

# **SARDINIA 2005**

## **Tenth International Waste Management and Landfill Symposium**

**3-7 October 2005**

S. Margherita di Pula (Cagliari), Sardinia, Italy

### *Organized by:*

IMAGE, University of Padua (IT)

TUHH, Hamburg University of Science and Technology (DE)

CISA, Environmental Sanitary Engineering Centre (IT)

IWWG, International Waste Working Group

### *With the participation of:*

European Union Commission

UNEP, United Nations Environment Programme

US-EPA, Environmental Protection Agency (US)

Regional Government of Veneto - Environmental Policy  
Department (IT)

Regional Government of Sardinia - Department of the  
Environment (IT)

### *Special Sponsorship:*

Institute for Resources Sustainability (ES)

### *Promoted by:*

ADEME, Agence de l'Environnement et de la Maitrise de l'Energie,  
France

AGI, Italian Association of Geotechnics

AIDIS, InterAmerican Association of Environmental and Sanitary  
Engineering

ANDIS, National Association of Sanitary Engineering, Italy

APAT, The Agency for Environmental Protection and Technical  
Services, Italy

ASCE, Geo-Institute Technical Coordination Council, USA

ATEGRUS, Technical Association for the Waste Management and  
the Environment, Spain

ATIA, Italian Association of Environmental Technicians

CIWM, Chartered Institution of Wastes Management, UK

Danish Environmental Protection Agency

DEFRA, Department of Environment, Food and Rural Affairs, UK

DSWA, Delaware Solid Waste Authority, USA

Environment Agency, United Kingdom

ESA, Environmental Services Association, United Kingdom

Federal Ministry for the Environment, Nature Conservation and  
Nuclear Safety, Germany

FEDERAMBIENTE, Italian Federation of Public Environmental  
Management Companies

IGS, International Geosynthetics Society

Institute of Solid Waste, Ministry of Environment, Portugal

IWMSA, Institute of Waste Management South Africa

JSWME, Japan Society of Waste Management Experts

LSA, The Landfill Systems & Technology Research Association of  
Japan

### *Under the aegis of*

Ministry of the Environment, Italy

## PRESENTATION

The International Symposia "Sardinia" were established in 1987 in order to make ideas and experiences in the rapidly developing field of waste management and landfilling readily available to professional communities worldwide. Since then the Symposia have rapidly become the International Reference Forum where every two years planners, operators, public officials and scientists present their relevant experiences and discuss new concepts and technologies of waste management.

As a result of this the Symposia witnessed and contributed to the development of modern strategies such as the integrated waste management hierarchy.

The ninth Symposium was held in 2003, in the traditional venue of the Forte Village Complex at S. Margherita di Pula (Cagliari), with an attendance of more than 1000 delegates from 57 different countries.

For the present edition, papers were selected according to quality by a group of International Referees from a total of 720 abstracts from 66 countries.

The 2005 Sardinia Symposium will include general, specialized, workshop and poster sessions. Before the start of the symposium, training courses providing the fundamentals of waste landfilling and healthcare waste management will be offered by IWWG, under the supervision of international leading experts.

The CD of the Proceedings and an extended abstracts volume will be distributed to delegates at the Symposium Registration Desk.

In accordance with a consolidated tradition, the Symposium will be opened by an introductory lecture not strictly linked to sanitary landfilling. In this edition the Mercer Lecture is foreseen, a prestigious biennial lecture having the aim of promoting cooperation and information exchange between geotechnical engineering and geosynthetics engineering. The Mercer Lecture will be delivered by Prof. J.P. Giroud and the title will be *"Contribution of geosynthetics to the geotechnical aspects of waste and liquid containment"*.

## THE SYMPOSIUM STRUCTURE

The symposium is structured in two General Parallel Sessions (A and B), usually attended by a considerable number of delegates. Topics discussed during Sessions A and B will be examined in greater detail during Specialized Parallel Sessions (C, D and E) and Workshop Sessions (F and G), where more controversial aspects will be discussed.

In sessions A and B, contributions (20 minutes) are presented following a strict schedule, in order to enable delegates to plan participation adequately. Twenty minutes are devoted to discussion.

In Sessions C, D and E shorter lectures (15 minutes each) are scheduled. Workshop Sessions F and G are primarily addressed to experts on the specific topics. Some introductory presentations are given in order to open discussion. A final report will be presented during the Closing Session of the Symposium.

## TRAINING COURSES

Five Courses on Management of healthcare waste, Landfill design, Landfill processes and emissions, Leachate management and Landfill gas management will be held on Sunday October 2nd. The courses are reserved for the conference delegates (min 15 participants). Certification of completion will be distributed at the conclusion of each class.

## Executive Programme Committee

*Raffaello COSSU*

University of Padua (IT)

*Rainer STEGMANN*

Technical University of Hamburg-Harburg (DE)

## International Advisory Board

*Morton A. BARLAZ*

North Carolina State University (US)

*Bernd BILITEWSKI*

Technical University of Dresden (DE)

*Nick C. BLAKEY*

Waste Strategy Division, DEFRA (UK)

*Geoffrey E. BLIGHT*

Witwatersrand University, Johannesburg (ZA)

*Jean E. BOGNER*

Landfill + Inc. (US)

*Luciano BUTTI*

Legal firm Butti Peres & Partners (IT)

*Andrea CANCELLI*

University of Milan- Bicocca (IT)

*Alvaro Luis G. CANTANHEDE*

Federal University of Rio de Janeiro, UFRJ (BR)

*Daniele CAZZUFFI*

CESI SpA (IT)

*William CLARKE*

University of Queensland (AU)

*Eugenio DE FRAJA FRANGIPANE*

CIPA srl(IT)

*Luis F. DIAZ*

Cal Recovery Inc., Hercules, CA (US)

*Hans. Jurgen EHRIG*

University of Wuppertal (DE)

*Matti ETTALA*

University of Kuopio(FI)

*Tobru FURUICHI*

Graduate School of Hokkaido University (JP)

*Marcello GHLANI*

University of Cagliari (IT)

*Jean Pierre GIROUD*

Ip Giroud Inc. (US)

*Jean Pierre GOURC*

University of Joseph Fourier , Grenoble (FR)

*Jan GRONOW*

Environment Agency (UK)

*Robert K. HAM*

University of Wisconsin-Madison (US)

*Stephen HANCOCK*

URS Australia Pty Ltd (AU)

*Quan HAO*

Environmental Protection Centre (CN)

*Mohd Nasir HASSAN*

University Putra (MY)

*Tokio HIRATA*  
 Kagoshima National College of Technology (JP)

*William HOGLAND*  
 University of Kalmar (SE)

*Jae Young KIM*  
 National University of Seoul (KR)

*Gunay KOCASOY*  
 Bogazici University, Istanbul (TR)

*Albert KOENIG*  
 University of Hong Kong (CN)

*Anders LAGERKVIST*  
 Lulea University of Technology (SE)

*Peter LECHNER*  
 BOKU, Agriculture University, Vienna (AT)

*Duncan MARTIN*  
 University of Limerick (IE)

*Carlos MARTINEZ ORGADO*  
 Institute for the Resources Sustainability (ES)

*Yasushi MATSUFUJI*  
 University of Fukuoka (JP)

*Andjelka MIHAJLOV*  
 University of Novi Sad, Serbia and Montenegro (YU)

*Aurelio MISITI*  
 University of Roma- La Sapienza-(IT)

*Gerhard RETTENBERGER*  
 Zweigniederlassung Trier (DE)

*Sergio REYES*  
 R & A Ingenieria s.r.l. (AR)

*Howard ROBINSON*  
 Enviro Consulting Limited (UK)

*R. Kerry ROWE*  
 Queen's University, Kingstone, Ontario (CA)

*Fernando SANTANA*  
 Universidade Nova de Lisboa (PT)

*Susan THORNELOE*  
 US-EPA, Office of Research and Development (US)

*Giordano URBINI*  
 University of Insubria (IT)

*Julian URLARTE JAUREGUIZA*  
 ATEGRUS, Bilbao (ES)

*Hans VAN DER SLOOT*  
 Netherlands Energy Research Foundation (NL)

*N.C. VASUKI*  
 Delaware Solid Waste Authority (US)

## Organizing Committee

*Raffaello Cossu*

*Luca Alibardi*

*Roberta Gadia*

*Osamu Hirata*

University of Padua (IT)

*Aldo Muntoni*

*Giovanna Cappai*

University of Cagliari (IT)

*Alessandro Asso*

*Laura Betelli*

*Paola Bisarello*

*Monica Gallo*

*Anna Pesavento*

*Elena Volpato*

*Mauro Zane*

EuroWaste Srl, Padova (IT)

*Michela Giangrasso*

MC Michela Giangrasso, Cagliari (IT)

## Scientific Secretariat

*Roberto Raga,*

Department IMAGE

University of Padua

Padova - Italy

Tel. +39.049.8275429 - Fax +39.049.8275446

e-mail: [raga@idra.unipd.it](mailto:raga@idra.unipd.it)

## General Secretariat

*Valeria Zampalocca*

EuroWaste Srl

Via B. Pellegrino 23 - 35137 Padova - Italy

Tel. +39.049.8726986 - Fax +39.049.8726987

E-mail [eurowaste@tin.it](mailto:eurowaste@tin.it)

## Conference Site

Forte Village Resort

09010 S. Margherita di Pula (Cagliari) - Italy

Tel. +39 070 92171 - Fax +39 070 921246

Continuously updated information will be also available on the Web site: <http://www.sardiniasymposium.it>

For further information please contact the e-mail address: [info@sardiniasymposium.it](mailto:info@sardiniasymposium.it).

# DAILY PROGRAMME

Sunday October 2

## Gerani Room

### IWWG TRAINING COURSES

**08.00 - 11.00** Training Courses Registration at the Congress Hall

**09.00 - 10.30**

#### **T1: Healthcare waste management**

*Chairman: Dr. L. Diaz*

- Definitions of healthcare waste, quantities and composition
- Minimization, segregation and recycling
- Treatment and disposal alternatives
- Healthcare waste management program for a healthcare establishment and training

**10.45 - 12.15**

#### **T2: Landfill processes and emissions**

*Chairman: Prof. T.H. Christensen*

- Impacts
- Concepts
- Leaching
- Processes- reactor landfills
- Processes archaeology

**14.15 - 15.45**

#### **\*\*\*T3: Landfill design and barriers**

*Chairman: Prof. P. Lechner*

- Siting and planning
- Landfill structure
- Barriers
- Top covers

**16.00 - 17.30**

#### **T4: Leachate management**

*Chairman: Prof. H. Robinson*

- Biological and physical-chemical treatments
- Leachate recirculation
- Phytoremediation

**17.45 - 19.15**

#### **T5: Landfill gas management**

*Chairman: Prof. R. Stegmann*

- Biogas production model
- Extraction systems
- Transport and flaring
- Energy recovery

**16.00 - 18.00** Registration for Symposium Delegates

**19.45** *Get Together Cocktail*

## Monday October 3 - Morning

**08.00 - 13.00**

Registration

### Central Hall

#### OPENING SESSION

Chairman: R. Cossu (IT)

**09.00 - 10.00**

Welcome addresses by Representatives of:

*University of Padua*

*Technical University of Hamburg-Harburg*

*Regional Government of Veneto - Environmental Policy Department (IT)*

*Regional Government of Sardinia - Department of the Environment (IT)*

*Institute for Resources Sustainability, Spain*

*IGS, International Geosynthetics Society*

*US-EPA, Environmental Protection Agency, United States*

*Directorate General for the Environment DGXI- European Commission*

*Parlament Committee for Waste Cycle Control, Italy*

**10.00 - 10.50**

\*\*\*Mercer Lecture:

*J.P. Giroud (USA)*

Contribution of geosynthetics to the geotechnical aspects of waste and liquid containment

**10.50 - 11.20**

Coffee break

Introductory Presentations

#### Waste management in developing countries

**11.20 - 11.50**

*C. Nels (DE)*

Singing from a different song sheet - The widening gap between North and South

**11.50 - 12.20**

*A. Savino (AR)*

Waste management problems in Latin America

**12.20 - 12.50**

*L.R. Iskandar (EG)*

Urban waste managers in Cairo: waste collectors, traders and recyclers

**12.50 - 13.10**

Discussion

## Monday October 3 - Afternoon

**14.30 - 15.30**

Registration

### Central Hall

#### SESSION A1

#### Waste Management Policy (I)

**15.30 - 15.50**

*L. Butti (IT)*

The precautionary principle and the waste legislation

**15.50 - 16.10**

*T. Parker, P. Hardisty, A. Rosevear and J. Gronow (UK)*

Economic impact assessment of implementing new landfill regulatory guidance

**16.10 - 16.30**

*D.T. Case, E. de Wit and G. Wright (US)*

Role of insurance in environmental policy

**16.30 - 16.50**

*G. De Feo and R.M.A. Napoli (IT)*

New and old paradigms on production and management of municipal solid waste

**16.50 - 17.10**

Discussion

**17.10 - 17.40**

Coffee break

**17.40 - 18.00**

Poster discussion

#### SESSION A2

#### Waste Management Policy (II)

**18.00 - 18.20**

*R. Stegmann (DE)*

Waste as a resource

**18.20 - 18.40**

*H. Reisinger and H.J. Krammer (AT)*

Development of the Austrian 2006 waste prevention and recycling strategy

**18.40 - 19.00**

*P.H. Nicholls (AU)*

The emergence of waste policy and legislation in Australia, Sydney, 1788-2000

**19.00 - 19.20**

*A. De Maio, A. Franchi and E. Capraro (IT)*

A proposal for a new, effective, cost-efficient and environmental-friendly waste management

**19.20 - 19.40**

Discussion



# Panorama Hall

## SESSION B1

### Landfill processes

**15.30 - 15.50**

*G. Rettenberger (DE)*

Landfill gas characterization over time - The nine-phase model

**15.50 - 16.10**

*P. Wens and W. Verstraete (BE)*

Monitoring of anaerobic processes in the landfill body

**16.10 - 16.30**

*H. Scharff and J. Jacobs (NL)*

Equifill: inorganic waste landfill meeting EU landfill criteria

**16.30 - 16.50**

*L.C. Lange, F.V.B. Silva and G.F. Simoes (BR)*

Influence of moisture content on anaerobic biodegradation of municipal solid waste in experimental reactors

**16.50 - 17.10**

Discussion

**17.10 - 17.40**

Coffee break

**17.40 - 18.00**

Poster discussion

## SESSION B2

### Sustainable landfilling

**18.00 - 18.20**

*R. Cossu (IT)*

The sustainable landfilling concept

**18.20 - 18.40**

*H. Woelders, L. Luning, F. van Velthoven, H. Hermkes and H. Oonk (NL)*

Dutch sustainable landfill research program: four years experience with the bioreactor test cell Landgraaf

