



Residuals and Biosolids 2013 Conference

Emerging Opportunities for
Sustainable
Resource Recovery

May 5 – 8, 2013



This conference is held by the Water Environment Federation in cooperation with the Kentucky-Tennessee Water Environment Association, Air & Waste Management Association (A&WMA) and US Composting Council

Energy and Water 2013 Conference

Integrated Solutions for Advancing
Technology and Management

May 6 – 9, 2013



This conference is organized by the Water Environment Federation in cooperation with the Kentucky-Tennessee Water Environment Association, Water Environment Research Foundation, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Imagine H₂O, and the Alliance for Water Efficiency.

TABLE OF CONTENTS

Consider Eco-Friendly Options in Nashville.....	4
Conference Committee and Volunteers.....	5
Registration.....	7
Presenter and Moderator Information.....	7
Reception and Meal Functions.....	8
Continuing Education.....	9
Proceedings.....	9
Sponsorship Information.....	10
Committee Meetings.....	11
Program Reference Grid.....	12
Residuals and Biosolids Conference Programing	
Tour.....	14
Workshops.....	15
Opening General Session.....	18
Technical Program.....	19
Sessions at-a-Glance.....	37
Energy and Water Conference Programing	
Workshops.....	39
Opening General Session.....	41
Technical Program.....	42
Advanced Virtual Conference.....	56
Sessions at-a-Glance.....	58
Exhibition Hours and Exhibitor Directory.....	58
Index of Exhibitors by Product Category.....	74
Presenter and Moderator Directory.....	77
Upcoming Education and Training Events.....	82

CONSIDER ECO-FRIENDLY OPTIONS IN NASHVILLE



Supporting WEF's ongoing mission to support sustainable programming, we would like to ask conference attendees to please consider their carbon footprint as you travel to, stay in, and depart from Nashville and the Nashville Convention Center.

Recognize the efforts of the Nashville Convention Center:

The Nashville Convention Center is committed to supporting and encouraging sustainable practices, including the hosting of environmentally-friendly "green" meetings in their facilities. Because conservation of energy and natural resources is a high priority for the Nashville Convention Center, they have made substantial efforts through the years to minimize their carbon footprint, such as: heating/cooling via steam/chilled water, energy management software, low-flow automatic faucets/flush valves, automatic soap/paper towel dispensers, environmentally-responsible cleaning products/supplies, donation of excess food, donation of unclaimed lost/found items to the local rescue mission, and recycling of various items, including cardboard, paper, and fluorescent light bulbs. Nashville Convention Center provides recycling containers for paper, aluminum cans, and cardboard as space permits.

Dine at local farm-to-table restaurants:

Nashville Originals are local restaurateurs dedicated to sustaining the independent restaurant as a fixture of Nashville's culture and community. What Nashvillians eat—and where they eat—helps define the city.

The home-grown restaurants reflect who they are and lead the way in Nashville's future development. Nashville Originals member restaurants support one another. Together they support local initiatives and charities and help feed the community.

417 Union

417 Union Street
Nashville, TN 37219
615-401-7241

Copper Kettle

94 Peabody Street
Nashville, TN 37210
615-742-5545

Boundary

911 20th Ave. South
Nashville, TN 37212
615-321-3043

Cork and Cow

403 Main Street
Franklin, TN 37064
615-538-6021

Cabana

1910 Belcourt Avenue
Nashville, TN 37212
615-577-2262

Jackson's

1800 21st Ave S
Nashville, TN 37212
615-385-9968

RESIDUALS AND BIOSOLIDS CONFERENCE COMMITTEE



Robert O'Dette
*Tennessee Dept. of Environment &
Conservation*
Conference Co-Chair



Doug Yarosz
Brown and Caldwell
Conference Co-Chair

RESIDUALS AND BIOSOLIDS CONFERENCE COMMITTEE

Wale Adewunmi
*Middlesex County Utilities
Authority*

Kenneth Baker
*Gresham, Smith and
Partners*

Robert Bastian
US EPA

Robert Bates
*Louisville Metropolitan
Sewer District (KY)*

Kari F. Brisolara
Louisiana State University

C. Michael Bullard
Hazen and Sawyer

J Scott. Carr
CDM Smith

Kevin Colvett
CH2M HILL

Roy Denney
*Metro Water Services
(Nashville)*

John F. Donovan
CDM Smith

Sandra Dudley
*TN Dept. of Enviro. and
Conservation*

Doug Fredericks
Atkins Global

Robert A. Gillette
Carollo Engineers

Liping Han
URS

John Harward
Principle Environmental

Michelle Hatcher
CDM Smith

Jon Hay
Black & Veatch

Mark Lang
URS

Jeff LeBlanc
We Care Organics

F Michael Lewis
F. Michael Lewis, Inc.

Lynne Moss
CDM Smith

Christopher Muller
Brown and Caldwell

David W. Oerke
CH2M HILL

Tazio Qubeck
Brown and Caldwell

Hari Santha
Black and Veatch

Patricia A. Scanlan
Black & Veatch

Tim Shea
CH2M HILL

Roy Smith
Guthrie Sales

Jim Smith
Retired USEPA

Aaron Stephens
Material Matters

Lori Stone
Black & Veatch

Richard Tsang
CDM Smith

Steve Wilson
Brown and Caldwell

Greg Woodward
Stantec

Bobby Worthington
*Harpeth Valley Utilities
Dist.*

ENERGY AND WATER CONFERENCE COMMITTEE



Cindy Wallis-Lage
Black & Veatch
Conference Chair

ENERGY AND WATER CONFERENCE COMMITTEE

Priscilla Bloomfield
CH2M Hill

Charles Bott
*Hampton Roads
Sanitation District*

Jeanette Brown
Manhattan College

Joseph Cantwell
SAIC

Peter Cavagnaro
Johnson Controls, Inc.

Alicia Chakrabarti
*East Bay Municipal
Utility District*

Shahid Chaudhry
*California Energy
Commission*

Nate Cullen
Clean Water Services

Cindy Dybala
*Alliance for Water
Efficiency*

Bob Forbes
CH2M Hill

Beven Griffiths-
Sattenspiel
River Network

Liping Han
URS Corporation

Jose Jimenez
Brown and Caldwell

Andy Kricun
Camden County MUA

Jordan Macknick
*National Renewable
Energy Lab*

Ed Myers
Lescure Engineers, Inc.

Leiv Rieger
*McMaster Innovation
Park*

Diego Rosso
*University of California,
Irvine*

Rusty Schroedel
AECOM

Steve Tarallo
Black & Veatch

Jason Turgeon
US EPA

Louann Unger
US EPA

James Wheeler
US EPA

John Willis
Brown and Caldwell

REGISTRATION

All events are held in the Nashville Convention Center.

The Registration Desk is located in the **Convention Center Lobby** and will be open at the following times:

Hours:

Sunday, May 5	7:30am – 5:00pm
Monday, May 6	7:30am – 5:00pm
Tuesday, May 7	7:30am – 5:00pm
Wednesday, May 8	8:00am – 5:00pm
Thursday, May 9	8:00am – 12:00pm

PRESENTER AND MODERATOR INFORMATION

Speaker, Moderator and Assistant Moderator Briefing

All presenters included in either conference technical program should sign-in at Conference Registration before presenting and must attend their assigned briefing. If you are unable to attend your assigned briefing, please notify staff and your session moderator(s).

Presenters, session moderators and assistant moderators participating Monday thru Thursday should attend the briefing. Speakers should attend only once unless they are speaking on two different days. The Speaker Briefing and room schedule is as follows:

<u>Monday, May 6 – Room: West Exhibit Hall</u> *RB Sessions 1 through 18 <i>Note: This includes all technical session presenters in the Residuals and Biosolids Conference</i>	7:00am – 8:00am
<u>Tuesday, May 7 – Room: Center/East Exhibit Hall</u> *EW Sessions 1 through 7	7:15am – 8:00am
<u>Wednesday, May 8 – Room: 102</u> *EW Sessions 8 through 14	7:15am – 8:00am

RECEPTION AND MEAL FUNCTIONS

Networking Reception – Monday, May 6

5:00pm – 6:30pm

The Networking Reception will be held in Center/East Exhibit Hall. It is your opportunity to view the exhibits, renew acquaintances, and make new contacts. Light hors d'oeuvres and refreshments will be served.

Sponsored by HelioPower and Kruger

Luncheon

Lunch will be provided for all full conference, daily registrants, and exhibitors of both conferences. Please advise staff as soon as possible if you have any special dietary requirements. The luncheons will be held:

Monday, May 6 – West Exhibit Hall
12:00pm - 1:30pm

Tuesday, May 7 – Center/East Exhibit Hall
12:00pm - 1:30pm
Sponsored by BDP Industries and seepex

Wednesday, May 8 - Center/East Exhibit Hall
12:00pm - 1:30pm
Sponsored by seepex

Networking Breaks

The Networking Breaks will be held:

Sunday, May 5
Meeting Foyer Area Outside Rooms 204 – 206
10:00am – 10:30am and 3:00pm – 3:30pm

Monday, May 6
Center/East Exhibit Hall
10:00am – 10:45am and 3:00pm – 3:45pm

Tuesday, May 7
Center/East Exhibit Hall
10:00am – 10:45am and 3:00pm – 3:45pm
Sponsored by Kruger

Wednesday, May 8
Center/East Exhibit Hall
10:00am – 10:45am and 3:00pm – 3:45pm

Thursday, May 9
Meeting Foyer Area Outside Rooms 103 - 105
10:00am – 10:15am

CONTINUING EDUCATION

EDUCATION CREDITS

Participants who attend these conferences and accurately document their participation will be issued continuing education credits. For technical sessions WEF will award Professional Development Hours (PDHs) at a rate of 1.0 PDH for every hour of participation. For workshops, WEF will award Continuing Education Units (CEUs) at a rate of 1.0 CEU for 10 hours of participation. Please note that conference attendees are responsible for exploring continuing education requirements in their state to ensure that WEF credits are accepted by the appropriate authority.

