

• 14TH ANNUAL •

WATER REUSE & DESALINATION RESEARCH CONFERENCE

GRAND HYATT TAMPA BAY
TAMPA, FL • MAY 24-25, 2010

• CONFERENCE REGISTRATION •



THE WATER REUSE FOUNDATION

is an educational, nonprofit corporation that serves as a “leading-edge” research organization to advance the science of water reuse, recycling, reclamation, and desalination on behalf of the water community. The Foundation’s applied research program covers a broad spectrum of issues, including chemical contaminants, microbiological agents, treatment technologies, salinity management, public perception, public acceptance, economics, and marketing.

The 14th Annual Water Reuse & Desalination Research Conference provides an opportunity for the water reuse and desalination community to hear and see presentations by researchers on the latest results of ongoing research. The conference provides a forum for water reuse and desalination research professionals to interact, network, and discuss current and future research needs and trends.

The focus of the conference is on research that is likely to generate future scientific breakthroughs in water reuse and desalination. More than 40 podium and poster presentations in the program provide a focused and unique opportunity for water reuse and desalination professionals to learn about new developments and trends emerging from current and ongoing research.

CORE TOPIC AREAS

- Aquifer Storage and Recovery and Groundwater Recharge
- Concentrate Management and Disposal
- Economics and Marketing
- Energy-Water Nexus
- Environmental Impacts and Mitigation
- Greenhouse Gas Emissions and Carbon Neutral Approaches
- Health Effects
- Innovative Treatment Technologies
- Intake and Outfall Structures
- Integrated Resources Planning
- Membrane Research
- Pathogen Occurrence, Inactivation, and Removal
- Pharmaceuticals and Personal Care Products
- Pilot/Demonstration Projects
- Potable Reuse
- Produced Water
- Public Perception/Public Acceptance
- Risk Assessment
- Salinity Management
- Storage, Conveyance, and Distribution
- Water Quality

WHO SHOULD ATTEND

- Academics
- Consultants
- Engineers
- Government Officials
- Scientists
- Water and Wastewater Utility Officials
- Water Agency Managers



HOTEL ACCOMMODATIONS

The 14th Annual Water Reuse & Desalination Research Conference will be held at the Grand Hyatt Tampa Bay in Tampa, Florida. Special rates have been secured for conference attendees at the hotel. Please refer to the 14th Annual Water Reuse & Desalination Research Conference when making reservations to obtain the conference rate. We have a limited block of rooms at the hotel; therefore, all rooms are on a first-come, first-served basis. All reservations must be made by **Friday, May 14, 2010** to ensure the special conference room rate.

Grand Hyatt Tampa Bay
2900 Bayport Drive
Tampa, FL 33607
(813) 874-1234

Room Rate: \$179 per night plus tax

TRANSPORTATION INFORMATION

The Grand Hyatt Tampa Bay is conveniently located 3.5 miles or 10 minutes from the Tampa International Airport (TPA). Estimated taxi fare is \$15 from the Tampa International Airport to the hotel.

CAR RENTAL

The WaterReuse Foundation and Enterprise Rent-A-Car have partnered to provide discounted car rental rates for the 14th Annual Water Reuse & Desalination Research Conference. The discounted rates include 10% off all airport rentals with no underage fees and no additional driver fees. Reservations can be made two ways:

- Visit www.enterprise.com and enter in the promotional/account code of **16SW201**.
When prompted for a pin, enter **wat**.
- Call 1-800-Rent-A-Car and give them our promotional/account code of **16SW201**.

PARKING

The Grand Hyatt Tampa Bay offers ample parking at a rate of \$16 per day for overnight guests and \$10 per day for daily commuters.

TECHNICAL TOUR INFORMATION

Tampa Bay Seawater Desalination Plant Tour

Sunday, May 23, 2010

3:00 pm – 5:00 pm

Fee: \$45

The Tampa Bay Seawater Desalination Plant is currently the largest operating seawater desalination plant in North America. The 30,000 square-foot plant is located on 8.5 acres next to Tampa Electric's Big Bend Power Station in Apollo Beach, which already withdraws and discharges up to 1.4 billion gallons a day of seawater from Tampa Bay for cooling water. The plant is designed to divert approximately 44 million gallons a day (mgd) from Tampa Electric's power plant cooling system. Upon entering the desal plant, the water goes through a rigorous pretreatment process. Then, the reverse osmosis process separates 25 mgd of freshwater from seawater. The remaining 19 mgd of concentrated seawater is blended back into the power plant's cooling system before being returned to the Bay.