**18.40 - 19.00**

*O. Hjelm and J.B. Hansen (DK)*

Sustainable landfill: the role of final storage quality

**19.00 - 19.20**

*D.H. Hall, J. Gronow, R. Smith and A. Rosevear (UK)*

Estimating the post-closure management time for landfills containing treated MSW residues

**19.20 - 19.40**

Discussion

## Central Hall

### SESSION A3

#### Waste management strategies (I)

**09.00 - 09.20**

*P. Wens (BE)*

Landfills and sustainable municipal solid waste management

**09.20 - 09.40**

*L.L. Eggerh, G.M. Savage and L.F. Diaz (US)*

Innovations on procurement for waste management services

**09.40 - 10.00**

*D.C. Wilson and N. Blakey (UK)*

Developing a national strategy for waste and resources research

**10.00 - 10.20**

*J. Villeneuve, P. Wavrer, P. Michel and Y. Menard (FR)*

Comparative analysis of integrated waste management solutions: a case study

**10.20 - 10.40**

Discussion

**10.40 - 11.10**

Coffee break

### SESSION A4

#### Waste management strategies (II)

**11.10 - 11.30**

*T. Matsuto (JP)*

Past and present waste management strategy in Japan

**11.30 - 11.50**

*S.A. Thorneloe, K.A. Weitz and J. Jambeck (US)*

Moving from solid waste disposal to materials management in the United States

**11.50 - 12.10**

*G. Hafner and M. Kranert (DE)*

Performance and evaluation of new waste management strategies in Germany

**12.10 - 12.30**

*V. Feodorov (RO)*

Waste management and sustainable development in Romania

**12.30 - 12.50**

Discussion

# Panorama Hall

## SESSION B3

### Landfill bioreactor

**09.00 - 09.20**

*D. Augenstein, R. Yazdani, J. Kieffer and J. Benemann (US)*

Yolo County, California controlled landfill program: a summary of results since 1994

**09.20 - 09.40**

*E.A. McBean, F.A. Rovers, E. del Rosso and T. Gidda (CA)*

Performance results from the Tucuman solid waste bioreactor

**09.40 - 10.00**

*Y. Moreau-Le Golvan, T. Lagier, L. Smith and M. Lane (AU)*

A strategy to achieve optimal performance at fullscale operational bioreactor landfill

**10.00 - 10.20**

*C. Felske and U. Wolf (CA)*

Implementation of bioreactor technology at a Northern Canadian landfill

**10.20 - 10.40**

Discussion

**10.40 - 11.10**

Coffee break

## SESSION B4

### Mechanical biological pretreatment

**11.10 - 11.30**

*R. Stegmann (DE)*

Mechanical biological pre-treatment of municipal solid waste

**11.30 - 11.50**

*S. Silvestri, L. Dallago, G. Odorizzi, G. Zorzi, G. Gardelli and M. Ragazzi (IT)*

Biological stabilization of residual solid waste: technologies and methods

**11.50 - 12.10**

*H. Santen and K. Fricke (DE)*

Percolation as pre-treatment before anaerobic digestion - Result of small-scale-surveys and full-scale balancing campaigns

**12.10 - 12.30**

*D. Panza, G. De Feo and V. Belgiorno (IT)*

Quality of the stabilized organic fraction from mechanical and biological treatment

**12.30 - 12.50**

Discussion

### Central Hall

#### SESSION A5

##### Waste characterisation

**15.30 - 15.50**

*V. Jokinen, V. Niutanen, K. Karhu and R. Anderson (FI)*

Quality of the household waste in the Helsinki metropolitan area in Finland - Towards high recycling rates of waste

**15.50 - 16.10**

*R.J. Slack, J.R. Gronow and N. Voulvoulis (UK)*

Hazardous substances in household waste

**16.10 - 16.30**

*C. Riber and T.H. Christensen (DK)*

Characterisation of solid waste by direct and indirect analysis

**16.30 - 16.50**

*P. Beigl, P. Gamarra and R. Linzner (AT)*

Waste forecasts without "rule of thumb": improving decision support for waste generation estimations

**16.50 - 17.10**

Discussion

**17.10 - 17.40**

Coffee break

**17.40 - 18.00**

Poster

#### SESSION A6

##### Waste collection

**18.00 - 18.20**

*A. Read and S. Reed (UK)*

Maintaining high diversion wet & dry recycling in the UK: lessons from Daventry district council

**18.20 - 18.40**

*A. Heilmann and J. Winkler (DE)*

Influence of the source separation efficiency of recyclable materials on the environmental performance of municipal waste management systems

**18.40 - 19.00**

*C.D.H. Wilson and I.D. Williams (UK)*

Kerbside collections: a comparison of 3 wards in the North-West of England

**19.00 - 19.20**

*E. Cossu and D. Rossetti (IT)*

State of the art of the pneumatic collection of municipal solid waste

**19.20 - 19.40**

Discussion

# Panorama Hall

## SESSION B5

### Landfill engineering

#### 15.30 - 15.50

*S. Purdy and R. Shedden (US)*

Master plan development of the Monterey Peninsula landfill, Marina, California

#### 15.50 - 16.10

*A. Sia and N. Dixon (UK)*

\*\*\*Probabilistic landfill design: selection of input data distributions

#### 16.10 - 16.30

*R.P. Beaven, J. White and P. Lucas (UK)*

Modelling the performance of a horizontal leachate drain

#### 16.30 - 16.50

*M. Kuroiwa, O. Nabata, S. Ogino, S. Nakajima, M. Fujita, M. Hanashima and T. Furuichi (JP)*

A confirmation test result of the modulus of ground reaction of the cover material for a leachate collection facility

**16.50 - 17.10** Discussion

**17.10 - 17.40** Coffee break

**17.40 - 18.00** Poster discussion

## SESSION B6

### Mechanical properties and behaviour of landfills

#### 18.00 - 18.20

*V. Krase and D. Dinkler (DE)*

Constitutive modelling of mechanical behaviour of municipal solid waste

#### 18.20 - 18.40

*F. Olivier, J.P. Gourc and C. Coquant (FR)*

Predicting the storage capacity of deep landfills: Ferques bioreactors case study

#### 18.40 - 19.00

*N.G. Gawande, D.R. Reinhart and A.L.G. Cortazar (US)*

Landfill MSW hydraulic conductivity estimation using in situ moisture sensors

#### 19.00 - 19.20

*F. Koelsch, K. Fricke, C. Mahler and E. Damanhuri (BR)*

Stability of landfills - The Bandung dumpsite disaster

**19.20 - 19.40** Discussion

## Central Hall

### SESSION A7

#### Waste recycling

09.00 - 09.20

*J. Reichenbach and B. Bilitenwski (DE)*

Can economic motivations enhance citizen's efforts for waste reduction and diversion?

09.20 - 09.40

*S. Goldoni, A. Bonoli and L. Ponti (IT)*

Material and energy recovery from municipal solid waste. Regulation, economic, environmental and social aspects

09.40 - 10.00

*F. Schneider and G. Wassermann (AT)*

The consideration of materials from renewable resources in waste management

10.00 - 10.20

*A. I. Zacharof and C. Cheeseman (UK)*

Scrap tyre recycling - Opportunities and challenges

10.20 - 10.40

Discussion

10.40 - 11.10

Coffee break

### SESSION A8

#### Biological treatment

11.10 - 11.30

*R. Linzer and P. Mostbauer (AT)*

Composting and its impact on climate change with regard to process engineering and compost application - A case study in Vienna

11.30 - 11.50

*S. Lebersorger, R. Linzner and N. Unger (AT)*

Potential reduction of residual waste by home composting - A case study

11.50 - 12.10

*J. Streese, O. Bade and R. Stegmann (DE)*

Integrated concept for decentralised waste water and biowaste treatment

12.10 - 12.30

*E. Kraft and J. Liebetrau (DE)*

Automatic operation control of anaerobic digestion plants - A key factor for increasing efficiency

12.30 - 12.50

Discussion

# Panorama Hall

## SESSION B7

### Barriers

09.00 - 09.20

*H. Aurinko and K. Kujala (FI)*

Comparison of mineral liners used in landfill construction

09.20 - 09.40

*L. Conti and L. Nettuno (IT)*

\*\*\*Design and construction of landfills barrier systems: performance criteria and equivalence levels

09.40 - 10.00

*A. Stringfellow, A. Simoes, D.J. Smallman, H. Potter, W. Powrie and R. Beaven (UK)*

Attenuation of toluene by mineral landfill liners

10.00 - 10.20

*B. Forget, A.L. Rollin and T. Jacquelin (CA)*

\*\*\*Lessons learned from 10 years of leak detection surveys on geomembranes

10.20 - 10.40

Discussion

10.40 - 11.10

Coffee break

## SESSION B8

### Top cover design

11.10 - 11.30

*S. Hancock, M. Jorgensen, R. Gallagher and B. Fox-Lane (AU)*

Landfill final cap design alternative

11.30 - 11.50

*J. Weiss and A. Witzsche (DE)*

Results of the efficiency of the capillary barrier system at the landfill Grix Offenbach - Germany

11.50 - 12.10

*J. Berger, B. Warwa, L. Fornes and J. Jager (DE)*

Indicators and factors for the development of methane oxidising layers in landfill cover soils

12.10 - 12.30

*R.N. Michael, S.T.S. Yuen, A.J.M. Baker and C.S. Bateman (AU)*

Utilisation of mine wastes in plant based alternative cover trials

12.30 - 12.50

Discussion

## Central Hall

### SESSION A9

#### Thermal treatment

**15.30 - 15.50**

*B. Bilitewski (DE)*

Waste thermal treatment - State of the art

**15.50 - 16.10**

*R. Paulnsteiner, M. Graf and J. Stubenvoll (AT)*

Advanced flue gas cleaning system technology for waste incinerators on the example of the new plant MSZ3 Moscow

**16.10 - 16.30**

*M.S. Snow, D. Kennedy and T. Garza (CA)*

Pyrolysis transformation of organic wastes - Results of full-scale trial demonstration

**16.30 - 16.50**

*D. Mutz (CH)*

Co-processing waste materials in cement production - A contribution for improving waste management in developing countries

**16.50 - 17.10**

Discussion

**17.10 - 17.40**

Coffee break

**17.40 - 18.00**

Poster discussion

### SESSION A10

#### Landfill concepts

**18.00 - 18.20**

*R. Stegmann (DE)*

Discussion of different landfill concepts - From open dump to MBP-landfill

**18.20 - 18.40**

*G. Wassermann, E. Binner, P. Mostbauer and S. Salhofer (AT)*

Environmental relevance of landfills depending on different waste management strategies

**18.40 - 19.00**

*D. Augenstein, R. Yazdani and J. Benemann (US)*

Engineered landfills versus in-vessel processes for anaerobic composting and methane recovery from municipal solid waste

**19.00 - 19.20**

*P. Frith and D. Brooks (UK)*

Developing new technologies to divert municipal waste from landfill: a government initiative for England

**19.20 - 19.40**

Discussion



## Panorama Hall

### SESSION B9

#### Leachate management

**15.30 - 15.50**

*H.D. Robinson (UK)*

The composition of leachates from very large landfills: an international review

**15.50 - 16.10**

*R. Cossu, R. Stegmann and K-U. Heyer (IT)*

Landfill leachate treatment

**16.10 - 16.30**

*R. Thiel (US)*

Observed benefits and problems associated with leachate recirculation

**16.30 - 16.50**

*L. Martesson, S. Bergstrom, B-M. Svensson and L. Matbiasson (SE)*

Experience of leachate treatment in pilot plant studies

**16.50 - 17.10**

Discussion

**17.10 - 17.40**

Coffee break

**17.40 - 18.00**

Poster discussion

### SESSION B10

#### Landfill gas recovery technology

**18.00 - 18.20**

*M. Cassel and J. Tooley (US)*

Gas management with the automated extraction monitoring system

**18.20 - 18.40**

*F. Pelizzari, P. Poli, E. Pregliasco, E. Magnano and M. Aramili (IT)*

Design criteria of an energy recovery system based on microturbines powered with low methane content landfill gas

**18.40 - 19.00**

*M. Watts, R.G. Gregory and J. Blowes (UK)*

Continuous monitoring of landfill gas engine emissions: an aid for optimising operation and regulation

**19.00 - 19.20**

*A. Corti, L. Lombardi and L. Puglierin (IT)*

Landfill gas production and energy recovery in bioreactor landfill

**19.20 - 19.40**

Discussion

### Central Hall

#### SESSION A11

##### Waste management in developing countries

**09.00 - 09.20**

*A. Ali (PK)*

Waste management - Developing world and countries in transit

**09.20 - 09.40**

*A. Coad (EG)*

Experiences of private sector participation in solid waste management in low and middle income countries

**09.40 - 10.00**

*O. Esan and M. Wenborn (UK)*

Private sector participation in municipal solid waste management in developing and low income countries - A case study of Ethiopia

**10.00 - 10.20**

*P. Gamarra and S. Salhofer (AT)*

A comparison of waste management in Perù and some Latin-American countries: an overview of major problems, characteristics and real needs in the region

**10.20 - 10.40**

Discussion

**10.40 - 11.10**

Coffee break

#### SESSION A12

##### Special wastes

**11.10 - 11.30**

*R.J. Slack, M. Bonin, J.R. Gronow and N. Voulvoulis (UK)*

Quantities of household hazardous waste disposed to UK landfills

**11.30 - 11.50**

*S. Matsuda, A. Ichikawa and S. Suzuki (JP)*

Towards the best management of construction waste by using information technology

**11.50 - 12.10**

*V. Grilc and V. Fabjan (SI)*

Problems with disposal of the car shredder residue

**12.10 - 12.30**

*G. Kocasoy and E. Tiryaki (TR)*

Conversion of industrial sludge and fly ash into beneficial products

**12.30 - 12.50**

Discussion

# Panorama Hall

## SESSION B11

### Landfill gas emissions (I)

**09.00 - 09.20**

*O. Bour, S. Berger, C. Couturier and L. Riquier (FR)*

Determination of guidance values for closed landfill gas emissions

**09.20 - 09.40**

*H. Scharff and J. Jacobs (NL)*

Comparison of methane emission models and measurements

**09.40 - 10.00**

*J. Bogner, K. Spokas, J. Chanton, D. Powelson, J. Fleiger and T. Abichou (US)*

Modeling landfill methane emissions from biocovers: a combined theoretical-empirical approach

