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The Association for Environmental Health and Sciences (AEHS) is proud to announce



The Fifteenth Annual AEHS Meeting  
and West Coast Conference on

# Soils, Sediments and Water

March 14-17, 2005

Mission Valley Marriott, San Diego, California

Conference Directors: Paul T. Kostecki, Ph.D. and Edward J. Calabrese, Ph.D. University of Massachusetts, Amherst, MA

Analysis, Fate, Environmental and Public Health Effects, and Remediation



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- Over 200 Presentations • 9 Workshops • Socials • Exhibitors
- Tour of North Island Naval Air Station • Tour of Petco Park and the East Village Redevelopment Project

ENVIRON



## ABOUT THE CONFERENCE

This March will mark the fifteenth annual gathering of environmental professionals to the Annual AEHS Meeting and West Coast Conference on Soils, Sediments and Water. For the past fourteen years, this annual conference has helped to bring the environmental science community closer together by providing a forum to facilitate the exchange of information of technological advances, new scientific achievements, and the effectiveness of standing environmental regulation programs.

Attracting 500 - 600 participants, the West Coast Conference is a highly successful and nationally known conference focusing on important and timely environmental issues related to soil, sediment and water. Attendees are drawn from a variety of professions including state and federal regulatory agencies, environmental engineering and consulting firms, the petroleum and chemical industries, and academia.

The 2005 conference promises to be an exciting opportunity for environmental professionals who are concerned with developing creative, cost-effective assessments and solutions that can withstand the demands of regulatory requirements.

### WHO SHOULD ATTEND

- Environmental educators and students
- Federal, state, county, and municipal officials responsible for the development and implementation of environmental regulatory programs, as well as those responsible for issues arising from contaminated soils, sediments and water
- Consultants providing advice and guidance to property owners and businesses
- Attorneys with commercial and industrial clients
- Real estate, insurance, and banking representatives
- Environmental engineers, managers, and consultants
- Analytical laboratory staff specializing in environmental contamination

### WHY YOU SHOULD ATTEND

The Fifteenth Annual AEHS Meeting and West Coast Conference on Soils, Sediments, and Water offers attendees an opportunity to exchange findings, ideas and recommendations in a professional setting. The strong and diverse technical program has been developed to meet the changing needs of the environmental field.

Platform and poster sessions feature research, case studies, and the presentation of new programs. Equipment demonstrations augment the exhibition hall and bring applied technology to attendees. Focused evening and daytime workshops provide attendees with practical information for immediate application.

### SOCIAL PROGRAM

To facilitate networking and the enjoyment of all conference participants, we provide several social opportunities. The 2005 West Coast Conference will include afternoon socials with complimentary refreshments, a wine tasting welcome reception on Monday, and food and beverage receptions accompanying the afternoon poster presentations on Tuesday and Wednesday.

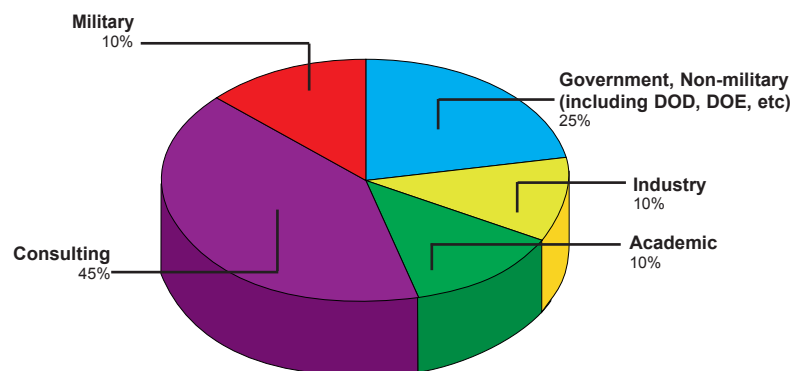
### WHERE DO OUR ATTENDEES COME FROM?

#### Conference Attendee Profile:

Attendees include representatives from state and federal agencies, military, industry (including railroad, petroleum, transportation and utilities), environmental engineering and consulting, and academia.



photo provided by: San Diego Convention and Visitors Bureau



# CONFERENCE AT A GLANCE

## CONFERENCE FORMAT

Conference *SESSIONS* start Monday at 1:00 pm. *WORKSHOPS* are Monday (workshop 1 only), Tuesday and Wednesday evening, and Thursday morning.

Platform sessions and workshops may run concurrently. Please check the schedule closely. This is a preliminary program and is subject to change. If you need to schedule hotel and travel plans, please contact AEHS to confirm the date and time of the workshop or presentation you are interested in.

## MONDAY, MARCH 14

**Registration:** 8:00 am – 5:00 pm

**Exhibit Hall Hours:** 5:00 pm – 7:00 pm

**Luncheon:** 12:00 pm – 1:00 pm

**Welcome Reception – Wine Tasting Social:** 5:00 pm – 7:00 pm

Free to all registered conference attendees

### WORKSHOP

Workshop 1 (9:00 am – 5:00 pm): **Integrating Observed & Modeled Vapor Attenuation**

### PLATFORM PRESENTATIONS -Sessions are Concurrent

1:00 pm – 5:00 pm

Session 1: **Heavy Metals**

Session 2: **Chemical Analysis**

Session 3: **Phytoremediation**

Session 4: **Acid Mine Drainage & Recovery of Metals**

## TUESDAY, MARCH 15

**Registration:** 7:00 am – 7:00 pm

**Exhibit Hall Hours:** 9:00 am – 5:00 pm

**Luncheon:** 12:00 pm – 1:30 pm (Presentation begins at 12:30 pm)

Speaker: William A. Kucharski, *Ecology & Environment, Inc., San Antonio, TX* **"United Nations - How They Dealt With Iraq's Environmental Terrorism"**

