

Odor Management: Principles, Policy, and Public Impacts Conference 2026

Bloomington, Minnesota, USA
12-14 May 2026

ISBN: 979-8-3313-3722-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

The information and opinions expressed in these papers/presentations are solely of the authors and should not be considered as having the endorsement or support of the Association.

Compilation Copyright © (2026) by Air & Waste Management Association.
Copyright of the individual papers are retained by the authors.

Additional copies of these and other A&WMA conference proceedings will be available through the A&WMA Online Store. To place an order, please visit the Online Store at www.awma.org or contact the A&WMA Publications Order Department at onlinestore@awma.org, +1-412-232-3444 (phone) or +1-412-232-3450 (fax).

Printed with permission by Curran Associates, Inc. (2026)

For permission requests, please contact Air and Waste Management Association at the address below.

Air and Waste Management Association
One Gateway Center, 3rd Floor
420 Fort Duquesne Blvd.
Pittsburgh, Pennsylvania 15222-1435
USA

Phone: +1-800-270-3444
+1-412-232-3444
Fax: +1-412-232-3450

info@awma.org

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

FINAL PROGRAM

Technical Program – Tuesday, May 12

7:30 am – 4:30 pm
Conference Registration
Minnetonka Foyer

7:30 am – 8:30 am
Continental Breakfast
Minnetonka Ballroom and Foyer

Opening Keynote

8:30 am – 9:30 am
Minnetonka Ballroom

Welcome and Opening Remarks...1

Leah Blinn, Civil & Environmental Consultants, Inc., A&WMA Immediate Past President; Angie Wanger, Conference Co-Chair, Trinity Consultants; Ray Porter, Conference Co-Chair, Porter Odor Science

The Smell of Progress: Tackling Disagreeable Odors from Nuisance to Extreme...6

Susan Schiffman, Adjunct Professor, Lampe Joint Department of Biomedical Engineering, University of North Carolina/North Carolina State University (UNC/NCSSU)

9:30 am – 10:00 am
Networking Break and Display Viewing
Minnetonka Ballroom and Foyer

Sponsored By:



Susan Schiffman

Track A Sessions will be held in the Cedar Room

Session 1A: Policy & Community

Chairs: Michael McGinley, St. Croix Sensory,
and Tony van der Vooren, Vooren Air Quality
Management Services

Sponsored By:



10:00 am – 10:30 am

OM-52 **Developing Effective Odor Management Plans: Part 2...38**
Angie Wanger, Trinity Consultants, Woodbury, MN

10:30 am – 11:00 am

OM-26 **The 90th Percentile or the 98th Percentile?...45**
Carlos Diaz, Cyntia Izquierdo, Ainhoa Antón, Lucía Herrero, Ambiente
et Odora, Spain

11:00 am – 11:30 am

OM-05 **Where Perception and Proof Intersect: Quantifying the
Qualitative in Odor Nuisance Enforcement...92**
Megan Brillault, Megan Morgan, Beveridge & Diamond, P.C., New
York, NY; Richard Pleus, Intertox, Inc.; Roberto Gasparini, Spirit
Environmental Consultants

Track B Sessions will be held in the Minnetonka Ballroom

Session 1B: Wastewater Treatment – Process (Part 1)

Chair: Casey Davis, Black & Veatch

Sponsored By:



10:00 am – 10:30 am

OM-40 **Three-Phase Odor Control for
a Rapidly Expanding Wastewater Treatment Plant...98**
Inken Mello, Lynne Moss, Black & Veatch; Karl Moellering, TRA

10:30 am – 11:00 am

OM-36 **What Tools Do We Need for the Job? A Guide to
Screening Odor Control Technologies and Selecting the Best
Solution for Wastewater Treatment Facilities...121**
Casey Davis, Black & Veatch

11:00 am – 11:30 am

OM-38 **Odor Control Implementation at City of Wichita
Plant 2...137**
Eric Compton, CDM Smith, Chicago, IL; Jamie Belden, City of
Wichita

11:30 am – 12:00 pm

OM-47 **When the Neighbors Offer to Pay for Odor Control:
Accelerating Solutions Through Public-Private
Cooperation...152**
Burhan Zaveri, Mark Perkins, Mead & Hunt, Texas

FINAL PROGRAM

Technical Program – Tuesday, May 12, con't.

