Wastewater and Biosolids Treatment and Reuse: Bridging Modeling and Experimental Studies

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Program

Wastewater and Biosolids Treatment and Reuse: Bridging Modeling and Experimental Studies

June 8-14, 2014
Otranto, Italy

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Sunday, June 8, 2014

ARRIVAL AND WELCOME RECEPTION

17:00 – 19:00   Registration
19:00 – 20:00   Welcome reception
20:00 – 22:00   Dinner

NOTES

• Audiotaping, videotaping and photography of presentations are prohibited.

• Speakers – Please have your presentation loaded onto the conference computer prior to the session start (preferably the day before).

• Speakers – Please leave at least 5 minutes for questions and discussion.

• Please do not smoke at any conference functions.

• Turn your cellular telephones to vibrate or off during technical sessions.

• Technical and poster sessions will be in the Conference Center.

• Meals will be in the restaurant.

• Be sure to check your contact information on the Participant List in this program and make any corrections to your name/contact information online. A corrected copy will be sent to all participants after the conference.
Monday, June 9, 2014 (session with simultaneous translation)

PLENARY SESSION – WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: WHAT DOES THE FUTURE HOLD?

Session Chairs: Domenico Santoro and Antonio Lopez

08:00 – 08:45 On-Site registration

08:45 – 09:00 Opening remarks

09:00 – 09:30 Keynote 1: Wastewater treatment: the paradigm shift
Antonio Lopez, National Research Council (CNR), Water Research Institute, Italy

09:30 – 10:00 Keynote 2: Role of anaerobic digestion in next generation wastewater treatment and biosolids management
Damien Batstone, Queensland University, Australia

10:00 – 10:30 Keynote 3: Approaches to rational microbial risk assessment of treated biosolids and wastewater
Charles N. Haas, Drexel University, USA

10:30 – 11:00 Coffee break

11:00 – 11:30 Keynote 4: Is industry ready to address wastewater treatment challenges?
Marvin Devries, Trojan Technologies, Canada

11:30 – 12:00 Keynote 5: Computational modeling: valuable tool or math exercise?
Carlo Poloni, University of Trieste, Italy

12:00 – 12:30 Round Table

12:30 – 14:00 Lunch

14:00 – 15:00 ad hoc sessions / free time

15:00 – 19:30 Tour of Lecce

20:00 – 22:00 Dinner

22:00 – 23:00 Social hour
TECHNICAL SESSION A - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE MATERIAL AND ENERGY "FACTORY"

Session Chairs: Wun Jern Ng and Giuseppe Mininni

08:45 – 09:00 Opening remarks

09:00 – 09:30 Keynote 6: Perspectives of sewage sludge management in Europe and expected development of legislation
Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy

09:30 – 10:00 Keynote 7: Sludge pretreatment methods for enhanced volatiles solids destruction and methane production
Wun Jern Ng, NEWRI-Nanyang Technology University, Singapore

10:00 – 10:30 Keynote 8: Harmless treatment and materials utilization of sludge containing high levels of heavy metals
Guoren Xu, Harbin Institute of Technology, China

10:30 – 11:00 Coffee break

11:00 – 11:30 Keynote 9: Valorization of sewage sludge via nitrite nutrients removal from anaerobic effluents
Francesco Fatone, University of Verona, Italy

11:30 – 12:00 Aerobic conditions prevail over scarce aeration and starvation conditions for activated sludge degradation
Jonathan Habermacher, Eawag, Switzerland

12:00 – 12:30 Round Table

12:30 – 14:00 Lunch

14:00 – 16:00 ad hoc sessions / free time

16:00 – 16:20 Innovative treatment solutions for sewage sludge management set up in the ROUTES FP7 project
Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy

16:20 – 16:40 Impact of enhanced stabilization treatments on sludge quality and methane recovery
Camilla Braguglia, National Research Council (CNR), Water Research Institute, Italy

16:40 – 17:00 Comparative study of the mechanisms of ultrasonic, alkaline, and sono-alkaline pretreatment of industrial biosludge
Santosh Pathak, AEBC-NEWRI-NTU, Singapore

17:00 – 17:20 Sludge minimization: ozonolysis and pure oxygen autothermal thermophilic digestion
Pier Luigi Radavelli, SIAD SpA, Italy
Tuesday, June 10, 2014 (continued)

17:20 – 17:40  **Influence of one step temperature increase acclimation method on microbial community dynamics during thermophilic biochemical methane potential test of an industrial wastewater**
Santosh Pathak, AEBC-NEWRI-NTU, Singapore

17:40 – 18:20  Coffee break

18:20 – 18:40  **Phototrophic bacteria for complete nutrient recovery from domestic wastewater**
Tim Huelsen UQ/AWMC, Australia

18:40 – 19:00  **Integrating the selection of PHA storing biomass and nitrogen removal via nitrite for the treatment of the sludge reject water**
Francesco Fatone, University Ca’Foscari of Venice, Italy