### PLATFORM PRESENTATIONS -Sessions are Concurrent

8:00 am – Noon

Session 1: **Environmental Biotechnology**

Session 2: **Site Assessment & Modeling**

Session 3A: **Risk Assessment**

Session 3B: **Perchlorates**

1:30 pm – 5:30 pm

Session 1: **Environmental Forensics**

Session 2: **Contamination at Military Installations**

Session 3A: **Cleanup Standards**

Session 3B: **Natural Attenuation**

Session 4: **Vapor Intrusion**

### TOUR

2:30 pm – 5:00 pm

**Tour of North Island Naval Air Station**

### POSTER SESSION I

3:00 pm – 6:00 pm (Social-Refreshments Served)

### WORKSHOPS

Workshop 2 (7:00 pm – 9:00 pm): **Application of Classic and Emerging Techniques in Environmental Forensics – Successful Case Studies**

Workshop 3 (6:30 pm – 9:30 pm): **Use of Stable Isotopes in Environmental and Forensic Geochemistry Studies**

## WEDNESDAY, MARCH 16

**Registration:** 7:00 am – 7:00 pm

**Exhibit Hall Hours:** 9:00 am – 5:00 pm

**Luncheon:** 12:00 pm – 1:30 pm **Student Contest Winners Announced**

(Presentation begins at 12:30 pm) Speaker: Dennis W. Nixon, *University of Rhode Island, Kingston, RI* **"Legislating Through Disaster - The Development of Oil Spill Liability Law"**

### PLATFORM PRESENTATIONS -Sessions are Concurrent

8:00 am – Noon

Session 1: **MTBE**

Session 2: **Bioremediation**

Session 3: **Innovative Remedial Technologies**

Session 4: **Brownfields**

1:30 pm – 5:30 pm

Session 1: **Ozone Chemical Oxidation of MTBE & Related Compounds**

Session 2: **Bioremediation Strategies for Contaminated Sediments**

Session 3: **Chlorinated Compounds**

Session 4: **Emerging Contaminants**

### TOUR

2:30 pm – 5:00 pm

**Tour of Petco Park and the East Village Redevelopment Project**

### POSTER SESSION II

3:00 pm – 6:00 pm (Social-Refreshments Served)

### WORKSHOPS

Workshop 4 (7:00 pm – 9:30 pm): **Environmental Fate of Hydrocarbons in Soils and Groundwater**

Workshop 5 (6:30 pm – 9:30 pm): **Optimizing Injection Strategies for Full-Scale In-Situ Reactive Zone Remediation**

## THURSDAY, MARCH 17

**Registration:** 8:00 am – 12:00 pm

**Luncheon:** 1:00 pm – 2:00 pm

### WORKSHOPS

Workshop 6 (9:00 am – 1:00 pm): **In-Situ Chemical Oxidation and Biostimulation**

Workshop 7 (9:00 am – 1:00 pm): **Environmental Forensics Fundamental Tools**

Workshop 8 (8:30 am – 12:00 pm): **Using Integrated Forensic Geochemical Approaches to Evaluate Sources of Contamination in the Environment**

Workshop 9 (9:00 am – 1:00 pm): **Environmental Forensic Team Approaches and Application to Brownfield Sites**

# SCIENTIFIC ADVISORY BOARD

AEHS attributes the success of this conference, in large part, to a very dedicated and hard working Scientific Advisory Board (SAB). The SAB evaluates abstract submissions, recommends invited papers and presenters, advises with regard to session topics, and serves as conference ambassadors. The SAB is crucial to the conference development. Care is taken to create a board that represents philosophical, scientific, regulatory, and geographical balance.

## ADVISORY BOARD MEMBERS

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Consider becoming a sponsor or supporter of

## The 16th Annual AEHS Meeting and West Coast Conference on Soils, Sediments and Water

March 2006 • Southern California

### Benefits include:

- Complimentary or reduced fee for exhibit space
- Complimentary full registration(s)
- Reduced registration rates
- Complimentary space to conduct special activities at the conference
- Conference attendee list (electronic, post-conference list)
- Advertisement on the preliminary program mailing and on the AEHS website
- Promotion of your company name in conference advertisements
- 3-4 Complimentary Memberships to AEHS
- Supporters and Sponsors are entitled to one membership on the Scientific Advisory Board, to assist in program development, and to receive submitted abstracts prior to the conference
- Supporters and Sponsors will receive priority to serve as Session Moderators, present technical workshops, and sponsor socials or other special conference events

For more information contact

Paul T. Kostecki • 413-577-9009 • [pkostecki@schoolph.umass.edu](mailto:pkostecki@schoolph.umass.edu)

[www.aehs.com](http://www.aehs.com)

1pm - 5pm • Sessions Are Concurrent

Afternoon Sessions

**Session 1:  
HEAVY METALS**

**Moderator:** Rodney Crother, *SECOR International, Inc., Cypress, CA*

**In-Situ Treatment of Lead and Arsenic in Soils by Chemical Fixation**

Todd Martin, *Integral Consulting, Inc., Boulder, CO*

**Adsorption of Heavy Metals in Lossial Soil**

Alton B. Johnson, *Alcorn State University, Alcorn State, MS*

**An Investigation of Pb Immobilization Mechanisms within Pozzolanic (S/S) Treated Firing Range Soils**

Xuanfeng Xu, *Stevens Institute of Technology, Hoboken, NJ*

**Accumulation of Arsenic by Vegetables from Soils Impacted by Pressure-Treated Wood and Soil Amendment Effects**

Xinde Cao, *Stevens Institute of Technology, Hoboken, NJ*

**Analysis of Mercury in Sewage System Sediments and Dental Amalgam**

Anthony Rattionetti, *San Francisco Public Utilities Commission, San Francisco, CA*

