety factors 6) protective systems
NV18-438	Confined Space Awareness Training	The course is intended to train and/or retrain individuals in the essential safety skills and knowledge for nonprofessional emergency procedures in Confined Space Entry. This class presents the requirements for procedures to protect employees in general industry and construction from the hazards of entry into permit-required confined spaces. This Presentation will review the Definitions of Confined Space Entry: *definition of a permit-required confined space entry; *analyze and decide if the space is permit required; *confined space entry safety hazards and precautions; *atmospheric testing; *confined space atmospheric testing video; personal protective equipment; *how to protect themselves and others (buddy system); *resources available to water and wastewater professionals
NV18-439	Internal Safety Auditing Program Development	This presentation will focus on the Internal Auditing Process. Why Internal audits are important to an organization, the steps involved in performing successful audits including preparation, ground rules, findings, communicating corrective action suggestions and reporting. The internal auditing program allows organizations to proactively identify issues and serve as a catalyst in improving overall safety.
NV18-440	How To Establish Internships At Your Utility	The dream...hire experienced employees who require very little, if any, training. But this dream conflicts with reality. How can organizations meet the needs of today and prepare the workforce of the future? One solution is to develop a safe and quality internship program. But implementing an internship program can seem daunting. This presentation will walk you through each step so that your program is a successful work or service experience for the lucky intern who walks through your door.
NV18-441	The Balancing Act: How Cost, Quality & Schedule Impact Safety	Safety is a critical aspect of the water and wastewater industry, but it is sometimes influenced by cost, quality, and schedule. Cost refers to the budgeted amount available. Quality refers to being suitable for its intended purpose while satisfying customer expectations. Schedule refers to the amount of time available. This presentation will talk about the difficult balancing act between workplace safety being collateral damage or making good business sense and what tips the scale.

NV18-442	Safety Data Sheets: How To Safely Manage Your Chemical Inventory	This session will focus on how Safety Data Sheets communicate hazards and how the access to this information improves workplace safety and reduces environmental risk, communicates safe handling practices and emergency control measures to utilize products safely.
STORMWATER		
NV18-443	WQ Management Plans & Associated Stormwater Treatment Devices	The Santa Ana Regional Water Quality Control Board mandated a WQMP be prepared to treat pollutants of concern in stormwater runoff for new development and redevelopment projects that fall within its criteria. These stormwater treatment devices or better known as, Post-Construction BMPs. The WQMP primarily includes developing strategies to implement a combination of structural and non-structural BMPs and measures to ensure adequate long-term operation and maintenance of those BMPs. In this session, we will cover; when did this become a requirement? What took place to require developers to implement these BMPs? What happens during and after the construction of the BMPs? Who is all involved with the post-construction BMPs? What is involved to ensure long-term maintenance? How do you run a successful WQMP program without upsetting everyone? In this presentation, I will let you know all the ups & downs and just maybe I will help you make life easier for yourselves.
NV18-444	Fill 3 Needs With 1 BMP	The Consolidated Rental Car Facility (CONRAC) project at San Diego Airport included a massive two-million square foot structure on 24.8 acres of coastal property. Water quality and quantity challenges included undersized existing drainage infrastructure, high groundwater table and multiple resource agency oversight typical of coastal redevelopment projects. With multiple project constraints and stringent oversight, the design team from Parsons Brinckerhoff developed an innovative storm water management strategy that integrated conventional bioretention treatment with flood control elements that mitigated flows up to the 50 year storm event. While the multifunctional basin designs were intended to provide exceptional post construction treatment of storm water flows, 3 of the 7 basins were constructed as the 1st phase of the construction project to provide sediment capture for storms up to the 10 year storm event.
NV18-445	Tracing the Steps from Compliance Thru Post- Implementation	The City of Los Angeles is subject to multiple Trash Total Maximum Daily Load (TMDL) regulations across various watersheds, all requiring that trash entering the City s watersheds be reduced to achieve a final compliance goal of zero. The City performed various studies & evaluated a series Best Management Practices (BMP) trash controls, and from these efforts developed an efficient two-pronged approach to achieving City-wide trash compliance in 2016. This presentation documents the history from conception to compliance and the continued efforts required to meet ongoing state and local regulations. Also, an overview of its BMP deployment strategy including the City s 5-year trash generation rate study, its institutional control effectiveness evaluation, and the evolution of the City s patented partial and full capture structural trash control technologies will be reviewed highlighting the lessons learned along the City s 15 year effort at attaining full trash compliance. The talk will conclude with a focus on the City s post-implementation strategy to continue supporting compliance efforts, including addressing the new state-wide trash amendments
NV18-446	Improving Stormwater Runoff Quality Thru Asset Management	Asset management has long been a part of most wastewater and water supply agencies operating plans, but it is a relatively new concept for owners/operators of municipal separate storm sewer systems (MS4s). In south Orange County (in Southern California), the municipalities covered under a regional MS4 Permit issued by the San Diego Regional Water Board, have developed a comprehensive Water Quality Improvement Plan (WQIP) that commits to developing an asset management system that will support long-term stormwater program asset tracking and effectiveness assessment. The asset management system will integrate a model that will help estimate the pollutant load reduction achieved by each asset. This will help the municipalities quantify the effectiveness of both structural and nonstructural stormwater improvement strategies.

NV18-447	Stormwater Protection for Water Utilities	Water utilities, as drinking water suppliers, are naturally concerned with the quality of water. This session discusses an overview of various Best Management Practices (BMPs) that can be used to minimize, or reduce the introduction of pollutants to surface water associated with planned releases from drinking water storage, treatment and distribution systems.
NV18-448	The Creation of NDOT's Stormwater Program	The Nevada Department of Transportation recently developed and implemented a robust and state-of-the-art stormwater program. This talk presents the many challenges encountered in the creation of a new water quality division in a large construction-oriented state department. It will describe the lessons learned during the process, and helpful conclusions that will be beneficial to other environmental professionals.
NV18-449	Options for Stormwater Rate Calculations	In this presentation, we explore the legal authority for charging storm water rates in Nevada and California, and the methodologies and best practices in calculating storm water rates, including the economic/public benefits of certain approaches.
NV18-450	Stormwater Management: It's Everyones Responsibility!	Presentation will discuss how pollutants can effect our environment, economy and our health, the importance of regulations, and the implementation of Lake Havasu's stormwater program, including tribulations stormwater inspectors come across.
NV18-451	Making A Wet Subject A Hot Topic! Training Techniques That Motivate	Never before in America's history has it become more important to effectively educate stormwater professionals and involve the public in protecting our watersheds. Often, the stormwater educator s focus in a classroom is on the technical aspects and details of properly designing, installing and maintaining stormwater pollution prevention plans (SWPPPs), with little or no emphasis on the reason why properly managing stormwater is so critical. This disconnect is most often observed in the under funded stormwater programs and/or on construction sites where the SWPPP is poorly designed, installed and maintained. Effectively communicating the principles behind effective best management practices (BMPs) in a way that's engaging and influences long lasting positive behavior toward watershed protection is absolutely critical today, and it's time for waste water and stormwater professionals to meet this challenge head on! The presentation will uncover the human mind and how it learns and is motivated to act; as well as training strategies and techniques that, if properly implemented, will make long lasting changes that will preserve and improve our watersheds and future quality of life.
NV18-452	What Stormwater Certification Do I Need?	Certified Stormwater Manager? Compliance & Enforcement Inspector? Erosion and Stormwater Management Certification? Certified Environmental Stormwater Compliance Professional? Which do I need for my career in my area? What if my focus is MS4? MSGP? Construction?
NV18-453	The New Face of Stormwater Management	Last year interns presented the arc of development for three structural BMPs. The projects were included in a \$720,000 grant awarded by the California State Water Board. This year interns will present on three new major structural projects: La Costa Heights - Capture and treat or infiltrate stormwater runoff from a drainage area of 47,000 sq ft by constructing BMP strategies. Mission Estancia - Capture and treat or infiltrate stormwater runoff from 51,800 sq ft asphalt playground area. Olivenhain Pioneer - Capture and treat stormwater runoff from the parking lot install a minimum of 640 sq ft of pervious pavers and 2 rain gardens. This year interns will report on the monitoring program of new BMPs at three schools from last year. They'll present the results of the first rain event collection. The projects opened a new window into storm water management: how to maintain BMPs and make adjustments to design and maintenance in order to achieve improved water quality? The new interns will inspire and motivate attendees about the future of the industry. Their knowledge and passion will demonstrate the stormwater profession has a young generation committed to improving water quality.