The Tampa Bay Seawater Desalination Plant is an important part of the Tampa Bay region's water supply, providing up to 10% of the region's drinking water needs. Fully operational since December 2007, this facility provides a sustainable, environmentally friendly, drought-proof supply of drinking water for Tampa Bay Water member governments' utility customers.

• MONDAY, MAY 24, 2010 •

8:00 am - 3:00 pm

Registration Open

8:00 am – 8:30 am

Continental Breakfast

OPENING SESSION

8:30 am – 8:45 am

Welcome and Opening Remarks

Mr. David Moore, Chair, WateReuse Foundation

8:45 am – 9:10 am

Keynote Speaker

Congressman C.W. Bill Young (R-FL) - Invited

9:10 am – 9:30 am

EPA's Research in Water Reuse

Dr. Christopher Impellitteri, Environmental Protection Agency

9:30 am – 9:50 am

Water Reuse and Desalination Research in Australia

Mr. Adam Lovell, Water Services Association of Australia

9:50 am – 10:15 am

Networking Break

RESEARCH CHALLENGES IN FLORIDA

10:15 am – 10:40 am

Assessment of Nutrient Levels and Potential Markers in Selected Reclaimed Waters

Dr. Joseph Jacangelo, MWH and The Johns Hopkins University

10:40 am – 11:05 am

Concentrate Minimization Study for South Florida

Dr. Sandeep Sethi, Carollo Engineers

11:05 am – 11:30 am

Solving the ASR Arsenic Problem: Pilot-Tested Approach Shows Promising Results

Ms. Barika Poole, CDM

11:30 am – 11:55 am

Pilot Scale Research for Meeting Extreme Nutrient Requirements for Indirect Potable Reuse in the City of Plantation

Mr. Richard Cisterna, Hazen & Sawyer

12:00 pm – 1:15 pm

AWARDS LUNCHEON

INNOVATIONS IN WATER REUSE

- 1:15 pm – 1:40 pm** Innovative Approaches to Optimizing Sulfuric Acid Consumption at West Basin Municipal Water District
Mr. Wyatt Won, West Basin Municipal Water District
- 1:40 pm – 2:05 pm** An Investigation of Commercially Available Membranes for the Production of Osmotic Energy
Mr. Mark Donovan, Separation Processes, Inc.
- 2:05 pm – 2:30 pm** Use of Ceragenins to Create Novel Biofouling Resistant Water-Treatment Membranes
Dr. Susan Altman, Sandia National Laboratories
- 2:30 pm – 2:55 pm** Fluorescent Fingerprinting of Dissolved Organic Matter as a Monitoring Tool in Reclaimed Water Systems
Mr. R.A. Polera, University of North Carolina at Chapel Hill
- 2:55 pm – 3:15 pm** **Networking Break**
- 3:15 pm – 3:40 pm** Evaluation of NF and LPRO for Maximizing Recovery of Recycled Water for Groundwater Recharge at the Water Replenishment District of Southern California
Dr. Christopher Yu, Psomas
- 3:40 pm – 4:05 pm** Pilot-Scale Evaluation of an MBR – Ozone – RO System for Water Reuse
Dr. Benjamin Stanford, Hazen & Sawyer
- 4:05 pm – 4:30 pm** Comparison of RO Membrane Performance: From Qualification Testing to Full Scale Application at West Basin MWD
Ms. Wendy Broley, Separation Processes, Inc.
- 5:00 pm – 6:30 pm** **Welcome Reception**

INNOVATIONS IN DESALINATION

- Desalination Research at the Water Research Foundation
Mr. Chris Rayburn, Water Research Foundation
- The Economics of Desalination: A Critical Review and Evaluation of What it Costs to Implement Desal
Dr. Robert Raucher, Stratus Consulting
- Potential Impacts of Harmful Algal Blooms on Ocean Water Desalination
Mr. Phil Lauri, West Basin Municipal Water District
- Selective Recovery of Desalination Concentrate Salts using Interstage Ion Exchange
Mr. Joshua Goldman, University of New Mexico
- A Novel Saltwater AOC Assay for Optimizing Desalination R/O Pretreatment
Ms. Lauren Weinrich, American Water
- Pilot Testing Pre-formed Chloramines for Biofouling Control in Ocean Water Desalination
Dr. R. Shane Trussell, Trussell Technologies, Inc.
- Zero Liquid Discharge Desalination: Results from a Water Research Foundation Project Conducted in Florida
Mr. Rick Bond, Black & Veatch

MONDAY SESSION DESCRIPTIONS

RESEARCH CHALLENGES IN FLORIDA

Assessment of Nutrient Levels and Potential Markers in Selected Reclaimed Waters

Dr. Joseph Jacangelo, MWH and The Johns Hopkins University

A potential unintended consequence of water reclamation practices is nitrogen and phosphorous loading into waterways. Consequently, a nutrient survey of selected water reuse plants in Florida was conducted. A variety of organic and inorganic compounds and selected metals were evaluated as markers for the targeted nutrients.