To receive the certificate, attendees must be mindful of the following:

- *Request a continuing education credit form from the Registration desk upon check in.*
- *Note each time you enter/exit a session room on the CEU/PDH form.*
- *Have CEU/PDH form signed by Federation staff beside each session attended.*
- *Return CEU/PDH form to the registration desk at the conclusion of the conference. You will be required to present your photo ID upon submittal.*

The forms will be used to create certificates which will be mailed 8-10 weeks after the conclusion of the conference.

PROCEEDINGS

Conference proceedings for both conferences, consisting of manuscripts for each presentation, have been produced on a single USB drives. Full conference and daily registrants will receive the proceedings at the registration desk at the time of badge pickup or onsite registration.

Copies of proceedings may be ordered after the conference at the member rate of \$75 USD; nonmember rate of \$115 USD, plus shipping and handling. All orders will be processed immediately after conclusion of the conference. You may call 1-800-666-0206. Ask for Stock Number CPRB1305 for the Residuals and Biosolids Conference and Energy and Water Conference Proceedings.

SPONSORSHIP INFORMATION

We would like to thank the following sponsoring companies for their contributions to the conference and program.



Tuesday Conference Luncheon
Wednesday Morning Refreshment Break
Printing of the Conference Program
www.BDPIndustries.com
Booth 600



Printing of the Conference Program
www.cdm.com



Opening General Session
www.danfossdrives.com
Booth 620



Printing of the Conference Program
www.HDRinc.com



Networking Reception
www.heliopower.com



Conference Lanyards
www.degremont-technologies.com
Booth 311



Opening General Session
www.insinkerator.com



Networking Reception
Tuesday Refreshment Breaks
www.krugerusa.com
Booth 210



Printing of the Conference Program
www.nefcobiosolids.com
Booth 519



Conference Luncheons
Printing of the Conference Program
www.seepex.com
Booth 511

COMMITTEE MEETINGS

Sunday, May 5

RBC NBP Certified Agencies
10:30am – 12:00pm
Room 105/106

RBC NBP Steering Committee
4:00pm – 5:30pm
Room 105/106

Monday, May 6

RBC Agriculture & Industrial Byproducts
Subcommittee
7:00am – 8:30am
Room 105/106

RBC ABBA Biosolids Luncheon
11:30am – 1:30pm
Room 105/106

RBC Outreach & Education Subcommittee
4:30pm – 5:30pm
Room 105/106

Tuesday, May 7

RBC Bioenergy Technology Subcommittee
7:00am – 8:30am
Room 110/111

RBC Specialty Conference Subcommittee
12:30pm – 2:00pm
Room 110/111

RBC Carbon Resource Subcommittee
4:30pm – 5:30pm
Room 110/111

Wednesday, May 8

Energy Task Force of Sustainability
Community of Practice
7:00am – 8:30am
Room 105/106

Residuals and Biosolids Committee Meeting
7:00am – 8:30am
Room 206

Residuals and Biosolids & Energy and Water Program Grid

Monday, May 6, 2013				Tuesday, May 7, 2013				Wednesday, May 8, 2013			Thursday, May 9, 2013			
204/205	103/104	108/109		204	205	206	209/210	103/104	108/109	205	103/104	108/109	103/104	108/109
RB OGS	EW WS A	EW WS B		RB 07 RB 11	RB 08	RB 09	RB 10	EW 01	EW 02	RB 18	EW 05	EW 06	EW 12	EW 13
											EW 07		EW 14	
Luncheon in Exhibit Hall				Luncheon in Exhibit Hall				RB Adjourns; EW Luncheon			EW Adjourns			
204	205	206	209/210	108/109	204	205	206	209/210	103/104	108/109		103/104	108/109	
RB 01	RB 02 RB 05	RB 03 RB 06	RB 04	EW OGS	RB 12 RB 16	RB 13 RB 17	RB 14	RB 15	EW 03	EW 04		EW 08	EW 09	EW 11
											EW 10			



Residuals and Biosolids 2013 Conference

May 5 – 8, 2013
Nashville, Tennessee
Nashville Convention Center



This conference is held by the Water Environment Federation in cooperation with the Kentucky-Tennessee Water Environment Association, Air & Waste Management Association (A&WMA) and US Composting Council

RESIDUALS AND BIOSOILDS CONFERENCE TOUR

Nashville's Biosolids Facilities Tour

Tuesday, May 7, 2013
1:30pm – 5:00pm

3.5 Contact Hours

Please note: The bus will begin to load at 1:15pm. Participants will meet in the Convention Center Main Lobby area near the registration desk for the bus loading and drop off. The bus will depart promptly at 1:30pm.

The first stop will be the Harpeth Valley Utilities District wastewater treatment plant which began operating in January 2001. The plant is located on 400 acres along the Cumberland River. The biosolids are land applied on the property. Native grasses, Bermuda grass, wheat and soy beans are grown in the application fields. Some crop is harvested while the remaining crop provides food and shelter for the abundant wildlife that calls this working farm home.

The second stop will take attendees to the Central Wastewater Treatment Plant which has had Nashville's Biosolids Facility in operation since 2009. Attendees will see how the over the past 50 years, the Central Wastewater Treatment Plant has changed processes from incineration, to composting, to land filling, to beneficially reusing biosolids as a Class A EQ product.



WORKSHOP A

Workshop A: Biosolids 101 – Fundamentals of Practice

Sunday, May 5, 2013
8:30am - 5:00pm

Room: 204
0.6 CEUs

- 8:30am** **Introduction and Welcome**
Natalie Sierra, RMC Water and Environment
- 9:00am** **Historical Overview of Biosolids Land Application Regulations**
Tom Crawford, MMSD
- 9:30am** **The Science Behind Biosolids Rule Making**
Greg Kester, California Association of Sanitation Agencies
- 10:00am** **Regulatory Requirements and Management Practices**
Mike McFarland, Utah State University
- 10:30am** **Break**
- 11:00am** **Breakout Exercises on Estimating Biosolids Land Application Rates or Class-A or B Monitoring Criteria**
Natalie Sierra, RMC Water and Environment; Mike McFarland, Utah State University
- 12:00am** **Successful Biosolids Land Application Programs – Case Studies**
Greg Evanylo, Virginia Tech
- 12:30pm** **Lunch**
- 2:00pm** **Biosolids Beneficial Use and Public Outreach**
Peggy Leonard, King County
- 3:00pm** **Breakout Exercises on Responses to Various Audiences**
Peggy Leonard, King County; Natalie Sierra, RMC Water and Environment
- 3:30pm** **Break**
- 4:00pm** **Managing Your Biosolids Program Beyond Regulatory Compliance**
Ned Beecher, Northeast Biosolids and Residuals Association
- 4:30pm** **Q & A, Closing Remarks**
Natalie Sierra, RMC Water and Environment
- 5:00pm** **Adjourn**

WORKSHOP B

Workshop B: Using Appropriate Economic Methodologies for Evaluation of Cost-Saving Projects

Sunday, May 5, 2013

1:30pm - 5:00pm

Room: 205

0.3 CEUs

- 1:30pm** **Welcome, Introductions, Goals for Workshop and General Summary of Barriers Project**
John Willis, Brown and Caldwell
- 1:40pm** **Testing Sensitivities and Expanded Financial Methodologies (TBL, Monte Carlo)**
Mike Elenbaas, Black & Veatch
- 2:20pm** **Overview of 5 Financial Methodologies in the Context of OWASA's Case Study**
John Willis, Brown and Caldwell
- 2:50pm** **Other Considerations for Economic Evaluations**
John Willis, Brown and Caldwell
- 3:00pm** **Networking Break**
- 3:15pm** **Breakout: Hands-On Financial Analysis of Real-World CHP Projects**
All in Breakout Groups
- 4:25pm** **Report Outs from Breakout Sessions**
- 4:45pm** **Wrap-up**
Lauren Fillmore, WERF
- 5:00pm** **Adjourn**

WORKSHOP C

Workshop C: 503 Biosolids Jeopardy

Sunday, May 5, 2013
1:30pm – 5:00pm

Room: 206
0.3 CEUs

- 1:30pm** **Introductions and Team Formation**
- 2:00pm** **Power Point Presentation on 503 Rule Overview**
- 2:30pm** **Jeopardy Round**
- 3:00pm** **Networking Break**
- 3:30pm** **Double Jeopardy Round**
- 3:30pm** **Final Jeopardy Round**
- 4:00pm** **Prize Presentation**
- 4:30pm** **Roundtable discussion on the Benefits of Biosolids Recycling and Beneficial Use**
- 5:00pm** **Adjourn**

Presenters:

Todd Shearin, Terra Renewal

Steve Hall, Terra Renewal

Bob O'Dette, Tennessee Department of Environment and Conservation

OPENING GENERAL SESSION

Monday, May 6, 2013
8:30am – 12:00pm

Room: 304/305
2.25 PDHs

Moderators: Robert O'Dette, Department of Environment & Conservation, TN
Doug Yarosz, Brown and Caldwell, TN

8:30am **Conference Overview**
Robert O'Dette, Department of Environment & Conservation, TN
Doug Yarosz, Brown and Caldwell, TN

8:40am **WEF Overview**
Rick Warner, Washoe County, NV

8:50am **KY/TN WEA Highlights**
Wes Sydnor, Louisville MSD, KY

9:00am **Welcome**
Governor Bill Haslam, State of Tennessee (Invited)
Mayor Karl Dean, Metropolitan Government of Nashville and Davidson County,
TN (Invited)
Comissioner Robert Martineau, Department of Environment & Conservation, TN
(Invited)

9:15am **The History: 20th Anniversary of Part 503 Rule**
Alan B. Rubin, North Carolina State University

10:00am **Networking Break**

10:30am **Part 2: Founding Biosolids Management on Sound Scholarship**
Moderator: Bill Toffey, Mid-Atlantic Biosolids Association
Panelists: John T. Novak, Virginia Tech
Paige J. Novak, University of Minnesota
Matthew Higgins, Bucknell University

11:35am **Lookng Forward to Austin in 2014!**
Lynn Moss, CDM Smith

11:45am **Recognition of Conference Co-Chairs and Past Chairs**

12:00pm **Adjourn**

TECHNICAL PROGRAM

Session RB 1: Advances in Stabilization Technologies

Monday, May 6, 2013
1:30pm – 4:45pm

Room: 204
2.5 PDHs

Moderators: Greg Woodward, Stantec
Roy Smith, Guthrie Sales & Service, Inc.