NV18-454	Wait! Didn't We Already Do That?!! The Progressive Need To Promote SW Goals	As a community's stormwater program is implemented and matures, periodic assessment of the program s efficacy is required. With each iteration and issuance of the stormwater permit, the program must morph to meet compliance. But what about when the permit doesn t change (administrative continuation of the expired general permit)? Stormwater program elements are not intended to be one and done!!! They warrant on-going implementation, refreshing and updating. This presentation will discuss various approaches to addressing the program elements of stormwater management programs, community reactions, and the ebb and flow of implementation and compliance. Factors influencing continued program interest include changing staff, regulatory pressure, politics, economy, changing population, demographics, and development to name a few.
NV18-455	Water Sampling	This presentation is to simplify the basic sampling techniques that can be used in the wastewater field, drinking water field and stormwater field, ground water etc. I will demonstrate the difference between flow proportional composite samples, grab samples, time composite samples and when not to take samples. I will also review what kind of bottles should be used for what type of samples, ie 40 mil amber vial with septa lid should be used for VOC sampling not a plastic bottle. What type of bottle should be used in your auto sampler? When to call your lab for help? Why it is important to maintain a good relationship with your lab, and the importance of getting your samples to the lab in a timely manner. I will also cover different types of sample techniques, dip buckets, bailers, peristaltic pumps, foot valves, etc. and of course safety in the field will be covered.
NV18-456	Conducting Wet Weather Inspections in an Arid Environment	As if it is not difficult enough to sample a qualifying rain event in the desert southwest, there are many factors to consider in performing safe and effective wet weather inspections. Additionally, every internet search will demonstrate proper sampling techniques in flowing streams, which many communities in the southwest do not have. It is important to conduct both dry and wet weather inspections. In addition to the issues evaluated during dry weather inspections such as erosion and staining, wet weather inspections can reveal other problems such as rainwater flushing accumulated contaminants. Tips and methods for conducting wet weather inspections will be reviewed. For example, inspectors should visit sites during favorable weather to determine access points, PPE, sampling equipment and evaluate potential hazards so that time can be used most effectively during a wet weather inspection.
NV18-457	Virginia Lake Water Quality Monitoring & Management Plan, Reno Nevada	Virginia Lake is ranked #2 Best Public Park in Reno, according to the City of Reno website and ThreeBest Rated. Located just west of the Peppermill Hotel Casino, this 25.5-acre urban lake offers a variety of activities for all ages. However, Virginia Lake has been plagued with persistent algae blooms during summer months, particularly during prolonged drought periods. The City of Reno began a water quality monitoring program in June of 2014 and expanded the program in 2015 in an effort to quantify nutrient inputs and develop suitable management strategies for the lake. The current monitoring effort at Virginia Lake encompassed periods of extreme drought (2015 being one of the driest years on record) to the record-breaking precipitation totals of 2017 in Reno. Data gathered during the past four years provides insight into how the lake responds to varying degrees of freshwater and stormwater inputs. This presentation will provide the findings of the research to date and the management strategies being considered.

NV18-458	What Do We Do With All This Corroding CMP Storm Drain Pipe?	CMP has been an inexpensive material to use for storm drain culvert design and installation since its invention, but its lifespan is not as lasting as other options, and is subject to degradation from rust, typically at the bottom of the culvert where water is present. This presentation will demonstrate how Centrifugally Cast Concrete Pipe (CCCP) is a trenchless structural repair alternative that can transform corroding CMP pipe into a new concrete pipe quickly and affordably. CCCP is an innovative structural repair option for failing stormwater and sewer pipelines and manholes. CCCP is used to line assets of any material and shape from 30 and larger. The structural concrete lining results in a high strength pipe-within-a-pipe, and is installed between 2 access manholes, vaults, or discharge points, with only a small equipment footprint necessary to install, and no need for disruptive and expensive insertion pits. Case studies of past projects will be presented and will include design parameters and calculations, outage requirements, surface preparation methods, installation procedure, problems encountered and overcome, overall increase in asset strength, and costs.
SURFACE WATER / WATER TREATMENT		
NV18-459	Turbidity - History, Measurement, Current Technologies	Turbidity is a principal physical characteristic of water and is an expression of the optical property that causes light to be scattered and absorbed by particles and molecules rather than transmitted in straight lines through a water sample. It is caused by suspended matter or impurities that interfere with the clarity of the water. Turbidity is a regulated parameter to ensure safe drinking water and public health. History of Turbidity Measurement One of the early parameters tested was turbidity. The normal procedure in 1912 used the turbidity standard adopted by the U. S. Geological Survey: A rod with a platinum wire on the end was calibrated by placing graduation marks on the rod, at various distances from the end, and this was lowered into the water as far as the wire could be seen. The vanishing depth was compared to a table of known values to get the measured turbidity. By 1933 the Jackson candle turbidimeter became the standard. The results are expressed as JTU (Jackson Turbidity Units).
NV18-460	Techniques for Accurate Measurement of Low-level Turbidity Samples	Accurately measuring low-level turbidity samples involves an understanding of what turbidity is, how turbidimeters measure it, proper instrument selection, proper instrument calibration and verification, and sources of interference. Turbidity (i.e., the cloudiness of water) is caused by plankton, bacteria, silt, sand, and other minute particles. When light passes through a sample in a turbidimeter, these particles scatter light, which is measured by one or more detectors oriented at different positions to the light source. Turbidimeters must be calibrated at least quarterly using primary standards. Calibration verification should be performed daily using primary or secondary standards. Low-level turbidity sample analysis can be affected by several factors such as: incorrectly collected samples, improperly cleaned sample bottles and sample cells, poor sample preparation, measurement of cold samples, stray light interference, damaged samples cells, bubbles in the sample, particle settling, not indexing sample cells, and more. These potential problems must be eliminated, or at least minimized, to ensure the accurate analysis of low-level turbidity samples.
NV18-461	Hexavalent Chromium Remediation: Affordable and Reliable Cr(VI) Treatment	While stannous chloride has been shown as a highly effective approach to reduce Cr(VI) to Cr(III), conventional stannous reagent dosing methodology is not without disadvantages. An innovative approach to generate a stannous ion reagent in-situ via an electrolytic process has been developed and demonstrated to eliminate the pitfalls of conventional dosing and aid in the delivery of an affordable and reliable hexavalent chromium remediation process. The technology has been successfully demonstrated at the City of Los Banos in California that has elevated Cr(VI) levels of 40 ppb and extremely challenging water quality due to the presence of uranium, high alkalinity, and hardness. This type of water composition is particularly problematic for traditional Cr(VI) treatment systems based on ion exchange or zerovalent Cr(VI) remediation and excellent for detailing the treatment efficacy of the technology. Results will be detailed.