**10.00 - 10.20**

*C. Scheutz, A. Fredenslund, J. Nedenskov and P. Kjeldsen (DK)*

Field measurements of methane emissions and oxidation at a modern disposal site receiving waste with a low organic content

**10.20 - 10.40**                      Discussion

**10.40 - 11.10**                      Coffee break

## SESSION B12

### Landfill gas oxidation in top covers

**11.10 - 11.30**

*C. Felske, R. Haubrichs and R. Widmann (CA)*

Engineering strategies for efficient methane oxidation in landfill cover liners and biofilters systems

**11.30 - 11.50**

*H. Woelders, H. Oonk, A. Hensen, K. Mabieu, A. de Visscher, F. van Velthoven and D. Overzet (NL)*

Enhancing methane oxidation in landfill top-layers: result of field trials

**11.50 - 12.10**

*M. Huber-Humer (AT)*

Extended effects of methane oxidation and their relevance for biocover application in the field

**12.10 - 12.30**

*K. Mabieu, A. de Visscher, P.A. Vanrolleghem and O. van Cleemput (BE)*

Improved quantification of methane oxidation in landfill cover soils by numerical modelling of stable isotope fractionation

**12.30 - 12.50**                      Discussion

### Central Hall

#### SESSION A13

#### LCA in waste management

**15.30 - 15.50**

*J. den Boer, E. den Boer, J. Jager, P. Beigl, K. Tsilemou, D. Panagiotakopoulos, M. Meneses, J. Rodrigo and F. Castells (DE)*

LCA-IWM: a sustainability assessment tool for municipal solid waste management planning and optimisation

**15.50 - 16.10**

*J. Kirkeby, T.H. Christensen, G.S. Bhandar, T.L. Hansen and H. Birgisdottir (DK)*

LCA modelling of MSW management system: approach and case study

**16.10 - 16.30**

*E. Gentil, D. Hall, B. Thomas, S. Shiels and M. Collins (UK)*

LCA tool in waste management: new features and functionalities

**16.30 - 16.50**

*E. Aoustin, M. Saade, E. Redon, S. Renou and O. Jolliet (FR)*

LCA as a decision supporting tool in MSW management: application to mechanical-biological pre-treatment before landfilling

**16.50 - 17.10** Discussion

**17.10 - 17.40** Coffee break

**17.40 - 18.00** Poster discussion

#### SESSION A14

#### Decision support tools in waste management

**18.00 - 18.20**

*S.C. Jose, N. Mitchell, R. Little and P. Longhurst (UK)*

Working to plan or planning to work: testing policy by modelling London's waste

**18.20 - 18.40**

*M. Loeschau and S. Rotter (DE)*

Input-output analysis for modelling of complex networks of waste treatment processes

**18.40 - 19.00**

*F. Ferreira and A. Calmeiro (PT)*

Indicators for environmental performance evaluation of MSW management. Proposal and application on two Portuguese MSW management systems

**19.20 - 19.40**

*P. Viotti, G. Marella, M. Leccese and K. Verde (IT)*

Comparing different viable MSW management system in terms of environmental performance and cost analysis

**19.40 - 20.00** Discussion

# Panorama Hall

## SESSION B13

### Landfill aftercare

#### 15.30 - 15.50

*K.-U. Heyer, K. Hupe and R. Stegmann (DE)*

Landfill aftercare-scope for actions, duration, costs and quantitative criteria for the completion

#### 15.50 - 16.10

*M. Rappthel (DE)*

Closure and aftercare regime for landfills below the water table

#### 16.10 - 16.30

*P. Malesani, F. Furlan and F. Cossio (IT)*

Aftercare of some landfill sites in the province of Verona

#### 16.30 - 16.50

*J.L. Martel, S. Follet and A. Peltier (FR)*

Use of compost for landfill revegetation: main results of the Arnouville landfill pilot scale experimentation

**16.50 - 17.10**                      Discussion

**17.10 - 17.40**                      Coffee break

**17.40 - 18.00**                      Poster discussion

## SESSION B14

### In situ aeration

#### 18.00 - 18.20

*R. Cossu, G. Sterzi. and D. Rossetti (IT)*

Full-scale application of aerobic in situ stabilization of an old landfill in North Italy

#### 18.20 - 18.40

*K.-U. Heyer, K. Hupe, A. Koop and R. Stegmann (DE)*

Aerobic in situ stabilization of landfills in the closure and aftercare period

#### 18.40 - 19.00

*M. Hudgins and J. Peck (US)*

Rehabilitation and redevelopment of closed landfill using an in situ aeration approach

#### 19.20 - 19.40

*H. Yoshida (JP)*

Landfill temperatures in semi-aerobic landfills

**19.40 - 20.00**                      Discussion

### Central Hall

#### SESSION A15

##### Public concern (I)

09.00 - 09.20

*L. Vasconcelos, M.J. Marques and G. Martinho (PT)*

Public participation in waste management - Overcoming ingrained myths

09.20 - 09.40

*I.D. Williams and C. Alsop (UK)*

Best practice for running civic amenity sites in England & Wales

09.40 - 10.00

*D.R. Aguilar (US)*

Reaching our future generation with a solid waste message

10.00 - 10.20

*G. De Feo, D. Panza and V. Belgiorno (IT)*

Public opinion and resident's concerns, perceptions and attitudes towards MSW treatment and disposal plants

10.20 - 10.40

Discussion

10.40 - 11.10

Coffee break

#### SESSION A16

##### Public concern (II)

11.10 - 11.30

*E. Walsh and J. Barrett (IE)*

Ballyally landfill Dublin - A case study of public relationships and concerns

11.30 - 11.50

*T. Hanamura, T. Matsuzaki and K. Mizuno (JP)*

Public involvement and construction management of a high performance MSW landfill project in Japan

11.50 - 12.10

*C. Stiglitz (AT)*

The achievement of consensus - Communication in waste management

12.10 - 12.30

*L.D. Domeij, A. Lagerkvist, J-E. Meijer and S. Vukicevic (SE)*

How to describe and compare the effects of MSW source sorting systems

12.30 - 12.50

Discussion

## Panorama Hall

### SESSION B15

#### CO<sub>2</sub>-credits from landfill gas oxidation

**09.00 - 09.20**

*E. McBean, S. Ritchie and T. Gidda (CA)*

Landfill gas collection for greenhouse gas credits: an Argentinian case study

**09.20 - 09.40**

*M. Cavalli and E. Rossato (IT)*

Experiences with landfill gas collection and flaring for greenhouse gas credits

**09.40 - 10.00**

*C. Lee, E.J. Bogner and Aalders (US)*

Landfill gas recovery: the low hanging fruit for carbon credits trading in developing countries

**10.00 - 10.20**

*W.H. Stachowitz (DE)*

Carbon trading with landfill gas and carbon credits - JI and CDM projects

**10.20 - 10.40**

Discussion

**10.40 - 11.10**

Coffee break

### SESSION B16

#### Remediation of old landfills

**11.10 - 11.30**

*R. Cossu (IT)*

Remediation technology for old landfills

**11.30 - 11.50**

*G. Allgaier and R. Stegmann (DE)*

Old landfills in the focus of urban land management

**11.50 - 12.10**

*R.B. Wallace, I.K. Sutton and M.J. Stepic (US)*

Landfill redevelopment: selecting restrictions and constraints

**12.10 - 12.30**

*J. Dunn (US)*

After many years it is now a regional sports park - Successful closure of the oldest sanitary landfill in the United States

**12.30 - 12.50**

Discussion

## Central Hall

### CLOSING SESSION

Chairman: R. Stegmann (DE)

#### 15.30 - 16.30

##### Reports on Workshop Sessions

Chairmen's reports on Workshop activity highlighting the controversial aspects, open questions and future developments that arisen from discussion

#### 15.30 - 16.30

##### Round Table

*"Thermal Treatment - A solution for our waste problems or a threat for the human society?"*

The number and size of megacities is increasing and in many cases waste is landfilled. In Europe due to legislation less amount of waste will be landfilled. The long term after-care of closed landfills becomes an enormous financial load.

How can these problems be solved and is the thermal treatment the solution? In many countries people's organizations and/or politicians oppose against thermal treatment: is the fear more emotional or scientifically based.

During the Round Table these questions will be discussed by an International Panel of Experts.

Prof. dr. ing. B. Bilitewski, TU Dresden (DE), will give the scientific background during an Introductory Lecture.

The following topics will be discussed:

- Problematics of Dioxins and other emissions
- Public Acceptance
- New Technologies: Plasma, Pyrolysis, Hybrid Technologies, etc.
- Material vs. Energy Recovery
- Mass burning vs. RDF production & utilisation
- Landfill vs. Thermal Treatment: economical and ecological aspects

#### 21.00

##### *Gala Dinner and Closure*

The SARDINIA 2005 Award *"A Life for Waste"* will be delivered during the Dinner.



# SPECIALIZED SESSIONS AND WORKSHOPS

## Daily Programme

This sessions will be held, as indicated, in rooms with different seating capacity, according to the expected attendance:

Baldacchino Room (150 places)

Chiesa Room (100 Places)

Le Dune Room (100 places)

Pub Room (50 places)

Naturista Room (40 places)

Due to the limited number of places, pre-registration is required. Please fill in and return the enclosed registration form.

## Monday October 3 - Afternoon

15.30 - 19.40

### SPECIALIZED SESSIONS

#### Baldacchino Room

##### SESSION C1

##### **Management of contaminated soil**

*U. Ruiz Saucedo, W. Schmidt and G. Wehenpohl (MX)*

Institutional development of contaminated sites management in Mexico

*S. Silvestri, L.M. Moretto, P. Ugo, G. Zorzi and C. Baiocchi (IT)*

Degradation by composting of Polycyclic Aromatic Hydrocarbons present in a soot contaminated soil

*J.M. Chimenos, A.I. Fernandez, M. Segarra, N. Gangutia and H. Hernandez (ES)*

Evaluation of the use of low grade MgO to stabilize heavy metals contained in contaminated soils. Ex situ and in situ case remediation studies

*P. Hallgren and R. Westbom (SE)*

Selective supercritical fluid extraction - A new tool in risk assessment for misuring bioavailability of PCBs

*Y. Ogane, K. Kumagai and T. Higa (JP)*

Ground reclamation by using effective microorganisms (EM)

##### SESSION C2

##### **Special wastes**

*L.Yurramendi, S. Caballero and S. Perez (ES)*

Acid neutralisation capacity as criteria for the acceptance of hazardous waste at landfills

*P. Jovanic and B. Gavric (YU)*

Waste metal and oil treatment and recycling plant case study

*C. Mollea, F. Chiampo, F. Bosco and R. Conti (IT)*

Reuse of food industry wastes: the case of cocoa husks

*B. Inanc, M. Nagamori, Y. Ono, Y. Inoue, M. Yamada and Y. Ono (JP)*

Behavior of VOCs in aerobic and anaerobic landfill bioreactors for co-disposed MSWI bottom ash and shredded municipal and industrial wastes

*G. Malina, J. Krupanek and H.H.M. Rijnaarts (PL)*

Risk-based approach to manage hazardous waste deposits in the vicinity of the chemical plant in Tarnowskie Gory (Poland)

## Chiesa Room

### SESSION D1

#### Plastic recycling

*E. Pancaldi, L. Ferrari, R. Melloni and P. Neri (IT)*

LCA analysis of possible scenarios of plastics disposal

*C. Ciotti and S. Cicerani (IT)*

Feasibility study for PVC waste in light concrete

*M. Griffiths (BE)*

Vinyl 2010: the voluntary commitment approach of the european PVC industry to the challenge of sustainable development

*M. Della Zassa and P. Canu (IT)*

Pyrolysis of plastic wastes

*M. Tabiri (FR)*

Plastic regeneration and recycling: introduction in composite materials elaboration

*W. Claes (BE)*

Roof waterproofing membranes and the EU environment

### SESSION D2

#### Landfill siting

*J.M. Ball (ZA)*

Landfill site selection

*L. Fernandes and M. Matias (PT)*

The siting of household waste management facilities in Portugal

*M. Vaccari, C. Collivignarelli and P.L. Vercesi (IT)*

Risk analysis as a decisional tool for the location of landfills

*M.J. Marques, M.G. Martinho, L. Vasconcelos and J. Maia (PT)*

NIMBY geographic prevision: a partecipatory model applied to landfill siting in Portugal

*K. Nakaishi, F. Igari, K. Hayashi, M. Saito, K. Kuwamoto and M. Hanashima (JP)*

The study on method appropriate site selection considering environmental risk management

# Le Dune Room

## SESSION E1

### Leaching tests

*H.A. van der Sloot, A. van Zomeren, J.C.L. Meeussen, J. Jacobs and H. Scharff (NL)*

Prediction of the leaching behaviour of waste mixtures by chemical speciation modelling based on key parameters from individual waste materials

*T. Astrup, J. Hyks and T.H. Christensen (DK)*

Predicting Cr leaching from MSWI residues

*J.B. Hansen, O. Hjelm, O. Asmussen, S. Klem, J. Gamst, M. Wahlström, L. Larsson and G.D. Breedveld (DK)*

Leaching of non-volatile organic compounds from soil and waste: evaluation of two leaching methods

*B-M. Svensson, L. Martensson and L. Mathiasson (SE)*

Practical experiences from leachability tests

*R. Gadia and R. Raga (IT)*

Leaching of organic compounds from waste and soils

## SESSION E2

### Risks assessment for landfilling

*S. Hanada, H. Tojo, T. Matsuto and N. Tanaka (JP)*

Risk assessments of MSW landfill under various options for design operation and maintenance

*F. Belfiore, A. Toma, L. D'Aprile, G. Marella, L. Musmeci and E. Beccaloni (IT)*

A national framework for risk assessment of landfills

*D. Wenig, D. Strudwick and S. Schroder (AU)*

Environmental risk assessment of landfills exempt from licensing in Victoria, Australia

*L. D'Aprile, S. Spina, E. Beccaloni and L. Musmeci (IT)*

Development of a clean-up strategy for the national priority list site of Frosinone (Italy)

*P. Morra, G. Spadoni, R. Lisi and G. Maschio (IT)*

Assessment of the human health risk using a GIS approach: the case of the Pace Valley

*Y. Ono, M. Yamada, Y. Ono and K. Endo (JP)*

Risk management and security strategy on toxic substances in final disposal site

## WORKSHOPS

### Pub Room

## SESSION F1

### Acceptance criteria in landfilling

Introductory lectures:

*I. Luberti and M.S. Giamberini (IT)*

A new software tool for the management of environmental data for MSW landfills according to the EU "Landfill Directive"