Concentrate Minimization Study for South Florida

Dr. Sandeep Sethi, Carollo Engineers

The study evaluated alternatives for concentrate minimization in South Florida. Evaluations were performed for representative RO plants to assess recovery limiting salts, promising concentrate treatment/minimization alternatives, and associated costs and implementation factors. The dual RO with intermediate chemical precipitation approach was pilot tested at one site and demonstrated stable performance.

Solving the ASR Arsenic Problem: Pilot-Tested Approach Shows Promising Results

Ms. Barika Poole, CDM

Challenges implementing ASR have discouraged utilities from developing this tool, as studies have shown that injecting water with higher dissolved oxygen and ORP than native groundwater may release arsenic into the stored water. This presentation will discuss testing results of a pretreatment system and its effects on arsenic leaching.

Pilot Scale Research for Meeting Extreme Nutrient Requirements for Indirect Potable Reuse in the City of Plantation

Mr. Richard Cisterna, Hazen & Sawyer

Many utilities in water stressed regions of the country are considering indirect potable reuse applications that could impact surface water bodies. As such, nutrient limitations are becoming increasingly important for some projects. This presentation will review the growing nutrient challenges and present the City of Plantation, FL pilot test results for meeting nitrogen limits < 1.5 ppm and phosphorous < 0.02 ppm.

INNOVATIONS IN WATER REUSE

Innovative Approaches to Optimizing Sulfuric Acid Consumption at West Basin Municipal Water District

Mr. Wyatt Won, West Basin Municipal Water District

West Basin MWD investigated four separate strategies for optimizing costs associated with calcium phosphate scale control in their RO reuse applications. This presentation will provide performance data and compare the economics of the four strategies, which include more frequent cleaning, periodic pH cycling, and seasonal pH adjustments.

An Investigation of Commercially Available Membranes for the Production of Osmotic Energy

Mr. Mark Donovan, Separation Processes, Inc.

This presentation shows the results of a laboratory scale investigation of commercially available membranes for the production of osmotic energy. Experiments were run on four different types of commercially available membranes to determine the technical and economic feasibility of using these membranes to generate osmotic energy.

Use of Ceragenins to Create Novel Biofouling Resistant Water-Treatment Membranes

Dr. Susan Altman, Sandia National Laboratories

Ceragenins have been shown to decrease biofilm formation on a reverse osmosis membrane by over 90%. Ceragenins are synthetically produced antimicrobial peptide mimics that display broad-spectrum bactericidal activity. Creation of biofouling resistant membranes will assist in creation of clean water and energy with lower energy usage.

Fluorescent Fingerprinting of Dissolved Organic Matter as a Monitoring Tool in Reclaimed Water Systems

Mr. R.A. Polera, University of North Carolina at Chapel Hill

This research provides a new monitoring approach based on distinct fluorescence signatures of reclaimed and potable water, such that it can be broadly applied to different water reclamation systems to enhance monitoring of treatment processes and the distribution system; ultimately preventing contamination events that are potentially harmful to public health.

Evaluation of NF and LPRO for Maximizing Recovery of Recycled Water for Groundwater Recharge at the Water Replenishment District of Southern California

Dr. Christopher Yu, Psomas

Due to their promising higher recovery and permeate flux while providing a product water quality comparable to RO membranes, new generation, low-fouling NF and LPRO membranes have been evaluated and field tested for recycled water application. This presentation is to discuss the operational issues and cost implications associated with using these membranes at the Water Replenishment District of Southern California for groundwater recharge.

Pilot-Scale Evaluation of an MBR – Ozone – RO System for Water Reuse

Dr. Benjamin Stanford, Hazen & Sawyer

Ozone and other oxidation/advanced oxidation processes have the potential to change the nature and behavior of dissolved/effluent organic matter and reduce the fouling associated with such material in RO membranes used for water reuse. This presentation will summarize the bench scale testing data and will provide an overview of the current pilot scale testing for a novel MBR-Ozone-RO reuse system.

Comparison of RO Membrane Performance: From Qualification Testing to Full Scale Application at West Basin MWD

Ms. Wendy Broley, Separation Processes, Inc.

Reverse osmosis membranes are not created equal when it comes to treating microfiltered municipal effluent. West Basin MWD has employed rigorous qualification testing to allow acceptable RO membranes to be bid on new and replacement installations. The presentation will detail the test procedure, results, and compare with full-scale performance.