NV18-462	Fundamentals of Disinfection 101	Disinfection is required for all 'water treatment facilities' (drinking water, wastewater, and water reuse). This presentation focuses on the history of water treatment disinfection, from a scientific advancement and regulatory development perspective, as well as an overview of the application and process design fundamentals of industry accepted water treatment processes
NV18-463	Chemical Metering pump and accessories	Do you have an existing chemical system that is causing you problems? Pipe Breaking? Inconsistent feeding? What are the best choices we can make for a long lasting, functional and cost effective chemical feed system? How do I calculate the Dosage of chemical? Pump accessories, what are they and how will they help? A detailed look at Back Pressure Valves, Pressure Relief Valves, Pulsation Dampener, Inlet Stabilizer, Calibration Column, Pressure Gauge, Metering Monitors and strainers. This Power Point presentation will look at different chemical feed systems. We will have an interactive discussion on existing systems. What is wrong with the system? What is correct with the system? What changes changes could be made to make the system better? This presentation will provide you that information.
NV18-464	Comparison of laser turbidity values to particle counts	Discussion of results from an ongoing research study examining a new laser-turbidity method in parallel with conventional particle count technology during conventional filter backwash cycles. Results, implications, and what does this really mean will be the focus of the presentation.
NV18-465	Using Particle Counters w / Turbidimeters To Optimize Performance	Particle Counters are not new to the water treatment industry, but there is still some lack of understanding about how to interpret the data, how the measurement differs from turbidity, and where this technology should and should not be used. This presentation will discuss and demonstrate the differences between the measurement principles of Particle Counters and Turbidity and what those differences mean in terms of response to particles of various sizes and the ability to quantify the amount of particulate in a sample in a way that is useful to plant operations. This will lead into a discussion of how it is that these two technologies are used together to get a clearer picture of coagulation and filtration processes. This presentation will draw on over 15 years of real world experience to show how particle counters and turbidity can be used to help optimize and troubleshoot water treatment processes. The presentation will close with a short review of advancements in particle counters and why these instruments are becoming easier to own and operate.
NV18-466	Use of Mixed Oxidants to Improve WQ in A Distribution System	Mixed oxidants (MOS) are approved by EPA and follow the same standards of chlorine. Mixed oxidant chemistry has provided water municipalities with chlorine residual enhancement, biofilm control, taste & odor improvement, disinfection by product (DBP) reduction, and alum/polymer savings by micro-flocculation in conventional surface water treatment plants. Data and research from sites across the country has shown that MOS is able to penetrate the polysaccharide substrate of biofilm uses to attached to pipe distribution walls where standard chlorine & bleach could not. Recent evidence from laboratory research indicates that mixed oxidants include H ₂ O ₂ & other reactive oxygen species. Research on the composition continues; but the evidence on the chemical and biocidal behavior continues to show, as it has for the past 20 years, that MOS is a superior oxidant compared to sodium hypochlorite alone. The presentation will discuss the onsite generation process, including mixed oxidant (MOS) chemistry used at water utilities & the evaluation of the field data collected & how it has significantly improved water quality and how it has saved municipal utilities significant costs.

NV18-467	Filtration at Its Finest	<p>The elements behind design and operation of filtration vary between installations to meet individual site needs. To maximize the benefits of filtration, optimize performance, and enhance efficiency, certain key parameters may be targeted and adjusted. Finished water quality is commonly used as a control feature for design and operation of filtration facilities. Filtration directly contributes to the success of a plant meeting quality requirements. When designed and operated with strategic intent, treatment is optimized and finished water quality improves. In addition to water quality, the time, energy, and money spent on operating a filtration plant significantly benefits through improving operations. Backwashing at the appropriate rate, frequency, and time will benefit both operations and maintenance. Filter run time, chemical addition, and hydraulic loading rates are also critical to effective filtration. This presentation will provide you with basic understanding of how to operate media filters at their highest performance level, achieve the best finished water quality possible, and experience filtration at its finest.</p>
NV18-468	Online Instrument for Raw-Water THM Precursor Analysis	<p>THM formation is dependent on water quality, treatment operations and network activity. As such, the quantity and quality of THM precursors in water sources will affect disinfection by-product levels. A robust online raw-water THM precursor analyzer has been developed to rapidly assess the THM-FP levels in raw, not yet chlorinated, water. The instrument combines sample chlorination with thermally-accelerated formation of THMs, and subsequent rapid THM determination. Results from this THM precursor analyzer are being compared in a long-term pilot study to precursor concentrations, characteristics, and levels determined by conventional laboratory methods that take an average of three to five days to return data on resulting THM levels. This novel instrument benefits water utilities by helping them to adjust their treatment processes accordingly to minimize the production of THMs; and for some, even reduce the costs of producing water that satisfies THM regulations. This presentation will detail data from a long-term pilot study on the performance of this innovative online raw-water THM precursor analyzer.</p>
NV18-469	REMOVAL OF PERFLUORINATED CHEMICALS (PFCs) FROM GROUNDWATER	<p>Perfluorinated Chemicals have been highly exposed to humans due to its direct or indirect use in various everyday products like clothing, cookware, food storage, etc. It is yet not completely proven to be harmful but its high exposure to human itself is a big concern. It was also a highly popular compound in various industries until it was banned, but this intensive usage in various industries have led it into surface and ground water just like any other popular chemical and hence contaminated severe surface and ground water. This presentation discusses different species of PFC and the concentrations found in Arizona groundwater. It also presents the adsorption effectiveness of various conventional adsorbents like GAC, PAC and carbonaceous nanoadsorbents like graphene, graphene oxides, etc.</p>
NV18-470	Pass on the Pepto, We have UV	<p>The presentation will focus on the following aspects of UV disinfection: "UV fundamentals "Equipment selection "Installation requirements "Maintenance items "Validation requirements "Regulatory summary and why municipalities might/have to implement UV</p>
NV18-471	Liquid Ionic Copper Offers 3-for-1 as Drinking Water Pre-Treatment	<p>Harmful Algae Blooms may occur in source water and algae can grow directly within the WTP, where it contributes to TOC and ultimately forces costly and cumbersome removal steps. Experiences in diverse facilities and climates illustrate a liquid copper formulation that is NSF-certified for drinking water can provide excellent control of nuisance algae. Its use has led to the empirical discovery of several other benefits as well. Operators at WTPs using a liquid copper called EarthTec realized that the product also controlled invasive zebra and quagga mussels, when shells of dead mussels started appearing. The product is now labeled for the purpose of mussel control and is being used in a wide variety of drinking water utilities around the U.S. Operators also report an improvement in their TOC removal rates and data have now been collected to corroborate the claims. Similarly, major utilities have reported a repeatable reduction in taste and odor, especially geosmin. Copper as a pre-treatment to drinking water presents an economic alternative to more hazardous or costly chemicals, essentially offering a 3-for-1 benefit to utilities seeking to meet multiple treatment criteria.</p>