*O. Hjelm, J. Holm, J.G. Hansen and K. Dahlstrom (DK)*

Implementation of the EU waste acceptance criteria for landfilling in Denmark

*D. Drury, D. Hall and J. Gronow (UK)*

Modelling in support of establishing monolithic waste acceptance criteria in England and Wales

*O. Hjelm, D. Bendz, M. Wahlström, P. Suér, J. Laine-Ylijoki and D.L. Baun (DK)*

Criteria for acceptance of monolithic waste at landfills

## SESSION F2

### Healthcare waste

Introductory lectures:

*B.A. Zeren, G. Kocasoy, E. Yildirim and M. Kilic (TR)*

Determination of the correlation between the parameters of the health-care institutions by the statistical analysis

*M. Tsakona, E. Anagnostopoulou and E. Gidarakos (GR)*

Complete system of hospital waste management and treatment: a case study

*G.M. Savage and L.F. Diaz (US)*

Risks associated with the disposal of healthcare wastes on land

## Naturista Room

## SESSION G1

### Tests for assessing biological activity of biodegradable waste

Introductory lectures:

*J. Heerenklage and R. Stegmann (DE)*

Analytical methods for the determination of the biological stability of waste samples

*R. Cossu and R. Raga (IT)*

Comparison of different test methods for assessing biological stability of biodegradable waste

*G. Andreottola (IT)*

Dynamic respirometric tests for assessing the biological activity of waste

*F. Fior, G. Vendrame, L. Franz, F. Germani, L. Paradisi, L. Bergamin and A. Ceron (IT)*

The management of the biowaste and the monitoring of the composting process by the determination of Dynamic Respiration Index (DRI) to assess the quality of compost in the Veneto region

## SESSION G2

### Management of hygiene products

Introductory lecture:

*I.D. Williams and B. Whittaker (UK)*

The environmental impacts of sanitary protection products

## SPECIALIZED SESSIONS

### Baldacchino Room

#### SESSION C3

##### Combustion residues (I)

*H. Birgisdottir, T. Christensen, R. Bhandar and M. Hauschild (DK)*

LCA-tool for disposal of MSWI residues: recycling in road construction and landfilling

*A. Poletti, R. Pomi and M. Ramaglia (IT)*

Accelerated ageing as a tool for sustainable disposal of incinerator bottom ash

*Y. Tojo, T. Okada, N. Tanaka, T. Matsuo, Y. Kakuta and T. Matsuo (JP)*

Optimum washing condition for condensing heavy metals in melting furnace fly ash

*K. Sato, S. Yamada and T. Fujikawa (JP)*

Mechanical and leaching properties of the air-cement treated soil using incineration residue from MSW

*K. Suzuki and Y. Ono (JP)*

Characteristics of leaching behaviour of cement-solidified fly ash with chelating agent from melting furnace

#### SESSION C4

##### Combustion residues (II)

*Y. Kanjo, H. Saika, M. Abdurishit and Y. Ono (JP)*

Improvement of the BCR sequential extraction method for evaluation of extractable forms of heavy metals in fly ash and its cement solidified waste

*J.-J. Lee, T. Shimaoka, S. Sakita and F.G. Umesaki (JP)*

Formation and leaching characteristics of humic substances in landfills mainly disposed with municipal solid waste incineration residues

*Y. Dote, T. Sekito and M. Ikegami (JP)*

Effect of carbonation of fly ash from vitrification plant on pretreatment for recovery of heavy metals

*M. van Praagh, M. Persson and K.M. Persson (SE)*

Assessment of hydrological parameters in column leaching tests by time domain reflectometry

*R. Zhang, T. Shimaoka and T. Haraguchi (JP)*

Leaching behaviour and alterations of heavy metals in MSW incinerator residues under geochemical weathering in a landfill

*S. Heuss-Assbichler and C. Speiser (DE)*

Factors controlling the leachability of Pb in MSWI fly ashes

## Chiesa Room

### SESSION D3

#### Production and recovery of sludge

*G. Angelucci, K. Bedin and F. Moedinger (IT)*

Sewage sludge disposal in the autonomous province of Bolzano, Southtyrol, Italy

*S. Pratt, S. Banker, S. Barnes, B. Negret and A. Shilton (NZ)*

Volatile fatty acids production from sewage sludge - Influence of pH

*M. Kranet and I. Berkner (DE)*

Quality assurance for compost and other products made from sewage sludge - Status and perspectives

*L. Alibardi, R. Cossu and M.C. Lavagnolo (IT)*

Aerobic stabilisation of tannery sludge

### SESSION D4

#### Education in waste management

*N. Mair, C.D.H. Wilson and I.D. Williams (UK)*

Waste education and competency-based qualifications: experiences from the UK and their international relevance

*E. Fagogeni, A. Karkazi, T. Mavropoulos and A. Mavropoulos (GR)*

E-learning tools in the sector of solid and hazardous waste management

*J. Ceballos Aranda (ES)*

Interpretation centers in municipal solid waste landfills "CIVeRUs": tool for environmental awareness and showroom of the governmental management

*J. Martens (DE)*

Development of an international long distance internet-based master course on environmental technology and management

*C. Kuschke, I. Koerner and R. Stegmann (DE)*

Planning a composting facility

*G. Hills, T. Dice and B. Couth (UK)*

Waste procurement toolkit

*C. Kuschke, I. Koerner and R. Stegmann (DE)*

Waste management inventory

## Le Dune Room

### SESSION E3

#### Landfilling under specific climatic conditions

*C. Springer, E. Kraft and W. Bidlingmaier (DE)*

Development of alternative concepts for construction and operation of landfills under the conditions of tropical climate

*M. Griffith and C. Trois (ZA)*

Effects of waste pre-treatment on landfill emissions under a subtropical climate

*C. Visvanathan, J. Tränkler, C. Chiemchaisri and W. Schöll (TH)*

The open cell landfill: a suitable approach for landfill design and operation in the tropical region

*B. Cencur Curk, K. Hrast and M. Jug (SI)*

Design and environmental impact assessment of landfill for metallurgical slag and crushed plastics in a mountainous region, NE Slovenia

## SESSION E4

### New ideas in landfilling

*K. Ishii, T. Furuichi and N. Tanikawa (JP)*

Proposal for a new final disposal system with resource storage in closed system disposal facilities

*H. Ellard, J. Ingrams, P. Hewitt and N. Arber (UK)*

The use of glass cullet as leachate drainage in landfill engineering

*R.B. Green, G.R. Hater, C.D. Goldsmith, F. Kremer and T. Tolaymat (US)*

Commercial-scale aerobic-anaerobic bioreactor landfill operations

*H. Kokubo, K. Kotani, T. Katoh, M. Hanashima and T. Furuichi (JP)*

A study on benefit and cost effectiveness of closed system disposal facilities

*R. Cossu (IT)*

PAF model with mechanical pretreatment and separate fractions landfilling

## WORKSHOPS

### Pub Room

## SESSION F3

### Landfill extension

Introductory lectures:

*S. Purdy and R. Shedden (US)*

Cost/benefit analysis for the development of a landfill expansion module in California

*M. El-Hoz (LB)*

Sanitary landfill expansion

*M. Kumabara, H. Kokubo, N. Usui and S. Namamura (JP)*

Methods for renewal and prolonging lifetime of existing wastes disposal landfills in Japan

*Z. Milanovic and A. Hojnik (HR)*

Implementation of rehabilitation project of the old landfill and building of new sanitary landfill in accordance with EU norms in a transition state like the republic of Croatia

## SESSION F4

### Leachate toxicity

Introductory lectures:

*B-M. Svensson, S. Bergstrom, L. Martensson and L. Mathiasson (SE)*

Acute toxicity test of leachate water from landfills using *Artemia Salina* as test organism

*H. Okamura, M. Kuchii, T. Kose, S. Mobri, M. Yamada and Y. Ono (JP)*  
Phytotoxic effects of landfill leachate in Japan

*K. Endo, Y. Ono, M. Yamada, Y. Inoue and Y. Ono (JP)*  
Test cells to analyze behavior of toxic chemicals in ash landfill  
slightly mixed with organic matter

## Naturista Room

### SESSION G3

#### Leachate analytical method

Introductory lectures:

*P. Pinel, D. Amouroux, I. Le Hecho, O. Donard and M. Potin-Gautier (FR)*  
Influence of sample processing on metals and metalloids partitioning  
and speciation in landfill leachate

*S. Mobri, R. Syoji, Y. Ono and M. Yamada (JP)*  
The feasibility of biomass battery applicability to construct an early  
warning system for leachate from solid wastes and recycled materials  
in Japan

*S. Grellier, J.M. Bouyé, R. Guerin, S. Moreau, H. Robain and N. Skhiri (FR)*

Influence of temperature and volume water content on electrical  
resistivity of leachate and waste samples

*P. Pinel, M. Ponthieu, I. Le Hecho, D. Amouroux, L. Mazzeas, O. Donard  
and M. Potin-Gautier (FR)*

Validation of metals analysis in bulk and filtered landfill leachate  
using an internal reference leachate material

*P. Pinel, I. Le Hecho, D. Amouroux, O. Donard and M. Potin-Gautier (FR)*  
Importance of metals and organometals speciation analysis to  
evaluate the environmental impacts of landfill leachate and biogas

### SESSION G4

#### Odour analyses

Introductory lectures:

*R. Lornage, K.K. Kleeberg, R. Stegmann, T. Lagier and J. Carre (FR)*  
Investigation on volatile organic compounds (VOC) and odorous  
emissions during solid waste treatment: implementation of  
different analytical methods

*A. Bockreis and I. Steinberg (DE)*  
Comparison of different sampling methods on area sources

*C. Fabbri, L. Rossi and A. Pedrielli (IT)*  
A programme for monitoring odorous and other gaseous emissions  
at a composting plant

*L. Valli, L. Rossi, I. Riccò, M. Della Torre, E. Semeghini, S. Forti,  
M. Tonelli and A. Del Carlo (IT)*  
Assessment of malodours from a composting plant by an electronic  
nose and olfactometry

*E. Senante, J.L. Martel, P. Dauthuille, L. Bouchy and P. Masse (FR)*  
Odour emissions on sludge composting sites



## Tuesday October 4 - Afternoon

15.30 - 19.40

### SPECIALIZED SESSIONS

#### Baldacchino Room

##### SESSION C5

##### **Environmental landfill monitoring and quality assessment**

*A. Capruzzi, P. Ganassi, C. Fabbri and L. Rossi (IT)*

Air quality of a landfill monitoring plan

*N. Bolton (US)*

Summary of results of efficiency audits of solid waste landfills

*A. Tazioli and G.S. Tazioli (IT)*

Water and leachate tritium content as pollution tracer in sanitary landfill investigations

*M.S. Giamberini, B. Raco and L. Tognotti (IT)*

Combined use of monitoring and prediction tools for environmental performance assessment in a MSW landfill according to the 'EMAS' regulation

*V. Nizzoli, I. Negri, M. Pellecchia, L. Pizzetti and T. Tellini (IT)*

Using honey bees as monitors of aromatic hydrocarbon pollutants in Rio Riazzone waste-landfill (Reggio Emilia, Italy)

*A. Haastrick, D. Rasch, K. Munnich, J. Bauer and D.C. Hempel (DE)*

Landfill monitoring - Novel in situ measurements and techniques

##### SESSION C6

##### **Landfill engineering**

*G.E. Swarbrick, S.A. Dever and L. Annett (AU)*

Landfill gas bioremediation using methane oxidation in a permeable reactive wall

*C. Zeiss (CA)*

Bioreactor landfills in Northern Regions - Challenges and outlook

*T.C. Rees White, R.P. Beaven, W. Powrie and H. Ellard (UK)*

Designs to prevent sediment ingress to vertical wells in landfills containing CKD

*Q. Huang, Q. Wang, Y. Yang and L. Dong (CN)*

Influence of landfill structure on leachate characteristics

*J.F.T. Jucà, M.O.H. Mariano, M.C.M. Alves, F.J. Maciel and E.A. Mlins (BR)*

Feasibility of gas recovery from the Muribeca landfill - Brazil

## Chiesa Room

### SESSION D5

#### Waste hydraulics in landfill

*K. Endo, Y. Sugimoto, N. Yamada, T. Aono, K. Kamura, Y. Isobe, Y. Ono, T. Ishigaki, M. Yamada, B. Inanc and Y. Inoue (JP)*

Searching for water paths and distribution in landfill using electrical resistivity and electromagnetic surveys

*N. Woodman, R.P. Beaven and J.A. Barker (UK)*

Identification of transport processes from a tracer test through waste

*J-M. Bouyé, M. Chanet, C. Heckmann and S. Moreau (FR)*

An experimental dielectric system using flexible integrating probe for waste water content measurement

*E. Durmusoglu, M.Y. Corapcioglu and I.M. Sanchez (TR)*

Permeability of municipal solid waste samples

*H. Rosqvist, T. Dablin and C. Lindhé (SE)*

Investigation of water flow in a bioreactor landfill using geoelectrical imaging techniques

### SESSION D6

#### Energy from biomass

*G. De Gioannis and A. Muntoni (IT)*

Energy recovery from waste through hydrogen production

*D. Zurawski, M. Meyer and R. Stegmann (DE)*

Fermentative production of biohydrogen from biowaste using digested sewage sludge as inoculum

*S. Caffaz, F. Tabani, C. Lubello and R. Canziani (IT)*

Anaerobic co-digestion of septage with waste activated sudge: a pilot plant experimental study

*W.P. Clarke, P. Radnidge, E. Lai, P. Jensen and M. Hardin (AU)*

Digestion of waste bananas to generate energy in Australia

*A. Rodrigues, L. Arroja, A. Flor, C. Rocha and I. Capela (PT)*

Impact of organic fraction of municipal solid waste on anaerobic co-digestion of biological sludge and cattle manure

## Le Dune Room

### SESSION E5

#### Landfilling as part of waste management strategies

*M. Fontana Giusti (FR)*

Landfill and incineration: final treatment facilities?