**Session 2:  
CHEMICAL ANALYSIS**

**Moderator:** Gary Foote, *Geomatrix Consultants, Inc., Oakland, CA*

**Assessment of Filtering and Centrifuging on Dissolved Semi-Volatile Petroleum Hydrocarbons**

Gary R. Foote, *Geomatrix Consultants, Inc., Oakland, CA*

**Selection of Analytical Methodology for Sediment and Soil Elemental Analysis Part Two**

Anthony Rattionetti, *San Francisco Public Utilities Commission, San Francisco, CA*

**Simultaneous Quantification of Pharmaceuticals, PAHs and PCBs in Mississippi River, in New Orleans, Louisiana**

Shaoyuan Zhang, *Xavier University of Louisiana, New Orleans, LA*

**Characterization of Motor Oils and Their Oil-Water Partition**

Shan-Tan Lu, *ZyMaX Forensics, San Luis Obispo, CA*

**Ultra High Throughput Microwave Digestion: A Novel Breakthrough Approach for Pressurized Dissolutions**

Michael Burnett, *CEM Corporation, Antioch, CA*

**Competing Transformations of Cyclic Nitramines in Soil and Water: Spectroscopic Support of Theoretical Predictions**

John Furey, *Computer Science Corporation, Vicksburg, MS*

**Session 3:  
PHYTOREMEDIATION**

**Moderators:** Jason C. White, *CT Agricultural Experiment Station, New Haven, CT*  
Lee Newman, *University of South Carolina, Columbia, SC*

**Phytoextraction of Weathered PCBs and p,p'-DDE From Soil**

Jason C. White, *The CT Agricultural Experiment Station, New Haven, CT*

**Phytovolatilization of Gasoline Oxygenates Methyl t-butyl Ether and t-butyl Alcohol**

Charles W. Arnold, *California Water Resources Control Board, Sacramento, CA*

**Multi-Faceted Considerations for Sustainable Phytoremediation Under Field Conditions**

Gary Banuelos, *USDA-ARS, Parlier, CA*

**Phytoremediation of Selenium and Other Toxic Trace Elements**

Norman Terry, *University of California, Berkeley, CA*

**Phytoremediation of Depleted Uranium-Contaminated High Desert Mountain Soil Using Caladium and Perennial Plant Species**

Stacy T. Kuykendall, *The New Mexico Institute of Mining and Technology, Socorro, NM*

**Revegetation of a Coal Reject Pile Waste Basin**

Jaclin Durant, *University of South Carolina, Columbia, SC*

**Uptake of Trichloroethylene (TCE) by Apple and Peach Trees: Greenhouse Study**

J. Doucette, *Utah State University, Logan, UT*

**Session 4: ACID MINE DRAINAGE & RECOVERY OF METALS**

**Moderator:** Henry H. Tabak, *US EPA, ORD, Cincinnati, OH*

**Treatment of Acid Drainage by Means of a Pilot-Scale Multibarrier**

Stoyan N. Groudev, *University of Mining and Geology, Sofia, Bulgaria*

**Sulfate-Reducing Bacteria in Extreme Environments – Do We Know the Limits to Sulfate Reduction?**

Kjeld Ingvorsen, *University of Aarhus, Aarhus, Denmark*

**Overview of Control Technologies for Acid Mine Drainage**

Jeff Skousen, *West Virginia University, Morgantown, WV*

**Aerated Sewage Sludge as Inoculation for Treatment of Acid Mine Drainage**

Paul H. Fallgren, *Western Research Institute, Laramie, WY*

**Sulfidogenesis at Low pH: a Novel Approach for Bioremediating Acid Rock Drainage and Recovering Soluble Metals**

D. Barrie Johnson, *University of Wales, Bangor, UK*

**EPA Mining Technical Support: Today's Tests of Tomorrow's Technology**

David Reisman, *US EPA, Cincinnati, OH*

**Bioreactors for Mineral Mine Drainage: Recent EPA Field Tests**

Edward Bates, *US EPA, Cincinnati, OH*

**MONDAY LUNCHEON:** 12:00 pm - 1:00 pm

**Session 1: ENVIRONMENTAL BIOTECHNOLOGY**

**Moderator:** Stephen Koenigsberg, *Regenesis, San Clemente, CA*

**An Overview of Environmental Biotechnology**

Terry C. Hazen, *Lawrence Berkeley National Laboratory, Berkeley, CA*

**Bioaugmentation and Molecular Diagnostics in Reductive Dechlorination**

Erin Rasch, *Regenesis, San Clemente, CA*

**The Molecular Biology and Microbiology of MTBE Degradation**

Kate Scow, *Kearney Foundation of Soil Science, Davis, CA*

**The Center for Environmental Biotechnology at Arizona State University – Our Mission in this New Endeavor**

Bruce Rittmann, *Northwestern University, Evanston, IL*

**Horizontal Gene Transfer in Bioaugmentation**

Maryam Azad, *Applied Power Concepts (APC), Anaheim, CA*

**The Commercialization of Molecular Diagnostic Testing – A Status Report with Case Histories**

Greg Davis, *Microbial Insights, Rockford, TN*

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**Session 2: SITE ASSESSMENT & MODELING**