NV18-472	On-Site Hypochlorite Generation: A Disinfection Alternative	On-site hypochlorite generation (OSHG) systems for disinfection have seen an increased adoption rate in the last decade as water and wastewater utilities continue to grapple with the onerous complexity of risk management plans in the case of gas chlorine disinfection and the operational or cost challenges of using bulk hypochlorite for disinfection. OSHG systems which have been utilized in North America since the early 1990 s use electricity to convert simple table salt (sodium chloride) into 0.8% bleach or hypochlorite. The latest generation of systems such as the Microclor OSHG system have a designed-in emphasis on safety, reliability and maintainability. Design advances such as the vertical electrolytic cell which vents by-product hydrogen immediately away from the system, modular cell configurations which allow for operational contingencies, efficient power management and open architecture have all contributed to the latest surge in OSHG adoption. In most regions, acceptable paybacks are achieved by replacing bulk hypochlorite delivery with enhanced operator and ratepayer safety as a bonus.
WASTEWATER COLLECTIONS		
NV18-473	Winning the War Against Wipes	Wastewater infrastructures were not designed to handle flushable wipes and other non-dispersible fabrics. We will review today s status of the wipes market, PSA and legal efforts to curb disposal of non-dispersibles in sewage systems, and look at technical options in pumps and grinders to pre-condition these difficult solids.
NV18-474	Types of Lift Stations & Associated Costs / A Case Study	Asset management is critical in maintaining and evaluating equipment crucial to the successful operation of a utility. A key aspect is the collection of complete, meaningful data for each piece of equipment and the ability to easily evaluate the data. In 2002, the Unified Government of Wyandotte County/Kansas City, Kan. implemented a system to collect data from their wastewater pump stations. For each station, they logged labor hours, material costs, and outside contractor costs. From this data, they can establish a predictive maintenance schedule, budget for station repair and/or replacement based on return on investment, establish a benchmark for the cost of maintaining a typical station, compare the cost to operate and maintain different types of stations, etc. The utility has saved money by choosing equipment that results in lower life cycle costs, replacing equipment where costs exceed the benchmark and determine the financial impact of maintaining its pump stations.
NV18-475	BEST PRACTICES: Use, Care and Repair of High-Pressure Sewer Cleaning Hose	In the presentation, we will learn how to identify the various manufactures, how to maintain your cleaning hose, how to protect your cleaning hose and how to identify when it requires repair and finally how to repair the hose properly. We will look at and discuss proper use techniques enabling the user to obtain maximum possible life of your sewer cleaning hose. Our presentation is for all users in our industry and is not brand specific. We teach how to identify the brand and pressure rating of your hose, even if the layline is worn off.
NV18-476	Sewer cleaning vehicles with water recycling technology	Have you ever thought about the fundamental importance of water? Today fresh water is becoming increasingly scarce. In order to counteract this problem, water recycling in the sewer cleaning industry is also a need. But what does water recycling mean in relation with sewer cleaning vehicles? It means to separate sewage water from sludge, sand and mineral matters inside the vehicle, so that it can be reused for cleaning sewers again, and allowing you to work without interruptions.
NV18-477	Combination Machine Maintenance	Maintaining a combination sewer cleaning hydro unit. Will explain proper lubrication techniques, adjustments of chains or belts, proper fluids for use in blowers and water pumps, explain air flow and how to care for blowers and fans, care of PTO and transfer gear boxes. Coverage of pre-trip inspection for unit and chassis and proper fluids

NV18-478	INNOVATIVE OVERFLOW PREVENTION - Using Echos For Detection	Sanitary sewer overflows (SSOs) pose a significant threat to public health and the environment. While most sewer utilities have Sewer Overflow Response Plans (SORPs) to react to SSOs, preventing them in the first place is the preferred and far less costly option. According to the Environmental Protection Agency (EPA), sewer blockages are a leading cause of SSOs and often result from grease, roots, and debris.
NV18-479	Lateral Solutions	Wastewater laterals continue to plague facility owners with cost related challenges. Whether infiltration, improper repair, or damage from directional drilling (cross bores), cities are constantly tasked with addressing unforeseen costs with O&M funds. This presentation will cover key elements when taking action to control costs, whether full ownership or limited maintenance responsibility of wastewater laterals. Steps that will be covered include permit driven performance standards, damage prevention, lateral assessment and repair methods that leverage advancements in trenchless technologies, including rehabilitation by lateral-lining from the mainline.
NV18-480	Choosing The Best Gas Detector / Calibration & Bump Test Requirments for Direct Reading Portable Gas Monitors	The "best" Confined Space Gas Detector doesn't come from anyone manufacturer; the way in which Gas Detectors are used can vary between different confined space programs. The instrument providing the best service and value for one program may not be the best choice for another. Gas detection equipment manufacturers put a lot of emphasis on their instruments; there are numerous models to pick from with varying features, price points and capabilities. The perfect product for your application is "out there", the key is understanding which features are needed, then choosing the design that best fullfills the requirement. / Calibration and Bump Test requirments for direct reading portable gas monitors; manufacturers and regulatory agencies agree the safest approach is to perform a functional test by exposing a gas detector to test gas before each day's use. The only way to know whether an instrument is capable of proper performance is to expose it to known concentration test gas verifying the proper performance of the alarms and that the readings are accurate. Failure to periodically test and document increases liability exposure in the event of an injury or accident.
NV18-481	Pumps 201	In the water and wastewater industries, pumps are the machines that do the "heavy lifting". From moving water out of the ground or out of a lake, to pushing it through a treatment plant, moving it through a distribution system, and getting sewage to and through a wastewater plant, pumps are involved every step of the way. Pumps move water, wastewater, sludge, slurry, chemicals, hydraulic fluids, and virtually any other liquid that needs to be moved. Yet despite their widespread use, pumps are often victims of poor selection, installation, or use. This often results in systems that don't perform as expected and cost more to operate and maintain than anticipated. During the presentation we will review pump types and applications, installation and piping best practices, using pump curves, and operation and maintenance. Building on these key concepts we'll discuss more advanced topics to help users gain a deeper understanding of their existing systems and well as things to consider when trying to improve performance and reduce operating costs. To pull these concepts together, we'll highlight a few real-world examples of pump sizing and performance monitoring.
NV18-482	Digital Side-Scanning Technology	CCTV inspection equipment is essential in the process of maintaining aging infrastructure. Investing in the equipment has proven to save municipalities millions of dollars while reducing the amount of catastrophic failures. Traditional methods of CCTV inspection include an analog pan and tilt camera, requiring the operator to stop during inspections to locate observations and enter that observation/defect into asset management software. Side-Scanning cameras utilize a fixed view fisheye lens, visually capturing everything in the pipe without the need to pan and tilt. Eliminating the need to pan and tilt enables the operator to rapidly gather data in the field while not missing a defect. The observation and defect coding process is also expedited by stitching together the HD video images and generating a flat image of the entire pipe. When coordinated properly, a digital side-scanning camera can increase production significantly at the same time as reducing repairs and downtime.