RB1A 1:30pm **San Francisco Sequencing Batch Reactor Temperature Phased Anaerobic Digestion: Efficient Adaptation to Class A Biosolids**
Drury D. Whitlock, David W. Green, CH2M HILL; Bonnie M. Jones, Alexandre Miot, San Francisco Public Utilities Commission; Tim L. Bauer, Douglas Barber, CH2M HILL

RB1B 2:00pm **Achieving Biogas Generation and Minimized Sludge Production Using a High-Rate Anaerobic Sidestream Reactor (ASSR) Process - Pilot Study**
Aaron Brennan, Heonseop Eom, Chris Watt, Dong-Hyun Chon, Chul Park, UMass Amherst

RB1C 2:30pm **Assessment of Methane Production during Marine Transportation of Wastewater Solids**
Christopher A. Wilson, Greeley and Hansen

3:00pm **Networking Break**

RB1D 3:45pm **Upgraded Digester Mixing: Achieving Sludge Minimization while Renewing a Key Asset**
Rebecca Schaefer, Christopher A. Wilson, Joe M. Gorgan, Greeley and Hansen

RB1E 4:15pm **Fate of Nonylphenol Compounds during Aerobic and Anaerobic Digestion of Sludge**
Seçil Ömeroğlu, Hande Bozkurt, F. Dilek Sanin, Middle East Technical University

4:45pm **Adjourn**

Alternate 1 **Accelerated Composting Methods and Equipment**
Fred P. Mussari, BCR Environmental Corporation; James E. Smith, Jr, U.S. EPA, retired; Darren Midlane, Harvest Quest International; Robert Finch, Michael Norris, BCR Environmental Corporation

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session RB 2: Facilities Operation, Management, and Planning

Monday, May 6, 2013
1:30pm – 4:45pm

Room: 205
2.5 PDHs

Moderators: Bob Forbes, CH2M HILL
Michael Bullard, Hazen and Sawyer

- RB2A 1:30pm** **Economic Methods Matter - Appropriate Analysis Can Overcome the Biggest Barrier to Biogas Use**
John L. Willis, Karen Durden, Brown & Caldwell; Mike Ellenbaas, Black and Veatch; Lauren Fillmore, WERF; Lori Stone, Marc Walch, Brown and Caldwell
- RB2B 2:00pm** **Making the Case for Sustainable Biosolids Management Solutions: A Roadmap for Fourteen Facilities**
Matthew Berg, CH2M HILL; Bruce Cole, Ken Wesson, Jeff Ray, Tiffany Currie, North Texas Municipal Utility District; Jenna Covington, Brigit Buff, Dru Whitlock, Todd Williams, CH2M HILL
- RB2C 2:30pm** **To Haul or Not to Haul? Capacity and Class A Biosolids Processing Expansion at the Haifa, Israel Wastewater Treatment Plant**
Matthew P. Van Horne, Michael Bullard, Hazen and Sawyer
- 3:00pm** **Networking Break**
- RB2D 3:45pm** **Biosolids Processing and Distribution: Challenges Continue**
Robert Bates, Louisville Metropolitan Sewer District
- RB2E 4:15pm** **Benefits and Costs of Co-Digestion for a Large Utility**
John F. Donovan, David Parry, CDM Smith; Daniel K. O'Brien, David Duest, Massachusetts Water Resources Authority
- 4:45pm** **Adjourn**

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session RB 3: Beneficial Use

Monday, May 6, 2013
1:30pm – 3:00pm

Room:206
1.25 PDHs

Moderators: Tazio Qubeck, Brown and Caldwell
Trudy Johnson, Material Matters

- RB3A 1:30pm** **Sustainable Solution to the Disposal Epidemic: Beneficial Use of Water Treatment Residual in Manufactured Topsoil**
Jennifer Callahan, Trudy Johnston, Material Matters, Inc.
- RB3B 2:00pm** **Why the Fertilizer Industry Could Use a Little Biosolids**
John F. Donovan, CDM Smith Inc.; Jeffrey C. Burnham, VitAg Corporation
- RB3C 2:30pm** **Over 20 Years of Successful Beneficial Use: Adapting the Management System Approach: Los Angeles Experience**
Diane Gilbert-Jones, City of Los Angeles
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session RB 4: Conditioning and Dewatering Technologies

Monday, May 6, 2013
1:30pm – 3:00pm

Room: 209/210
1.25 PDHs

Moderators: Bob Gillette, Carollo Engineers
Jim Smith Jr., Independent Environmental Consultant

- RB4A 1:30pm** **Evaluation of Electrodewatering for Enhanced Biosolids Dewatering**
Kelly Brenner, Aaron Stephens, Material Matters, Dean Minnich,
Nazareth Borough Municipal Authority
- RB4B 2:00pm** **High Solids Loading for a DAFT Retrofit for Co-Thickening Operation**
Richard T. Kelly, Dave Newman, John Bratby, Brown and Caldwell; Mike
Patrick, City of Tacoma
- RB4C 2:30pm** **Decision Factors on Solids Dewatering Technologies for DC Water's
Biosolids Program**
Perry L. Schafer, Brown and Caldwell; Salil Kharkar, Sudhir Murthy,
Christopher Peot, Diala Dandach, DC Water and Sewer Authority; Sam
Roberts, Philip Braswell, Brown and Caldwell
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session RB 5: Public Support

Monday, May 6, 2013
3:45pm – 4:45pm

Room: 205
1 PDH

Moderator: Steve Wilson, Brown and Caldwell

RB5A 3:45pm **Improving Public Communication and Outreach at the METROGRO Farm**

Alicia Gilley, Kelley Merritt, Bryan Mitchell, Metro Wastewater Reclamation District

RB5B 4:15pm **New Biosolids Technologies and Processes for Developing Countries**

Richard D. Kuchenrither, University of Colorado Boulder; Lori Stone, Black & Veatch; Roger T. Haug, Loyola Marymount University; Lauren Fillmore, Amit Pramanik, WERF

4:45pm **Adjourn**

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session RB 6: Odor and Pathogen Control

Monday, May 6, 2013
3:45pm – 4:45pm

Room: 206
1 PDH

Moderators: Todd O. Williams, CH2M HILL
Yinan Qi, Black & Veatch

RB6A 3:45pm **Novel BioElectro™ Process for Biosolids Sterilization**
Eham Takhtehfouladi, Maria Elektorowicz, Concordia University;
Robert S. Reimers, Tulane University; Jan A. Oleszkiewicz,
University of Manitoba

RB6B 4:15pm **Treatment of Odor by a Seashell Biofilter at Lake Wildwood WWTP**
Samantha M. Abraham, UCLA; Scott Joslyn, Nevada County Sanitation
District; Irwin Suffet, UCLA

4:45pm **Adjourn**

Alternate 1 **Sanitary Assurance at Biosolids Composting Facilities: Development of a Temperature Contact Time Test Protocol**
Pulat Isobaev, Daryl McCartney, Kristine Wichuk, Norman Neumann, University
of Alberta

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of this session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session RB 7: Thermal Processes

Tuesday, May 7, 2013
8:30am – 10:00am

Room: 204
1.25 PDHs

Moderators: Robert Bates, Louisville Metropolitan Sewer District (KY)
Scott Carr, CDM Smith

RB7A 8:30am **Thermal Drying to Achieve Class A Biosolids Can be a Viable Option for Medium Sized Generators - A Case Study in Bowling Green, Kentucky**

Kristi Schnell, Ronald Abraham, Kenneth Baker, Gresham Smith and Partners; Scott Neighbors, Bowling Green Municipal Utilities

RB7B 9:00am **The Duffin Creek Biosolids to Energy Experience - Lessons in Energy Recovery**

Peter Burrowes, CH2M HILL; Brad Dobson, Regional Municipality of Durham; Euan Ferguson, York Region; Robert Christopher, Serge Larocque, CH2M HILL

RB7C 9:30am **A Comparison of Conventional Heating and Microwave Irradiation for Enhanced Biogas Production from Municipal Biosolids**

Seyedeh Neda Mehdizadeh, Cigdem Eskicioglu, Hanna Hamid, University of British Columbia-Okanagan

10:00am **Adjourn**

Alternate 1 **Meeting the New SSI MACT Regulations - A Case Study**

Jay R. Surtj, Peter Burrowes, CH2M HILL

TECHNICAL PROGRAM

Session RB 8: Success Stories and Lessons Learned

Tuesday, May 7, 2013
8:30am – 11:45am

Room: 205
2.5 PDHs

Moderators: Kevin Colvette, CH2M Hill
David Oerke, CH2M Hill

RB8A 8:30am **PCBs in Biosolids: Monitoring In a Large Urban WWTP Using a Newly Developed Practical Extraction Procedure**
Devrim Kaya, Middle East Technical University/ Kocaeli University; Filiz Karakaş, F.Dilek Sanin, Ipek Imamoglu, Middle East Technical University

RB8B 9:00am **Composting Success at Spotsylvania County**
Todd O. Williams, CH2M HILL; Doug Crooks, Spotsylvania County

RB8C 9:30am **Speedway, Indiana, WWTP Biosolids Upgrade: Storage Nitrification/Denitrification Reactor Results in Ammonia Loading Reduction**
Cynthia L. Fort, American Structurepoint Inc; Norman Berry, Town of Speedway

10:00am **Networking Break**

RB8D 10:45am **Sustainable Biosolids Management in South Florida: Lessons Learned from the Design, Construction, and Operation a Regional Biosolids Pelletization Facility Fueled by Landfill Gas**
Amber M. Barritt, CDM Smith; Raymond H. Schauer, Solid Waste Authority of Palm Beach County