**Moderator:** Kevin Mayer, *Steptoe & Johnson, LLP, Los Angeles, CA*

**Method for Sealing Boreholes to Facilitate Soil Gas Sampling by SimulProbe® in Hollow-Stem Auger Borings**

Richard Pawlowicz, *Bechtel National, Inc., San Diego, CA*

**Use of the EPA Triad Approach to Delineate PCB in Lower Duwamish River Sediments**

John S. Wakeman, *Army Corps of Engineers, Seattle District, Seattle, WA*

**LIF and Geophysical Characterization of a Tidally Influenced Diesel Plume**

Steven Humpal, *Jacobs Engineering Inc., Anchorage, AK*

**Solution of Radioactive Transfer Problems with Applications in Environmental Modeling**

Mohsen Razzaghi, *Mississippi State University, Mississippi State, MS*

**Validation of an Air Flow in Soil Model for Low Hydraulic Conductivity Soils**

Bruce A. DeVantier, *Southern Illinois University, Carbondale, Carbondale, IL*

**Site Characterization Case Study: Grants Chlorinated Solvents Plume Site**

Sai S. Appaji, *US EPA, Region 6, Dallas, TX*

**Reliability Analysis of Groundwater Models**

Chin Man Mok, *Geomatrix Consultants, Inc., Oakland, CA*

**Session 3A: RISK ASSESSMENT**

**Moderator:** Deborah Neev, *Earth Tech, Long Beach, CA*

**Risk Assessment in Distributed Modeling: a case study of the Nete Basin**

Mark Henry Rubarenzya, *Katholieke Universiteit Leuven, Heverlee, Belgium*

**Trends in Environmental Regulation of Naturally Occurring Radioactive Materials (NORM) and Technologically Enhanced Naturally Occurring Radioactive Materials (TENORM) in the Oil & Gas Industry**

John D. Elliott, *Johnson Wright, Inc., Lafayette, CA*

**Incorporating Susceptibility in Risk Assessment Using a Mixture Dose-Response Model**

Mehdi Razzaghi, *Bloomsburg University, Bloomsburg, PA*

**Estimating Risk from Copper in Soil: Challenges with Using Drinking Water Criteria**

Anne M. Babyak, *Blasland, Bouck & Lee, Inc., Glendale, CA*

**Session 3B: PERCHLORATES**

**Moderator:** Deborah Neev, *Earth Tech, Long Beach, CA*

**In-Situ Bioremediation of Perchlorate-Contaminated Soils and Groundwater**

Walter L. O'Niell, *Planteco Environmental Consultants, Athens, GA*

**Anodic Reduction of Perchlorate**

Richard M. Peekema, *San Jose, CA*

**LUNCHEON PRESENTATION:**

12:00 pm - 1:30 pm (Presentation begins at 12:30)

William A. Kucharski, *Ecology & Environment, Inc., San Antonio, TX*

**UNITED NATIONS - HOW THEY DEALT WITH IRAQ'S ENVIRONMENTAL TERRORISM**

**TOUR**

2:30 pm – 5:00 pm

**NORTH ISLAND NAVAL AIR STATION SITE VISIT**

On Tuesday, March 15th, the Navy is offering a tour of the North Island Naval Air Station. The tour will include stops at various remediation systems at North Island. The tour will last approximately 1.5 hours, beginning at 3:00 pm.

Free transportation will be provided. Meet at the registration desk at 2:30 pm.

Space is limited. Pre-registration is required (see registration form). Government-issued ID is necessary.

1:30pm - 5:30pm • Sessions Are Concurrent

Afternoon Sessions

## Session 1: ENVIRONMENTAL FORENSICS

**Moderator:** Ioana G. Petrisor, *DPRA, Inc., San Marcos, CA*

**Applications of Forensic Chemistry to Discern Environmental Contaminants**  
Diane L. Saber, *Gas Technology Institute, Des Plaines, IL*

**Forensic Applications of Microbiology: Past and Future**  
Ioana G. Petrisor, *DPRA, Inc., San Marcos, CA*

**Source Identification by Statistical Analyses of Surface Soil Concentrations**  
Wen-Whai Li, *The University of Texas at El Paso, El Paso, TX*

**Forensic Polycyclic Aromatic Hydrocarbon Fingerprint Interpretation and Source Characterization Using Compound Ratio Analysis Technique (CORAT)**  
Ken Scally, *ALcontrol Laboratories Ireland, Dublin, Ireland*

**Sampling in the Smear Zone: Forensic Evaluation of "Dissolved" BTEX and MTBE Data**  
Dawn A. Zemo, *Zemo & Associates LLC, San Francisco, CA*

**Identification of Middle Distillate Fuels and Their Sources in Weathered Environmental Samples**  
Yakov W. Galperin, *Battelle Memorial Institute, Moorpark, CA*

**Environmental Forensics of Coastal Oil Spills**  
Christopher Reddy, *Woods Hole Oceanographic Institution, Woods Hole, MA*

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## Session 2: CONTAMINATION AT MILITARY INSTALLATIONS

**Moderator:** Leslie Karr, *NFESC, Port Hueneme, CA*

**CERCLA Early Transfer and Privatization: A Phenomenal Success at the Former Fitzsimons Army Medical Center**  
Julie A. Carver, *Matrix Environmental Services, LLC, Denver, CO*

**Fast-Track Remedial Investigation of Commingled Chlorinated Solvent, Petroleum Hydrocarbon and Hexavalent Chromium Plume and Use of Screening-Level Data**  
Gina M. Calderone, *EA Engineering, Science and Technology, Newburgh, NY*