INNOVATIONS IN DESALINATION

Desalination Research at the Water Research Foundation

Mr. Chris Rayburn, Water Research Foundation

For over 20 years, Water Research Foundation (formerly AwwaRF) has sponsored applied desalination research projects for our utility members. As desalination has emerged from a small scale technology to a critical supply component for many large municipal utilities, the Foundation's research has broadened to address the challenges of incorporating desalination into existing utility processes and operations. This has been accompanied by increased investment in more fundamental desalination research that represents first steps toward potential breakthroughs in desalination science and technology. As desalination R+D activities have increased in the US and abroad, the Foundation has played a central role in ensuring effective coordination and collaboration among desalination R+D stakeholders.

The Economics of Desalination: A Critical Review and Evaluation of What it Costs to Implement Desal

Dr. Robert Raucher, Stratus Consulting

For a variety of reasons, it has been difficult to compile a set of valid and useful estimates of the true cost of desal projects and of desal water (e.g., on a \$ per kgal or \$ per acre-foot basis). As more desal projects get implemented in the U.S., Australia, and elsewhere, it is possible and useful to have a careful compendium compiled of the complete (full accounting) costs for capital and other one-time project development outlays, and of annual operation and maintenance costs (including energy, chemicals, and labor). Based on a soon-to-be-completed Water Research Foundation project, this presentation will report results that attempt to accurately show (and interpret) the complete costs by cost category, by desal project component (e.g., membrane processes, concentrate management), and also in terms of the full cost per volume of product water produced.

Potential Impacts of Harmful Algal Blooms on Ocean Water Desalination

Mr. Phil Lauri, West Basin Municipal Water District

One of the most significant challenges faced in ocean water desalination are the impacts of harmful algal blooms. This presentation will present a summary of the algal biotoxins that have been identified, but will focus on the demonstrated removals achieved by pilot and bench-scale testing of the relevant toxins in Southern California.

Selective Recovery of Desalination Concentrate Salts using Interstage Ion Exchange

Mr. Joshua Goldman, University of New Mexico

The presentation will present findings from a research project focused on the selective recovery of salts from RO concentrate, using ion exchange as an intermediate step in an RO system. Benefits include increased potable water recovery, the generation of salts that might have commercial value, and reduced concentrate volume.

A Novel Saltwater AOC Assay for Optimizing Desalination R/O Pretreatment

Ms. Lauren Weinrich, American Water

A method measuring assimilable organic carbon (AOC) was developed using a naturally luminescent marine organism and is an important tool to evaluate the biofouling potential in desalination pretreatment. AOC levels from jar tests of coagulants and from various treatment points in both pilot and full scale desalination facilities is discussed.

Pilot Testing Pre-formed Chloramines for Biofouling Control in Ocean Water Desalination

Dr. R. Shane Trussell, Trussell Technologies, Inc.

This work presents pilot-scale results of preformed chloramines for biofouling control in ocean water desalination. Because the chloramines are formed prior to their addition to the ocean water, the strong oxidant bromamine does not form and the benefits of maintaining a chloramine residual for biofouling control can be realized.

Zero Liquid Discharge Desalination: Results from a Water Research Foundation Project Conducted in Florida

Mr. Rick Bond, Black & Veatch

A Water Research Foundation project is being conducted to evaluate zero liquid discharge (ZLD) desalination. This paper discusses one of the ZLD approaches evaluated, RO combined with electro dialysis metathesis (EDM) and MIEX. EDM is innovative modification of electro dialysis that has the potential to reduce the cost and energy consumption for ZLD.

• TUESDAY, MAY 25, 2010 •

8:00 am - 2:30 pm Registration Open
8:00 am - 8:30 am Continental Breakfast

PATHOGENS AND DISINFECTION

8:30 am - 8:55 am Enteric Virus Reduction and Occurrence in a Water Reclamation Facility
Dr. Christine Moe, Emory University

8:55 am - 9:20 am Enhancing the UV Inactivation of Adenoviruses in Reclaimed Water
Dr. Karl Linden, University of Colorado at Boulder

9:20 am - 9:45 am Combining UV and Free Chlorine in Pilot-Scale Experiments: Disinfection Efficacy, Byproducts, and Constituents of Emerging Concern
Dr. Naoko Munakata, County Sanitation Districts of Los Angeles County

9:45 am - 10:00 am **Networking Break**

INSTITUTIONAL ISSUES AND THE FUTURE OF WATER REUSE

10:00 am - 10:25 am Initial Findings about Survey Research from WRF 07-03 Talking About Water: Vocabulary and Images that Support Informed Decisions about Water Recycling and Desalination
Ms. Linda Macpherson, CH2M HILL