RB8E 11:15am **How to Make Improvements When The Cupboard is Bare: Energy Service Contracting**
Patricia A. Scanlan, Bob Wimmer, Pete Thomson, Justin Dickstein, Black & Veatch; Tom Appleman, UOSA; Jesse Moffat, FWSA; Dennis Clough, ESG

11:45am **Adjourn**

Alternate 1 **The Shafdan Digestion and Cogeneration Project**
David L. Parry, Scott Vandenburg, CDM Smith

TECHNICAL PROGRAM

Session RB 9: Research and Development Activities

Tuesday, May 7, 2013
8:30am – 11:45am

Room: 206
2.5 PDHs

Moderators: John Willis, Brown and Caldwell
David Parry, CDM Smith

- RB9A 8:30am** **Investigation of the Impacts of Thermal Activated Sludge Pretreatment and Development of a Pretreatment Model**
Gillian R. Burger, Wayne J. Parker, University of Waterloo
- RB9B 9:00am** **Second Law Analysis of Resource Recovery from Wastewater**
David L. Parry, CDM Smith
- RB9C 9:30am** **Simultaneous Sludge Disintegration and Carbon Source Generation for Enhanced Biological Phosphorous Removal Using Ozonation**
Devendra P. Saroj, University of Surrey; Adriana Inchauste-Daza, Carlos Lopez-Vazquez, UNESCO-IHE Institute for Water Education
- 10:00am** **Networking Break**
- RB9D 10:45am** **“Second Generation” ATAD Success Stories - “Show Me The Data”- Several Years of Performance Data from Two Case Studies of Conversion from “First Generation” to “Second Generation” ATAD Systems**
David W. Oerke, CH2M HILL; Chad Olsen, McMahon Associates; Jim Kirk, Grand Chute Menasha West Sewerage Commission; Parker Newbanks, Candi Burbridge, Eagle River Water and Sanitation District; Heidi Bauer, CH2M HILL
- RB9E 11:15am** **An Approach to Dewatering Optimization using UV/Visible Spectrometry by Monitoring Residual Polymer in Centrate**
Banu Ormeci, Fares Almomani, Carleton University;
Peter Gallant, ENDETEC/Veolia Water Solutions and Technologies;
Richard DiMassimo, Jeffery Privott, Kruger Inc.
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session RB 10: Bioenergy from Residuals I

Tuesday, May 7, 2013
8:30am – 11:45am

Room: 209/210
2.5 PDHs

Moderators: Aaron Stephens, Material Matters, Inc.
Dustin Craig, CDM Smith

- RB10A 8:30am** **Pilot Study of Siloxanes Removal from Digester Biogas through Various Adsorbents**
Yuanming Tsai, Sunil Mehta, Infilco Degremont, Inc; Jordi Raich-Montiu, CETaqua; Charles B. Bott, William J. Balzer, Hampton Roads Sanitation District; Peter A. Burrowes, CH2M HILL
- RB10B 9:00am** **Sometimes Average isn't Good Enough: Understanding the Impact of Variability on Energy Recovery from Digester Gas**
James H. Long, Charles M. Bullard, Hazen and Sawyer; Chris Shamel, Frank Crump, City of Winston-Salem
- RB10C 9:30am** **Restaurant Trap Waste Characterization and Full Scale FOG Co-Digestion at the San Francisco Oceanside Plant**
Alexandre Miot, Bonnie Jones, Karri Ving, San Francisco Public Utilities Commission; Morayo Noibi, Carollo Engineers; Irina Likicheva, Domenech Jolis, San Francisco Public Utilities Commission
- 10:00am** **Networking Break**
- RB10D 10:45am** **Clean Combustion of Sludge Derived Fuel Part 1 of 2 - Concept to Pilot**
Roger T. Haug, Loyola Marymount University; F. Michael Lewis, F. Michael Lewis Inc.
- RB10E 11:15am** **Clean Combustion of Sludge Derived Fuels: Part 2 of 2 Pilot to Practice**
F. Michael Lewis, F Michael Lewis Inc.; Roger T. Haug, Loyola Marymount University; Lee Lundberg, Veolia Water
- 11:45am** **Adjourn**
- Alternate 1** **What Can Solids Do for You? - Shifting Towards Solids as an Energy Resource**
Eric Auerbach, Malcolm Pirnie Inc; Thomas E. Kunetz, Metropolitan Water Reclamation District of Greater Chicago; Rob Van Evra, City of Columbus Division of Sewerage and Drainage; James Keller, Buffalo Sewer Authority

TECHNICAL PROGRAM

Session RB 11: Legislative, Regulatory, and Legal Issues

Tuesday, May 7, 2013
10:45am – 11:45am

Room: 204
1 PDH

Moderators: Charlie Alix, Stantec
Greg Kester, California Association of Sanitation Agencies

RB11A 10:45am Biosolids 2013: Odors, Nuisance and Current Legal Challenges to Beneficial Use

James B. Slaughter, Beveridge & Diamond PC

RB11B 11:15am Historical Review of United States (US) Guidance and Regulations for Sludge Disinfection and Stabilization Including a Future Projection

Jim Smith Jr., Independent Environmental Consultant

11:45am Adjourn

TECHNICAL PROGRAM

Session RB 12: Collaboration to Advance Energy Sustainability Initiatives

Tuesday, May 7, 2013
1:30pm – 3:00pm

Room: 204
1.5 PDHs

Moderators: Doug Yarosz, Brown and Caldwell
Patricia Scanlan, Black & Veatch

- RB12A 1:30pm** **A National Survey of Biogas use at Wastewater Treatment Plants in the United States: The Results**
Yinan Qi, Black & Veatch; Ned Beecher, North East Biosolids and Residuals Association (NEBRA); Lori Stone, Black & Veatch
- RB12B 2:00pm** **Road to Energy Neutrality – WERF is Paving the Way with a Focus on Biosolids Energy**
Ralph Eschborn, AECOM; Paul Kohl, Philadelphia Water Department; Steve Tarallo, Black and Veatch; Lauren Fillmore, Water Environment Research Foundation
- RB12C 2:30pm** **Nineteen Agencies Team to Convert Biosolids to Energy for Regional Solution**
Robert A. Gillette, Todd C. Jordan, Carollo Engineers; Caroline Quinn, Delta Diablo Sanitation District; EJ Shalaby, West County Wastewater District
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session RB 13: Biosolids Land Application, Land Reclamation, and Nutrient Management

Tuesday, May 7, 2013
1:30pm – 4:45pm

Room: 205
2.5 PDHs

Moderators: Jeffrey J. LeBlanc, WeCare Organics, LLC
Michelle Hatcher, CDM Smith

- RB13A 1:30pm** **Fate and Removal of Steroidal Hormones during Advanced
Advanced Municipal Biosolids Treatment Process**
Hanna Hamid, Cigdem Eskicioglu, University of British Columbia
- RB13B 2:00pm** **Long Term Monitoring Results for the METROGRO Farm Near Deer
Trail, Colorado**
James E. Johnson, Arlisa Michael, Alicia Gilley, Metro Wastewater
Reclamation District
- RB13C 2:30pm** **Case Study: Nutrient Trading Options for Satisfying NPDES Cap
Load in the Chesapeake Bay Watershed**
Aaron B. Stephens, Jennifer Callahan, Material Matters, Inc
- 3:00pm** **Networking Break**
- RB13D 3:45pm** **Mine Land Reclamation and Biosolids: A Perfect Match**
Trudy Johnston, Material Matters, Inc.; Jennifer Callahan, Material
Matters, Inc.; Michael Deily, Harrisburg Advanced Wastewater Treatment
Facility
- RB13E 4:15pm** **Too Much Nitrogen?**
Dale D. Gabel, CH2M HILL; Dave Meyer, Tim Woodard, Kent Brugler,
City of Westminster; Jim Jordahl, Heidi Bauer, Kerry Meyer, CH2M HILL;
Thomas Borch, Colorado State University
- 4:45pm** **Adjourn**

TECHNICAL PROGRAM

Session RB 14: What's the Future For Biosolids? Findings of a New WEF/WERF Report

Tuesday, May 7, 2013
1:30pm – 3:00pm

Room: 206
1.5 PDHs

WEF and WERF have collaborated with CDM Smith, Black & Veatch, Hazen & Sawyer and CH2M Hill Inc. to examine the future of biosolids treatment with specific regard to resource recovery. This effort is summarized in a new publication, funded by the US EPA that addresses policy and planning, technical and communication/outreach needs to advance resource recovery. The document focuses on organics, nutrients, and energy recovery, but also examines emerging recovery areas such as bio-plastics. Perspectives on these issues will be reviewed and discussed by a select panel of contributors, along with a moderator, concluding with questions and answers from the audience as a means to formally roll out and promote the study.