*J. Ryan and M. Minch (US)*

Evaluating the effectiveness of landfill regulations - A comprehensive study of waste management practices and regulations

*M. Kueble-Weidemeier (DE)*

Online measurement of gaseous emissions from mechanical-biological waste treatment (MBT)

*R. Lewicki, I. Gadsby and S. Cuadrat Dieste (UK)*

Safety implications in the waste industry following implementations of Atex directives

*C. Visvanathan, J. Trankler, P. Kuruparan and B.F.A. Basnayake, C. Chiemchaisri, K. Joseph and Z. Gonming (TH)*

Asian regional research programme on sustainable solid waste landfill management in Asia

## SESSION E6

### Landfill lysimeter and test cells

*M. Magnani, P. Magnani and S. Pinamonte (IT)*

Aerobic-anaerobic treatment of MSW organic fraction in landfill: a bridge to bioreactor technology

*K. Knox, F. Wong and A. Vosper (UK)*

Effects of chemically enhanced primary treated sewage sludge on leachate and gas from landfills

*P. Radnidge, W.P. Clarke, E. Lai and H.H. Song (AU)*

Landfill based pretreatment of MSW in Australia

*L.K. Ivanova, D.J. Richards and D.J. Smallman (UK)*

A preliminary analysis of waste biodegradation and landfill settlement rate using consolidating anaerobic reactors

*M. Swati, K. Joseph and R. Nagendran (IN)*

Bioreactor landfill lysimeter studies on Indian urban refuse

*R. Bayard, C. Gachet, F. Achour, C. de Brauer and R. Gourdon (FR)*

Organic matter stabilization of sorted MSW under leachate recirculation

## WORKSHOPS

### Pub Room

## SESSION F5

### In situ aeration (IWWG)

Introductory lectures:

*M. Ritzkowski and R. Stegmann (DE)*

Reduction of greenhouse gas emissions by landfill in situ aeration

*M. Tesar, R. Prantl and C. Heiss-Ziegler (AT)*

Applicability of selected parameters for characterizing organic matter of municipal solid waste after in-situ aeration

## SESSION F6

### Appropriate landfill technologies for developing countries

Introductory lectures:

*J. Kurian, S. Esakku, R. Nagendran and C. Visvanathan (IN)*

A decision making tool for dumpsite rehabilitation in developing countries

*F.J. Maciel and J.F.T. Jucà (BR)*

Investigations to analyse gas recovery potential from Muribeca's landfill - Brazil

*P.B. Alcantara, V.E.D. Monteiro, M.C.M. Alves, A.R. Brito and J.F.T. Jucà (BR)*

Construction and monitoring of an experimental reduced scale cell of MSW in Muribeca - Brazil

## Naturista Room

### SESSION G5

#### Co-treatment with sewage

Introductory lecture:

*H. Robinson (UK)*

Overview on leachate co-treatment with sewage

### SESSION G6

#### Quality and role of intermediate cover

Introductory lectures:

*S.Yannopoulos, N. Dermissi and H. Bakasis (GR)*

Methodology for the examination of cover material of a proposed landfill site at Thessaloniki, Greece

*T. Naruoka, Y. Ono, T. Harigai, K. Endo, M. Yamada, Y. Inoue and Y. Ono (JP)*

Development of landfill covers as permeable reactive barrier

## Wednesday October 5 - Morning

09.00 - 12.50

## SPECIALIZED SESSIONS

### Baldacchino Room

#### SESSION C7

#### Mechanical biological pretreatment

*C. Pizzingrilli, M. Pazzaglia, S. Cavaggion, B. Rimini, M. Bergonzoni and A. Bonoli (IT)*

Technical-economical analysis of waste pretreatment plants and benchmark with BAT (Best Available Technology) through the realization of a regional database

*E. Redon, R. Lornage, T. Lagier and I. Hebe (FR)*

Measurement and comparison of different stability parameters during a mechanical biological pretreatment before landfilling

*R. Lornage, E. Redon, T. Lagier and O. Kergaravat (FR)*

Gaseous emissions during a mechanical and biological pretreatment (MBP) of MSW prior to landfilling

*G. De Gioannis, A. Muntoni and M. Piredda (IT)*

Further investigations on MBP and relative implications

*T. Kaartinen, J. Laine-Ylijoki, M. Wahlstrom and U-M. Mroueh (FI)*

Impacts of co-disposing MBP waste with MSWI bottom ash on leachate quality - Lab scale tests

*K. Munnich, J. Bauer and K. Fricke (DE)*

Investigation on relationship between vertical and horizontal permeabilities of MBT wastes

## SESSION C8

### Biofilters for landfill gas

*S.A. Dever, G.E. Swarbrick and R.M. Stuetz (AU)*

Passive drainage and biofiltration of landfill gas using recycled waste materials under Australian conditions

*J. Gebert and A. Grongroft (DE)*

Microbial oxidation of landfill methane in a biofilter system -Passive ventilation and oxygen supply

*S.A. Dever, G.E. Swarbrick, L. Annett and R.M. Stuetz (AU)*

The effect of landfill gas loading on the performance of a passive biofiltration system operating under Australian conditions

*J. Streese and R. Stegmann (DE)*

Potential and limitations of biofilters from methane oxidation

*M. Chandrakanthi and P.Hettiaratchi (CA)*

Performance of field-scale methanotrophic biofilters (MBFs) used to control point-source methane emissions: a numerical modeling approach

## Chiesa Room

## SESSION D7

### Waste characterisation

*G. Malina (PL)*

The methodology for development of database for effective waste management planning in Poland

*O. Buenrostro Delgado and L. Marquez Benavides (MX)*

Characterization of residential solid waste in an urban settlement in Central Mexico: a retrospective and comparative study

*E. Gidarakos, P. Ntzamilis and G. Havas (GR)*

Qualitative and quantitative analysis of municipal solid waste in the island of Crete

*S. Balzamo and M. Belli (IT)*

Characterization of waste: production of "Reference Materials" by RDF, MSWI fly ashes and other hazardous wastes

*F. Fior, G. Vendrame, L. Franz, M. Milan, F. Bergamini, G. Dotto, G. Fattoretto, C. Gelfi and S. Tesser (IT)*

Merceological analysis of bulky waste: definition of the method and assessment of collected waste quality

## SESSION D8

### Waste to energy

*D. Cocarta, M. Ragazzi, A. Cemin, A. Badea and T. Apostol (IT)*

Particulate matter emissions into the atmosphere: modern municipal solid waste incineration role

*C. Marculescu, G. Antonini and A. Badea (FR)*

The MSW non-oxidant treatment characterization

*M. Schirmer, A. Janz, B. Biltenwski and S. Rotter (DE)*

Sources of chlorine in MSW and RDF - Species, analytical methods and requirements on improved separation methods

*G. Mancini, G. Caruso and C. Barone (IT)*

Estimating landfilled fluff behaviour in terms of leachate composition: is the use of standard leaching tests effective?

*T.M. Chee, M.N. Hassan and M. Shitan (MY)*

Multiple regression models to estimate the calorific value of RDF produced from Malaysian wastes

*S. Heuss-Assbichler, G. Magel and K.T. Febr (DE)*

Abiotic hydrogen production in a monofill of MSWI-residues: a kinetic study

## Le Dune Room

## SESSION E7

### Landfill modelling

*T. Hase and Y. Ono (JP)*

Microbiological evaluation in waste degradation

*P. Kjeldsen and C. Scheutx (DK)*

Modelling the behaviour of slowly released organic compounds in landfills

*D. Chenu, N. Skhiri, L. Bletzacker and M. Quintard (FR)*

Reactive transport in bioreactors: development of a multiphase flow model

*R.P. Beaven, N. Woodman and J.A. Barker (UK)*

End-member flushing models for 'saturated' waste

*T. Reichel, A. Haastriick and D.C. Hempel (DE)*

Modelling long-term landfill emission - A segregated landfill model

## SESSION E8

### Modelling biological processes in landfill

*H. Heinke, A. Haastriick and D.C. Hempel (DE)*

Studies on the physico-chemical and biochemical properties of municipal solid wastes

*J. White, A. Haarstrick, J. Kindlein, T. Reichel, L.K. Ivanova and R.P. Beaven (UK)*

Experimental investigations of organic waste degradation and comparison of two numerical simulations

*T. Ishigaki, H. Sawamura, K. Endo, M. Yamada, M. Nagamori, Y. Ono, K. Kamura, Y. Hara, M. Takata and Y. Inoue (JP)*

Analysis of microbial community and biodegradation of waste in landfills in Japan

*M. Osako, Y. Kim and K. Kitamura (JP)*

Interaction between dissolved humic matter and micropollutants in landfill leachate

*G. Viviani, M. Torregrossa, S. Nicosia, D. Sabella, A. Putrone and C. Vigna Tagliati (IT)*

Modelling the changes in time of MSW properties in a landfill

## WORKSHOPS

### Pub Room

#### SESSION F7

##### Landfill remediation

Introductory lectures:

*M.A.B. Promentilla, T. Furnichi, K. Ishii and N. Tanikawa (JP)*

A multi-criteria decision analytic process for evaluation of remedial countermeasures of contaminated site: a case study of uncontrolled landfill

*T. Gisbert and J. Burdick (FR)*

Application of in situ reactive zone - IRZ: in situ biological stabilization of chromium in a former industrial landfill

*B. Drnjevic and A. Vukelic (CI)*

Remediation of the Jakusevec landfill - Case study

#### SESSION F8

##### Waste minimisation

Introductory lectures:

*G. Wassermann and F. Schneider (AT)*

Waste minimisation potential through the limitation of unwanted mail advertising

*I.D. Williams, C.D.H. Wilson and N. Mair (UK)*

Improving resource use and business performance in small and medium-sized companies

*F. Schneider and G. Wassermann (AT)*

The loss of useable goods in production and trade - a case study in Austria

### Naturista Room

#### SESSION G7

##### Decision support tools

Introductory lectures:

*B. Thomas, S. Shiels, A. Gottberg, T. Coleman, M. Collins and E. Gentil (UK)*

Gaps, traps & scraps: data collection for municipal solid waste (MSW) management processes for life cycle assessment (LCA)

*S. Salhofer, E. Binner and G. Wassermann (AT)*

Strategic environmental assessment in waste management planning -  
An Austrian case study

## SESSION G8

### Life Cycle Assessment

Introductory lectures:

*N. Unger (IE)*

A review and comparison of the environmental impact of different materials across their life cycle

*S. Xarà, M. Fonseca Almeida, M. Silva and C. Costa (PT)*

Porto 1990/2000: evaluation of environmental burdens from MSW management using life cycle assessment

## Wednesday October 5 - Afternoon

15.30 - 19.40

## SPECIALIZED SESSIONS

### Baldacchino Room

## SESSION C9

### Mechanical behaviour of MSW landfills

*J. Bauer, K. Munnich and K. Fricke (DE)*

Settlement processes of landfill bodies - Long-term survey of a slope deformation

*F. Olivier, D. Lhomme, J.P. Gourc and M. Hydra (FR)*

The measurement of landfill settlement using terrestrial 3D laser scanner imaging

*D.P. Zekkos, J.D. Bray, E. Kavazanjian, N. Matasovic, E. Rathje, M. Riemer and K.H. Stokoe II (US)*

A framework for the estimation of MSW unit weight profile

*U. Langer, N. Dixon, P. Gotteland and J-P. Gourc (UK)*

Waste mechanics: investigations using synthetic MSW

*W. Decottignies, L. Galtier, X. Lefebvre and T. Villerio (FR)*

Comparison of analytical methods to determine the stability of municipal solid waste and related wastes

## SESSION C10

### Top cover hydraulic performance

*S. Avono, C. Collart, A. Kheffi, R. Fafchamps and P. Dengis (BE)*

\*\*\*Flame ionization detector and linear kriging method for landfill cap leakage detection

*F. Hirano, M. Tanaka, H. Matsugu, Y. Matsufuji and T. Kobriyama (JP)*

\*\*\*The method of preventing rainfall infiltration from the landfill surface

*S. Camp, J.P. Gourc, O. Ple, P. Villard and D. Rey (FR)*

\*\*\*Landfill cap cover issue: improvement of the capability to sustain differential settlements



*M. Suzuki, J. Imai, Y. Saita and M. Nishigaki (JP)*

Substantiations and analysis for the capping with the capillary barriers

*F.J.P. Oliveira and P.P.F. Gouveia Filho (BR)*

Use of soil/bentonite mix in waterproofed layers composition of upper waterproofed capping of industrial waste landfill

*G. Tham, A. Mellström, R. Sioblom, A. Lagerkvist and L. Andreas (SE)*

Utilization of secondary construction materials in a landfill cover system

## Chiesa Room

### SESSION D9

#### Odour

*T. Bramryd and M. Olsen (SE)*

Recent international trends for odour minimization during biological treatment of wastes

*M. Schlegelmilch, J. Streese, W. Biedermann, T. Herold and R. Stegmann (DE)*

Reducing odorous emissions from biowaste composting plants by means of biological waste gas treatment systems

*K. Freudenthal, R. Otterpohl and J. Bebrendt (DE)*

Selective absorption for odour control of production processes by application of solubility agents in bioscrubbers

*T. Pagé, T. Lagier and D. Chereau (CA)*

Comparison of French and Canadian landfill odour impact assessment results

### SESSION D10

#### Specific waste management problems

*D.C. Wilson, S. Pow, A. Read and D. Kolganov (UK)*

Regional waste management planning in the Kaliningrad Oblast of Russia - A case study of technical assistance to achieve sustainable improvements in waste management

*H. Stevanovic-Carapina, M. Ilic, A. Jovovic and A. Mihajlov (YU)*

Establishment of regions for solid waste/best options for sustainable waste management (case study - Serbia)

*B.F.A. Basnayake, C. Chiemchaisri and M.I.M. Monjood (LK)*

Solid wastes arise from the Asian Tsunami disaster and their rehabilitation activities: case study of affected coastal belts in Sri Lanka and Thailand

*L.C.Theng, M.N. Hassan, M.Awang and M.I. Mohammed (MY)*

Material flow analysis of selected recyclable solid wastes in Malaysia

# Le Dune Room

## SESSION E9

### Inventory and characteristics of old landfill sites

*S. Esakku, K. Joseph and R. Nagendran (IN)*

Methodological constraints and challenges in sampling and characterization for dumpsite rehabilitation

*F. Fior, R. Rosselli, S. Silvestri, G. Biotto, E. Furlan, L. Gobbo, M. Omri, S. Valenti, S. Rampazzo, V. Nicoletti, C. Buzzino, P. Beltrame,*

*M. Dal Tin, A. Bellomo and S. Beghi (IT)*

The use of remote sensing and GIS to map illegal dumps: a project sponsored by the Veneto region

*V. Pignoni, M. Bergonzoni, M. Becchi and A. Bonoli (IT)*

Illegal micro-dump analysis through a campaign product research and characterization of the present waste

*R. Cossu, R. Di Maio, S. Fais, A. Fraghi, P. Ligas and A. Menghini (IT)*

Physical and structural characterization of an old landfill site by a multimethodological geophysical approach