19:00 – 19:20  **The integrated biohydrogen reactor clarifier system (IBRCS): setup, performance, and application**
Hesham El Naggar, University of Western Ontario, Canada

19:20 – 19:40  **Sewage sludge valorization by pyrolysis using a mechanically fluidized reactor**
Franco Berruti, ICFAR/Western University, Canada

19:40 – 20:00  **Treatment of carbide slurry using electrocoagulation**
Shereen Hasan, UAEU, United Arab Emirates

20:00 – 22:00  Dinner

22:00 – 23:00  Poster session and social hour
**TECHNICAL SESSION B - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE WATER "FACTORY"**

Session Chairs: Ronald Gehr and Franco Berruti

08:45 – 09:00 Opening remarks

09:00 – 09:30 **Keynote 10: How drugs in wastewater enforce advanced drinking water treatment**
Bram Martijn, PWN Technologies, Netherlands

09:30 – 10:00 **Keynote 11: New insights into the ultraviolet disinfection of wastewater**
Ramin Farnood, University of Toronto, Canada

10:00 – 10:30 **Keynote 12: Wastewater disinfection with UV or PAA: Are those surviving microbes really benign?**
Ronald Gehr, McGill University, Canada

10:30 – 11:00 Coffee break

11:00 – 11:30 **Keynote 13: High-rate sieve microfiltration as an alternative unit process to primary clarifiers**
Domenico Santoro, Trojan Technologies, Canada

11:30 – 12:00 **CFD optimized woven filter media for wastewater application**
Markus Knefel, GKD, Germany

12:00 – 12:30 Round Table

12:30 – 14:00 Lunch

14:00 – 16:00 *ad hoc* sessions and free time

16:00 – 16:20 **Peracetic acid use in north America as a wastewater disinfectant**
Thomas Mooney, PeroxyChem, USA

16:20 – 16:40 **Peracetic acid: a good choice for wastewater reuse**
Paola Toniolo, Solvay Chimica Italia Spa, Italy

16:40 – 17:00 **Agricultural reuse of treated wastewater: the case of Milano-Nosedo municipal wastewater treatment plant**
Francesca Pizza, MilanoDepur SpA, Italy

17:00 – 17:20 **Perfomic acid as disinfectant in wastewater treatments: effectiveness and comparisons**
Patrizia Ragazzo, ASI, Italy

17:20 – 17:40 **Large wastewater agricultural reuse with adaptive nutrient removal case study of Milano S. Rocco**
Luca Pedrazzi, Degremont, Italy

17:40 – 18:20 Coffee break
18:20 – 18:40  **Sludge ozonation and intermittent aeration through the OSCAR® controller – A combined strategy for OPEX minimization in wastewater treatment**  
Giuseppe Guglielmi, ETC Engineering, Italy

18:40 – 19:00  **Phenolic wastes valorization through bioenergy and bioactive compounds production**  
Francesco La Cara, Istituto di Bioscienze e Biorisorse, CNR, Italy

19:00 – 19:20  **Evaluating the performance of spouted bed bio-reactor (SBBR) during aerobic biodegradation of 2,4 dichlorophenol (DCP)**  
Taghreed Al-Khalid, UAE University, United Arab Emirates

19:20 – 19:40  **Ecotoxicological bioassays for treated wastewater monitoring and assessment**  
Maria Giulia Lionetto, University of Salento, Italy

19:40 – 20:00  **Liquid waste treatment: can combined biological processes be really effective?**  
Luca Rondi, University of Brescia, Italy

20:00 – 22:00  Dinner

22:00 – 23:00  Poster session and social hour
Thursday, June 12, 2014

**TECHNICAL SESSION C - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: THE ROLE OF MODELING**

Session Chairs: Charles N. Haas and M. Concetta Tomei

08:45 – 09:00 Opening remarks

09:00 – 09:30 Keynote 14: Modeling reactions between activated sludge fractions and ozone to optimize biosolids reduction processes
Dominic Frigon, McGill University, Canada

09:30 – 10:00 Keynote 15: Modeling of anaerobic digestion of sludge
M. Concetta Tomei, National Research Council (CNR), Water Research Institute, Italy

10:00 – 10:30 Keynote 16: Simulation based feed stream estimation of wastewater treatment plants using a surrogate model
Peter Kern, Cologne University of Applied Sciences, Germany

10:30 – 11:00 Coffee break

11:00 – 11:30 Keynote 17: Accelerating product innovation using computational fluid dynamics
Ted Mao, Trojan Technologies, Canada

11:30 – 12:00 Reactor configuration modeling for anaerobic digestion of waste activated sludge
Daniele Montecchio, National Research Council, Water Research Institute, Italy

12:00 – 12:30 Round Table

12:30 – 16:00 Boxed Lunch & Excursion (Masseria L'Astore)