12:00 pm – 1:00 pm
Lunch for all attendees
Minnetonka Ballroom and Foyer

Sponsored By:



Track A Sessions will be held in the Cedar Room

Session 2A: Regulations & Odor Management

Chair: Tony van der Vooren, Vooren Air Quality Management Services

1:00 pm – 1:30 pm

OM-06 Denver Odors and Regulation...170

Bill Obermann, Denver Department of Public Health and Environment, Denver, CO; Priyanka DeSouza, University of Colorado-Denver, Denver, CO

1:30 pm – 2:00 pm

OM-29 Adoption and Implementation of Odor Control Plan Regulations...183

Jacob Zangrilli, Ryan Insley, Hannah Brubach, District of Columbia Department of Energy and Environment

2:00 pm – 2:30 pm

OM-09 Odors from a Recycled Fiber Paper Mill – Measurements, Impacts and Mitigation...193

Dale Raczyński, Gabby D'Arcangelo, Epsilon Associates, Inc.

Track B Sessions will be held in the Minnetonka Ballroom

Session 2B: Ambient Odor Assessment

Chairs: Flavio Galvao, ECP Engenharia, Consultoria e Planejamento Ambiental Ltda., and Anna Bokowa, Environmental Odour Consulting Corporation

1:00 pm – 1:30 pm

OM-16 Odor Attribution Via Facility Fingerprinting Using High-Resolution Real-Time Analytical Sampling and Multivariate Analysis...201

Steven Yuchs, Montrose Environmental Group, Houston, TX

1:30 pm – 2:00 pm

OM-22 Analysis of the Impact of a Composting Plant through Odor Forecasting and Citizen Science...213

Cynthia Izquierdo, Carlos Diaz, Ainhoa Antón, Lucía Herrero, Ambiente et Odora, Spain; Roberto Bianconi, Roberto Bellasio, Enviroware, Concorezzo, Italy

2:00 pm – 2:30 pm

OM-45 Advancing Objective Methods to Evaluate Chemosensory and Physiological Responses to Odorant Exposure...240

Kelli Hackney, Jeremy MacMahon, Heidi C. O'Neill, Gretchen M. Bruce, Richard C. Pleus, Intertox, Inc.

2:30 pm – 3:00 pm
Networking Break and Display Viewing
Minnetonka Ballroom and Foyer

FINAL PROGRAM

Technical Program – Tuesday, May 12, con't.

Panel: Odor Management Policy...248

3:00 pm – 4:30 pm

Minnetonka Ballroom

Moderators: Angie Wanger, Trinity Consultants, and Bill Obermann, Denver Department of Public Health and Environment

There are many perspectives to balance when crafting effective odor management policy. Odorous facilities that are permitted to operate may not have odor management requirements from the regulatory body. When odor complaints occur, local governments often get pulled into managing community odor concerns and developing their own odor ordinance and/or policy. This panel pulls together varied perspectives to explore effective ways to manage community odors.

Panelists include:

- Hannah Brubach, District of Columbia Department of Energy & Environment
- Bill Hefner, Fredrickson & Byron, P.A.
- Michael McGinley, St. Croix Sensory
- Jacob Zangrilli, District of Columbia Department of Energy & Environment

4:30 pm – 5:30 pm

Networking Reception

Minnetonka Ballroom and Foyer

Join our sponsors, presenters, and colleagues for an informal reception to build relationships in the industry.

Sponsored By:



FINAL PROGRAM

Technical Program – Wednesday, May 13

Run with Carlos – Wednesday, May 13 at 6:45 am

Whether you're an avid runner or just looking for an easy jog, Run with Carlos is a great way to explore the sights of the city. Join Carlos Diaz and fellow attendees to discover what Bloomington has to offer! Participation is free. Meet by the main entrance of the hotel. Distance is five kilometers (approximately 30 minutes). May be cancelled due to inclement weather.