*M. Zorzi, A. Dagnino, F. De Lucchi, F. Dondero, M. Borasi, G. Cossa, L. Ariati, P. Trivero and A. Viarengo (IT)*

Monitoring and risk assessment activities of exhausted rubbish dump characterized by a release of leachate in the superficial groundwater aquifer

## SESSION E10

### Leachate composition

*M. Nagamori, T. Naruoka, Y. Watanabe, Y. Kurata, Y. Ono, K. Kawamura and Y. Ono (JP)*

Chemical characteristics of leachates in landfill sites of municipal solid wastes

*M. Poggio, M.C. Zanetti, P. Luciani and G. Genon (IT)*

Hydrological and chemical factors affecting leachate in comparison with legislative required test

*K. Haarstad, T. Eggen, H. Borch and T. Maehlum (NO)*

New pollutants in Norwegian leachates

*C. Mahler, M.A. Ferreira and W. Gunther (BR)*

Studies of landfill leachate in Brazil

*G. Bertanza and R. Pedrazzani (IT)*

Endocrine disrupting compounds (EDCs) in landfill leachate

*R. Biquillon, M. Robustelli, M. Poitrenaud and B. Efremenko (FR)*

Characterisation and treatment of composting leachate

## WORKSHOPS

### Pub Room

## SESSION F9

### Landfill gas modelling

Introductory lecture:

*J. Lamborn (AU)*

Developing a landfill gas model

## SESSION F10

### Transport process modelling in landfills

Introductory lectures:

*V. Ustobalova, T. Ricken and R. Widmann (DE)*

Process oriented modelling of long-term behavior impact of landfills in closure care and post closure care - Decompositions and transport processes

*J. Kindlein, D. Dinkler, H. Abrens and A. Haarstrick (DE)*

Modelling reactive transport processes in landfills - Change of hydraulics due to degradation and biofilm growth

## Naturista Room

## SESSION G9

### Waste characterisation

Introductory lectures:

*M.I. Kisser, A. Giove, R. Clever and K. Tireç (AT)*

Test sample preparation for waste samples

*G. Wassermann and F. Schneider (AT)*

Edibles in household waste

*N.T.D. Trang, N.V. Hieu and T.H. Con (VN)*

Investigation of organic waste characterization in Hanoi

*N. Skhiri, D. Denois, M. Shabeen and T. Lagier (FR)*

Waste characterisation in Egypt

## SESSION G10

### Use of combustion residues

Introductory lectures:

*G. Belz and P. Caramuscio (IT)*

Overview on quality and reuse of coal combustion residues

*N. Ghafoori, M. Karakouzian and C. Alarcons (US)*

Evaluation of pulverized coal combustion dry bottom ash for concrete piles

## Thursday October 6 - Morning

09.00 - 12.50

## SPECIALIZED SESSIONS

## Baldacchino Room

### \*\*\*SESSION C11

### Performance of synthetic liners

*T. Harada, S. Imaizumi, I. Nishizaki, M. Takahashi and T. Kashinagi (JP)*

\*\*\*Durability evaluation of geomembrane liners by outdoor exposure test for 10 years

*G.J. Fowmes, D.R.V. Jones and N. Dixon (UK)*

\*\*\*Analysis of a landfill directive compliant steepwall draining system

*D.R.V. Jones, G.M. Swift and D. J. Reddish (UK)*

\*\*\*Assessment of potential landfill liner damage due to ground movements

*J.Y. Shin, B.R. Seo, H.Y. Geon and J.Y. Kim (KR)*

\*\*\*A Pd/Fe based reactive geomembrane for mitigation of TCE and PCE

*D. Cazzuffi and E. Crippa (IT)*

\*\*\*Long term behaviour of geomembranes exposed to oil for secondary containment application

*C. Tarnowski, S. Baldauf and E. Sost (DE)*

\*\*\*Assessment of the durability of HDPE-geomembranes in landfills practical approach under consideration of material examination performed during service life

## SESSION C12

### Performance of mineral liners

*L. Ait Saadi, A. Couradin and G. Didier (FR)*

Homogeneity and hydraulic conductivity control of a tight barrier treated with bentonite

*B.V.S. Viswanadham and S. Sengupta (IN)*

Deformation behaviour of compacted clay liners of landfills in a geocentrifuge

*I.M.C. Lo (HK)*

Using organoclay liners for resisting gasoline flow and removing organic pollutants

*K.K. Tripathi and B.V.S. Viswanadham (IN)*

Ascertainment of bentonite content for sand-bentonite liners

*K. Mizuno, T. Okada, K. Endo and T. Fujiwara (JP)*

The performance evaluation of the bentonite mixed clay liner using the radioisotope method for field compaction

*C. Della Porta, F. Barresi and G. Tresso (IT)*

Tests of durability: effect of wetting-drying and freezing-thawing cycles on index flux and hydraulic conductivity of GCLs

## Chiesa Room

## SESSION D11

### Waste management strategies at local level

*R. Conti, G. Filippini, C. Mollea and P. Molina (IT)*

Wastes management in province of Torino

*K. Malinska, M. Zabochnicka-Swiadek and G. Malina (PL)*

Solid waste management strategy: the case study of the town and commune of Pajeczno (Poland)

*H. Bertasi, E. Gamberoni, X. Kangning, P. Malesani, A. Marcello, Z. Zhongfa and R. Zorzin (IT)*

Waste management in some county of Guizhou Province (China)

*A. Pompili, F. Trombetti and G. Garbarino (IT)*

Waste management system in regione Campania

*J. Chabine, S. Srour and Z. Khayat (LB)*

Baghdad solid waste master plan: post war challenges and long term planning

*M. Fedorov (RU)*

Separate collection of municipal solid waste in St-Peterburg (Russia)

## SESSION D12

### **Waste management in developing countries cooperation among institutions**

*E. Huttner and A. Zurita (CL)*

New forms of international cooperation in Chile: successful improvement of hazardous waste management due to an innovative private-public project management structure

*S. Spies, A.L. Florisbela dos Santos and G. Wehenpohl (DE)*

Informal sector activities - Obstacles and examples for its integration in municipal solid waste management

*C. Trois, M. Griffith, N. Mollekopf and J. Brummack (ZA)*

A comparative study of aerobic waste treatment: a solution for developing countries

*U. Cusnick, B. Schenk, E. Huttner and P. Pisani (DE)*

Institutional approach for the development of an intermunicipal cooperation for the operation of new integrated solid waste management systems in the Xth Region de Los Lagos of Chile

## **Le Dune Room**

## SESSION E11

### **Leachate recirculation**

*I.R. Fleming, E.F. Ruiz, G.J. Putz and M.K. Singh (CA)*

Passive treatment of MSW leachate in a modified drainage system

*G. Barina, O. Oberti and B. Budka (FR)*

Leachate recirculation by horizontal trenches: a new French experience

*S. Moreau, J-M Bouyé, G. Barina and O. Oberti (FR)*

Evolution of waste mass resistivity during 3 years of leachate recirculation operations

*R. Cossu (IT)*

A new concept for leachate recirculation

*T. Kose and Y. Ono (JP)*

Rapid and small scale leaching test for organic compound in solidified ash

## SESSION E12

### **Physical-chemical leachate treatment**

*E. Nebrenheim, L. Johansson Westholm and S. Waara (SE)*

Treatment of landfill leachate using filter substrates

*S. Hercule, V. Taramini, P. Samat, E. Giust and R. Biquillon (FR)*

Cogeneration and evaporation: an example of leachate treatment

*E. Gombault, J.K. Skevs, J.P. Botes and K. Karakatsanis (ZA)*

Treatment of leachate at the Aloes landfill site by reverse osmosis from pilot plant testing to full-scale plant operation

*L.C. Lange and J.F. Alves (BR)*

Evaluation of removal of organic matter from landfill leachate by fenton reagent

*S. Awono, P. Hennebert and S. Godfroid (BE)*

Landfill waste water treatment plants permeates and European Union Directive 2000/60/CE: a case study of PAHs

## WORKSHOPS

### Pub Room

#### SESSION F11

##### Waste baling

Introductory lectures:

*R. Stegmann (DE)*

Landfilling of MBP-baled waste

*B.H. Halldorsson and O. Einarsson (IS)*

Alfnes landfill in Iceland: 12 years experience of a baled waste landfill

#### SESSION F12

##### Sustainable landfilling (IWWG)

Introductory lectures:

*P. Hettiaratchi, M.D.N. Perera, D. Davies, N. Richards, J. Hundal and D. Vaneverdingen (CA)*

Sustainable landfills or zero methane landfills: the Calgary biocell project

*Y. Inoue, H. Asakura, B. Inanc, K. Endo, T. Ishigaki, M. Yamada and Y. Ono (JP)*

A new approach for a sustainable landfill in Japan

*A. van Zomeren, H.A. van der Sloot, J.C.L. Meeussen, J. Jacobs and H. Scharff (NL)*

Prediction of the long-term leaching behaviour of a sustainable landfill containing predominantly inorganic waste

*A. van Zomeren, E. van der Weij-Zuiver, H.A. van der Sloot, P. van der Berg and R. Bleijerveld (NL)*

Environmental behaviour of a stabilised waste disposal in the framework of sustainable landfilling

*K. Knox, P. Braithwaite, M. Caine and B. Croft (UK)*

Brogborough landfill test cells: the final chapter. A study of landfill completion in relation to final storage quality (FSQ) criteria

## Naturista Room

### SESSION G11

#### Elution of dioxins from combustion residues

Introductory lectures:

*N. Kishimoto, Y. Yasuda, T. Oomura and Y. Ono (JP)*

Ozonation combined with electrolysis as an alternative technology for removing 1,4-dioxane from landfill leachates

*K. Yoshikawa, S. Urabe, Y. Matsufuji, Y. Kanjo, I. Fukunaga and Y. Yagi (JP)*

Experimental study on dioxin removal in landfill leachate by advanced oxidation process

*K.H. Johnson and J.L. Panders (US)*

Methyl tert-butyl ether degradation to tert-butyl alcohol in landfill leachate under methanogenic conditions

### SESSION G12

#### Leaching tests

Introductory lectures:

*H.A. van der Sloot (NL)*

Overview on leaching tests

*M. Kissler, H. Muntau, A. Giove and M. Bianchi (AT)*

Validation of CEN draft standards for the analysis of waste

## Thursday October 6 - Afternoon

15.30 - 19.40

## SPECIALIZED SESSIONS

### Baldacchino Room

### SESSION C13

#### Landfill gas emissions (II)

*M. Minch and J. Ryan (US)*

Recommended changes to regulations for the monitoring and control of landfill gas at California MSW landfills

*E. Gidarakos and M. Geniatakis (GR)*

In situ landfill gas measurements and estimation of CH<sub>4</sub> uncontrolled emissions from the solid waste disposal site at Pera Galinous

*M. Héroux and C. Guy (CA)*

Influence of weather parameters on landfill surface emissions

*M. Yamada, T. Ishigaki, K. Endo, Y. Inoue, M. Nagamori, Y. Ono and Y. Ono (JP)*

Distribution of temperature and methane flux of landfill surface

*Y. Ogor and M. Guerbois (FR)*

Comparison of landfill methane emission models: a case study

*C. Scheut, G. Bukh Pedersen and P. Kjeldsen (DK)*

Biodegradation of trace gasses in simulated landfill biocover systems

## SESSION C14

### Landfill gas utilisation / trace compounds

*M. Sylvain, F. Ducray, J. Gouello, F. Thevot, C. Renner and T. Lagier (FR)*

Evaluation of the performances of three adsorbent to limit diffuse emission of hydrogen sulphide - Laboratory tests and full scale tests on a landfill

*T.G. Poulsen (DK)*

Impact of wind turbulence on landfill gas emissions

*M. Bergin, M. Heavey and G. Dennison (IE)*

Landfill gas generation and management in a deep fill dry commercial and industrial waste landfill in Ireland

*S. Shafi, S.J.T. Pollard, R. Smith, A. Sweetman and A. Rosevear (UK)*

A fugacity approach for generating a landfill gas trace component source term

*J. Jacobs and H. Scharff (NL)*

Combustion of LFG containing less than 5% methane

*R. Lewicki and I. Gadsby (UK)*

Development of low noise landfill gas flare

*M. Caine, I. Bristow and N. Blakey (UK)*

Monitoring and speciating mercury in landfill gas

## Chiesa Room

## SESSION D13

### Waste characterisation and recycling in developing countries

*A.B. Farouque (PK)*

Gujarat sanitation program

*J. Blight and L. Mussane (ZA)*

Sustainability and recycling in poor communities: a case study in the Eastern Cape, South Africa

*M.A. Seck, R. Badiane and C. Lo (SN)*

Decentralised composting of urban waste in the town of Rufisque (Senegal): study of the achieved compost agronomic quality

*Y. Aguilera-Corrales, I. Koerner and I. Saborit-Sanchez (DE)*

Solid waste management in Cuba under special consideration of composting

*H. Roeper, I. Koerner and R. Stegmann (DE)*

Low-tech options for chicken manure treatment and application possibilities in agriculture

*B.F.A Basnayake and K.M. Ekanayake (LK)*

Evaluation of different MSW landfill pretreatment (composting) systems in Sri Lanka

## SESSION D14

### Waste management in developing countries national strategies and policies

*G. Hadrich and H.W. Bidlingmaier (DE)*

Capacity building and policy reinforcement in Cambodia in the field of waste management



*G. Wehenpohl (MX)*

Training and building awareness: national network of environmental promoters for solid waste management in Mexico

*A. Belberazem, D.C. Wilson and J. Friaa (DE)*

Integrated SWM capacity building for the Mashreq and Maghreb countries

*H.O. Sherif (EG)*

Solid waste management in Egypt: current situation and future prospects

## Le Dune Room

### SESSION E13

#### Biological leachate treatment

*H. Jupsin and J.L. Vassel (BE)*

Mathematical model of a membrane bioreactor to optimize leachate treatment

*M. Zupancic Justin, T.G. Bulc, D. Vrhovsek, P. Bukovec, M. Zupancic, A. Zrimec and M. Berden Zrimec (SI)*

Slovenian experience: MSW landfill leachate treatment in constructed wetland and leachate recycling on landfill cover vegetated with trees

*C.H. Pendleton, J.W.F. Morris, H. Goldemund, L.R. Rozema, M.S. Mallamo and L. Agricola (US)*

Leachate treatment using vertical subsurface flow wetland systems - findings from two pilot studies

*A. Spagni, M.C. Lavagnolo, P. Vendrame and L. Luccarini (IT)*

Modelling biological leachate treatment in a sequencing batch reactor

*S.F. Tyrrel, I. Seymour, J.A. Harris, A. Savage and R. Smith (UK)*

Biological treatment of compost liquor using waste-derived filter media

### SESSION E14

#### N-Removal from leachate

*P. Balslev, P.D. Pedersen, H. Eliassen and T.R. Fossum (NO)*

Nitrogen removal from leachate by nitrification and recirculation

*V. Vigneron, M. Ponthieu, L. Mazaes, G. Barina, J-M. Audic, N. Bernet and T. Bouchez (FR)*

Nitrate injections during municipal solid waste anaerobic digestion

*K. Furukawa, P.K. Lieu, R. Hatozaki, H. Homan and T. Fuji (JP)*

Single-stage nitrogen removal using anammox and partial nitrification (SNAP) process and its application to treatment of synthetic landfill leachate

*B. Dominguez, A. Lobo, X. Moreno-Ventas and I. Tejero (ES)*

Heterotrophic and anammox nitrogen removal in leachate treatment plants: modelling the coexistence of processes

*R. Valencia, W. van der Zon, H. Woelders, H.J. Lubberding and H.J. Gijzen (NL)*

Evolution and fate of nitrogen compounds in pilot scale bioreactor landfills

# WORKSHOPS

## Pub Room

### SESSION F13

#### **Pneumatic waste collection**

Introductory lectures:

*E. Cossu (IT)*

Architectural aspects in planning the pneumatic collection

*D. Rossetti (IT)*

Case studies in pneumatic collection

### SESSION F14

#### **Mining and metallurgic waste**

Introductory lectures:

*R. Ciccu (IT)*

Overview on production and disposal of mining waste

*L. Saria, T. Shimaoka and K. Miyawaki (JP)*

Effect of a mixed humus-topsoil layer for preventing acid mine drainage

*B. Ruffino, M.C. Zanetti and S. Fiore (IT)*

Minimization and recycling of waste coming out from a magnesium foundry

## Naturista Room

### SESSION G13

#### **Modelling mechanical landfill behaviour**

Introductory lectures:

*J.R. McDougall and R. Silver (UK)*

Hydro-bio-mechanic modelling landfilled waste: real insights?

