Odors and Air Pollutants 2010
Table of Contents

Session 1: Odor Control Planning and Monitoring

Odor Emissions from Biological Nutrient Removal Processes
Carl V. Huber, *Huber Environmental, Inc*.; Kristen L. Smeby, *Hazen Sawyer, P.C*.

Odor Control Stategy for a Rapidly Changing Treatment Plant
Steven Davidson, Theresa Muller, *Brown and Caldwell Consultants*; Mark Berrelez, *City of Tolleson, Arizona*

A Staged Approach to Odor Control at the Mason Farm Wastewater Treatment Plant
Peter Schuler, *Brown and Caldwell*; Vishnu Gangadharan, *Orange Water and Sewer Authority*

From Master Planning to Implementation - Odor Mitigation Experience from East Honolulu WWTP
Miaomiao Zhang, Jaimie Hennessy, *CH2M HILL*; Lee Mansfield, Bruce Zhang, *American Water*

Dried Sludge Odours: Classification and Case Study
V. Decottignies, A. Bruchet, *CIRSEE*; I. H. (Mel) Suffet, *UCLA*

Session 2: Biological Odor Control #1

Testing of a New Media in Bio-Trickling Filter at Hyperion Treatment Plant
Cyrous A. Gilani, Kenneth R. Redd, Mike Sarullo, R. Tim Haug, *City of Los Angeles*, *Environmental Engineering Division (EED)*

Using a Biotrickling Filter System to Remove Hydrogen Sulfide fom Digester to Gas
Daniel Gary, Andy Lee, Robert Morton, Chi-Chung Tang, Philip Friess, *Sanitation Districts of Los Angeles County*

Biofilters and Biotowers for Treating Odors - Performance Experience at Various Empty Bed Contact Times and Resulting Odor Elimination Capacity Curves
Chris Easter, Chris Quigley, Peter Burrowes, Petros Dimetriou-Christidis, *CH2M HILL*

Performance Testing of a Biotrickling Filter/Chemical Scrubber Odor Control System at Western Australia's Largest WTTP
Gayle P. Van Durme, *Black & Veatch*; Keith Cadee, Sharon McNeil, *Water Corporation*

Utilization of Trickling Bed Air Biofilter in the Treatment of VOCs and Odors

Ashraf Aly Hassan, Abderrahman Zehraoui, George Sorial, *University of Cincinnati*

Biofilter Beds for Sewer Odor Control in Public Places
Mark Ludwigson, *Symbiont*

Improving NPV and Sustainability of the Treatment of Wastegas Containing Sulfurous Compounds with Biotechnology
B. Kraakman, *Bioway*
**Paper not Available*

Session 3: Design of Odor Control Systems #1

A Side by Side Testing of 4 Different Types of Media in Bio-Trickling Filter at The Hyperion Treatment Plant
Cyrous A. Gilani, Kenneth R. Redd, Mike Sarullo, R. Tim Haug, *City of Los Angeles, Environmental Engineering Division (EED)*

Help! My Packaged WWTP Stinks!
Michael T. Lannan, Matthew L. Riegert, Andrew J. Beaton, Ryan T. Callahan, *Tech Environmental, Inc.*

Spotsylvania County's New Improved Composting Facility with State of the Art Odor Control
Todd O. Williams, Chris Easter, *CH2M HILL*

Design Guidelines for Foul Air Ventilation and Collection
Philip L. Wolstenholme, *Brown and Caldwell Consultants*

Australia's Largest Wastewater Odour Control Facility: A Whole Life Approach
Joseph Otter, Ian Evanson, *MWH Australia Pty*; Rod Mackenzie, Adnan Firat, *Sydney Water*

Session 4: Methods of Sampling Measuring and Estimating Emissions

One Odour Unit-Precisely How Can an Odour Unit be Measured?
Anna H. Bokowa, *ORTECH Environmental*

Applying European Olfactometry Standard EN 13725 for Odor Performance Testing in Milford, Connecticut - Lessons Learned
Robert B Stallings, Charles N Smith, Kenneth Bradstreet, *AECOM*