**Dynamic Field Characterization of Groundwater TCE Plume Boundaries at Former Air Force Base and Surrounding Area**  
Sheri L. Moore, *U.S. Army Corps of Engineering, Seattle, WA*

**Correlating Tungsten and Lead Leaching with Soil Properties in Pb-Contaminated Firing Ranges' Soils**  
Gang Shen, *Stevens Institute of Technology, Hoboken, NJ*

**In-Situ Thermal Remediation of NAPL Using Electrical Resistance Heating**  
David Fleming, *Thermal Remediation Services, Inc., Snoqualmie, WA*

**A Streamlined Approach to Subsurface Wastewater Line Contamination Investigations**  
John C. Scholfield, *Brown & Caldwell, Honolulu, HI*

**Biological Treatment of Groundwater Contaminated with Mixed Recalcitrants**  
Shane Austin, *Shaw Environmental, Inc., San Diego, CA*

## Session 3A: CLEANUP STANDARDS

**Moderator:** Wally Hise, *Shaw E&I, Midvale, UT*

**A Re-Evaluation of Antiquated Partitioning Coefficients and Their Affect on Soil Clean-Up Goals**  
Maryann H. Sapanara, *GZA GeoEnvironmental, Inc., Norwood, MA*

**Tier 2 RBCA Software: Determining Arizona Site-specific Cleanup Standards for Underground Storage Tanks**  
Jeanene P. Hanley, *Arizona Department of Environmental Quality, Phoenix, AZ*

**Environmental Data Quality and the Search for Representativeness**  
Travis C. Shaw, *U.S. Army Corps of Engineers, Seattle District, Seattle, WA*

## Session 3B: NATURAL ATTENUATION

**Moderator:** Wally Hise, *Shaw E&I, Midvale, UT*

**Source Zone Natural Attenuation - Methods of Investigation and a Case Study**  
Paul D. Lundegard, *Unocal Corporation, Brea, CA*

**Metal Availability and Monitored Natural Attenuation of Inorganics**  
Kimberly R. Powell, *Savannah River National Laboratory, Aiken, SC*

**Feasibility of the NA Potential for Mixed Plumes: Impact of Heavy Metals on Halorespiration**  
Karolien Vanbroekhoven, *Flemish Institute for Technological Research (Vito), Belgium*

**Monitored Natural Attenuation at a Closed Landfill - A Viable Corrective Measure**  
Timothy J. Cox, *URS Corporation, Denver, CO*

## Session 4: VAPOR INTRUSION

**Moderator:** Henry Schuver, *US EPA, Washington, DC*

**Methane in Shallow Soil Gas at Petroleum-Impacted Sites**  
Paul D. Lundegard, *Unocal Corporation, Brea, CA*

**New Techniques for Determining Vapor Concentration Data with Passive Sampling**  
Jay Hodny, *W.L. Gore & Associates, Elkton, MD*

**A Project Profile - Mitigating Methane Gas Vapor Intrusion**  
Michael D. Geyer, *SCS Engineers, Long Beach, CA*

**Canadian Vapor Intrusion Guidance and Empirical Factors**  
Ian Hers, *Golder Associates Ltd., Burnaby, BC, Canada*

**Soil Gas Sampling Methods and Approaches**  
Blayne Hartman, *H&P Mobile Geochemistry, Solana Beach, CA*

**Influence of Parameter Uncertainty on Vapor Intrusion Assessments: Considerations for Empirical and Model-Based Evaluations**  
Helen E. Dawson, *US EPA Region 8, Denver, CO*

## STUDENT COMPETITION

This year we are proud to announce the Adventus Americas Student Competition. At the Wednesday luncheon, two \$500.00 cash prizes will be awarded to the two best student presentations (must be pre-entered for this competition).



**Session 1: MTBE**

**Moderator:** Susan Henry, *AEHS Affiliate, Irvine, CA*

**Comparison of iSOC Technology Approach to Remediate MTBE, Benzene v.s. Monitored Natural Attenuation at Low Permeability Sites**  
Walter S. Mulica, *Global Technologies, Inc., Fort Collins, CO*

**Ozone, Hydrogen Peroxide, and Air Injection Systems for Aggressive BTEX, MTBE, and TBA Remediation**  
Charles B. Whisman, *Groundwater & Environmental Services, Inc., Exton, PA*

**Remediation of Gasoline and MTBE in Groundwater via Hydrogen Peroxide and Ozone Injection**  
Paul Garcia, *DPRA, Inc., San Marcos, CA*

**Methodology for Integrating Direct Sensing Tools with In-Situ Remediation Injection Technology to Facilitate Cost Effective Treatment of Groundwater**  
Eliot Cooper, *Vironex, Inc., Golden, CO*

**Characterization and Remediation Options of a BTEX/MTBE Plume in the Vicinity of a Drinking-water Well in Belgium**  
Leen Bastiaens, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

**Low-Mass Oxygen/Ozone Microbubble Injection for MTBE and Petroleum Compound Removal at Gasoline Retail Outlets**  
William B. Kerfoot, *Kerfoot Technologies, Inc., Mashpee, MA*

**Session 2: BIOREMEDIATION**

**Moderator:** Barry Molnaa, *ARCADIS, Fullerton, CA*

**Efficacy of Bioremediation with Hydrogen Release Compound (HRC®) as a Replacement for a Pump and Treat System**  
Anna Willett, *Regenesis, San Clemente, CA*

**Microbial Processes and Mechanisms Affecting Bioremediation of Metal Contamination in Soils and Sediments**  
Henry H. Tabak, *US EPA, ORD, Cincinnati, OH*