*N. Dixon, B. Zhang and A. El-Hamalani (UK)*

Constitutive modelling of MSW

*M. Demanet and A. Holeyman (BE)*

Validation of the Asaoka and Baguelin methods for Anton landfill. Multicriteria qualification of past settlement data to project future settlement

*F. Olivier, J.P. Gourc, F. Achour, J. Morais and R. Bayard (FR)*

Evolution of bio-physical and mechanical characteristics of MSW after 2 years incubation in a laboratory-scale bioreactor

### SESSION G14

#### **Use of residual materials in barrier construction**

Introductory lectures:

*I. Travar, L. Andreas, G. Tham and A. Lagerkvist (SE)*

Field test of landfill covers with secondary construction materials

*L. Andreas, I. Herrmann, M. Lidstrom-Larsson and A. Lagerkvist (SE)*  
Physical properties of steel slag to be reused in a landfill cover  
*M. Karakouzzian, N. Ghafoori, J.M. Fenton and B. Purkayastha (US)*  
The effects of fly ash on clay

## Friday October 7 - Morning

09.00 - 12.50

### SPECIALIZED SESSIONS

#### Baldacchino Room

##### SESSION C15

###### **In situ aeration**

*M. Ritzkowski and R. Stegmann (DE)*

Mechanisms effecting the leachate quality in the course of landfill in situ aeration

*R. Prantl, M. Tesar and M. Huber-Humer (AT)*

Changes in organic matter during in-situ aeration of old landfills

*M. Ritzkowski and R. Stegmann (DE)*

Estimation of operation periods for in situ aerated landfills

*R. Cossu and S. Cestaro (IT)*

Modelling in situ aeration process

*Y. Matsufuji, A. Tanaka and H. Matsugu (JP)*

Biodegradation mechanism and mass balance in the semi-aerobic landfill type

##### SESSION C16

###### **Groundwater investigation at landfill sites**

*P. Kjeldsen*

Overview paper on groundwater investigation in landfill sites

*C.K. Vidanarachchi, S.T.S. Yuen and S. Pilapitiya (AU)*

A methodology for the assessment of potential groundwater impact at waste disposal sites in developing countries

*H. Suito, Y. Horikawa, T. Morozumi and Y. Ono (JP)*

Numerical simulation of underground water flow around landfill sites

*S. Sironi, L. Capelli, A.N. Rossi, M. Giorgi and M. Il Grande (IT)*

Study of the hydrochemical variations in groundwater near a sanitary landfill

*S.A. Reyes, S. Fernandez, M.A. Gomez, M.D. Baldini and A. Martinez (AR)*

Assessing contamination potential of a twelve year sanitary landfill

*M. Guidi, V. Campigli, A. Cozzolino and M.S. Giamberini (IT)*

Principle component analysis and isotopic determination as investigation tools for underground waters contamination in case of mixing and exchange processes

## Chiesa Room

### SESSION D15

#### Waste management in developing country cities

*A. Read, D. Wilson and J. Olley (UK)*

Building local municipal capacity for strategic waste management decision-making in developing countries

*G. Hunger and J. Stretz (MZ)*

Approaches to reach sustainability in solid waste management in the greater Maputo area in the context of Mozambican democratization and decentralization process

*R. Damiecki, J. Domroes, M. Diphon and J. Bilong (DE)*

Kuching integrated waste management park

*E. Manga (CM)*

Urban waste management in Cameroon: a new policy perspective?

*P. Pluschke, M. Chalabi, A. Ajir and H. Chouaouta (MA)*

Voluntary agreements as a tool in the management of industrial solid waste in Morocco

### SESSION D16

#### Landfilling in developing countries

*P. Novella, H. Robinson, S. Haider, L. Strachan, S. Last and M. Trant (ZA)*

Landfill leachate treatment in a developing country: the South Africa experience

*C.K. Vidanaarachchi, S.T.S. Yuen and S. Pilapitiya (AU)*

Optimising environmental improvement at existing waste disposal sites in developing countries

*C.F. Mahler, L.E.H.B. Costa Leite, L.F. Brito Fo and W. Gunther (BR)*

Assessment of potential revenue from landfill biogas

*F. von Buchwald (EC)*

The operation experiences in the sanitary landfill "Las Iguanas" Guayaquil - Ecuador

*E. Kavazanjian Jr. and S.M. Merry (US)*

The 10 July 2000 Payatas landfill failure

*J. Trankler, C. Visvanathan and P. Kuruparan (YH)*

Mechanical biological waste treatment - The South-East Asian experiences

## Le Dune Room

### SESSION E15

#### Anaerobic digestion

*A.G. Capodaglio, S. Labò and I. Angelidaki (IT)*

Enhancing biogas production in centralized generation and recovery facilities

*V. Vigneron, L. Mazzeas, G. Barina, J-M. Audic, J-L. Vassel, N. Bernet and T. Bouchez (FR)*

Anaerobic digestion of municipal solid waste: a mass balance analysis

*C. O'Sullivan, H. Song, P.C. Burrell, L.L. Blackall and W.P. Clarke (AU)*  
Fundamental studies on the colonization and hydrolysis of solid organic particles in anaerobic digesters

*T. Bouchez, W. Laloui, V. Vigneron, L. Mazzeas and T. Li (FR)*  
Methanogens in municipal solid waste landfill leachates

*F. Straka, P. Jenicek, J. Zabranska, M. Dobanyos and M. Kuncarova (CZ)*  
Anaerobic treatment of nitrogen containing wastes

## SESSION E16

### Composting

*S. Silvestri, G. Odorizzi, G. Zorzi, C. Caglioni and M. Zorzi (IT)*  
Optimization of the first thermophilic phase in a real scale composting plant

*E. Smidt, K. Meissl and V. Parravicini (AT)*  
Advanced treatment of residues from anaerobic digestion by means of co-composting

*M. Raabe, R.A. Diaz-Bone, A.V. Hirner and R. Widmann (DE)*  
The occurrence and synthesis of organometal(loid)s composting in composting plants

*R. Iannelli, D. Giraldi, M. Pollini and F. Russomanno (IT)*  
Effect of pure oxygen injection as an alternative to air and oxygen - Enriched air in the composting processes

*K.R. Butt, A.J. Holden and C.N. Lowe (UK)*  
Compost characterisation with a focus on heavy metals and a biological indicator

*Q.H. Bari and A. Koenig (CN)*  
Mathematical model of composting in a closed system: effect of airflow rate on the vertical temperature distribution

## WORKSHOPS

### Pub Room

## SESSION F15

### Landfill gas emission monitoring

Introductory lectures:

*T. Parker, J. Armstrong and P. Pointer (UK)*  
Vapour modelling using meteorological data to assess the risk posed by a closed landfill

*B. Capaccioni, P. Lucci, P. Scartoni and F. Tatano (IT)*  
Biogas flux measurements using the static, not-stationary accumulation chamber method: mapping, classification and selective characterization of dispersions at Italian provincial scale

*M. Bragaglia, P. Ganassi, A. Caprucci, E. Magnano and R. Zocchi (IT)*  
Monitoring of gaseous emissions from a closed landfill, techniques and practices

*B. Raco, A. Scozzari, M. Guidi, M. Lelli and G. Lippo (IT)*  
Comparison of two non-invasive methodologies to monitor diffuse biogas emissions from MSW landfills soil: a case study

*R.G. Gregory and A. Rosevear (UK)*

GasSim 2: landfill gas management quantified

*O. Bour, K. Favereaux and M. Sylvain (FR)*

Case study of sulphur compounds emissions characterisation

## SESSION F16

### **Integrated wastewater solid waste management**

Introductory lectures:

*G. De Gioannis, A. Muntoni and A. Pisano (IT)*

Possible role of MSW anaerobic digestion in an integrated waste water and solid waste management cycle

*R. Valencia, W. van der Zon, E. Elpido, H.J. Lubberding and H. J. Gijzen (NL)*

Codigestion of municipal solid waste and septic tank sludge in bioreactor landfill simulators

*R. Cossu, O. Hirata and M.C. Lavagnolo (IT)*

Anaerobic digestion of sewage faecal component and kitchen waste

## **Naturista Room**

## SESSION G15

### **Evapotraspiration cover**

Introductory lectures:

*P.J. Lightbody, M. Salt and J.W. Cox (AU)*

Evaluation of performance of alternative evapotranspiration cover designs using the waves (Water Atmosphere Vegetation Energy and Solutes) model - Wingfield South Australia

*D. Cazzuffi, A. Corneo and E. Crippa (IT)*

Soil stabilisation and erosion control with bioengineering techniques on the capping slopes of landfills

## SESSION G16

### **Waste management on islands**

Introductory lectures:

*C.N. Lowe, K.R. Butt and F. Hough (UK)*

Waste management in isolated communities: the Isle of Rum, Scotland

*R.B. Wallace and C.J. Castro (US)*

Landfill design and operations in remote Pacific islands

# POSTERS

Posters discussion will take place in the Poster Hall, with authors present, every afternoon from 17.40 to 18.00

## A. Waste management concepts and strategies

*A. Read, M. Harder and A. Coates (UK)*

UK best practice in doorstep recycling promotions campaigns

*P. Malesani, G. Campostrini, F. Cossio, C. Mansoldo and O. Piazzini (IT)*

Management of processing marble waste

*J. Wates, R. Parker, M. Snow, F. Belfiore and R. Lopes (ZA)*

Sustainable development and waste management practices

*G. Di Marco, F. Giarolli and A. Maggiore (IT)*

Environmental damage compensation related to the illegal waste management

*C. Collivignarelli, F. Prandini, S. Sorlini and M. Vaccari (IT)*

Current MSW management and perspectives in Bosnia-Herzegovina, Senegal and Guatemala: research activities by CeTAmb Center (Brescia)

## B. Waste management technology

*L. Otero and J. Gallego (ES)*

The last mechanical biological treatment concept for municipal solid waste resources recovery & valorisation centers

*A. Chiumenti, F. da Borso, T. Rodar and R. Chiumenti (IT)*

Swine manure composting by means of experimental turning equipment

*D.R.V. Jones (UK)*

Dispute resolution techniques for the waste management industry

*E.C. Rada, M. Ragazzi, V. Panaitescu and T. Apostol (IT)*

An example of collaboration for a technology transfer: municipal solid waste bio-drying

*A.K. Sabir Ali and S.N. Hag Ibrahim (SD)*

Soba wastewater Stabilization Pond (WSP) - Sudan: treatment performance and microbiological quality

*K. Tameda, S. Higuchi, T. Yamato, M. Hanashima, N. Lee and C. Chang (JP)*

A study on the applicability of a waste washing process to the treatment of incinerator ashes for recycling and early stabilization

*R. Stegmann and J. Heerenklage (DE)*

MBP- using the anaerobic/aerobic Treatment Concept in the liquid phase

*G. Bertanza, M.C. Collivignarelli and S. Zanaboni (IT)*

Synergy between research activity and management procedures in an industrial waste treatment plant

*S. Masi, I.M. Mancini, R. Pandolfo, M. Piscitelli and D. Caniani (IT)*

Accelerated under screening biostabilization in biocells: one-year activity on S. Arcangelo (PZ-Italy) plant

*T. Kobinata, K. Ishii, R. Yanase, M. Hanashima and T. Furuichi (JP)*

Verification of closed system disposal facilities based on survey data

*N. Hassan, A.M. Abdullah and W.N.A. Sulaiman (MY)*

Semi-aerobic composting of solid waste: possible application for the treatment of chicken manure

*M. Bertolini, N. Bergonzoni and F. Valcavi (IT)*

Optimization of a non-ferrous metal separator based on experimental evaluations

*C. Collivignarelli and S. Sorlini (IT)*

MSWI bottom ash reuse in concrete

*F.A. Fabim, D.H. Fleita and F.S.E. Dars*

A comparative study on the characteristics of fish and poultry processing industries wastewaters before and after using five different chemical procedures

## **C. Environmental aspects of landfilling**

*R. Zhang, T. Shimaoka, S. Sakita and J. Etob (JP)*

Geochemical weathering indices of MSW incinerator residues in a landfill - Assessment with correlation analysis

*S. Masi, I.M. Mancini, E. Trulli, F. Russo and D. Caniani (IT)*

Evaluation of the environmental state after 15 years from the closure of an uncontrolled landfill of urban solid wastes

*A. Tachifuji and Y. Matsufuji (JP)*

Rehabilitation of landfill for incineration ash and assimilation of natural soil conditions