NV18-483	Vacuum Truck Dewatering Revolution - Water Recycling	The history and background of sewer cleaning will be reviewed and vocabulary definitions will be presented as building blocks to help the newest user become familiar with how and why vacuum trucks are used in the sewer collection market. A class room style walk around of a combination sewer cleaner will be presented to familiarize everyone on how the parts fit together and work. With these basics covered the concept of water recycling will be presented and how it can almost eliminate the use of fresh water and dramatically enhance productivity and enable the user to eliminate equipment and more than double the feet of line cleaned. Case studies will be presented on municipalities that have used this type of unit in various applications in the US for well over a decade as well as the huge impact this product is making with new users.
NV18-484	APPROPRIATE CLEANING METHODS FOR DIFFERENT SEWER PIPE MATERIALS	This presentation will discuss the appropriate tool/ method for removal of obstructions, roots, grease, protruding service laterals, calcified grease and mineral deposits. It will also detail the variations of mechanical cleaning methods such as rodding machines, bucketing, and balling; hydro-jet methods including static vs rotating nozzles, jet angles (high clean/ low thrust; low clean/ high thrust), jet pressures, and their effect on different types of sewer pipe materials.
NV18-485	When One Plus One Equals Three - How Data Fusion Makes Life Easier	Wastewater systems are complex structures to measure, manage and control. Conditions in sewers are uncontrolled and changing continuously, making accurate hydraulic modelling difficult. The answer to understanding your sewer is real-time data, provided clearly and reliably with data fused from a variety of sources. Technology advancements over the past decade have made it possible for a variety of sensor types, data types, communications systems and analytical models to be used to assess the quality and capacity of wastewater systems under normal, abnormal, and highly stressed conditions. Examples are: water level, temperature, gas sensing, pH, flow, rainfall or any combination of measurements. The advantages are lower costs, shared communication, more compact installations, more detailed data, and insights from different data views. Data fusion provides synergy between real time remote sensing by client owned instruments in concert with government owned data acquisition, such as radar and more. A series of case studies on California utilities and around the country will be discussed showing the value of multiple data streams over modeling or single point sensors.
NV18-486	Reducing I&I through mainline CIPP lining, manhole lining and lateral repairs.	Having to meet our discharge limits of reducing inflow and infiltration the district created a pilot system. Once complete the district implemented a 10-year plan to reduce I&I. By using flow monitor data, we were able to obtain important data to target specific areas to reduce I&I. Using the information gathered by the collections crew we were able to implement the rehabilitation of the collection system using CIPP liners, top hats, manhole grouting and sealing, and a private sewer lateral ordinance with point of sale inspection requirements. This session will also cover the type of projects that we have performed, how the collection department assisted in day to day operations and projects that were created for our collection crew to perform. Present our procedures and outcomes of our private sewer lateral program. Having completed over 800 lateral inspections in the past two years with a 42% fail rate and a 98% repaired within the six months time allotted for repair.
NV18-487	Golf Course Sewer Cleaning Solution	To clean and televise approximately 16,000 l/f of 24 through 36 sanitary sewer pipe located through the Gleneagles Country Club Golf Course in Plano, TX. This project was required to be completed during the golfing off-season in the winter of 2016-2017, approximately November through January, prior to rehabilitation of the lines via CIPP. Protection of the golf course greens was of utmost importance. Access to the manholes was very limited, so we were required to perform cleaning in continuous runs of over 5,000 l/f, utilizing a patented process designed for cleaning long runs with limited access. The cleaning was completed on schedule. Insituform Technologies was the prime contractor for the multi-million dollar cleaning and rehabilitation project.

NV18-488	Confusions and Solutions with Specialty Coatings	This presentation offers a detailed explanation of the mechanism of corrosion specifically found in a water and wastewater environments along with real field experiences, supported with photos of before and after installations, with an explanation of why the coating failed. As the owners and operators realize they need to address biogenic corrosion in their own collections systems and leak mitigation in water structures, well directed questions need to be answered with technically supported experience and data in an effort to wade through the available options for future structure protection. This presentation will enhance the knowledge of the operator/designer/engineer and allow them to make an educated decision for their next project.
NV18-489	Gravity Sewer Rehabilitation Design	This presentation provides an overview of the design principals for gravity sewer rehabilitation. In a sewer rehabilitation project, condition of the existing conduit should be factored into the design; nevertheless, it can be quite expensive, if possible at all, to determine the material properties with high confidence levels on existing pipes and manholes. Determining the residual strength of existing sewer is a complex problem due to degradation in material over time, missing mortar and brick layers (for brick sewers), and effect of geometric deformation, mainly due to compressive (ring) stresses along these pipes. The author will discuss condition assessment methods that can be implemented within reasonable costs, and how those data can be utilized for a feasible and economical rehabilitation design. The design approach can be generally divided into two categories: This presentation will also include: -An overview of the conventional and emerging rehabilitation techniques for gravity sewers. -A new design tool developed for manhole rehabilitation (from a WERF/USEPA sponsored project) -Rehabilitation design for non-circular conduits.
NV18-490	Fats, Oils, and Grease Control through Up-Stream Treatment	Fats, oils, and grease pose serious public health and environmental problems when discharged into sanitary sewers. When pipes become clogged, wastewater can no longer flow, and it becomes backed up into sinks, toilets, and other devices connected to the collection system. The overflows that result at pump stations and other areas result in the pollution of waterways and property. They also result in Environmental Protection enforcement activities. FOG enforcement programs are in place that require the control of fats, oils, and grease. Within these programs, fats, oils, and grease must be mitigated so that they do not pass through to the collection system and treatment plant. Grease traps are placed between the commercial discharge of oils, fats, and grease in order to trap these organics. Grease traps are biological systems, and the treatment of fats, oils, and grease can begin in these systems if they are managed correctly. By reducing BOD, TSS, and nutrients and by reducing the overall sludge volume that reaches the treatment plant, the costs associated with treating wastewater can be reduced with mitigation beginning upstream.
NV18-491	Using Hydroxyl Radicals to Treat Odors	Odors are a natural byproduct of wastewater and, consequently, odor control is frequently required at pump stations and collection systems to mitigate the nuisance it causes especially to residents. Removal of odors has historically been achieved by adsorption, absorption, biological oxidation or chemical scrubbing. Suppression of odors has typically been achieved by chemical addition. Newer technologies introduced to control odors are ionization and photocatalytic oxidation. Another method that has been in use for over 15 years is oxidation of odorous compounds in the vapor phase using hydroxyl radicals. The hydroxyl radical is one of the most reactive species in the reactive oxygen species (ROS) family. This presentation surveys odor control technologies and provides an explanation of using hydroxyl radicals to treat odors including the fundamental chemistry and results in real world applications.