**Empirical Observations from Multiple Field Applications of Bioaugmentation for Remediation of Chlorinated Ethenes in Groundwater**  
Philip Dennis, *SiREM, Guelph, Ontario, Canada*

**Remediation of Chlorinated VOCs in Fractured Bedrock Through In-Situ Bioaugmentation**  
Brian R. Hitchens, *GeoSyntec Consultants, San Diego, CA*

**Biodegradation-Composting with Gypsum to Remediate Oily Soils**  
Dorothy A. Keech, *Assessment and Remediation, Fullerton, CA*

**Optimal Substrates for Enhanced Biodegradation of Nitrate and Explosive Contaminants in Groundwater**  
Song Jin, *Western Research Institute, Laramie, WY*

**Interpretation of Indirect Geochemical Indicators for In-Situ Bioremediation of Petroleum Hydrocarbons**  
James A. Jacobs, *Environmental Bio-Systems, Inc., Mill Valley, CA*

**Session 3: INNOVATIVE REMEDIAL TECHNOLOGIES**

**Moderator:** Peter Guest, *Parsons, Pasadena, CA*

**Successful Remediation Project in a Tight Soil Matrix**  
Richard T. Cartwright, *MECx, LLC, East Amherst, NY*

**Water Migration into and Through Emulsions Used to Stabilize Radioactive Contamination from a Dirty Bomb**  
Garey A. Fox, *University of Mississippi, University, MS*

**Performance of a One-Hundred Foot Long Pilot Permeable Reactive Barrier (PRB)**  
Grant Hocking, *GeoSierra, Atlanta, GA*

**Competitive Contaminant Destruction During Ozone-Peroxide Chemical Oxidation: Implications for In-Situ Remediation of 1,4 Dioxane**  
Lowell Kessel, *Haley & Aldrich, Inc., Brea, CA*

**Doing The Right Thing: Detoxification of the Warren County PCB Landfill**  
Michael A. Kelly, *NC Department of Environmental & Natural Resources, Raleigh, NC*

**Inactivation of Aquatic Nuisance Species (Brine Shrimp) in Ballast Water Using Acoustic Cavitation and Advanced Oxidants**  
Robert W. Peters, *University of Alabama at Birmingham, Birmingham, AL*

**Comparison of Batch and Continuous Flow Treatment Performance Using Combined Sonication + Vapor Stripping**  
Robert W. Peters, *University of Alabama at Birmingham, Birmingham, AL*

**Session 4: BROWNFIELDS**

**Moderator:** John Harris, *Richards, Watson & Gershon, Los Angeles, CA*

**Transforming a Paint Pigment Factory to Playing Fields: A Case Study**  
Thomas J. Holden, *Haley & Aldrich, Inc., San Diego, CA*

**Project Homerun: State and Federal Grants and a Clear Vision Lead to Successful Brownfield Redevelopment**  
Anthony C. Catalano, *Malcolm Pirnie, Inc., White Plains, NY*

**Designing, Implementing, and Tracking Institutional Controls at Brownfield Sites**  
J. Michael Sowinski, *DPRA, Inc., San Marcos, CA*

**Recent Legislative and Regulatory Changes in the Environmental Assessment and Development of Contaminated Properties**  
John J. Harris, *Richards, Watson & Gershon, Los Angeles, CA*

**Brownfields to Ballfields: Lessons Learned in California's Largest Redevelopment Project - San Diego's Downtown Ballpark**  
Christopher S. Spengler, *Environmental Business Solutions, An SCS Engineers Company, San Diego, CA*

**LUNCHEON PRESENTATION:**  
12:00 pm - 1:30 pm  
(Presentation begins at 12:30)  
Dennis W. Nixon, *University of Rhode Island, Kingston, RI*

**LEGISLATING THROUGH DISASTER - THE DEVELOPMENT OF OIL SPILL LIABILITY LAW**

**TOUR OF PETCO PARK AND THE EAST VILLAGE REDEVELOPMENT PROJECT** 2:30 pm - 5:00 pm



Join us on an Old Town Trolley bus for a tour of brownfield redevelopment in action. Take the tour throughout the 26-block redevelopment project and see how Petco Park has revitalized the East Village of Downtown San Diego. The tour will combine a bus tour and a walking section. Mr. Chris Spengler of Environmental Business Solutions, An SCS Engineers Company, has been the project manager for the assessment and mitigation of 19 of the 26 block-project for the past 7 years. The environmental cleanup was conducted by the use of unprecedented methods involving the Polanco Act, a Master Workplan, and turn-key Property Mitigation Plans which incorporated dynamic workplans and risk-based cleanup goals designed to meet the needs of the developments. As a continuation of Mr. Spengler's platform presentation, the tour will highlight some of challenges faced while completing this one-of-a-kind redevelopment project.

1:30pm - 5:30pm • Sessions Are Concurrent

Afternoon Sessions

## Session 1: OZONE CHEMICAL OXIDATION OF MTBE & RELATED COMPOUNDS

**Moderator:** William B. Kerfoot, *Kerfoot Technologies, Inc., Mashpee, MA*

**Atlantic Coast In-Situ Remediation of MTBE and Petroleum Product Spills Utilizing Ozone Sparging**  
Scott Miller, *Resource Control Corporation, Moorestown, NJ*

**Low-Mass Oxygen/Ozone Microbubble Injection for MTBE, TBA, and Petroleum Compound Removal at Gasoline Retail Outlets**  
William B. Kerfoot, *Kerfoot Technologies, Inc., Mashpee, MA*

**Monitoring During Remediation of Hydrocarbon Contaminated Soil and Groundwater Using Microbubble Ozone Technology**  
Christine Manhart, *LACO Associates, Eureka, CA*