- 1:30pm** **Introduction**
John Donovan, CDM Smith
- 1:35pm** **Policy and Planning: Building a Framework for Resource Recovery**
Lynne Moss, CDM Smith
- 1:45pm** **Organics Recycling: A New Perspective**
Lynne Moss, CDM Smith
- 1:50pm** **Energy Recovery**
Christine Polo, Black & Veatch
- 2:00pm** **Changing Perspectives: From Nutrient Removal to Nutrient Recovery**
Ron Latimer, Wendall Khunjar, Hazen and Sawyer
- 2:10pm** **Enabling the Future: Investing in People, Quality and Communications**
Ned Beecher, North East Biosolids & Residuals Association
- 2:20pm** **Panel Discussion**
John Donovan, CDM Smith
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session RB 15: Bioenergy from Residuals II

Tuesday, May 7, 2013
1:30pm – 4:45pm

Room: 209/210
2.5 PDHs

Moderators: Mohammad Abu-Orf, AECOM
Richard Tsang, CDM Smith

- RB15A 1:30pm The Tale of Two Digesters: Hydraulic Versus Compressed Biogas Mixing**
Richard W. von Langen, RVL Associates, Inc.; Richard Althouse, Fairfield Suisun Sewer District; Glenn Dorsch, Vaughan Company; Brad Rockwell, Rockwell Equipment and Engineering, Co.
- RB15B 2:00pm An Update to the City and County of Honolulu Biosolids Management Plan - A Focus on Energy and Solids Minimization**
Charles T. Goss, Mohammad Abu-Orf, Jeremy Koch, Jordan Fahmie, AECOM
- RB15C 2:30pm Maximizing Opportunities for Beneficial use of Biogas for Pima County, Arizona**
Jing Luo, Pima County; Gary Newman, Brown and Caldwell, Inc; Michael Gritzuk, Private Consultant; Eron Jacobson, Brown and Caldwell, Inc; Jerry Bish, Greeley and Hansen, LLC; Fernando Sarmiento, Greeley and Hansen, LLC; Jackson Jenkins, Pima County
- 3:00pm Networking Break**
- RB15D 3:45pm Positive Business Case for Codigestion and Resource Recovery Facilities in Australia without Pre-Existing Anaerobic Digesters**
John Kabouris, Tim Shea, Kate Simmonds, CH2M HILL
- RB15E 4:15pm Co-Thickening and Cogeneration in The Electric City**
Vincent Apa, CDM Smith
- 4:45pm Adjourn**
- Alternate & Poster Development, Implementation and Demonstration of The Co-digestion of Source Separated Food Waste by The City of Tacoma**
Christopher Muller, Brown & Caldwell; James Parvey, Lewis Griffith, City of Tacoma, WA; John Burke, David McBride, Donald Stallman, Brown and Caldwell

TECHNICAL PROGRAM

Session RB 16: Biosolids Management Approach: A Panel Discussion on Technology Selection Specific to End Use

Tuesday, May 7, 2013
3:45pm – 4:45pm

Room: 204
1 PDH

Moderators: Chris Peot, DC Water
Tazio Qubeck, Brown and Caldwell

In this panel discussion, representatives from three utilities will discuss the approaches behind recent updates to their biosolids management programs. Inherently, every utility has a unique combination of evaluation criteria (economic, political, environmental, social, geographical, etc.) that are used to select the chosen technology and ultimate end use of its biosolids. Experience and lessons learned from these utilities and the ensuing discussion are intended to provide insight to those who are contemplating an update to their biosolids management approach.

- **Biosolids Management System at the Moccasin Bend WWTP in Chattanooga, TN**
Matthew L. Snyder, Alice Cannella, City of Chattanooga, TN
- **Indirect Heat Drying at Bowling Green Municipal Utilities in Bowling Green, KY**
Michael Gardner, Bowling Green Municipal Utilities
- **Biosolids Processing at the Morris Forman Water Quality Treatment Center in Louisville, KY**
Robert Bates, Louisville Metropolitan Sewer District

TECHNICAL PROGRAM

Session RB 17: Why Must We Manage Biosolids as a Nutrient Resource

**Tuesday, May 7, 2013
3:45pm – 4:45pm**

**Room: 205
1 PDH**

The U.S. Department of Agriculture and The U.S. Environmental Protection Agency in cooperation with State Departments of Agriculture, Environment, and Conservation and Land Grant Universities have initiated a long term project to reduce the load of nutrients entering streams and rivers throughout the nation. A comprehensive nutrient management strategy involves application of a science, technology and management -based framework to assess and reduce nutrient losses to waters of the U.S while optimizing crop yield and quality. A nutrient management plan is designed to optimize nutrient use for crop production and reduce nutrient introduction to surface water from both point and nonpoint sources in a scientifically sound and cost effective manner.

Farmers involved in nutrient management programs have demonstrated that voluntary management practices are reducing the loss of fertilizer from fields. Their goal is to better manage nutrients to make them available for plant growth rather than drain into shallow groundwater and surface waters. The application of comprehensive nutrient management planning processes to biosolids management has started in many jurisdictions and discussion with state personnel indicate these plans will be an essential part of future land based biosolids management efforts. This session presents a general assessment of nutrient content of biosolid material and biosolid derived products, examples of research results documenting consequences of land treatment efforts, and implementation efforts for nutrient management planning at the state level.

Presenters:

Robert Rubin, North Carolina State University

Forbes Walker, University of Tennessee

Patricia Turman, USDA-NRCS

TECHNICAL PROGRAM

Session RB 18: Featured Session: Local Metro Water Services Panel

Wednesday, May 8, 2013
8:30am – 11:45am

Room: 205
2.5 PDHs

Moderators: Heather Crabtree, Metro Water Services
Doug Yarosz, Brown and Caldwell

In this special panel discussion, representatives from Nashville's Metro Water Services (MWS) will present the history and evolution of biosolids management at MWS facilities, focusing on the challenges and opportunities encountered during and after implementation of a system-wide Biosolids Management Upgrade.

The planning discussion will feature project drivers, design considerations and the evaluation process that led to the selection and design-build delivery of the \$125M Central Biosolids Facility. Highlights of this facility include circular dissolved air flotation co-thickening, anaerobic digestion and thermal drying.

Now 5 years since the facility was completed, MWS will share lessons learned throughout the project. Operations staff will discuss their experience during the commissioning period as well as the current operation of the facility. The panel will conclude with discussion related to the facility damage resulting from the Nashville flood of May 2010 and emergency operating protocols that are implemented when solids handling facilities are flood damaged.

- 8:30am** **Welcome**
Scott Potter, Metro Water Services
- 8:35am** **The History and Evolution of Biosolids Management**
David Tucker, Metro Water Services
- 9:05am** **Biosolids Facility Planning and Implementation**
Ron Taylor, Metro Water Services
Shannon Lambert, Barge Waggoner Sumner and Cannon, Inc.
- 10:00am** **Networking Break**
- 10:15am** **Biosolids Facility Commissioning and Lessons Learned**
Roy Denney, Metro Water Services
- 10:50am** **Flood Recovery by the Book, While Writing the Book**
Bob Wimmer, Black & Veatch
- 11:25am** **Question & Answer**
- 11:45am** **Adjourn**

RESIDUALS AND BIOSOLIDS SESSIONS AT-A-GLANCE

Session #	Title	Credits	Room
SUNDAY			
Workshop A	Biosolids 101 – Fundamentals of Practice	0.6 CEUs	204
Workshop B	Using Appropriate Economic Methodologies for Evaluation of Cost-Saving Projects	0.3 CEUs	205
Workshop C	503 Biosolids Jeopardy	0.3 CEUs	206
MONDAY			
	Opening General Session	2.25 PDHs	204/205
1	Advances in Stabilization Technologies	2.5 PDHs	204
2	Facilities Operation, Management, and Planning	2.5 PDHs	205
3	Beneficial Use	1.25 PDHs	206
4	Conditioning and Dewatering Technologies	1.25 PDHs	209/210
5	Public Support	1 PDH	205
6	Odor and Pathogen Control	1 PDH	206
TUESDAY			
7	Thermal Processes	1.5 PDHs	204
8	Success Stories and Lessons Learned	2.5 PDHs	205
9	Research and Development Activities	2.5 PDHs	206
10	Bioenergy from Residuals I	2.5 PDHs	209/210
11	Legislative, Regulatory, and Legal Issues	1 PDH	204
Tour	Nashville's Biosolids Facilities	3.5 Contact Hours	Offsite
12	Collaboration to Advance Energy Sustainability Initiatives	1.5 PDHs	204
13	Biosolids Land Application, Land Reclamation, and Nutrient Management	2.5 PDHs	205
14	What's the Future For Biosolids? Findings of a New WEF/WERF Report	1.5 PDHs	206
15	Bioenergy from Residuals II	2.5 PDHs	209/210
16	Biosolids Management Approach: A Panel Discussion on Technology Selection Specific to End Use	1 PDH	204
17	Why Must We Manage Biosolids as a Nutrient Resource	1 PDH	205
WEDNESDAY			
18	Featured: Local Metro Water Services Panel	2.5 PDHs	205



Energy and Water 2013: Integrated Solutions for Advancing Technology and Management



This conference is organized by the Water Environment Federation in cooperation with the Kentucky-Tennessee Water Environment Association, Water Environment Research Foundation, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Imagine H₂O, and the Alliance for Water Efficiency.

WORKSHOP A

Workshop A: Energy Services Performance Contracting: Innovative Delivery that GUARANTEES Energy and Cost Savings!

Monday, May 6, 2013

Room: 103/104

8:30am – 12:00pm

0.3CEUs

- 8:30am** **Opening Remarks**
Peter Thomson, Black & Veatch
- 8:40am** **Introduction to Performance Contracting**
Peter Thomson, Black & Veatch
- 9:00am** **First Breakout Session – Identify Challenges to Implementing Performance Contracting**
- 9:20am** **Report out from Breakout**
- 9:40am** **Helping a Colorado Town Save 35% on Well Pumping Costs**
Justin Rundle, Honeywell Building Solutions
- 10:00am** **Break**
- 10:30am** **How a Texas Community Leveraged Guaranteed Utility Savings to Pay for Water and Wastewater Infrastructure Improvements**
- 10:50am** **Challenging “Business As Usual” – FWSA Looks to Energy Savings Performance Contracting**
Dennis Clough, Energy Systems Group
- 11:10am** **Second Breakout Session – Identify Solutions to Challenges from Breakout Session 1**
Jordan Lerner, Energy Solutions, Schneider Electric
- 11:30am** **Report out from Breakout**
- 11:50am** **Closing Remarks**
Peter Thomson, Black & Veatch
- 12:00pm** **Adjourn**