10:25 am - 10:50 am Valuing Reclaimed Water
Mr. David Hagan, Greeley and Hansen

10:50 am - 11:15 am Public Attitudes toward Expanding Reclaimed Water Use in Arizona
Ms. Kerri Jean Ormerod, University of Arizona

11:15 am - 11:45 am Water Reuse 2030 - Challenges and Opportunities
Ms. CJ McClelland, University of Colorado at Boulder

LUNCHEON AND PRESENTATION

11:45 am - 1:00pm Managing Risk of Seawater Desalination Development
Mr. Kenneth Herd, Southwest Florida Water Management District

TRACE ORGANIC COMPOUNDS

1:00 pm - 1:25 pm Membrane Bioreactor Effluent Water Quality - Modeling Process Performance for Organic Microconstituents
Ms. Joan Oppenheimer, MWH

1:25 pm - 1:50 pm Monitoring Trace Organics in a Subtropical Reservoir using Passive Samplers and Bioassays: Baseline Monitoring Prior to the Introduction of Indirect Potable Reuse
Mr. Michael Bartkow, Queensland Bulk Water Supply Authority

1:50 pm - 2:15 pm Evaluating the Performance of a Pilot-Scale Managed Aquifer Recharge for the Removal of Emerging Trace Organic Contaminants Using Select Indicator and Surrogate Parameters
Dr. Eric Dickenson, Colorado School of Mines

2:15 pm - 2:35 pm **Networking Break**

POTABLE REUSE

2:35 pm - 3:00 pm The Path from Indirect to Direct Potable Reuse - Ready for Prime Time?
Dr. Jörg Drewes, Colorado School of Mines

3:00 pm - 3:25 pm Singapore's Experience in the Supply of NEWater through a Secondary Distribution System
Ms. Marie Chan, Singapore PUB

3:25 pm - 3:50 pm Feasibility of Using Reclaimed Water Aquifer Recharge in the Tampa Bay Area
Ms. Sandie Will, Southwest Florida Water Management District

3:50 pm - 4:00 pm Conference Summary and Closing Remarks
Wade Miller, WateReuse Foundation

TUESDAY SESSION DESCRIPTIONS

PATHOGENS AND DISINFECTION

Enteric Virus Reduction and Occurrence in a Water Reclamation Facility

Dr. Christine Moe, Emory University

This study examined the occurrence of five enteric virus pathogens (norovirus, adenovirus, rotavirus, enterovirus and hepatitis A virus) and E. coli and coliphage in raw sewage, secondary effluent, granular media filtration effluent, Zee-Weed ultrafiltration membrane effluent and post-ozonation final effluent at a water reclamation facility over a one-year period.

Enhancing the UV Inactivation of Adenoviruses in Reclaimed Water

Dr. Karl Linden, University of Colorado at Boulder

Although adenoviruses are considered resistant to UV disinfection, application of multiple UV wavelengths greatly increases the effectiveness of UV. The increased effectiveness was shown to be a result of induced protein damage, coupled with DNA damage at water reuse doses. The results were demonstrated in both cell culture and animal infectivity models.

Combining UV and Free Chlorine in Pilot-Scale Experiments: Disinfection Efficacy, Byproducts, and Constituents of Emerging Concern

Dr. Naoko Munakata, County Sanitation Districts of Los Angeles County

Combining UV and free chlorine for disinfection of recycled water may offer numerous advantages, such as improved water quality, operational flexibility, and potential cost savings. This bench and pilot-scale study investigated the effects of combined UV/free chlorine on disinfection efficacy, disinfection byproducts, and trace organic constituents (e.g., pharmaceuticals).

INSTITUTIONAL ISSUES AND THE FUTURE OF WATER REUSE

Initial Findings about Survey Research from WRF 07-03 Talking About Water: Vocabulary and Images that Support Informed Decisions about Water Recycling and Desalination

Ms. Linda Macpherson, CH2M HILL

The WaterReuse Foundation recognized the need for the water industry to have the ability to clearly, precisely and reliably communicate regarding water quality. The research project will evaluate how words, images and concepts influence public perception of recycled water. The presentation will focus on initial research findings and will suggest how the water industry might be able to explain water reuse and desalination without creating confusion and negative perceptions.

Valuing Reclaimed Water

Mr. David Hagan, Greeley and Hansen

Reclaimed water pricing has evolved from being primarily promotional based to increasingly more conservation based. Many utilities are now considering the value of the resource in addition to the cost of production. This paper explores factors that affect the value of reclaimed water and provides Florida examples.