16:00 – 17:40 **Modeling and Optimization Workshop**
Vito Primavera, EnginSoft SpA, Italy

- Introduction to modeFRONTIER
- Case Study 1
- Case Study 2
- Case Study 3

17:40 – 18:20 Coffee break

18:20 – 18:40 Temperature adjustment and calibration of an ASM2D-ADM1 model
Alessio Fenu, Aquafin, Belgium

18:40 – 19:00 Optimal control for activated sludge alternating flow/aeration systems with more than two basins
Alessio Fenu, Aquafin, Belgium
Thursday, June 12, 2014 (continued)

19:00 – 19:20 Linear time invariant model of anaerobic digestion of waste activated sludge development and analysis
Antonius Yudi Sendjaja, AEBC-NEWRI-NTU, Singapore

19:20 – 19:40 Life cycle assessment of a full scale case study on agricultural reuse of treated agro-industrial wastewater
Pompilio Vergine, National Research Council (CNR), Water Research Institute, Italy

19:40 – 20:00 Surface modified cellulosic membrane and its application in membrane bioreactor (MBR) system
Ning Yan, University of Toronto, Canada

20:00 – 20:20 Equilibrium, kinetic and thermodynamic study of adsorption of rhodamine B from aqueous solution by activated carbon from *Peltophorum Pterocarpum* leaf
Jeyaraj Boniface, Loyola College, India

21:00 – 23:00 Banquet Dinner in Otranto
Friday, June 13, 2014 (session with simultaneous translation)

TECHNICAL SESSION D - WASTEWATER AND BIOSOLIDS TREATMENT AND REUSE: FIELD STUDIES AND FULL-SCALE APPLICATIONS

Session Chairs: Gianfranco Boari and Antonio Lopez

08:00 – 08:45 On-site registration
08:45 – 09:00 Opening remarks
09:00 – 09:30 Keynote 18: On the sustainable management of sewage sludge disposal in Apulia
   Adriana Lotito, Arpa Puglia & Politecnico Di Bari, Italy
09:30 – 10:00 Keynote 19: Agricultural use of sewage sludge data as a tool for legislative revision
   Giuseppe Mininni, National Research Council (CNR), Water Research Institute, Italy
10:00 – 10:30 Keynote 20: Developments in sludge dewaterability characterization
   Ludovico Spinosa, CEN/TC308/WG1 and ISO/TC275/WG6, Italy
10:30 – 11:00 Coffee break
11:00 – 11:30 Wastewater reuse in Apulia: between dream and reality
   Antonio Lopez, National Research Council (CNR), Water Research Institute, Italy
11:30 – 12:00 Wastewater reuse in Apulia: constraints and perspectives
   Vito Colucci, Apulia Hydric Authority (AIP), Italy
12:00 – 12:30 Back to future: The success story of Fasano’s agricultural wastewater reuse plant
   Oronzo Santoro, AquaSoil SrL, Italy
12:30 – 13:00 Round Table
13:00 – 15:00 Lunch
15:00 – 15:20 Surface filtration technologies for municipal wastewater reuse for irrigation – Preliminary results of demo-scale activities
   Pompilio Vergine, National Research Council (CNR), Water Research Institute, Italy
15:20 – 15:40 Wastewater treatment and reuse in the oil & petrochem industry – a case study
   Alberto Girardi, Degremont, Italy
15:40 – 16:00 Design of semiconductors-based composites for the efficient photodegradation of organic micropollutants in water
   Giuseppe Mele, University of Salento, Italy
16:00 – 16:20 Experimental measurement and modeling of radiation fields in TiO2 nanoparticle photocatalysis
   Andrea Turolla, Politecnico de Milano, Italy
16:20 – 16:40 Deep UV-LEDs based on group III-nitride for water disinfection applications
   Iolanda Pio, National Nanotechnology Laboratory CNR, Italy
16:40 – 17:00 Closing Remarks
Wastewater and Biosolids Treatment and Reuse:
Bridging Modeling and Experimental Studies

Poster List

1. Impacts of temperatures and physico-chemical conditions on biosolids electrodewatering
   Dominic Frigon, McGill University, Canada

2. Measurement and modeling of photogenerated holes and hydroxyl radicals production in TiO2 nanoparticle photocatalysis
   Andrea Turolla, Politecnico di Milano, Italy

3. Modeling of vertical constructed wetland for embedded greywater treatment
   Matjaz Nekrep Perc, University of Maribor, Slovenia

4. Removal of arsenic from drinking water by coagulation-adsorption combined process
   Anna Scarlino, University of Salento, Italy

5. Synthesis, characterization and binding studies of water compatible ion imprinted polymer as sorbent materials for Hg(II) removal from water
   Lucia Mergola, University of Salento, Italy

6. Sawdust-based natural clay sorbents from removal of heavy metals from wastewater
   Lucia Mergola, University of Salento, Italy