Odor Assessor Performance to Reference and Non-Reference Odorants
Michael A. McGinley, Charles M. McGinley, *St. Croix Sensory, Inc.*

Measuring and Modeling Ventilation in Wastewater Collection Systems

Matthew Ward, *CH2M HILL*; Richard Corsi, *University of Texas at Austin*; Robert Morton, Tom Knapp, *Los Angeles County Sanitation Districts*; Dirk Apgar, *King County Wastewater Treatment Division*; Chris Quigley, *CH2M HILL*; Wayne Parker, *University of Waterloo*

Comparison of Sampling & Analytical Techniques for Hydrogen Sulfide
Alyson Fortune, Michael Tuday, *Columbia Analytical Services, Inc.*

Session 5: Collection System Odors and Corrosion

Minimization of Odors and Related Corrosion in Collection Systems - A Summary of the Water Environment Research Foundation Project 04-CTS-1
Chris Easter, *CH2M HILL, Inc*.; Dirk Apgar, *King County - Wastewater Treatment Division*; Jay Witherspoon, *CH2M HILL, Inc*.; Amit Pramanick, *WERF*

Why Inverted Siphons are Typically an Odor Source and How to Eliminate this Source Through Superoxygenation
Kevin Jacobs, David Clidence, *ECO Oxygen Technologies*

Planning and Implementing Odor Control During Sewer System Inspection, and Rehabilitation Work in a Sensitive Resort Setting in Orange County, California - Case Study
Robert B. Stallings, Cherylle Barrido, Saurabh Shekhar, *AECOM*

A System-Wide Sulfide Control Plan for the Lee County, Florida Wastewater Collection System
Mark Gould, *CDM*; Jon H. Myer, *Lee County*; Ravi Tej Bandi, *CDM*

Pump Station Odor Control in a Tourist Location
David McEwen, Philip Wolstenholme, *Brown and Caldwell*

Session 6: Sustainability and Greenhouse Gases

Analysis of Nitrous Oxide and Helium in Air: Greenhouse Gas Inventory
Joseph Khoury, Alfred Sattler, Bryan Linsley, Keith Magers, Jean Lee, *Sanitation Districts of Los Angeles County*

Top-down and Bottom-up Approaches for Establishing Greenhouse Gas Emissions and Carbon Footprints at Wastewater Treatment Plants
Sock-Hoon Koh, Andrew Shaw, Steve Tarallo, *Black & Veatch*

Estimation of Greenhouse Gas Emissions from a 2 MGD Full Scale Wastewater Treatment Plant
Velmurugan Subramanian, *PSA-Dewberry*

Determination of Siloxanes and Other Volatile Silicon Compounds in Biogas Samples - Using Sample Preconcentration with GC-MS and GC-ICP-MS
Sally Mathison, Al Sattler, Robin Lile, Felix Guillen, Brian Linsley, Keith Magers, Jean Lee, *Sanitation Districts of Los Angeles County*

Climate Change Risks and Opportunities at Wastewater Treatment Plants
James E. Sandoval, *CH2M HILL*

Modeling Greenhouse Gas Reduction as an Economic Factor in NYC Biosolids Management Planning
Raymond Pun, Geoff Baldwin, *CDM*; Keith Mahoney, Arthur Spangel, Pedick Lai, *New York City Department of Environmental Protection*

Session 7: Dispersion Modeling

Implications of the Proposed 1-hour NO2 National Ambient Air Quality Standard
Phyllis G. Diosey, Russell J. Jalbert; Lorraine Farrell, *Malcolm Pirnie, Inc.*

Improvements in Odor Modeling Using Non-Steady-State Models and More Realistic Source Physics
Robin Ormerod, Geordie Galvin, Graeme Starke, *PAEHolmes*

The Review of the Odour Legislation
Anna H. Bokowa, *ORTECH Environmental*

Optimal Strategies for Minimizing the Emissions of Volatile Organics and Odors During Excavation of MGP Sites
Lei Wang, *University of Cincinnati*; Jim Lingle, *Manufactured Gas Plant Site Management, EPRI*; Rakesh Govind, *PRD Tech, Inc.*