**Microbubble Ozone Sparging in the California Central Valley Region**  
Kevin G. Brown, *Geocon Consultants, Inc., Rancho Cordova, CA*

**Ozone Sparging for In-Situ Oxidation of MTBE**  
David H. Hull, *LFR Levine Fricke, Granite Bay, CA*

**Geochemical Monitoring During Remediation of Chlorophenol Contaminated Soil and Groundwater Using Microbubble Perozone Technology**  
Christopher Watt, *LACO Associates, Eureka, CA*

**Vapor Phase Ozone Injection as an Innovative Technology Under the FDEP to Remediate BTEX, MTBE, and EDB Groundwater Plumes at Petroleum Contaminated Sites**  
Scott Lato, *Advanced Environmental Technologies, LLC, Tallahassee, FL*

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## Session 2: BIOREMEDIATION STRATEGIES FOR CONTAMINATED SEDIMENTS

**Moderator:** Henry H. Tabak, *US EPA, ORD, Cincinnati, OH*

**Effects of Reaction Parameters on Electrochemical Dechlorination of Trichloroethylene Rate and By-Products**  
Souhail Al-Abed, *US EPA, Cincinnati, OH*

**Microbial Sequestration of Lead and Other Heavy Metals**  
Wendy Davis-Hoover, *US EPA, NRMRL/NHSRC, Cincinnati, OH*

**Nutrient Delivery and Bioaugmentation Processes Using Membranes and Gel Beads for In-Situ Bioremediation of PAH Contaminated Sediments**  
Rakesh Govind, *University of Cincinnati, Cincinnati, OH*

**A Distributed Model for Assessment of Natural Attenuation in Bottom Sediments**  
Mohamed M. Hantush, *US EPA, NRMRL, Cincinnati, OH*

**Evaluation of Gas Generation Through Sand Capped PAH Contaminated Sediments**  
Terrence Lyons, *US EPA, NRMRL, Cincinnati, OH*

**Spectroscopic Speciation of Metals in Contaminated Environments**  
Kirk G. Scheckel, *US EPA, Cincinnati, OH*

**A Test of Surrogate Sampling Tools for Evaluating Contaminated Sediments**  
Joseph Schubauer-Berigan, *US EPA, Cincinnati, OH*

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## Session 3: CHLORINATED COMPOUNDS

**Moderator:** Gina M. Calderone, *EA Engineering, Science & Technology, Newburgh, NY*

**A Comprehensive Performance Analysis of Hydrogen Release Compound (HRC®)**  
Stephen S. Koenigsberg, *Regenesis, San Clemente, CA*

**Permanganate Oxidation Beyond Chlorinated Solvents: Oxidation of Pentachlorophenol and RDX with Permanganate**  
Philip A. Vella, *Carus Chemical Company, LaSalle, IL*

**Comparison of Installation Methods for Subsurface Placement of EHC™ For Treatment of Recalcitrant Groundwater Contaminants**  
David Hill, *Adventus Remediation Technologies, Inc., Mississauga, Ontario, Canada*

**Evaluation of Full-Scale Closed Loop Potassium Permanganate Injection and GWETS Remediation of Chlorinated VOCs**  
Ramkishore Rao, *LFR Levine-Fricke, Emeryville, CA*

**DNAPL Remediation Technologies: Recent Examples of Sites Approaching Regulatory Closure**  
Raji J. Ganguli, *Tetra Tech EM Inc., Reston, VA*

**Chemical Oxidation Treatment of a Methylene Chloride DNAPL Source**  
Gary Cronk, *MECx, LLC, Irvine, CA*

**Technology Assessment for Remediation of Drycleaner Solvent Contaminated Sites**  
Bruce Gilles, *Oregon DEQ, Portland, OR*

## Session 4: EMERGING CONTAMINANTS

**Moderator:** Rula Deeb, *Malcolm Pirnie, Inc., Emeryville, CA*

**Those Pesky Emerging Contaminants: Will We Ever be Done with Them?**  
Lee Shull, *MWH, Sacramento, CA*

**A Regulatory Perspective on Emerging Contaminants: Lessons Learned from Perchlorate in USEPA Region 9**  
Kevin Mayer, *USEPA, Region 9, San Francisco, CA*

**Analytical Methods Issues for Emerging Contaminants - Regulated, Soon to be Regulated, and Unregulated**  
Andrew Eaton, *MWH Laboratories, Monrovia, CA*

**Perchlorate Site Prioritization at DoD Facilities in California: A Practical Outcome of DoD's Program on Emerging Contaminants**  
Baha Y Zarah, *Air Force Center for Environmental Excellence (AFCEE), San Francisco, CA*

**Emerging Chemicals of Concern for the Environment by SPE Coupled with HPLC and HPLC/MS/MS Detection**  
Michael A. Erickson, *Columbia Analytical Services, Kelso, WA*

**Reducing Logistics Footprints and Replenishment Demands: Nano-engineered Silica Aerogels a Proven Method for Water Treatment**  
Kevin O'Brien, *Livermore National Laboratory, Livermore, CA*

**Emerging Contaminants: Application of Microarray Technology to the Detection of Mixtures of Endocrine-Active Agents**  
Linda Hall, *Lawrence Livermore National Laboratory, Livermore, CA*

# WORKSHOPS

## MONDAY, MARCH 14

### Workshop 1 (9:00 am – 5:00 pm)

#### **INTEGRATING OBSERVED & MODELED VAPOR ATTENUATION - A SUMMARY WORKSHOP A STUDY OF VAPOR INTRUSION MEASUREMENT AND MODELING IN THE CONTEXT OF EPA'S VAPOR INTRUSION GUIDANCE**

