

Ozone Basics Workshop

Monday, August 28

The International Ozone Association is hosting an Ozone Workshop for participants who are both new and experienced with ozone, touching on topics such as Ozone 101, Ozone Applications, Maintenance and Safety, Regulations, and back by popular demand, a hands on Indigo Blue Workshop. This workshop is meant for utility managers, operators, consulting engineers, manufacturers, regulators, and academics alike!

Pavilion 1 / Moderator: Christine Ngan Love, CDM Smith

9:00 - 9:30 am	Ozone 101 <i>Glenn Hunter, Process Applications, Inc.</i>
9:30 - 10:00 am	Ozone Applications in Drinking Water, Water Reclamation, Reuse, and Advanced Oxidation <i>Denise Funk, Brown and Caldwell</i>
10:00 - 10:30 am	Ozone in Industrial Applications <i>Jim Lauria, Mazzei Injector Company, LLC</i>
10:30 - 10:45 am	Break, Rooftop Ballroom
10:45 - 11:15 am	Utilities Perspective <i>Bill Mundy, City of Kenora</i>
11:15 - 11:45 am	Maintenance <i>Ralph D. Franco, Xylem</i>
11:45 - 12:00 pm	Open Discussion with Workshop Presenters
12:00 - 1:00 pm	Lunch, Rooftop Ballroom
1:00 - 1:30 pm	Ozone Safety <i>Ben Kuhnel, Stantec</i>
1:30 - 2:00 pm	Comparison of Ozone Regulations from Different Jurisdictions <i>Tom Steinke, Mazzei Injector Company, LLC</i> <i>Avi Avantika, BlueInGreen</i>
2:00 - 2:15 pm	Break, Rooftop Ballroom
2:15 - 3:45 pm	Indigo Blue Workshop <i>Ariel Atkinson, Southern Nevada Water Authority</i> <i>Glenn Hunter, Process Applications, Inc.</i>
3:45 - 4:00 pm	Open Discussion with Workshop Presenters / Adjourn
5:00 - 7:00 pm	Exhibitors Welcome Reception, Salon 2

Technical Program

Tuesday, August 29

Opening Session

Salon 3

- 8:00 - 8:30 am **President's Welcome and Awards**
Nick Burns, Black & Veatch
- 8:30 - 9:45 am **Keynote: Science Not Communicated is Science Not Done**
Melissa Marshall, Present Your Science
- 9:45 - 10:30 am **Break, Salon 2**

Session I (Concurrent): Ozone Innovations

Pavilion 1 / Moderator: Eric Wert, Southern Nevada Water Authority

- 10:30 - 11:00 am **PFAS Treatment of Complex Wastewaters with Foam Fractionation Utilizing Air and Ozone Gasses**
Baxter Miatke, Arcadis U.S.
- 11:00 - 11:30 am **Part 1: Nano Bubble Ozone Technology (NBOT): Using Nanobubbles to Harness the Oxidizing Power of Ozone, Hydroxy Radicals and Peroxides in Water Mitigation/Remediation Processes**
Peter Moeller, NOAA/NOS
- 11:30 - 12:00 pm **Part 2: Nano Bubble Ozone Technology (NBOT): Open Water and Mesocosm Trials Demonstrating Effectiveness, Utility and Scalability of the Technology**
Peter Moeller, NOAA/NOS
- 12:00 - 1:30 pm **Lunch, Salon 2**

Session 2 (Concurrent): Regional Drinking Water Applications

Salon 3 / Moderator: Bob Hulsey, Black & Veatch

- 10:30 - 11:00 am **WaterOne Ozone System Design and Operational Summary**
Hanley Barker, WaterOne
- 11:00 - 11:30 am **Sidestream Injection Increases Ozonation Flexibility and Efficiency at WaterOne**
Thomas Steinke, Mazzei Injector Company, LLC
- 11:30 - 12:00 pm **Lessons Learned: 40+ Years of Operational Experience With Ozone Disinfection at the Springfield, Missouri Wastewater Treatment Plant**
Brian Wirth, City of Springfield Missouri
- 12:00 - 1:30 pm **Lunch, Salon 2**