Public Attitudes toward Expanding Reclaimed Water Use in Arizona

Ms. Kerri Jean Ormerod, University of Arizona

In order to meet future water demand, many communities in Arizona are planning to significantly increase their rate of reclaimed water use. This study examines the publicly acceptable future uses for reclaimed water and community attitudes towards regional growth and water management.

Water Reuse 2030 - Challenges and Opportunities

Ms. CJ McClelland, University of Colorado at Boulder

The future of water reuse depends upon numerous complex issues. The Water Reuse 2030 project evaluated these issues and developed a vision of water reuse in the year 2030. Challenges that will influence water reuse over the next 20 years, adaptation strategies, and research opportunities will be presented.

LUNCHEON AND PRESENTATION

Managing Risk of Seawater Desalination Development

Mr. Kenneth Herd, Southwest Florida Water Management District

This presentation will focus on the inherent implementation challenges of seawater desalination development as learned from the Tampa Bay Seawater Desalination Project experience and will overview the implementation issues included in the 2008 National Research Council publication – Desalination: A National Perspective.

TRACE ORGANIC COMPOUNDS

Membrane Bioreactor Effluent Water Quality - Modeling Process Performance for Organic Microconstituents

Ms. Joan Oppenheimer, MWH

The WaterReuse Foundation funded a study to elucidate the impact of membrane bioreactor operational variables on process effluent quality. This presentation focuses on modeling scenarios performed for organic micropollutants in order to discern process removal capabilities as a function of microconstituent fate properties and MBR operating conditions.

Monitoring Trace Organics in a Subtropical Reservoir using Passive Samplers and Bioassays: Baseline Monitoring Prior to the Introduction of Indirect Potable Reuse

Mr. Michael Bartkow, Queensland Bulk Water Supply Authority

Monitoring for trace organics was undertaken in a water storage using both passive samplers and grab sampling. Samples were analyzed using chemical and bioanalytical techniques. A range of chemicals and effects were detected, albeit at low levels. Comparisons were made between the two analytical techniques.

Evaluating the Performance of a Pilot-Scale Managed Aquifer Recharge for the Removal of Emerging Trace Organic Contaminants Using Select Indicator and Surrogate Parameters

Dr. Eric Dickenson, Colorado School of Mines

A recent study has been completed at a well-equipped research demonstration surface-spreading operation, where a suite of indicator compounds, emerging trace organic chemicals, and surrogate parameters were monitored for a detailed subsurface profile that represented travel times of 10 hours to 60 days in order to assess recharge treatment performance.

POTABLE REUSE

The Path from Indirect to Direct Potable Reuse – Ready for Prime Time?

Dr. Jörg Drewes, Colorado School of Mines

This presentation will highlight recent trends in indirect potable reuse regarding the role of the environmental buffer (retention time, dilution) for water quality improvement. Lessons learned will help identifying the requirements for direct potable reuse projects that substitute these functions with engineered systems.

Singapore's Experience in the Supply of NEWater through a Secondary Distribution System

Ms. Marie Chan, Singapore PUB

In Singapore, PUB, the national water authority produces NEWater by further purifying treated used water. Since 2003, NEWater has been primarily supplied to industries and commercial buildings as non-potable water. This presentation highlights the marketing strategy involved and the planning and implementation of the NEWater distribution network.

Feasibility of Using Reclaimed Water Aquifer Recharge in the Tampa Bay Area

Ms. Sandie Will, Southwest Florida Water Management District

In 2008, the Southwest Florida Water Management District initiated a feasibility study to assess the use of aquifer recharge in the Tampa Bay Area. Findings from the study indicate that it is possible to develop direct and indirect aquifer recharge projects to improve Upper Floridan aquifer water levels.



POSTER PRESENTATIONS

Addressing Critical Issues Associated with USEPA Method 1623 through the Development of a Real Time RT-PCR Assay for *Giardia* Viability

Mr. Robert Baque, Orange County Utilities

This poster will discuss some of USEPA Method 1623's shortcomings and present opportunities to address them through Real-Time RT-PCR technology. The assay being developed has been a work in progress for almost three years and an overview of progress and recent results will be shared.

An Innovative Approach to PPCP Testing-Getting More for Less

Dr. Andrew Eaton, MWH Laboratories

Using online preconcentration, we screen for over 80 PPCPs using a small sample. The method can be used on RO water or brine concentrate and produce results with good spike recoveries. By looking for a large number of analytes rather than a small subset, site-specific indicator compounds can be determined.