NV18-492	Pre-Treatment of WW Streams by DO Addition & Sewage Agitation	Every modern town or city has a wastewater collection system of some type. The collection system is the conduit for used water, both sanitary and gray (relatively clean, including storm water) water, which initiates at the individual homes and businesses in the community. A primary part of the collection system is a number of wet wells that are used as wastewater collection points, or intercepts, from community neighborhoods. Often, lift stations, complete with large electric waste pumps, are used to keep the water moving to the city's wastewater treatment plant. There are numerous daily problems to deal with for Operations personnel responsible for the maintenance and continued operation of any collection system. But the major problems are odors from the wet wells and a collection of FOG (fats, oils and grease) masses which solidify on top of the water in the wells. Water in these wells can sit for hours without movement, which results in a buildup of H2S gas that can become dangerous, but always emits an odor, both in the wet well itself and the conduit lines leading downstream. Billions of dollars per year are spent by communities in attempts to eliminate these odors.
NV18-493	How a novel plant-based degreaser & large-bubble mixer Reduced O&M	Aqua America, Pulsed Hydraulics Inc, and Protein Matrix studied the effects of a novel plant protein-based degreasing formulation and large-bubble mixing technology to reduce O&M at a historically-problematic lift station. Whereas prior to the study, this station required de-ragging and degreasing on a monthly basis, it was found that these two technologies complement one another, leading to the complete elimination of routine and emergency O&M for 14 mo. and counting. In addition, no harmful effects were noted at the downstream sewer treatment plant.
NV18-494	BEST PRACTICES FOR PIPELINE INSTALLATION	This presentation will discuss best practices for buried pipe installation and inspection covering many topics such as Trench Design, Bedding Classes, Load Factors, Unloading, Handling, Storage, Trench Foundation, Shoring, Trench Boxes, Sheeting, Bedding Materials, Haunching/ Shovel Slicing, Bell Holes, Pipe Joining, Backfill, Compaction, Manhole Connections, Service/ Lateral Connections, Tapping, Repairs, and Field Acceptance Testing.
NV18-495	3D Manhole Scanning and Rehab Assessment	The SPiDER Scanner is the first wireless and color manhole inspection technology in a lightweight and compact form factor. Three-dimensional (3D) Scanning is a new technology in the sewer industry. Existing manhole cameras use panoramic photographic imagery (360 degree horizontal stitched imagery) and pinpoint measurement is defined as scanning but this is surveying with a laser, not scanning. The sparse point cloud generated from existing manhole scanners provides manhole measurements from one point to another for distance inquiries only with inconsistent accuracy. With 3D scanning technology, manholes can now be documented in true 3D (360 degree spherical instead of panoramic horizontal) creating a mesh with 1 mm accurate density. The mesh can be used to document the structural change of a manhole before and after rehabilitation (cured-in-place lining or coating) up to 100 feet deep. CUES SPiDER is the first MRI type manhole scanner of its kind in the world. Most user-friendly system onsite with the most detailed output in the market. CUES SPiDER is revolutionizing manhole inspections and case studies will be presented.
NV18-496	Flow, Pressure and the care of rodder hose	This presentation explains what takes place in a sewer line as it is being cleaned with a hydro jet machine. It will explain the effect of air flow through the line and laterals. What effect different flow nozzles have? Explain the different tiers, angles and designs of nozzles. Pressure loss through hose. What the savings are when using the proper nozzle? The care and proper repair of rodder hose.
NV18-497	Safe Dig Hydro Excavating Safety and Procedures	Combo Machines Vs dedicated hydro Excavation Machines. Personal PPE and safe procedures. Care of both types of machines. This session will address: Hydro Excavation, The equipment and care for it. Safety Procedures the safe manor in witch to dig and protect the equipment, and the safe manor in witch to protect yourself when digging. Combination truck Vs Dedicated Hydro Excavation Machines why it matters how it does affect your operation, we will address some of the common assumptions why they ARE NOT created equal.