7:00 am – 5:00 pm
Conference Registration
Minnetonka Foyer

7:00 am – 8:00 am
Continental Breakfast
Minnetonka Ballroom and Foyer

Track A Sessions will be held in the Cedar Room

Session 3A: Laboratory – Odor Panel/ Chemical Analysis

Chair: Diane Freeman, SLR Consulting

Sponsored By:



St. Croix Sensory, Inc.

8:00 am – 8:30 am

OM-02 Olfactometry: From Field Methods to Laboratory Setting Odor Panels, Understanding How the Application of Different Methods Generates Varying Results...249

Christopher Petro, SCS Engineers, Santa Maria, CA

8:30 am – 9:00 am

OM-50 Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) Advancing Comprehensive Odor Assessments...261

Sherrie Vicker, Michael McGinley, St. Croix Sensory, Stillwater, MN

9:00 am – 9:30 am

OM-42 Selected Ion Flow Tube Mass Spectrometry (SIFT-MS) for the Identification of VOCs from Human Remains...285

Leslie Silva, Beau Bealmear, Nathan Hoppens, Syft Technologies, Inc., Anaheim, CA; Jonathon Brooks, LocatED Missing Person Intelligence

9:30 am – 10:00 am

OM-44 Reevaluating ASTM D6646 H₂S Breakthrough Capacity Test Method for Modern Odor Control Challenges...295

Roy Clackum, Norit Activated Carbon

Track B Sessions will be held in the Minnetonka Ballroom

Session 3B: Wastewater Treatment – Process (Part 2)

Chair: Casey Davis, Black & Veatch

8:00 am – 8:30 am

OM-58 Prioritizing Odor Sources at a Central North Carolina Wastewater Treatment Plant: Science and Operations Pave the Way...307

David McEwen, Brown and Caldwell, Raleigh, NC

8:30 am – 9:00 am

OM-27 Using Your Nose to Protect Your Assets - Wastewater Collection System Odor and Corrosion Control...328

Vaughan Harshman, V&A Consulting Engineers, Manchester, NH; Nickolas Wagner, Erik Gibson, Manatee County Utilities, Bradenton, FL; David Hunniford, V&A Consulting Engineers, Sarasota, FL

9:00 am – 9:30 am

OM-59 One Small Step for Industrial Wastewater; One Giant Leap for Odor Prevention...340

Alison Trollier, Florida WEF and FWEA Air Odors Committee; Steve Mattson, Grand Rapids Public Utilities

9:30 am – 10:00 am

OM-21 Lessons Learned from the Pinedo WWTP: The Largest Project in the World Testing Different Odor Monitoring Approaches...354

Carlos N. Díaz, Ainhua Antón, Cyntia Izquierdo, Lucía Herrero, Ambiente et Odora S.L., Spain; Lidia Saúco, Angel Jiménez, S.A. Agricultores de la Vega, Spain; Enrique Albors, Fernando Andrés, Global Omnium Medioambiente S.L., Spain

10:00 am – 10:30 am
Networking Break and Display Viewing
Minnetonka Ballroom and Foyer

FINAL PROGRAM

Technical Program – Wednesday, May 13, con't.

Track A Sessions will be held in the Cedar Room

Session 4A: Odor Management & Control

Chairs: Angie Wanger, Trinity Consultants, and Garret Schleis, ECO₂

10:30 am – 11:00 am

OM-08 **Making Scents of Cannabis Odor Control: Evaluating Mitigation Technologies and Trade-offs...368**

Eva Luu, Armando Hurtado, SCS Engineers, Santa Maria, CA

11:00 am – 11:30 am

OM-12 **Programmatic Odor Management...386**

Jeff Schwarz, Metropolitan Council, St. Paul, MN

11:30 am – 12:00 pm

OM-35 **Optimizing H₂S Control in Large Wastewater Lagoons: Lessons from Minnesota Food Processing Facilities...403**

Mike Nelson, Ian Watson, USP Technologies

Track B Sessions will be held in the Minnetonka Ballroom

Session 4B: Community Perceptions

Chairs: Ted Bowie, Ramboll, and Tony van der Vooren, Vooren Air Quality Management Services

10:30 am – 11:00 am

OM-18 **A Unique Combination of Sensory and Chemical Analysis for an Atmospheric Odor Treatment System Evaluation...413**

Mel Suffet, Tadeo Vitko, Zhihang Peter Yin, UCLA Dept. of Env. Health Sciences, Los Angeles, CA

11:00 am – 11:30 am

OM-19 **Community Dialogue – A Fact of (Odor Control) Life...426**

Richard J. Pope, Hazen and Sawyer, Iselin, NJ

11:30 am – 12:00 pm

OM-54 **Non-Violent Odors/Odours...446**

Charles McGinley, McGinley Associate, P.A., Stillwater, MN; Jeff Mann, GAS; Michael McGinley, St. Croix Sensory, Inc.