Odowatch Odor and H_2S Monitoring System: Performance, Benefits, and Lessons at the Roger Road Wastewater Reclamation Facility in Tucson Arizona
Dennis Froehlich, *Pima County Regional Wastewater Reclamation Department*

Session 8: Design of Odor Control Systems #2

Rollout and Application of the Water Environment Research Foundation (WERF) Biosolids Odor-Reduction Roadmap
Robert H. Forbes, Zeynep Erdal, Thomas Hahn, *CH2M HILL, Inc;* Alan Hais, *Water Environment Research Foundation*

North Head STP: The Innovative Application of Venturi Technology. Providing Enhanced Operational Security, Process Performance, and Minimising Chemical Consumption
Paul Kynaston, Ian Evanson, *MWH*; Rod Mackenzie, *Sydney Water*

Headworks Odor Control and Ventilation – A Practical and Regulatory Compliant Approach
Jim Joyce, Christopher Hunniford, *Odor and Corrosion Technology Consultants, Inc*.

Case Study - Successful Operation of Biotechnology For Odour Control at the Western Treatment Plant
Josef Cesca, Amy McDonald, Azaria Rahardjo, *CH2M HILL Australia Pty. Ltd*.; Bart Kraakman, *Bioway Technologies Australia Pty. Ltd*.; Imogen Malpas, Lina Vallin, *Melbourne Water Corporation*

Comparison of Cassette Odor Control Scrubbers and Traditional Deep Bed Odor Control Scrubbers
W. Brad M. Stanley, *AAF International*

Session 9: Biological Odor Control #2

Removal Effectiveness of Reduced Sulfur Compounds in Multi-Stage Biotrickling Filter for Biosolids Handling Processes
Neil A. Webster, *Webster Environmental Associates, Inc*.; Sharon Worley, *Louisville & Jefferson County Metropolitan Sewer District*; Brian Herner, *Biorem Technologies, Inc*.

Biofiltration of Carbon Dioxide Using Algae
Rakesh Govind, Rajit Singh, *University of Cincinnati*

Membranes for Odour Control? A Case Study on a New Approach for the Clovis Water Reuse Facility
Trevor Jones, Chris Easter, *CH2M HILL*; Steve White, *City of Clovis, California*

Columbus Discovers a Greener Odor Control Approach
Chester M. Morton, Richard J. Pope, *Malcolm Pirnie, Inc*.; Richard A. Reinhold, *City of Columbus*; Bart Kraakman, *Bioway*; Steve Mess, Chad Dunn, *Malcolm Pirnie*

Performance of High-Rate Biotrickling Filter Under Ultra-High H_2S Loadings at a Municipal WWTP
Louis D. le Roux, Matthew E. Johnson, *BioAir Solutions, LLC*

Study of Biofilm Growth and Metabolic Activity Using Impedimetry
Rakesh Govind, Juan Gonclaves, *University of Cincinnati*

Session 10: Odor and Emission Control Systems

Odor Removal Using Palygorskites in a Fixed Bed Adsorber
Takaya Higuchi, Qiong Zhang, Masahiko Sekine, Tsuyoshi Imai, *Yamaguchi University*

Denver Metro's Solids Processing Buildings Ionized Air Odor Control Systems Eliminate Odor with Ninety-Eight Percent Less Power and Carbon Emissions than Traditional Capture and Treat Technologies
Dennis Tulenko, *Trans-Tech Energy and Environmental, Inc.*

Innovative Approaches for Upgrading Atomized Mist Scrubbers
David McEwen, Perry Schafer, Philip Wolstenholme, *Brown and Caldwell*; Raymond Chau, *Union Sanitary District*

Innovative Odor Containment and Treatment at a Large Wastewater Pumping Station
Robert P.G. Bowker, *Bowker & Associates, Inc*.; David J. Skibicki, *Richard A. Alaimo Engineering Company*; Joseph T. Kotowski, *Township of Woodbridge*

Emissions Reduction from Digester Gas-Fired Engines at WWTPs
Vladimir Kogan, *Orange County Sanitation District*; Kit Liang, *Malcolm Pirnie, Inc*.