WASTEWATER TREATMENT

NV18-498	External Carbon for Wastewater Treatment	This presentation contains an in-depth review of external carbon in the wastewater treatment processes. Mr. Allen will discuss many of the reasons external carbon may be used to optimize wastewater treatment processes. The class will include how and when these beneficial programs are to be used. Rick will discuss some of the accepted, well-known and marketed products. He will also cover more obscure but very beneficial carbon sources available today. Due to the diversity of applications for external carbon, Rick will be providing information on additional uses, such as F/M ratios, denitrification, phosphorous removal processes. Attendees will learn the what, where, when, why and how to use external carbon sources in wastewater systems. Specific content covers; Biological Reduction using external carbon, the food to microbe issue and what some programs are costing utilities in their budget and operational process; reasons to consider breaking the methanol habit and how other external carbon sources benefit the denitrification process.
NV18-499	Pima County Addresses P Concerns	Pima County Regional Wastewater Reclamation Department's journey to sustainable struvite management at their Tres Rios Water Reclamation Plant began decades ago after an initial bout of clogged solids handling pipelines returning centrate from centrifuge dewatering operations to the headworks. The clogging situation was so bad that original underground pipe was abandoned and an HDPE pipeline was run across the plant site to transport the centrate to the headworks. The seamless pipe in combination with the addition of dilution water to reduce the ortho-phosphorus saturation concentration cured the struvite formation issue until 2015.
NV18-500	Centrifugal Pumps Part 1	Many operators work at larger treatment facilities with separate maintenance departments. Instead of learning to repair equipment, they may learn to write work orders instead. A fundamental understanding of how centrifugal pumps work is critical for process troubleshooting. This presentation walks attendees through each of the components of a centrifugal pump and the function of each piece, common causes of cavitation, the origins of the horsepower equation, how to interpret a pump curve, and the pump affinity laws.
NV18-501	Centrifugal Pumps Part 2	Many operators work at larger treatment facilities with separate maintenance departments. Instead of learning to repair equipment, they may learn to write work orders instead. A fundamental understanding of how centrifugal pumps work is critical for process troubleshooting. This presentation walks attendees through each of the components of a centrifugal pump and the function of each piece, common causes of cavitation, the origins of the horsepower equation, how to interpret a pump curve, and the pump affinity laws.
NV18-502	The "Test" of a Clarifier is in the "Testing"!	The DELCORA (Chester, PA) WRRF is currently a 32 mgd BNR facility. As a part of a plan to increase the capacity of the plant, they embarked on a complete upgrade of one of their 130-ft diameter clarifiers. In order to prove its new capacity, we tested it to compare its performance with one of the existing clarifiers. This presentation will discuss the "Pro's" and "Con's" of the new upgrade.
NV18-503	Closed Vessel Ultraviolet (UV) Technology For Municipal Wastewater	Ultraviolet (UV) disinfection is now a standard feature in many wastewater utilities. UV has also been adopted by the drinking water community, as a barrier against chlorine tolerant species such as Cryptosporidium and Giardia. The technology is widely favored due to its non-chemical nature, the fact that no subsequent de-chlorination process is required, and its ability to be unselective in disinfection performance. Throughout the years, the focus in municipal wastewater is to install UV in an open channel. However, there are alternative UV solutions to achieve required disinfection. The presentation will focus on the following aspects: UV101, equipment selection, intro to closed vessel technology, and benefits to closed vessel. The purpose is to give engineers and municipalities information regarding other forms of successfully operating ultraviolet disinfection systems instead of designing around the "traditional open channel" types of UV disinfection.

NV18-504	Rare Earth Technology for Phosphorus Removal and Enhanced Sludge Properties	Environmental regulations continue to restrict the discharge of Total P from WW treatment facilities with traditional methods of removal proving inadequate. To achieve the control necessary, a new coagulant, cerium chloride has been studied in municipal and industrial WW treatment facilities that must meet a Total P discharge limit of 0.5 mg/L. These studies demonstrated the high Total P removal capabilities of cerium chloride as well as sludge volume reduction, enhanced settling in clarifiers, and enhanced filter press performance. The results also show cerium chloride uses a lower volume of product compared to traditional coagulants, like ferric chloride. This reduction is due to the ability of cerium chloride to remove Total P as cerium phosphate. In cerium phosphate each cerium atom is bound to one phosphate and the driving force for cerium phosphate formation is nearly constant to very low concentrations. The results from plant trials using cerium chloride as a coagulant will be presented showing it as a viable alternative to other removal methods.
NV18-505	Solving Nutrients: How to biologically denitrify (and be phosphorus-ready)	California, Nevada, and Arizona's wastewater engineers and operators need no introduction to the dangers of nitrates in treated wastewater. While continuous backwash upflow sand filters have long been a convenient end-of-pipe technology for denitrification, what Aztec, New Mexico and Bellefonte, Pennsylvania found compelling about Blue Nite® biological denitrification is its patented control system and its full integration capability with Blue PRO reactive filtration for simultaneous phosphorus removal in the same tank. This presentation will explain the unique challenges of both the Aztec and Bellefonte cases and show how these full-scale installations hit 5 and 3 mg/L nitrate limits, respectively.
NV18-506	Water Work	The nation's most knowledgeable workforce is on the brink of retirement, with few qualified replacements in the pipeline. Many Americans remain unaware of the industry behind the tap, and public perception does little to promote entry. A critical need exists to develop career pathways that recruit and train a new generation of water stewards. In this interactive session, participants will explore education models and examples of successful pathways that lead to well-paying careers in water. Operators will define their roles in recruiting and training the new workforce.
NV18-507	Occurrence of Antibiotic Resistance in Wastewater Treatment Plants	Solids retention time (SRT) is a key factor in designing and operating biological wastewater treatment processes. Longer SRTs can facilitate nutrient removal, mitigate membrane fouling, and reduce the concentrations of trace organic compounds (TOCs). However, it may also contribute to antibiotic resistance (AR) proliferation. Also, higher antibiotic concentrations in wastewater entering the biological reactors may negatively impact the performance of these systems by inhibiting sensitive bacteria or promoting AR by exerting a selective pressure. The main goal of this study was to understand the role of SRT and elevated antibiotic concentrations on AR proliferation during biological wastewater treatment. Spread plate technique was used to determine the number of antibiotic resistant strains. The extent of AR was also determined based on minimum inhibitory concentrations (MICs) of resistant isolates. The results showed that longer SRTs select for antibiotic resistant bacteria. The results also indicated that spikes in influent antibiotic concentrations are expected to increase the level of AR.
NV18-508	10 Years of Successful Enhanced Primary Treatment At Point Loma WWTP	2018 marks the 10 year anniversary of the successful partnership between the City of San Diego and USP Technologies. Throughout the 10 years of service, their highly effective PRI-SC Program has saved the City between \$8 - \$9 Mio. in wastewater treatment chemicals while improving treatment processes and effluent water quality at the Point Loma Wastewater Treatment Plant.
NV18-509	Grit Happens! You Don't Know What You Are Missing	Grit management has become a high priority for plant operations in order to extend equipment life and reduce operating costs. Grit systems can work efficiently when designed with an accurate understanding of the characteristics of the grit and how it behaves in wastewater. Advancements in grit management technology now allow 95% capture of grit as fine as 75 µm.

NV18-510	Fine Start! Primary Treatment Utilizing Fine Screens at the Headworks	Proper selection of a fine screen in headworks facilities positively impacts the performance of equipment downstream. We will provide an overview of different fine screen designs and provide pertinent information to facilitate the optimal design of the headworks resulting in the optimal performance of downstream equipment.
NV18-511	One Dirty Water: Bridging the Organizational Gap	The City of San Luis Obispo Utilities Department is comprised of three departments: Water, Wastewater, and Administration, with 70 employees within nine sections ranging from water supply to wastewater treatment. The Utilities Department staff are located at five different locations around San Luis Obispo County which creates a natural communication barrier. To address these concerns the Wastewater Division initiated the One Dirty Water program. The idea behind the One Dirty Water program is to provide a platform for front-line staff to communicate openly, build relationships, and gain an understanding of each other's roles and responsibilities. This grassroots effort increased the respect of each other's responsibilities and available resources, while providing a conversation starter for different ways of doing business. The intent of the One Dirty Water program is to show how each section can be utilized as a resource for the collective benefit of the whole department. With the great success and conclusion of the One Dirty Water pilot program within the Wastewater Division, the program has been expanded to the entire Utilities Department as an on-going practice to effectively open communication channels and build organizational resiliency. This presentation will demonstrate the benefits of involving front-line staff in taking ownership and providing solutions for improving departmental communication and resiliency.
NV18-512	Math Made Easy	Math class presenting the power circle technique for solving problems in the water industry
NV18-513	Operational Analytics with Artificial Intelligence at Water Treatment Plants	Water treatment plants face extraordinary challenges, including excess energy consumption and fluctuating performance, which result in high operating costs. The goal of the operator is to determine the best operating parameters to spend the lowest amount of energy per gallon of water produced. Industrial water systems contain a multitude of disparate but interconnected systems, each churning out thousands of data points a day. Until now, operators and facility managers have been limited to manual computations to parse a large amount of data and develop actionable insights to manage their systems. Advanced operators are now utilizing Artificial Intelligence (AI) technologies to discover efficiencies and optimize treatment processes. With the assistance of AI, energy savings can be realized at multiple stages along the treatment process. For example, build a risk-cost simulation for overflow events or generating an optimal membrane cleaning schedule based on cost and performance. Prediction of maintenance events on key processes saves time and avoids outages that may lead to permit violations. Virtual simulations can leverage historical data to build a model of the plant