12:00 pm – 1:00 pm

Lunch for all attendees

Minnetonka Ballroom and Foyer

Sponsored By:

BIOREM
experience. integrity. performance.

Hartzell
AIR MOVEMENT

About the Air & Waste Management Association



Founded in 1907, the Air & Waste Management Association is a nonpartisan professional organization that enhances knowledge and expertise by providing a neutral forum for the professional development, networking, and public education to thousands of members and an even greater audience of environmental professionals worldwide. A&WMA also promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society. For more information, visit our website at www.awma.org.

FINAL PROGRAM

Technical Program – Wednesday, May 13, con't.

Track A Sessions will be held in the Cedar Room

Session 5A: Dispersion Modeling for Optimizing Odor Control and Minimizing Impacts

Chair: Ray Porter, Porter Odor Science

1:00 pm – 1:30 pm

OM-55 **Evaluating and Improving a Proposed Headworks Odor Control System with Dispersion Modeling...455**

Phyllis Diosey, Hazen and Sawyer, New York, NY; Maggie Nelson, Hazen and Sawyer, Atlanta, GA

1:30 pm – 2:00 pm

OM-28 **Optimizing Stack Discharge...463**

Isabel Reams, Hazen and Sawyer, St. Paul, MN

2:00 pm – 2:30 pm

OM-17 **Optimization of Odor Mitigation Strategy Through Use of Measurement and Modeling Tools...478**

Robert Tyler, Woodard & Curran, Middletown, CT

2:30 pm – 3:00 pm

OM-04 **Determining Odor Culpability in the Community: A Case Study - Combining Community-based Monitoring and Backward Trajectory Modeling for Odor Evaluation and Culpability Analyses...487**

Scott Adamson, Jeremias Szust, Trinity Consultants, Salt Lake City, UT

Track B Sessions will be held in the Minnetonka Ballroom

Session 5B: Wastewater Treatment – Collection Systems

Chair: Inken Mello, Black & Veatch

Sponsored By:

DETECTION
INSTRUMENTS

1:00 pm – 1:30 pm

OM-37 **Sewer Process Modeling and the Implementation of a Collection System Odor Master Plan...496**

Ryan McKenna, Hazen and Sawyer, Tampa, FL

1:30 pm – 2:00 pm

OM-41 **Suck It Up! Applying Vacuum to Gravity Sewer to Solve an Odor Issue...508**

Benjamin Wallis, Vaughan Harshman, V&A Consulting Engineers; Michael Stanley, Kimley-Horn; Kathleen Templeton, JEA

2:00 pm – 2:30 pm

OM-46 **Sewer Process Modeling: A Powerful Tool for Mitigating Sulfide-Induced Corrosion and Odor Complaints in Collection Systems...521**

John Siczka, Bart Kraakman, Adrian Romero, Bill Desing, Jacobs, Milwaukee, WI

2:30 pm – 3:00 pm

OM-48 **Odor Mitigation Through Integrated Air Dispersion and Sewer Process Modeling...530**

Mugdha Mathure, Amy Kjome, Brown and Caldwell; Matthew Ward, The WATS Guys; Robin Burch, Louisville/Jefferson County Metropolitan Sewer District

3:00 pm – 3:30 pm

Networking Break and Display Viewing
Minnetonka Ballroom and Foyer

Panel: Development of Electronic Sensors for Continuous Odor Monitoring

3:30 pm – 5:00 pm (Minnetonka Ballroom)

Moderator: Ray Porter, Porter Odor Science

The promise of monitoring odors continuously along fencelines or in ambient air has been made many times in the past with variable success. When paired with dispersion modeling applications, it offers the potential to proactively manage adverse odor impacts instead of reacting to odor complaints. Sensor technology is progressing and the regulatory framework is expanding to allow for the promise to be kept.

