

# • 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.