WORKSHOP B

Workshop B: “Drivers Ed” for the Energy Roadmap

Monday, May 6, 2013

8:30am – 12:00pm

Room: 108/109

0.3 CEUs

- 8:30am** **Welcome, Workshop Format, Background Roadmap**
Alicia Chakrabarti, EBMUD
- 8:50am** **Strategic Management / Organizational Culture**
Ed McCormick, EBMUD
- 9:10am** **Innovating for the Future**
Bill Toffey, Effluential Synergies
- 9:25am** **Demand Side Reduction / Energy Generation**
Dave Reardon, HDR
- 10:00am** **Break**
- 10:25am** **Communications and Outreach**
Jason Turgeon, USEPA
- 10:40am** **Instructions for Teaching Case and Break Out**
Barry Liner, Water Environment Federation
- 10:45am** **Group Address Case Study Questions**
All Speakers and Facilitators
- 11:40am** **Report Out on Findings**
All Speakers
- 12:00pm** **Adjourn**

OPENING GENERAL SESSION

Monday, May 6, 2013

1:30pm – 5:00pm

Room: 108/109

3.0 PDHs

- 1:30 pm** **Welcome and Opening Remarks**
Cindy Wallis-Lage, Black & Veatch, *Conference Chair*
- 1:35pm** **WEF and KY/TN WEA Introductions**
Rick Warner, Washoe County, NV
Wes Sydnor, Louisville MSD, KY
- 1:45 pm** **Robert Balzar**
Vice President, Demand Side Management, Tennessee Valley Authority
- 2:00 pm** **Holmes Hummel**
Senior Advisor, Office of the Undersecretary for Energy
- 2:30 pm** **Cynthia Truelove**
Director and Visiting Scholar, Stanford University
- 3:00 pm** **Networking Break**
- 3:45 pm** **Panel Discussion: Energy Management Challenges and Opportunities for Wastewater Utilities**
Steve Rogowski, Metro Water Reclamation District, CO
Rob Taylor, Washington Suburban Sanitary Commission
George Martin, Greenwood Metropolitan District, SC
Moderator: Charles Bott, Hampton Roads Sanitation District
- 5:00 pm** **Adjourn**

Networking Reception – Center/East Exhibit Hall

Immediately following the conclusion of the Opening General Session, please join us for the Networking Reception held in Center/East Exhibit Hall from 5:00pm – 6:30pm

TECHNICAL PROGRAM

Session EW 1: Treatment

Tuesday, May 7
8:30am – 11:45am

Room: 103/104
2.5 PDHs

Moderator: Jeanette Brown, Manhattan College
Peter Cavagnaro, Johnson Controls

- EW1A 8:30am** **Energy Evaluation of Combination Processes for Secondary Effluent Treatment**
Hong Y. Wang, Dongbum Im, Aki Ito, Naoya Wada, Norihide Nakada, Research Center for Environmental Quality Management, Kyoto University; Michiko Aoki, Yasuhiro Kato, Metawater Co., Ltd.; Hiroaki Tanaka, Research Center for Environmental Quality Management, Kyoto University
- EW1B 9:00am** **Nexus of Energy and Virus Reduction of UF Membrane Filtration Process with Coagulation/UV Irradiation for Wastewater Reclamation**
Suntae Lee, Naoyuki Yamashita, Masaru Ihara, Hiroaki Tanaka, Kyoto University; Kentaro Kobayashi, Hiroaki Tanaka, Hiroo Takabatake, Yuji Tanaka, Toray Industries
- EW1C 9:30am** **Overview and Challenges of Anaerobic Wastewater Treatment: Is there a Place for It in Our Future?**
Jose A. Jimenez, Brown And Caldwell; Charles Bott, HRSD
- 10:00am** **Networking Break**
- EW1D 10:45am** **Achieving Positive Net Energy While Maximizing Use of Existing Assets: The Ejby Molle WWTP Story**
Julian Sandino, CH2M HILL; Per H. Nielsen, VandCenter Syd (VCS) Denmark; Dru Whitlock, Tom Johnson, CH2M HILL; Mads Leth, VandCenter Syd (VCS) Denmark; Thomas Jensen, Michael Nielsen, Ramboll Denmark
- EW1E 11:15am** **NEW (Nutrient, Energy, Water) Sustainability Principles Drive Technology Selection in Advanced Water Reclamation Application**
Randall Boe, Srinivas Jalla, Chuck Crandall, Julian Sandino, Jeremy Kraemer, CH2M HILL; Todd Cleaver, Tyler Richards, Holly Elmendorf, Gwinnett County, GA Department of Water Resources
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session EW 2: Alternative Energy

Tuesday, May 7
8:30am – 11:45am

Room: 108/109
2.5 PDHs

Moderators: Priscilla Bloomfield, CH2M HILL
Robert Lonergan, Tetra Tech

- EW2A 8:30am** **High Efficiency Bio-Diesel Production from a Municipal FOG Facility**
Michael D. Curtis, RPM Sustainable Technologies; J. Lanzoni, Siemens; R. Parnas, RPM Sustainable Technologies
- EW2B 9:00am** **Sustainable Energy Management Systems for Wastewater Treatment Facilities**
James C. McCaughey, Narragansett Bay Commission
- EW2C 9:30am** **eVortex: A Novel Energy Harvesting Mechanism for Waste and Storm Water Conveyance Systems**
Mungtra Chuslip, Arun Prakash Jaganathan, Erez Allouche, Louisiana Tech University
- 10:00am** **Networking Break**
- EW2D 10:45am** **Use of Alternative Water Sources for a Trigeneration System: A Case Study**
Priska Grace, Dwayne Myers, Enrique Lopez Calva, Shirley Zhang, Priyanka Mehta, CDM Smith
- EW2E 11:15am** **Demonstrating the Business Case for Biogas-fueled Stationary Fuel Cell Power Systems at Wastewater Treatment Facilities**
Gregory D. Moreland, SRA International; Peter Devlin, U.S. Department of Energy
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session EW 3: Greenhouse Gases

Tuesday, May 7
1:30pm – 4:45pm

Room: 103/104
2.5 PDHs

Moderator: Robert Lonergan, Tetra Tech
Priscilla Bloomfield, CH2M HILL

- EW3A 1:30pm** **Carbon Free Water - A Successful Case Study in Sonoma County, California**
Cordel Stillman, Amy Bolten, Sonoma County Water Agency
- EW3B 2:00pm** **Estimating Carbon Emissions in Water Supply Portfolio Evaluations Including Recycled Water and Greywater**
Enrique J. Lopez Calva, Shirley Zhang, Dwayne R. Myers, Priska Grace, P. Mehta, CDM Smith
- EW3C 2:30pm** **Climate Ready Water Utilities: Helping the Water Sector Prepare for and Adapt to a Climate Change**
Laura Dubin, U.S. Environmental Protection Agency
- 3:00pm** **Networking Break**
- EW3D 3:45pm** **Quantifying Fugitive CH₄ Emissions from Facultative Sludge Lagoons**
Anup Shah, Brown and Caldwell; Lauren Fillmore, Water Environment Research Foundation; A. Detweiler, NASA-AMES Research Center; John Willis, Brown and Caldwell; Brad Bebout, Adrienne Frisbee, NASA-AMES Research Center; Cheryl Kelley, University of Missouri; Jeff Chanton, Florida State University; Leslie Bebout, NASA-AMES Research Center
- EW3E 4:15pm** **Peak Amplification of Energy Demand, Energy Cost, and Carbon Emission in Water Reclamation and Purification Processes During Diurnal Cycles**
Reza Sobhani, University of California, Irvine; Lory Larson, Southern California Edison; Diego Rosso, University of California, Irvine
- 4:45pm** **Adjourn**

TECHNICAL PROGRAM

Session EW 4: Lessons Learned

Tuesday, May 7
1:30pm – 4:45pm

Room: 108/109
2.5 PDHs

Moderator: John Willis, Brown and Caldwell
Peter Cavagnaro, Johnson Controls

- EW4A 1:30pm** **Energy Consumption Trends in BNR Mixing Technologies**
Lamya Badr, Joe Rohrbacher, Patricia Stiegel, Hazen and Sawyer; Don Howard, Lori Cooper, City of Greensboro
- EW4B 2:00pm** **Making Energy Efficiency Happen - Experience and Lessons Learned in the EPA Region 4 - TN Department of Environment Conservation Energy Management Initiative**
Robert J. Freeman, US EPA Region 4 Atlanta; Jennifer Dodd, Tennessee Department of Environment & Conservation
- EW4C 2:30pm** **Energy Efficient, Sustainable Improvements and Technologies Implemented at Wastewater Treatment Plants**
Brian Sibiga, Wendel; Frank Nerone, Niagara County Sewer District No. 1
- 3:00pm** **Networking Break**
- EW4D 3:45pm** **Minimizing Energy Consumption in Decentralized Wastewater Collection and Treatment Systems**
Kartiki S. Naik, Michael K. Stenstrom, University of California, Los Angeles
- EW4E 4:15pm** **Ten Years and Counting in the Wastewater Process Energy Efficiency Industry: Northern California's CalPOP Program**
Edward C. Myers, Lescure Engineers; John Bidwell, Quantum Energy Services and Technologies (QuEST) Inc.
- 4:45pm** **Adjourn**

TECHNICAL PROGRAM

Session EW 5: Water Quantity

Wednesday, May 8
8:30am - 10:00am

Room: 103/104
1.5 PDHs

Moderator: Jeanette Brown, Manhattan College

EW5A 8:30am The Water Implications of Generating Electricity: Water Consumption Across the United States Based on Different Electricity Pathways through 2050

Jordan Macknick, National Renewable Energy Laboratory;
Sandra Sattler, Union of Concerned Scientists; Kristen Averyt,
Cooperative Institute for Research in Environmental Sciences;
Steve Clemmer, John Rogers, Union of Concerned Scientists

EW5B 9:00am Water and Energy Utilities: Improving Collaboration
Cindy Dyballa, Dyballa Consulting

EW5C 9:30am The Importance of Water for Power Generation
Michael C. Preston, Black & Veatch