Panelists include:

- **What are Sensor Monitoring Systems?...541**
Irene Lara, Kunak Technologies
- **IEEE Sensors Council Standards...547**
H. Troy Nagle, Department of Electrical and Computer Engineering, NCSU, and Lampe Joint Department of Biomedical Engineering, UNC/NCSU
- Susan Schiffman, Lampe Joint Department of Biomedical Engineering, UNC/NCSU

FINAL PROGRAM

Technical Program – Thursday, May 14

7:00 am – 10:30 am

Conference Registration (Minnetonka Foyer)

7:00 am – 8:00 am

Continental Breakfast (Minnetonka Ballroom and Foyer)

Track A Sessions will be held in the Cedar Room

Session 6A: Odor Control System Optimization

Chairs: Gary Hunt, TRC Companies, and Steven Moulds, SLR Consulting

Sponsored By:



8:00 am – 8:30 am

OM-10 **Operations & Maintenance Considerations for Chemical, Biological & Dry Media Odor Control Systems...551**
Jack Euclide, Xylem

8:30 am – 9:00 am

OM-25 **Biofilter Odor Control - Organic vs. Synthetic...563**
Richard Pope, Hazen and Sawyer, Iselin, NJ

9:00 am – 9:30 am

OM-53 **Odor Control Systems Optimization: Reduce Resource Impacts...580**
Raymond Porter, Porter Odor Science; Sean Trainor, Evoqua Water Technologies/Xylem

9:30 am – 10:00 am

OM-57 **The Critical Vessel - The Importance of Activated Carbon Vessel Selection and Design...594**
Sean Trainor, Evoqua Water Technologies/Xylem; Bryan Haan, Jack Euclide, Devang Pujara, Xylem

Track B Sessions will be held in the Minnetonka Ballroom

Session 6B: Innovative Odor Control Technology

Chair: Inken Mello, Black & Veatch

8:00 am – 8:30 am

OM-03 **Clean-Tech Sulfur and Phosphorus Removal...608**
Jon Jonis, Green Steel Environmental; Jon Teaford, University of Colorado and Green Steel Environmental, Boulder, CO

8:30 am – 9:00 am

OM-39 **Optimizing Activated Carbon for Wastewater Odor Control – Application Strategies and Product Innovation...618**
Regina Rodriguez, Norit Activated Carbon, Gainesville, FL

9:00 am – 9:30 am

OM-14 **Odour Control Technology to Treat 'All' Foul Air Pollutants in Municipal Wastewater and Biosolids Rather Than Select Odours...628**
Shan Shanchayan, NeutraTek Odour Solutions LP, Canada

9:30 am – 10:00 am

OM-13 **A Crowd-Based Web App for Reporting and Managing Environmental Hazards...639**
Gilad Shpitzer, Atmosfir Optics LTD

10:00 am – 10:20 am

Networking Break and Display Viewing (Minnetonka Ballroom and Foyer)

Session 7B: Odor Panel/Chemical Analysis and Odor Assessments

Chair: Diane Freeman, SLR Consulting

10:20 am – 10:50 am

OM-33 **Odour Threshold Determination: Development of a Secondary Reference Odour Mass for Assessor Qualification...648**
Alicia Tran, St. Croix Sensory, Burlington, ON, Canada; Michael McGinley, St. Croix Sensory, Stillwater, MN, USA

10:50 am – 11:20 am

OM-43 **Status Update for a New ASTM D8623-25 Standard Practice for Environmental Odor Assessment: An Analytical, Odorant Prioritization Approach...662**
Kurt Thaxton, Gerstel GmbH & Co. KG, Mülheim an der Ruhr, Germany; Jacek Koziel, Iowa State University and USDA-ARS; Donald W. Wright, Don Wright & Associates, LLC, Georgetown, TX

11:20 am – 11:50 am

OM-23 **Background Odor Assessment in Biogas Projects: Managing Exceedances in Cumulative Impact Analysis...674**
Carlos Diaz, Ainhua Antón, Cynthia Izquierdo, Lucía Herrero, Ambiente et Odora, Spain