NV18-514	<p>Anaerobic digestion enhancement through biocatalytic bioaugmentation increases volatile solids reduction and methane production. A Case Study Analysis.</p>	<p>Bio-augmentation (BA), is the process of enhancing the biological activity within an AD system for the benefit of increased destruction of VS through the addition of a biocatalytic compounds. Previous studies have shown that biocatalytic compounds containing either bacteria or enzymes alone have achieved positive AD improvements. There is however a gap in knowledge of how the use of a biocatalytic compounds containing both bacteria and enzymes together will affect an AD System. This presentation will analyze multiple full-scale biological enhancement experiments using a commercial grade biocatalytic compounds to determine the change in biological activity by comparing changes in total biosolids and biogas production. This presentation will outline effects of the addition of a commercial grade biocatalytic compounds on the biological activity and further degradation of biosolids. The treatment in the AD systems have shown results of a reduction in biosolids and an increase in biogas generation which if adapted can be a very significant improvement to a WWTP s long term economic sustainability.</p>
NV18-515	<p>Aggressive Renewable / Sustainable Energy Programs in Pima County</p>	<p>Utilities across the country are transitioning from their standard operational models and becoming innovators of sustainability and efficiency for their communities as Utilities of the Future (UOTF). Pima County s Regional Water Reclamation Department is pursuing aggressive resource recovery and energy sustainability initiatives. At the forefront of their efforts are recovery and treatment of biogas for beneficial use, and solar energy implementation. As the RWRD transitions toward the UOTF model, execution of these parallel renewable and sustainable energy initiatives have presented both challenges and rewards. The presentation will discuss challenges as they relate to renewable and sustainable energy, how initiatives were developed, evaluated, and the status of implementation.</p>
NV18-516	<p>Beat Ultra-Low Phosphorus and Metals Targets with Reactive Filtration: How Citronelle, AL and Georgetown, CO consistently hit ug / L targets</p>	<p>With Phosphorus-fed algae blooms plaguing the Great Lakes, Gulf of Mexico, and many other North American bodies of water, while the danger of metals rises in the public consciousness, regulators are putting the pressure on wastewater treatment facilities to meet ever-lower Phosphorus and Metals limits down to micrograms per liter. The full scale reactive filtration process at Citronelle, AL's Blue PRO installation for enhanced treatment efficiency and cost minimization reveals a sustainable method for producing < 20 mg/L TP effluent. Meanwhile Blue PRO installations at WWTPs like Georgetown, CO are having similar success removing metals to mg/L levels. This presentation will explain Blue PRO's proprietary reactive filtration process' adsorption/reaction kinetics and how it improves on traditional sand filters' particle coagulation and filtration.</p>
NV18-517	<p>Take a Little More Off the Top: Small-Footprint Primary Rotating Belt Filter</p>	<p>How much better would your WWTF perform if it delivered half its current loading to secondary treatment? In the Chicago suburb of Valparaiso IN, engineers needed an effective equivalent to screening and primary settling; they turned to EcoBELT, a rotating belt filter that offers small-footprint primary treatment. This presentation explains how the EcoBELT s proprietary advances cut life-cycle costs to a fraction of conventional technologies, how Valparaiso expanded primary clarification and relieved solids loading to the secondary system, and how Glendale, Oregon, provided treatment for combined sewer overflow (CSO), removing 69% of TSS and 59% of BOD.</p>

NV18-518	Wastewater Disinfection Management	The Clean Water Act has set guidelines for federal, state and local regulators to tighten the disinfection and discharge limits for thousands of municipal and industrial permit holders. The discharges limits for chlorine, ammonia, and other nutrients continue to tighten.
NV18-519	Solids Handling	Solids Handling for the removal of sludge deposits including how the process works. Discussion of different methods of sludge removal, how to determine your cost of removal and some new and accepted alternatives to mechanical extraction processes. Attendees will learn methods you can use today to improve your ROI in wastewater and water processes. This session covers how to save municipal waste water system tens or even hundreds of thousands of dollars in removal costs and will discuss how sludge calculators can help operators determine their sludge levels, including the cost of management of sludge using a financial calculator created to help systems determine their sludge management costs. Every wastewater facility is facing a growing sludge problem. Whether known or unknown, sludge handling and accumulation are becoming more regulated every year. In Solids Handling operators will learn valuable information about reducing sludge build-up in lagoons and processing plants, along with new proposed monitoring requirements for sludge.
NV18-520	Anti-Leak Technology for Chemical Feed / Dosing Piping Systems and Equipment	The presentation will be a combination of PowerPoint and hands-on demonstration of fusion joining methods for Asahi/America's Chem Proline and Poly-Flo piping systems in water treatment applications that require handling of hazardous or corrosive chemicals.
NV18-521	Drugs in the Workplace	Rick Allen presents a compelling conversation on "Drugs in the Workplace" where the topic of conversation is understanding CM (Crystal Meth) and its impact on personnel. Discussion of being able to identify the indicators for yourself and your workers will get the conversation started with operational safety and personal protective gear. Additionally, the conversation will be highlighting the impact on operations, the details of CM and its implications for operations and specifically things operations and personnel need to consider when doing their daily operations. While the title has a light-hearted spin, the concerns about operations and employee safety is a serious topic. Conversations in Drugs in The workplace will help educate the attendees on what to look for in the headworks and collection systems/lift stations. Discussion of both the safety and the legal concerns around illegal dumping by CM Producers will be discussed. This course highlights a problem that exists in most utilities and often does not have much knowledge in the workforce.
NV18-522	Proving the Biggest Can Also be the BEST!	The Great Lakes Water Authority (formerly Detroit Water) wastewater treatment facility is the largest in the country. With 250-ft diameter circular primary clarifiers, 310-ft rectangular clarifiers, and 200-ft diameter secondary clarifiers, each one of these process trains is unique. Testing clarifiers of these sizes present some unique challenges, but with modern testing methods, including the use of a drone, we will discuss how conclusive results were able to be obtained.