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Session 3 (Concurrent): New Ozone Installations

Pavilion 1 / Moderator: Ben Kuhnel, Stantec

- 1:30 - 2:00 pm **Equipment and Subsystem Testing on Houston's First Drinking Water Ozone Disinfection System**
Lander Kennedy, CDM Smith
- 2:00 - 2:30 pm **Optimizing Ozone-BAF performance at Loudoun Water Using Novel Bioindicators**
Ramola Vaidya, HDR
- 2:30 - 3:00 pm **Placement is Everything: Addressing Water Quality and Design Flexibility by Implementing Pre-ozone at a Surface Water Treatment Plant in Utah**
Erik Rosenfeldt, Hazen and Sawyer, P.C.

Session 4 (Concurrent): Present Your Science Workshop

Salon 3 / Moderator: Melissa Marshall, Present Your Science

- 1:30 - 3:00 pm Looking for improved and practical slide design strategies that go way beyond killing your audience's interest with bullet point after bullet point? This workshop takes a deep dive into the world of slide design and challenges the status quo of boring, text heavy slides with innovative, research-based strategies for more effective and engaging visual aids.

Technical Program

Tuesday, August 29

Roundtable Discussions

Salon 2 / Moderator: Benjamin Finnegan, CDM Smith

- 3:00 - 4:00 pm **Aquatic Habitat Disinfection and Treatment**
Austin Calpin, Kansas City Zoo
Ozone Policy and Regulations
Nick Burns, Black & Veatch
Ozone System Operations and Maintenance
Bill Mundy, City of Kenora
Ozone in the Wine Industry
Jim Lauria, Mazzei Injector Company, LLC
Rookie Ozone Professionals, Enthusiasts, and Students Committee
Gabe Trejo, Arcadis
- 4:00 - 5:00 pm **Ambient Ozone Safety in Treatment and Industrial Settings**
Michael McKie, C3 Water, a C3 Group Company
Batch Ozone Systems
Eric Wert, Southern Nevada Water Authority
Biologic Aspects of Ozone in Dentistry
Phil Mollica, American College of Integrative Medicine and Dentistry
Ozone for Micropollutant Removal
Renato Falcao Dantas, University of Campinas
"You Asked for It"
Open Table, IOA
- 4:00 - 6:00 pm **Networking Reception, Salon 2**

Poster Presentations

Salon 2

- 3:00 - 4:00 pm **Virucidal Efficacy of Gaseous Ozone Against Type 1 Herpes Simplex Virus (HSV-1)**
James Blaxland, Cardiff Metropolitan University
A Review Summarizing the Use and Potential Applications of Ozone Within the Food Industry
Weyna Xue, Cardiff Metropolitan University
- 4:00 - 6:00 pm **Networking Reception, Salon 2**

Technical Program

Wednesday, August 30

Session 5 (Concurrent): Water Reuse

Salon 3/Moderator: Denise Funk, Brown and Caldwell, and Nick Burns, Black & Veatch

8:15 - 8:45 am	Ozone and Water Reuse Association <i>Patricia Sinicropi, Water Reuse Association</i>
8:45 - 9:15 am	Using Ozone for Advanced Water Treatment in Anne Arundel County Maryland's Managed Aquifer Recharge Program <i>Ramola Vaidya, HDR</i>
9:15 - 9:45 am	Evaluating the Impacts of Bromate Minimization Strategies (Chloramine, Peroxide Addition) on Disinfection During Ozone Treatment for Potable Reuse <i>Eric Wert, Southern Nevada Water Authority</i>
9:45 - 10:30 am	Break, Salon 2
10:30 - 11:00 am	A Comparison of RO-based, NF-based, and Non-membrane-based (O3-BAC-GAC) Treatment Trains for Potable Reuse <i>Hannah Ray, Southern Nevada Water Authority</i>
11:00 - 11:30 am	Evaluation of Alternative Ozone Disinfection Frameworks in Low Ozone Exposure Conditions <i>Samantha Hogard, Virginia Tech-Hampton Roads Sanitation District</i>
11:30 - 12:00 pm	Towards New Virus Log Reduction Frameworks for Sub-residual Ozone Treatment <i>Delaney Snead, University of Michigan</i>
12:00 - 1:30 pm	Lunch, Salon 2