Applications of the WaterReuse Decision Support System to Evaluate Satellite Treatment Costs

Ms. Katie Porter, Malcolm Pirnie

This poster will present case studies where the WaterReuse Decision Support System (DSS) tool was applied and how this was used to aid in the recommendation for satellite treatment. A compilation of important lessons learned will be presented. These suggestions will provide a basis for future tool enhancement and updates.

Comparison of Extraction and Derivatization Methods for use in GC/MS Analysis of Bisphenol-A and 17 β -Estradiol in Water

Mr. Won-Seok Kim, University of South Florida

Methods of analyzing endocrine-disrupting compounds in water are compared. Specifically, the poster considers two methods (SPE and SPME) for extracting target contaminants from water, and two methods (MSTFA and BSTFA) for derivatizing the target contaminants prior to analysis by GC/MS. Recommendations are made for water reuse applications.

Evaluation of Recycled Water for a Ground-Source Heat-Pump Demonstration Project

Ms. Abigail Holmquist, Denver Water

This poster will summarize the findings of a feasibility study to investigate the use of municipal recycled water as the source for thermal heating and cooling in a proposed open-loop, ground-source heat-pump system.

Progress in Use of Constructed Brackish Wetlands for Beneficial Reuse of Membrane Concentrate

Mr. James Bays, CH2M HILL

Recent pilot studies in California, Australia, Arizona and Florida provide data supporting the use of brackish wetlands to remove contaminants from membrane concentrate while reducing water volume. This process creates a supply of brackish water that may be feasible to reuse beneficially for habitat creation and irrigation.

Removal and Toxicity of Nano Silver, Zinc Oxide and Copper Oxide during Biological Wastewater Treatment

Dr. Ganesh Rajagopalan, Kennedy/Jenks Consultants

Manufactured nanomaterials are an emerging group of contaminants that may affect water reclamation in the near future. These materials are extremely small, highly reactive and known to behave differently than ionic pollutants in the wastewater. This bench-scale study evaluated removal and toxicity of three nanomaterials, that are used in cosmetics, personal care and other everyday products (Nano silver, zinc oxide and copper oxide), during biological wastewater treatment.

The Value of Water Supply Reliability for Desal and Reuse Investments

Dr. Robert Raucher, Stratus Consulting

The poster will provide: (1) a description of what "reliability" means, (2) an overview of ways in which reliability might be measured empirically, (3) a review of past studies on reliability values, focusing on how the values might be and how they can be used in evaluating water supply options, and (4) an update on the on-going WaterReuse Foundation project that is directly estimating the value of water supply reliability. 14th Annual Water Reuse & Desalination Research Conference

REGISTRATION INFORMATION

Register early and save! The Early Bird Registration deadline is **April 19, 2010**. All registration forms accompanied by full payment and received on or before April 19, 2010 will qualify for the Early Bird Registration rate. All registrations received after April 19, 2010 will be charged an additional \$50.

The Advance Registration Deadline is **May 10, 2010**. Registrations received after May 10, 2010 will not be processed and you will need to register onsite at the Grand Hyatt Tampa Bay. There will be an additional \$50 fee for all onsite registrations.

Badges and conference materials may be picked up at the conference registration desk at the Grand Hyatt Tampa Bay beginning May 24.

Confirmations

All registrants will receive a confirmation via e-mail once registration and full payment have been processed. This confirmation will also serve as your receipt of payment. Please allow two weeks from the time your registration is submitted until you receive a confirmation via e-mail.

Cancellation Policy

All cancellations must be submitted in writing by **May 10, 2010** to qualify for a refund. A \$50 administrative fee will be deducted from all refund requests received by May 10, 2010. No refunds will be made after May 10, 2010. Refunds are not given for no-shows.

E-mail cancellations or substitution requests to ctharpe@watereuse.org.

REGISTRATION INSTRUCTIONS

- Print or type and complete all sections of the registration form.
- Use one form per registrant. For additional attendees, photocopy the form as needed or print one from our website.
- Full time students must include a copy of their student identification with their registration form to receive the student registration rate.
- Registration will not be accepted without full payment (check or credit card) or federal government purchase order.
- Online and faxed registrations will be accepted with credit card payment only. To avoid duplicate charges, do not mail the original.
- Make checks payable to the WateReuse Foundation.
- Purchase orders are accepted in advance from U.S. Government agencies only. You must include the purchase order number on the registration form. Government purchase orders will not be accepted onsite.

Online

www.watereuse.org/foundation

Go to “Conferences & Events” and then choose the Annual Research Conference. To register online, you will be asked to login or create an account. If you are a member or past attendee, you already have an account established. Your username is your e-mail address and if you’ve forgotten your password you can click on the “Forgot password” link. To register another person for the conference, you must login using his or her WateReuse username (e-mail address) and password.