North Davis Sewer District WWTP Plant Wide Odor Review and Solution Implementaion
Charlie Alix, *MWH Americas, Inc*.; Kevin Cowan, Myron Bachman, *North Davis Sewer District*; Greg Dye, *MWH Americas, Inc.*

Session 11: Innovative Technologies, Operations, and Agriculture

Enclosed Headworks Design Considerations for Odor, Corrosion, and Safety
Gayle P. Van Durme, *Black & Veatch*

Design, Commissioning, and Operation of the Odor Control Systems for the Pine Creek Wastewater Treatment Plant
Catalina Nadeau-Bonilla, Trevor Jones, Kim Fries, *CH2M HILL Canada*; Andy Dutton, *City of Calgary*

Performance Validation of the First North American Shell-Based Biological Air Treatment System
Brendan K. Naples, *Bord na Mona Environmental Products U.S. Inc*

Use of Molecular Tools to Identify Microbial Communities in a Full Scale Biotrickling Filter Treating Odors from a Municipal WWTP
Louis D. le Roux, *BioAir Solutions, LLC*; Matthew E. Johnson, Francis L. de los Reyes III

Odor Emissions and Chemical Analysis of Odorous Compounds from Animal Buildings
Larry D. Jacobson, *University of Minnesota*; Neslihan Akdeniz, Lingshuang Cai, Shicheng Zhang, Jacek Koziel, Steven J. Hoff, Katie Heathcote, Albert J. Heber, Sarah Bereznicki, David B. Parker, Eddie Caraway

Miniature and Low-Cost Devices for the Precise and Reliable Monitoring of Low Concentrations of Air Pollutants in Changing Environments
Nazare Pereira-Rodrigues, Jean-Michel Guillot, Jean-Louis Fanlo, Bruno Aubert, *Cairpol*

Posters:

Biofilter Beds for Sewer Odor Control in Public Places
Mark Ludwigson, *Symbiont*
**Paper Available in Session 2*

Odor Control with Biological Treatment Methods High Efficiencies and Improved Robustness
Bart Kraakman, *Bioway*
**Paper Not Available*

Vapour Phase Nitrous Oxide Emissions and the Potential for Biological Treatment
Bart Kraakman, *Bioway*
**Paper Not Available*

A Side by Side Testing of 4 Different Types of Media in Bio-Trickling Filter at The Hyperion Treatment Plant
Cyrous A. Gilani, Kenneth R. Redd, Mike Sarullo, R. Tim Haug, *City of Los Angeles, Environmental Engineering Division (EED)*
**Paper Available in Session 3*

Why Inverted Siphons are Typically an Odor Source and How to Eliminate this Source Through Superoxygenation
Kevin Jacobs, David Clidence, *ECO Oxygen Technologies*
**Paper Available in Session 5*

Biofiltration of Carbon Dioxide Using Algae
Rakesh Govind, Rajit Singh, *University of Cincinnati*
**Paper Available in Session 9*

Case Study - Successful Operation of Biotechnology For Odour Control at the Western Treatment Plant
Josef Cesca, Amy McDonald, Azaria Rahardjo, *CH2M HILL Australia Pty. Ltd*.; Bart Kraakman, *Bioway Technologies Australia Pty. Ltd.*; Imogen Malpas, Lina Vallin, *Melbourne Water Corporation*
**Paper Available in Session 8*

Weatherford in Wastewater Treatment
William J. Hyland, *Weatherford Engineered Chemistry*
**Paper Not Available*

Miniature and Low-Cost Devices for the Precise and Reliable Monitoring of Low Concentrations of Air Pollutants in Changing Environments

Nazare Pereira-Rodrigues, Jean-Michel Guillot, Jean-Louis Fanlo, Bruno Aubert, *Cairpol*

**Paper Available in Session 11*