Technical Program

Wednesday, August 30

Session 6 (Concurrent): Drinking Water Applications

Pavilion 1 / Moderator: Michael McKie, C3 Water, a C3 Group Company, and Aswathi Pradeep, Black & Veatch

- 8:15 - 8:45 am **Estimating Ozone-BAF DBP Reduction Using a Validated TOC Reduction Model Paired with Site-specific DBP Data**
Josh Fuchs, The Ohio State University
- 8:45 - 9:15 am **Pilot-Scale Study of Temperature Effects on Ozonation and Bromate Control to Support Drinking Water Full-Scale Design**
Bilal Abada, Southern Nevada Water Authority
- 9:15 - 9:45 am **Cryptosporidium Inactivation with Ozone Using Six Different CT Calculation Methods: Implications on Ozone System Design and Operation**
Christine Ngan Love, CDM Smith
- 9:45 - 10:30 am **Break, Salon 2**
- 10:30 - 11:00 am **Enhance the Removal of Taste and Odor Compounds with Partial Ozone/Hydrogen Peroxide Advanced Oxidation**
Shih-Chi Weng, Gwinnett County DWR
- 11:00 - 11:30 am **Piloting Ozone and Biofiltration to Tackle Taste & Odor Issues for Maryville, MO**
Aaron Robison, HDR
- 11:30 - 12:00 pm **Winning the Battle Against 1,4-Dioxane with Ozone Advanced Oxidation**
Denise Funk, Brown and Caldwell
- 12:00 - 1:30 pm **Lunch, Salon 2**

Technical Program

Wednesday, August 30

Session 7 (Concurrent): Ozone Design

Salon 3 / Moderator: Christine Ngan Love, CDM Smith

- 1:30 - 2:00 pm **Pushing the Envelope on Turndown - Making 100:1 a Reality!**
Aswathi Pradeep, Black & Veatch
- 2:00 - 2:30 pm **Preparing for Wildfires in the Colorado Front Range – City of Westminster Case Study**
Carl Lundin, CDM Smith
- 2:30 - 3:00 pm **When Ozone Gets Out (of Solution): Examining Best-Practices for Managing Ambient Ozone in Water Treatment Facilities**
Michael McKie, C3 Water, a C3 Group Company
- 3:00 - 3:30 pm **Break, Salon 2**

Session 8 (Concurrent): Ozone Innovation

Pavilion 1 / Moderator: Bill Mundy, City of Kenora

- 1:30 - 2:00 pm **Disinfection of Listeria Monocytogenes from Food Contact Surfaces Using Gaseous Ozone**
James Blaxland, Cardiff Metropolitan University
- 2:00 - 2:30 pm **Ozone Air Purifier to Mitigate Avian Flu & Reduce Ammonia**
Michael Duggan, CerroZone
- 2:30 - 3:00 pm **Reducing Industrial Wastewater Toxicity by Ozonation – Case History**
Alex Bettinardi, De Nora Water Technologies
- 3:00 - 3:30 pm **Break, Salon 2**

Technical Program

Wednesday, August 30

Session 9 (Concurrent): Ozone Application

Pavilion 1 / Moderator: Benjamin Finnegan, CDM Smith

- 3:30 - 4:00 pm **Review of Ozone in Cooling Water Treatment**
Anthony Sacco, Spartan Environmental Technologies, LLC
- 4:00 - 4:30 pm **Virtual Witness Testing: A Relic of the COVID Era or Here to Stay**
Daniel Bond, CDM Smith
- 4:30 - 5:00 pm **Heterogeneous Advanced Oxidation of Antibiotic Drugs and Disinfection of Municipal Wastewater over Iron Oxochloride based Heterostructures**
Gcina Mamba, University of South Africa
- 5:00 - 7:00 pm **Conference Reception, Rooftop Bar**