Fax

(703) 548-5085

Faxed registration must be accompanied by full payment.

Mail

WateReuse Foundation
1199 North Fairfax Street, Suite 410
Alexandria, VA 22314

14TH ANNUAL WATER REUSE & DESALINATION RESEARCH CONFERENCE

ADVANCE REGISTRATION FORM

CONTACT INFORMATION

Full Name		First Name (as it should appear on your badge)	
Title		Organization	
Address			
City	State / Province	Postal / ZIP Code	Country
Phone		Fax	
E-Mail Address		cc: E-Mail Address	

ADDITIONAL INFORMATION

Please check that all apply

This is my first Water Reuse & Desalination Research Conference

I have the following dietary restrictions: _____

I am a Subscriber to: WateReuse Foundation Water Research Foundation WERF

How did you hear about the 14th Annual Water Reuse & Desalination Research Conference?

- | | | |
|--|--|---|
| <input type="checkbox"/> Registration Brochure | <input type="checkbox"/> Sponsors Prospectus | <input type="checkbox"/> Blast E-mail from WateReuse |
| <input type="checkbox"/> WateReuse Website | <input type="checkbox"/> Print Ad in a Publication | <input type="checkbox"/> Blast E-mail from another Organization |
| <input type="checkbox"/> Colleague | <input type="checkbox"/> Other: _____ | |

Why are you attending the 14th Annual Water Reuse & Desalination Research Conference?

- | | | |
|--|---|---|
| <input type="checkbox"/> Quality Technical Program | <input type="checkbox"/> Networking Opportunities | <input type="checkbox"/> Education/Professional Development Hours |
| <input type="checkbox"/> Location/Hotel | <input type="checkbox"/> Sponsorship Opportunity | <input type="checkbox"/> Speaker |
| <input type="checkbox"/> Other: _____ | | |

MEAL FUNCTIONS

To assist us in providing accurate food guarantees, please check the meal functions you plan to attend.

Monday, May 24

- Continental Breakfast
- Awards Luncheon
- Welcome Reception

Tuesday, May 25

- Continental Breakfast
- Luncheon and Presentation

REGISTRATION FEES

Please circle the appropriate fees that apply

Registration Rates	On or Before 4/19/10	After 4/19/10	After 5/10/10 Onsite Registration
WateReuse Foundation Subscribers	\$325	\$375	\$425
WateReuse Association Members	\$350	\$400	\$450
First Time Conference Attendee	\$375	\$425	\$475
Nonmembers/Nonsubscribers	\$425	\$475	\$525
Monday Only	\$225	\$275	\$325
Tuesday Only	\$225	\$275	\$325
Full-Time Students (ID Required)	\$100	\$150	\$200

Technical Tours

Tampa Bay Seawater Desalination Plant Tour \$45

Guest Tickets

Guest at Monday's Awards Luncheon \$30

Name of Guest

Guest at Monday's Welcome Reception \$35

Name of Guest

Guest at Tuesday's Luncheon and Presentation \$30

Name of Guest

Payment

Full payment must accompany your advance registration form. Your signature below authorizes the WateReuse Foundation to charge your credit card the total payment and acknowledges that there are no refunds after May 10, 2010.

Check payable to the WateReuse Foundation

VISA

MasterCard

AMEX

Purchase Order # _____

Card Number

Expiration Date

Print Cardholder Name

Total Due

Signature

Date

Mail or fax completed registration forms to:

WateReuse Foundation
1199 North Fairfax Street, Suite 410
Alexandria, VA 22314

Fax (703) 548-5085

Faxed registration must be accompanied by full payment.



UPCOMING EVENTS

25th Annual WaterReuse Symposium

Omni Shoreham Hotel
Washington, DC
September 12-15, 2010

Water Reuse and Desalination: Water Scarcity Solutions for the 21st Century

Sydney, Australia
November 15-17, 2010

2011 WaterReuse California Annual Conference

Laguna Cliffs Resort & Spa
Dana Point, CA
March 6-8, 2011

15th Annual Water Reuse & Desalination Research Conference

South Point Hotel and Casino
Las Vegas, NV
May 16-17, 2011

26th Annual WaterReuse Symposium

Sheraton Wild Horse Pass Resort
Phoenix, AZ
September 11-14, 2011

IMPORTANT DATES TO REMEMBER

April 19, 2010	Early Bird Registration Deadline
May 10, 2010	Advance Registration Deadline
May 10, 2010	Cancellation Deadline
May 14, 2010	Hotel Reservation Deadline



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Alexandria, VA 22314