10:00am Adjourn

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 6: Control Strategies

Wednesday, May 8
8:30am - 11:45am

Room: 108/109
2.5 PDHs

Moderator: Louann Unger, USEPA

- EW6A 8:30am** **Watery in the U.S.: Energy Management, Policy Mechanisms and Technologies to Optimize Energy Use in Pumping and Aeration Systems**
Bruce Lung, Alliance to Save Energy; Lisa Tryson, John Masters, Danfoss; Ryan Graf, Policy Navigation Group;
- EW6B 9:00am** **Energy Savings from Advanced Process Control: Two Case Studies**
Steven M. Kestel, Matthew Gray, Weixin Shi, BioChem Technology; Junquan Yan, Jieyuan Draining Co.
- EW6C 9:30am** **Dynamic Energy Footprint Monitoring and Reduction in Energy Demand from Wastewater Aeration Systems via Full-Scale Deployment of Real-Time Off-Gas Analyzers**
Matthew K. Jeung, University of California, Irvine; Lory E. Larson, Southern California Edison; Michael K. Stenstrom, UCLA; Diego Rosso, University of California, Irvine
- 10:00am** **Networking Break**
- EW6D 10:45am** **Advanced Controls Maximizes Energy Efficiency of a Large Effluent Pump Station**
Curt Wendt, CDM Smith Inc
- EW6E 11:15am** **Advanced Water Reclamation Minimizes the Energy Footprint: The Riverfront Water Reclamation Facility**
Brooks W. Newbry, Water Technology Group; Kenneth Knickerbocker, Wood, Patel and Assoc. Consulting Engineers; Dan Lueder, City of Cottonwood, Arizona
- 11:45am** **Adjourn**

TECHNICAL PROGRAM

Session EW 7: Water Quality

Wednesday, May 8
10:45am - 11:45am

Room: 103/104
1 PDH

Moderator: Cindy Wallis-Lage, Black & Veatch

EW7A 10:45am **Reclaimed Water Quality Requirements for Electric Utilities**
Don Vandertulip, CDM Smith

EW7B 11:15am **Maintaining NPDES Permit Compliance at Power Plants While
Using Municipal Treatment Plant Effluent with Variable
Ammonia and Nitrate Levels.**
Christopher Varnon, Randi Kim, Joseph Viciere, Nathan
Schmaus, Tina Petersen, CDM Smith; Jaron Bergin, Calpine Corp

11:45am **Adjourn**

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 8: Energy Savings

Wednesday, May 8
1:30pm - 3:00pm

Room: 103/104
1.5 PDHs

Moderators: Tom Schwartz, Woodard and Curran
Priscilla Bloomfield, CH2M HILL

- EW8A 1:30pm** **Get It Done! - Using Performance Contracting to Implement Energy-Related Improvements**
Richard Atoulikian, HDR; Clark Wiedetz, Siemens;
Thomas Kochaba, Kim Kennedy, Robert Huffmyer, HDR
- EW8B 2:00pm** **Demand Management Strategies Resulting in Zero and Low Cost Energy Saving Opportunities for Water and Wastewater Treatment Facilities**
Bryan R. Lisk, Hazen and Sawyer
- EW8C 2:30pm** **Aeration Efficiency in Oxidation Ditches**
John Lindam, Xylem Water Solutions AB
- 3:00am** **Adjourn**

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 9: Biogas

Wednesday, May 8
1:30pm - 3:00pm

Room: 108/109
1.5 PDHs

Moderators: Jeanette Brown, Manhattan College
Louann Unger, USEPA

- EW9A 1:30pm** **Guide to Bioaugmentation for Systems Experiencing Chemical Inhibition using an Operating Envelope**
Robin Schroeder, Martin Maxwell, and Dong Hyun, Environmental Business Specialists, LLC
- EW9B 2:00pm** **CHP System Implementation and Operations Optimization at F. Wayne Hill Water Resources Center**
Richard Schoeck, Gwinnett County Department of Water Resources; Srinivas Jalla, CH2M HILL; Richard Porter, Gwinnett County Department of Water Resources
- EW9C 2:30pm** **Energy-Recovery from Solids in St. Petersburg, FL: Biogas to Vehicle Fuel and CHP**
John Willis, Brown and Caldwell; Steve Leavitt, Steven Marshall, St. Petersburg; Todd Bosso, Brown and Caldwell
- 3:00pm** **Adjourn**

TECHNICAL PROGRAM

Session EW 10: Global Perspectives

Wednesday, May 8
3:45pm - 5:15pm

Room: 103/104
1.5 PDHs

Moderator: Bob Forbes, CH2M HILL

- | | | |
|-------|--------|---|
| EW10A | 3:45pm | Life Cycle Water use for Electricity Generation: Implications of the Distribution of Collected Estimates
James Meldrum, University of Colorado; <u>Jordan Macknick</u> , Garvin Heath, Syndi Nettles-Anderson, National Renewable Energy Laboratory |
| EW10B | 4:15pm | Water and Energy Efficiency through Steam Systems
Angela Ganley, <u>Lesley Smith</u> , Audra Liubinas, Sophea Eng, City West Water |
| EW10C | 4:45pm | Creating New Revenue with Existing Processes: Evaluating Grid Balance with Demand-Side Loads at Wastewater Treatment Plants Using Dynamic Modeling
<u>Daryl Letto</u> , ENBALA Power Networks; Spencer Snowling, Hydromantis Environmental Software Solutions; Raoul George, Christopher Morrissey, ENBALA Power Networks; Hank Andres, Hydromantis Environmental Software Solutions; Conrad Fox, ENBALA Power Networks |
| | 5:15pm | Adjourn |

Power Day

Note: This session is part of the Power Day Track geared specifically toward electric and gas utilities and their staff.

TECHNICAL PROGRAM

Session EW 11: Exemplary Programs That Save Both Energy and Water

Wednesday, May 8
3:45pm – 5:15pm

Room: 108/109
1.5 PDHs

Moderator: Sara Hayes, American Council for an Energy-Efficient Economy

This session addresses a topic at the heart of the conference: how to design programs that achieve both water and energy savings. The case studies to be presented and the speakers to be featured will provide information on best practices in designing and implementing these programs as well as lessons learned through their experiences.

- 3:45pm Exemplary Programs that Save Both Energy and Water**
Mary Ann Dickinson, Alliance for Water Efficiency
- 4:00pm Massachusetts Water Resource Authority (MWRA) Long Term Sustainability Program**
Stephen Estes-Smargiassi, Massachusetts Water Resources Authority (MWRA)
- 4:10pm Southern California Electric Leak Pilot Detection Program**
Gene Rodrigues, Southern California Electric
- 4:20pm City of Boulder Energy Performance Contracting Program**
Joe Castro, City of Boulder, Colorado
- 4:30pm United Technologies Corporation (UTC) 2015 Sustainability Goals Program**
Sean West, United Technologies Corporation (UTC)
- 4:40pm Questions and Discussion**
- 5:15pm Adjourn**

TECHNICAL PROGRAM

Session EW 12: Research

Thursday, May 9
8:30am - 10:00am

Room: 103/104
1.5 PDHs

Moderator: Stephen Tarallo, Black & Veatch

- EW12A** **8:30am** **Looking at the Future: How Metropolitan Sewer District of Greater Cincinnati (MSDGC) is Turning Waste into Resources and Energy**
Ting Lu, Biju George, MSD of Greater Cincinnati; Joo-Youp Lee, Mingming Lu, University of Cincinnati
- EW12B** **9:00am** **Energy Consumption of MBR for Municipal Wastewater Treatment Current Situation and Potential**
Pierre Cote, COTE Membrane Separation Ltd; Thor Young, Sebastian Smoot, GHD; Jeff Peeters, GE Water & Process Technologies
- EW12C** **9:30am** **Environment Enhancing Energy Innovative Adsorptive-Biological Process to Recovery/Recycle Carbon and Nitrogen from Aqueous Product of Hydrothermal Liquefaction to Maximize Bioenergy Production from Wastewater**
Yan Zhou, Lance Schideman, Yuanhui Zhang, X. Zhao, University of Illinois
- 10:00am** **Adjourn**

TECHNICAL PROGRAM

Session EW 13: Water MSW & Integrated Planning

Thursday, May 9
8:30am - 11:45am

Room: 108/109
3.0 PDHs

Moderator: Jason Turgeon, USEPA

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|--------------|----------------|--|
| EW13A | 8:30am | <p>Sustainable Solutions for the 21st Century - Integration of Water Treatment Systems with Energy Derived from Municipal Wastes
 <u>Paul Hauck</u>, Diane Kemp, Valerie Going, CDM Smith</p> |
| EW13B | 9:00am | <p>Integrating Major Components of a New Landfill Gas System - Coordination of Multiple Contracts for Gas Treatment, Pipeline Transmission and Turbine Energy Generation
 <u>Ralph Schroedel</u>, Brown & Caldwell; Michael Martin, Cary Solberg, William Krill, Milwaukee Metropolitan Sewerage District</p> |
| EW13C | 9:30am | <p>Integrated Net Zero for Energy, Water and Waste at Army Installations: Establishing Priorities in a Fiscally Constrained Context
 <u>Elizabeth Keysar</u>, Concurrent Technologies Corporation (CTC)</p> |
| | 10:00am | Networking Break |
| EW13D | 10:15am | <p>Santa Rosa Case Study - Water, Electric, and Gas Utility Collaboration
 <u>Adam Ross</u>, Brown and Caldwell; David Guhin, M. Prinz, City of Santa Rosa;</p> |
| EW13E | 10:45am | <p>Integrating Liquid and Solid Waste Planning to Make Green Infrastructure Pay
 <u>Stephen J. Salter</u>, Farallon Consultants Limited</p> |
| EW13F | 11:15am | <p>Embodied Energy of Lost Water: Evaluating the Energy Efficiency of Infrastructure Investments
 <u>Craig P. Aubuchon</u>, Analysis Group, Inc.; Alan Roberson, AWWA</p> |
| | 11:45am | Adjourn |

TECHNICAL PROGRAM

Session EW 14: Net Zero

Thursday, May 9
10:15am - 11:45am

Room: 103/104
1.5 PDHs

Moderator: Alicia Chakrabarti, East Bay Municipal Utility District
Peter Cavagnaro, Johnson Controls

- EW14A** **10:15am** **The Most Energy Efficient Pump is the One That's Not Running: A Case Study of Energy Savings Resulting from an I/I Reduction Program**
Kevin Colvett, CH2M Hill; Brent Freeman, Metro Water Services; Todd Spangler, City of Brentwood, TN
- EW14B** **10:45am** **Small Wastewater Treatment Facilities can be Energy Producers**
Joseph C. Cantwell, Science Applications Intl Corp
- EW14C** **11:15am** **The Treatment Plant of the Future Integrated CO₂ Capture for Enhanced Plant Growth**
James W. Schettler, Nancy E. Andrews, Brown and Caldwell
- 11:45am** **Adjourn**

ADVANCED VIRTUAL CONFERENCE

The Advanced Virtual Conferences were held on January 23rd and March 20th as two recorded webcasts that were used as an example of the content that will be presented onsite at the Energy and Water 2013 Conference.