Session 10 (Concurrent): Bromate

Salon 3 / Moderator: Keisuke Ikehata, Texas State University

- 3:30 - 4:00 pm **Bromate Mitigation and Downstream Biofiltration Impacts in Potable Reuse**
Aarthi Mohan, Southern Nevada Water Authority
- 4:00 - 4:30 pm **Online Monitoring of Bromate Formation at a Pilot-scale Advanced Water Purification System for Potable Reuse Using Ozone**
Keisuke Ikehata, Texas State University
- 4:30 - 5:00 pm **Case Studies Make a Strong Case for Ozone Sidestream Injection**
Jim Lauria, Mazzei Injector Company, LLC
- 5:00 - 7:00 pm **Conference Reception, Rooftop Bar**

Technical Tour

WaterOne Hansen Water Treatment Plant

Thursday, August 31

Registration Note: The registration deadline is August 11. For US citizens, a copy of your driver's license is required, and for non-US citizens, a scan of your passport is required at the time of registration. Please wear comfortable, closed-toe shoes.

Kansas City Zoo

The Kansas City Zoo, located in Swope Park, has been home to more than 1,700 animals since its start in 1909. Spanning over 200 acres, the zoo offers a diverse range of exhibits and attractions that showcase a wide variety of animal species from around the world. Visitors can explore themed areas like Africa, Australia, and Asia where animals such as lions, elephants, kangaroos, and tigers can be found. The zoo also features a tropical rainforest exhibit, an African savannah habitat, and a penguin plaza. With its focus on conservation, education, and providing a memorable experience for visitors of all ages, the KC Zoo continues to be a beloved destination for all animal enthusiasts.

As part of the IOA exclusive tour, participants will be taken behind the scenes of the zoo to learn about the systems meant to keep the animals healthy and thriving, especially their ozone system used to treat the water in many of their habitats. The KC Aquarium is set to open on September 1st, however, as part of this exclusive tour, IOA participants will get a chance to sneak behind the curtains of the brand-new aquarium as well.

WaterOne Hansen Water Treatment Plant

The Hansen WTP is composed of two facilities: Facility 1, (56 MGD) constructed in the 1950s and Facility 2 (127.5 mgd) constructed in phases with the last completed in the 1990s. There are several unique attributes for this facility: source water is both the Kansas and Missouri Rivers, which are subject to large changes in water quality, organic content, taste- and odor-causing compounds, constituents of emerging concern, and bromide. Second, the facility had limited space for additional treatment processes.



The facility was upgraded with ozone in 2020 to improve water quality and allow WaterOne to proactively meet future drinking water regulations. In addition, ozone allowed WaterOne to operate more efficiently and cost effectively and is projected to pay for itself within 20 years due to reduced operating expenses.



Ozone was added upstream from precipitative lime softening and used for disinfection, control of taste and odor causing compounds, and oxidation of constituents of emerging concern. A centralized 8,000 ppd ozone generating facility with ozone generators of 1,000 ppd and 2,000 ppd were installed to allow operation at the minimum and peak ozone production setpoints. Ozone is delivered by sidestream injection into two pipeline contactors (96-inch and 108-inch) serving Facilities 1 & 2, respectively.

Visitors will tour the various treatment process areas of the facility including liquid oxygen storage, ozone generation, ozone sidestream injection, lime softening basins, filters, and laboratory space. Other highlights of the tour will be consuming water that won both the Best of the Best Water Taste Test and the People’s Choice Water Taste Test at the American Water Works Association’s (AWWA’s) annual conference, ACE22.

Technical Tour Schedule

8:30	8:40	Board Tour Bus Meet outside at Hotel's Rotunda (Exhibit Hall Level)
8:40	9:00	Drive to Kansas City Zoo
9:00	11:00	Tour Kansas City Zoo
11:00	11:30	Board Tour Bus - Drive to WaterOne Hansen Water Treatment Plant
12:00	1:00	Lunch at WaterOne Hansen Water Treatment Plant Training Facility
1:00	3:00	Tour WaterOne Hansen Water Treatment Plant
3:00	3:30	Drive to and Dropoff at Kansas City International Airport
3:30	4:15	Drive to and Dropoff at InterContinental Hotel