*M. Franke (DE)*

Siloxanes in fermentation gas-solution of the problem: gas cleaning

*M.A.G.A. Lima, P.B. Alcantara, F.M.S. Silva, V.E.D. Monteiro, M.L.A.P.F. Palha and J.F.T. Jucá (BR)*

Microbiological evaluation of municipal solid waste disposal in the experimental cell

*T. Fujiwara, Y. Ono, T. Kose, F. Nishimura and K. Obotoshi (JP)*

Basic study on leaching characteristics of hydrophilic organic compounds from wastes

*W. Pourie, M. Bevan and T.O.L. Roberts (UK)*

Transport of cement kiln dust leachate from an unlined landfill during construction dewatering

*M. Pellecchia, I. Negri, L. Pizzetti, V. Nizzoli and T. Tellini (IT)*

Genetic structure of *isotomorus unifasciatus* (Insecta, Collembola) living in the soil cover of Rio Riazzone MSW landfill (Reggio Emilia, Italy)

*T. Sekito and Y. Dote (JP)*

Loads of organic matter and heavy metals on a landfill site by the landfilling of waste unsuitable for incineration treatment

*D. Sager, S. Heuss-Assbichler and A. Heindl (DE)*

Salt horizon: first results on retaining highly soluble salts within a landfill

*F. Nishimura, Y. Ono, T. Kose, T. Fujiwara, M. Watanabe and M. Masuda (JP)*

Effects of environmental conditions in landfill on leaching characteristics of Phenols from wastes



*I.H. Hwang, T. Matsuto and T. Tanaka (JP)*

Evaluation of carbonization residue derived from municipal solid waste and industrial waste from a view of resource recovery and pre-treatment for landfill

*C. Tournassat, D. Guyonnet and D. Caçaux (FR)*

Transport and chemistry coupling for the evaluation of diffusion through clayey barriers

*J.J.P. Zijlstra, V. Bellò, R. Ruggeri and A. Teodosi (IT)*

The bauxolite technology: an innovative sardinian solution for environmental remediation problems

*F. Misumi, T. Hirotsu, M. Sakagami, T. Furuichi and M. Hanashima (JP)*

Concentration of boron in leachates and investigation on the treatment method

*B. Rajmohan, B. Saidulu, M.B. Saidatta and G. Srinikethan (IN)*

Adsorption of cadmium metal cation from aqueous solution by Cashew nut shell waste

*B. Rajmohan, D. Vijayakrishna, M.B. Saidutta and G. Srinikethan (IN)*

Removal of colour from aqueous solutions by adsorption on cashew nut shell waste

*N. Bin Salleh and N. Hassan (MY)*

Physical and chemical characteristics of solid wastes disposed at Taman Beringin landfill Kuala Lumpur

*S. Cavallari (IT)*

A simple approach for biogas production estimation

*C. Indovino, G. Mancini and F.G.A. Vagliasindi*

Modelling the effects of landfill final cover design in terms of leachate production in semi-arid regions

*R. Ravishankar, B. Madhuri and M. Gopal (IN)*

Characterisation of the MSW leachate at Mangalore dump yard

*T. Takeshita, S. Higuchi and M. Hanashima (JP)*

Investigation of hydrogen sulfide emission occurred in final disposal sites

## **D. Landfilling technology**

*J. Imai, M. Mishina, Y. Sasai, M. Ura T. Furuichi and M. Kawaguchi (JP)*

Concept of the renovation method of the existing inadequate landfills and its applied site

*F. De Pascalis and A. De Pascalis (IT)*

Hazardous waste landfill construction and adjustment in Italy

*J.I. Yoon, K. Nam and J.Y. Kim (KR)*

An innovative cover design using oxygen releasing compounds to reduce methane emission from solid waste landfills

*M. Franke (DE)*

Implementation of a CDM-project considering as an example the landfill Zambisa-landfill in Quito/Ecuador

*F. Obno, M. Hanashima and T. Furuichi (JP)*

Study on a multi-security system at landfill sites

*Y. Otsuka, K. Ishii, M. Hanashima and T. Furuichi (JP)*

Application of optimization theory to waste stabilization control in community and controllable closed disposal facilities

*J.P. Obbard, M.J. Montefrio, N.K. Scene, K.L. Yih, E.C. Torio, M.H. Chua and L. de Sales-Papa (SG)*

A sustainable approach to the control and remediation of municipal solid waste leachate at the Payatas disposal facility in Metro Manila, Philippines

## **E. Risk analysis, environmental and technical assessment of landfilling**

*P. Luria (IT)*

European Nations harmonisation of after-use regulations

*W.H. Stachowitz (DE)*

Explosion protection document for gas extraction systems

*M. Bragaglia, P. Ganassi and M. Bartoli (IT)*

Implementation of a quality-environment integrated system in Mirandola non hazardous landfill (Modena, Italy)

## **F. Monitoring**

*M. Giorgi and S. Fasan (IT)*

Analytical determination of odour-causing compounds in ambient air at odour thresholds levels applied to the identification and control of odour causing events

*R.M. Cenci, N. Simonazzi, E. Meglioli, P. Trincherini, L. Canovi and V. Guberti (IT)*

Soils and mosses for the monitoring of trace elements in three landfills

*D. Farina and R. Testalunga (IT)*

Monitoring groundwater quality at landfills sites: a method to set hydrochemical threshold values

*N. Tanikawa, T. Furuichi and K. Ishii (JP)*

Development of convenient method of monitoring carbon dioxide in ambient air at landfill sites using portable openpath type analyzer

*V. Bretti, F. Belfiore, C. Bondi, L. Frassinetti and S. Scacchieri (IT)*

Criteria for the identification of trigger levels and contingency measures in landfill monitoring plans

*S. Silvestri, M. Omri and R. Rosselli (IT)*

The use of remote sensing to map illegal dumps in the Veneto plain

*M. Omri, S. Silvestri, R. Rosselli and C. Mering (IT)*

A method to discriminate waste material dumps through remote sensing: a comparison analysis

*J. Ratej and M. Brencic (SI)*

Groundwater monitoring network for landfills establishment - Case study of Slovenia

# INFORMATION

## Official Languages

The working language of the Symposium is English. A service of simultaneous translation into Italian will be provided for the General Sessions. During specialized sessions and workshops only English will be used. Other languages may be offered by national sponsors. Update information on this issue will be available on symposium website.

## Proceedings

The Symposium proceedings will be published on CD. The CD and an extended abstracts volume will be distributed to participants at the time of registration.

## Entrance Fee

### *Conference*

The registration fees are as follows:

A: Regular fee: 1150 Euro + VAT 20%

B: Promoting bodies members: 1050 Euro + VAT 20%

C: Students (with University certificate): 650 Euro+ VAT 20%

Fees B and C can be applied only before the 15th of August. The IWWG members are entitled for 50 Euro discount on the A, B, C fees. IWWG membership costs 140 Euro (VAT free) counts several benefits including the subscription to the international scientific journal "Waste Management", published by Elsevier as official journal of IWWG ([www.iwwg.nu](http://www.iwwg.nu)).

In accordance with Italian law **all participants**, irrespective of country of origin, are required to pay 20% VAT on entrance fee.

Registration fees include:

- Participation in Symposium works
- Proceedings and conference materials
- Gala Dinner (supplement to evening meal)
- Coffee breaks

### *Training Courses*

The registration fee is 50,00 Euro + VAT 20% per course. The minimum number of participants for a given course is 15. In case insufficient registrations have been received, the course will be cancelled, with each registrant's course fee being transferred to another course selected by the registrant or refunded.

Certificates of completion will be distributed at the conclusion of each class.

**The registration for the training courses should be done by ticking the appropriate box on the reservation form.**

### *Payment*

The enclosed form should be used for application and will be considered effective only after receipt of the respective fee.

EuroWaste Srl will reimburse registration fees already paid if written request of cancellation is submitted. Reimbursement will be as follows: 80% before **31 August 2005**, 50% before **20 September 2005**. No refund will be possible after this date.

Fees have to be paid by bank draft to:

EuroWaste Srl,

IBAN: IT27M0200812120000000641969

Cod BIC/Cod Swift: UNCRITB1QU0 (EuroWaste srl).

Please send a proof of payment by fax: +39.049.8726987.

We regret that payment by credit card or other means cannot be accepted.

## **Registration**

### *Conference*

Registration will take place at Forte Hotel Village on Sunday October 2, 2005 from 16.00 - 18.00. Monday October 3, 2005 from 08.00 - 13.00 and from 14.30 - 15.30. Late registration can be carried out on Tuesday October 4, 2005 from 09.00 -10.00.

### *Training Courses*

Registration for training courses will take place at Forte Village at the Congress Hall on Sunday October 2, 2005 from 08.00-11.00.

## **Official Travel Agent**

All delegates and authors are expected to make their own travel and hotel arrangements.

The Official Travel Agent is available for assistance:

Ms. Marion Schmitz and Ms. Veronica Giossi

World Travel Jet

Via Alghero, 48, 09127 - Cagliari (IT)

tel. +39.070.60051307 / 60051315 - fax +39.070.655071

e-mail: landfill2005@worldtraveljet.it

## **Transport**

Cagliari is linked to the main Italian cities by daily flights. The airport of Elmas (Cagliari) is located about 40 km from the Forte Hotel Village and 7 km from Cagliari city centre.

Participants are advised to fly to Cagliari airport, even though Cagliari can be reached by Ferry-Boat (Civitavecchia-Rome, Genova, Palermo, Napoli).

Special transfer service from Elmas airport to Forte Hotel Village will be available:

- Saturday October 1: 8.30-23.30

- Sunday October 2: 14.00-23.30

- Monday October 3: 8.30-23.30

and from Forte Village to Elmas airport:

- Friday October 7: 14.00-20.00

- Saturday October 8: 6.00-20.00

On Sunday October 9 a bus transfer service will be arranged in the early morning (7.00) and in the afternoon (14.00).

Transfer fees: One way ticket 30,00 Euro

Return ticket 60,00 Euro

Individual transfers during the symposium week will be provided at the following fees:

Vehicle (from 1 to 3 persons) 90,00 Euro

Minibus (from 4 to 8 persons) 122,00 Euro

## Accommodation

A block booking with special rates has been made at Forte Village Resort, La Pineta , Castello and Villa del Parco to accommodate all participants.

Prices on a halfboard basis in Euro are as follows:

*Il Villaggio / Le Palme* 108,00

Single supplement 29,00

*La Pineta / Il Borgo* 115,00

Single supplement 29,00

*Castello*

Standard room 127,00

Single supplement 29,00

Castello Deluxe 257,00

Single supplement 58,00

*Villa del Parco / Dune* 224,00

Single supplement 58,00

All prices quoted are per person per day. On a halfboard basis, meals included are breakfast and evening dinner. On the evening of the Gala Dinner the Organizers will be pleased to cover the necessary supplement with respect to the price paid for evening dinner. Accompanying persons wishing to attend the dinner should book at the Conference Secretariat, in this case the supplement will be payable directly to Forte Village Resort.

We regret that it will not be possible to modify type of accommodation once booking has been confirmed. Single rooms are double rooms with a single occupant.

Accommodation bookings to Forte Village Resort have to be made to the Official Travel Agent, World Travel Jet S.r.l. The booking request has to be sent with a deposit based on total accommodation cost:

- 50% per person for a stay of 5 days or more

- 75% per person for a stay of 4 days or less.

Deposit can be sent to World Travel Jet S.r.l. by bank transfer or credit card payment (Visa or American Express).

Bookings received after the deadline of **31 August 2005** cannot be guaranteed. No refund will be possible for advance departure respect to number of nights paid.

## Reductions

Reduction for children (only if sharing with 2 adults):

- Children 0-12 years, free;
- Third bed, 50%

The enclosed reservation form should be used for all reservations. Hotel booking will be confirmed only after receipt of a deposit (indicated on the form) which should be sent, together with the form, to World Travel Jet, Cagliari.

## The Hotel Complex

The Forte Hotel Resort is situated along a sandy bay on the southwestern coast of Sardinia.

The Hotel complex, about 40 km from Cagliari, the capital of the island, and 8 km from S.Margherita di Pula, is set in a natural park of 25 ha, of which at least half is given over to the gardens and pine woods. The Forte Hotel Resort comprises approx 600 cottages half hidden amongst the pine woods and gardens. Each cottage consists of a twin bedroom, private bathroom with shower, direct dial telephone, heating and private patio.

The Hotel Castello, Hotel Pineta and Hotel Villa del Parco are set in a secluded part of the Village grounds, surrounded by tall pine trees. Hotel Le Dune includes 34 extra luxury cottages near the sea. All rooms have air conditioning, private bathroom with shower, TV and direct dial telephone. On the WEB page of the Symposium (<http://www.sardiniasymposium.it>) you may find more information on Hotel accommodation.

## Sports

Hotel costs include the use of sports equipment (squash, tennis, with artificial lights) except for bicycle hire, water sports, riding and services offered by the Terme del Parco.

The entrance to the Terme del Parco costs 60 Euro for all day long (VAT included). Fees counts: the entrance to the thermal complex, the use of thalassotherapy baths, sauna, turkish bath and fitness centre.

## Hotel Cancellation

Please inform World Travel Jet, Cagliari, of any change or cancellation of hotel reservation.

Deposit can be refunded only if written notification of cancellation is received before **31 August 2005**.

## Social events

Social events play an important role in the success of the Sardinia Symposia. In view of the fact that the Scientific Programme is particularly intense and the Symposium lasts for five days, it is important to relax during session breaks and in the evening. The Social Programme will be as follows:

*Sunday 2nd October, h.19,15*

Get together cocktail

*Monday 3rd October, h.21,00*

Piano concert

*Tuesday 4th October, h.21,00*

Sardinian Folk Dinner (reservation and payment required)

*Wednesday 5th October, h.22,00*

International Soccer Match

*Thursday 6th October, h.22,00*

Musical “Hair” in the Main Square

*Friday 7th October, h. 21,00*

Gala dinner and Closure (supplement to normal evening meal in Hotel Forte Village is included in the registration fee). An orchestra will accompany the evening. Dark suit would be appreciated.

During the Gala dinner Awards will be given for the best papers in different areas. As for the past editions the Sardinia Symposium Award “*A Life for Waste*” will be presented in order to congratulate an outstanding personality in the field of Waste Management. The Award winner will be indicated by a Jury of International Experts.

## CONTENTS

Supporting Bodies	page 1
Presentation	page 2
International Advisory Board	page 3
Organizing Committee and Secretariat	page 5
Daily Programme (Session A and B)	page 6
Daily Programme (Session C,D,E,F and G)	page 25
Poster	page 55
Information	page 59