Panelists from the Virtual Conferences included:

Low Energy Process Control - January 23, 2013

- Leiv Rieger, inCTRL Solutions Inc.
- Jose Jimenez, Brown and Caldwell
- Andy Shaw, Black & Veatch (Moderator)

Energy-Water Nexus Highlights - March 20, 2013

- Radenka Maric, University of Connecticut
- Alex West, BioteQ Environmental Technologies
- Jeanette Brown, University of Connecticut (Moderator)

To hear these live recorded presentations, please visit www1.gotomeeting.com/register/547792017 and www1.gotomeeting.com/register/452252785.
To listen to other live recorded webcasts, please visit www.wef.org/webcasts/.

ENERGY AND WATER SESSIONS AT-A-GLANCE

Session #	Title	Credits	Room
MONDAY			
Workshop A	Energy Services Performance Contracting: Innovative Delivery that Guarantees Energy and Cost Savings!	0.3 CEUs	103/104
Workshop B	“Drivers Ed” for the Energy Roadmap	0.3 CEUs	108/109
	Opening General Session	3.0 PDHs	108/109
TUESDAY			
1	Treatment	2.5 PDHs	103/104
2	Alternative Energy	2.5 PDHs	108/109
3	Greenhouse Gases	2.5 PDHs	103/104
4	Lessons Learned	2.5 PDHs	108/109
WEDNESDAY			
5	Water Quantity *	1.5 PDHs	103/104
6	Control Strategies	2.5 PDHs	108/109
7	Water Quality*	1 PDH	103/104
8	Energy Savings*	1.5 PDHs	103/104
9	Biogas	1.5 PDHs	108/109
10	Global Perspectives*	1.5 PDHs	103/104
11	Exemplary Programs That Save Both Energy and Water	1.5 PDHs	108/109
THURSDAY			
12	Research	1.5 PDHs	103/104
13	Water MSW & Integrated Planning	3.0 PDHs	108/109
14	Net Zero	1.5 PDHs	103/104

* Power Day Track

EXHIBITION GENERAL INFORMATION

Located in the East and Central Hall of the Nashville Convention Center, the Exhibition hall hosts morning and afternoon refreshment breaks, luncheons, and a networking reception.

The exhibition offers networking opportunities with companies displaying the latest product and service solutions directly related to the conference's technical program.

Exhibit Hall Schedule

Monday, May 6 **5:00 pm – 6:30 pm**
5:00 pm – 6:30 pm...Networking Reception

Tuesday, May 7 **10:00 am – 4:45 pm**
10:00 am –10:45 am Coffee Break
12:00 pm – 1:30 pm Luncheon
3:00 pm – 3:45 pm Refreshment Break

Wednesday, May 8 **10:00 am – 3:45 pm**
10:30 am –10:45 am Coffee Break
12:00 pm – 1:30 pm Luncheon
3:00 pm – 3:45 pm Refreshment Break

Children under 18 entering the Exhibition must be accompanied by a parent or guardian at all times. The parent or guardian assumes all risk and responsibility for the child's safety.

Photographing or video recording in the Exhibition is only allowed with exhibitor's permission.

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INDEX OF EXHIBITORS BY PRODUCT CATEGORY

Advanced Wastewater Treatment Processes

Boerger, LLC..... 404
 Parkson Corporation..... 202
 SH+E U.S. CORP. 421
 WesTech Engineering..... 501

Aerobic Treatment

SH+E U.S. CORP. 421
 WesTech Engineering..... 501

Anaerobic Treatment

Boerger, LLC..... 404
 WesTech Engineering..... 501

Biosolids Conditioning & Sterilization

Andritz Separation, Inc.... 418
 CB&I..... 113
 RDP Technologies 104
 Schwing Bioset Inc..... 604
 SH+E U.S. CORP. 421
 Wyse Inc 503

Biosolids/Land Application Equipment

Boerger, LLC..... 404
 Schwing Bioset Inc..... 604

Centrifuges

Andritz Separation, Inc.... 418
 Centrisys Corporation 401
 Kusters Water 101
 Noxon North America Inc.200
 SH+E U.S. CORP. 421

Chemical Feed Equipment

Boerger, LLC..... 404
 Noxon North America Inc.200

Clarifier Equipment

WesTech Engineering..... 501

Conveyors

Andritz Separation, Inc.... 418
 Jim Myers & Sons, Inc. ... 301
 Kusters Water 101
 Noxon North America Inc.200
 Schwing Bioset Inc..... 604

Dewatering Equipment

Andritz Separation, Inc.... 418
 Boerger, LLC..... 404
 Centrisys Corporation 401
 Kusters Water 101
 Noxon North America Inc.200
 Parkson Corporation 202
 Uzelac Industries, Inc..... 623
 SH+E U.S. CORP. 421

Dewatering Services

Centrisys Corporation 401
 SH+E U.S. CORP. 421

Digesters

Boerger, LLC..... 404
 CB&I..... 113
 Kusters Water 101
 SH+E U.S. CORP. 421
 WesTech Engineering..... 501

Dissolved Air Flotation Systems

Kusters Water..... 101
 WesTech Engineering..... 501

INDEX OF EXHIBITORS BY PRODUCT CATEGORY

Engineering & Consulting Services
SH+E U.S. CORP. 421

Filters, Biological
WesTech Engineering..... 501

Filters, Gravity
Andritz Separation, Inc.... 418

Filter Presses & Belt Filter Presses
Andritz Separation, Inc.... 418
Parkson Corporation..... 202
SH+E U.S. CORP. 421

Flocculation Equipment
Jim Myers & Sons, Inc. ... 301
Noxon North America Inc.200

Gas Collection & Treatment
SH+E U.S. CORP. 421

Gates & Gate Controls
Jim Myers & Sons, Inc. ... 301
Schwing Bioset Inc..... 604

Grinders/Shredders & Comminutors
Boerger, LLC..... 404

Grit Handling Equipment
Jim Myers & Sons, Inc. ... 301
WesTech Engineering..... 501

Heat Exchangers
SH+E U.S. CORP. 421

Incinerators
Uzelac Industries, Inc..... 623

Lime Slakers
RDP Technologies 104

Mixers
Schwing Bioset Inc..... 604

WesTech Engineering..... 501

Odor Control Equipment & Systems
Parkson Corporation..... 202

Oil/Water Separators
Boerger, LLC..... 404
Centrisys Corporation 401
Parkson Corporation..... 202
SH+E U.S. CORP. 421

Operations & Maintenance Services
Schwing Bioset Inc..... 604

Oxygen Activated Sludge Systems
WesTech Engineering..... 501

Pipe Fittings
Schwing Bioset Inc..... 604

Pipe, Clay
Schwing Bioset Inc..... 604

Pipe, Steel
Schwing Bioset Inc..... 604

Polymers
Boerger, LLC..... 404
Fluid Dynamics (Pump Solutions Group)..... 205

Plate Settlers
Jim Myers & Sons, Inc. ... 301
Parkson Corporation..... 202
WesTech Engineering..... 501

Pump Controls
Schwing Bioset Inc..... 604

Pumps, Chemical Feed
Boerger, LLC..... 404

Pumps, Grinder
Boerger, LLC..... 404

Pumps, Lift Station
Boerger, LLC..... 404
Fluid Dynamics (Pump Solutions Group) 205

Pumps, Reciprocating
Schwing Bioset Inc..... 604

Pumps, Sludge
Boerger, LLC..... 404
Fluid Dynamics (Pump Solutions Group) 205
Noxon North America Inc.200
Schwing Bioset Inc..... 604

Pumps, Submersible
Boerger, LLC..... 404

Rental Equipment
Andritz Separation, Inc.... 418
Centrisys Corporation 401

Reverse Osmosis Equipment
SH+E U.S. CORP. 421

Screens, Fine
Andritz Separation, Inc.... 418
WesTech Engineering..... 501

Sedimentation Equipment
Kusters Water 101
WesTech Engineering..... 501

Sludge Collectors
Kusters Water 101

Sludge Drying Equipment
Andritz Separation, Inc.... 418
Kusters Water 101
Parkson Corporation 202
RDP Technologies 104
Schwing Bioset Inc..... 604
SH+E U.S. CORP. 421

INDEX OF EXHIBITORS BY PRODUCT CATEGORY

Sludge Drying

Equipment (cont.)

Uzelac Industries, Inc..... 623
 Wyse Inc 503

Sludge Hauling

Schwing Bioset Inc..... 604

Sludge Mixers

WesTech Engineering..... 501

Sludge Thickeners

Andritz Separation, Inc.... 418
 Centrisys Corporation 401
 Kusters Water 101
 Noxon North America Inc.200
 SH+E U.S. CORP. 421
 WesTech Engineering..... 501

Tanks/Wastewater

CB&I..... 113
 Jim Myers & Sons, Inc. ... 301

Valves, Rotary

Boerger, LLC..... 404

Valves, Telescoping

Jim Myers & Sons, Inc. ... 301

Water Recycling/Reuse

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www.wef.org/ResidualsBiosolids

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NOTES

NOTES