**Sponsored by US EPA**

Henry Schuver, *US EPA, Office of Solid Waste, Washington, DC*  
Douglas Grosse, *US EPA, Office of Research and Development, Cincinnati, OH*  
Paul C. Johnson, *Arizona State University, Tempe, AZ*  
Todd McAlary, *GeoSyntec Consultants, Inc., Guelph, ON, Canada*  
Ian Hers, *Golder Associates, Inc., Burnaby, BC, Canada*  
Helen Dawson, *US EPA, Region 8, Denver, CO*

The U.S. Environmental Protection Agency's (EPA's) Office of Solid Waste and Emergency Response (OSWER) has sponsored workshops focused on the observed and modeled attenuation of contaminant vapors in the subsurface and vapor intrusion (VI) into indoor air (AEHS Spring and UMass Fall, 2004, see <http://iavi.rti.org/resources.cfm?pageID=document>). EPA held these workshops as part of preparations to revise the November 2002 draft VI guidance. Specific objectives of these meetings were to expand the VI scientific knowledge base and to use current knowledge and resources to improve the VI guidance by specifically focusing on (1) collecting and interpreting observational data to support default attenuation factors (Question 4 in the guidance) and (2) modeling vapor attenuation for semi-site-specific attenuation factors (Question 5) and site-specific evaluations (Question 6).

Both observational data sets and screening models of vapor intrusion play a key role in the EPA's regulatory guidance for the VI exposure pathway (<http://www.epa.gov/correctiveaction/eis/vapor.htm>). This third workshop is likely to be the last opportunity prior to the revised guidance for presenting and commenting on approaches for using observational data sets; making measurements in soil gas and indoor air; and applying scenario-specific modeling techniques that can integrate these two data sources and improve the validity and usefulness of the EPA VI guidance. Topic areas include:

- the overall structure and philosophy of the VI pathway assessment approach
- soil gas and indoor air sampling methods
- how to determine, interpret, and use background concentrations
- overview of available attenuation observations and the empirical analyses of those data relative to the default attenuation factors in the VI guidance
- how to best apply models for predicting attenuation
- strategy, sequence, logic, scope, and rationale for the site-specific assessment
- tools in the toolbox of VI site-specific assessments.

The workshop will include both invited presentations on these topic areas and a session designed to allow input and comment on EPA guidance directions from regulators, regulated parties, consultants, communities, and other stakeholders.

## TUESDAY, MARCH 15

### Workshops 2 & 3

#### Workshop 2 (7:00 pm – 9:00 pm)

#### **APPLICATION OF CLASSIC AND EMERGING TECHNIQUES IN ENVIRONMENTAL FORENSICS – SUCCESSFUL CASE STUDIES**

Ioana G. Petrisor, *DPRA Inc., San Marcos, CA*  
Alan Jeffrey, *ZymaX Forensics, San Luis Obispo, CA*  
Julie Sueker, *Blasland, Bouck & Lee, Inc., Golden, CO*  
Helder J. Costa, *Blasland, Bouck & Lee, Inc., New Bedford, MA*

The complex pollution problems facing mankind today along with the arising environmental legislation worldwide resulted in the blossoming of the multi-disciplinary field of Environmental Forensics. Information and techniques from a variety of unrelated scientific disciplines are usually required to establish pollution sources/age and finally allocate and manage site liabilities.

The current workshop will present the general principles of environmental forensic investigations focusing on several classic and emerging techniques with high potential in forensics investigations (theory and applications).

Techniques based on chemical fingerprinting and those based on isotopic (stable and/or radioactive) analyses could be considered classic as they have proven performances in many environmental forensics investigations. Several case studies, involving PAHs and/or chlorinated solvents contamination, where chemical fingerprinting and isotopic analyses were efficiently applied for tracking contamination to finally manage liabilities, will be provided and

discussed. Development of innovative forensic techniques based on the classic methods described will also be discussed. Finally, emerging forensics techniques that may use recent advances in molecular microbiology for reconstructing contaminant release events will be pointed out. Several emerging molecular microbiological techniques (including terminal restriction fragment length polymorphism and ribotyping) promise tremendous applicability in environmental forensic investigations, but their use to date has been scarcely documented in criminal forensics and tracking of water contamination. One of the most promising opportunities is the ability to track contamination by examining the impact of contaminant on microbial populations in a particular environment and monitor its time effect, since microorganisms respond to the tiniest changes in contamination. Data from successful applications of microbiological emerging techniques in both criminal and environmental forensics will be discussed emphasizing future application opportunities.

#### Workshop 3 (6:30 pm – 9:30 pm)

#### **USE OF STABLE ISOTOPES IN ENVIRONMENTAL AND FORENSIC GEOCHEMISTRY STUDIES**

Paul Philp, *University of Oklahoma, Norman, OK*

Stable carbon and hydrogen isotopes have been used for many decades in the petroleum industry but the development of combined gas chromatography-isotope ratio mass spectrometry (GCIRMS) has led to a virtual explosion in applications of this technique not only in petroleum exploration but in the environmental and forensic geochemical fields. This workshop will present an introduction to stable isotope geochemistry and discuss applications of stable isotopes to various environmental problems. Topics to be covered will include an introduction to the concept of stable isotopes, with particular attention to carbon, hydrogen, and, to a lesser degree, chlorine. Techniques for determination of bulk isotope values will be described along with the advantages and disadvantages of the GCIRMS approach.

Examples on the use of bulk isotopic data combined with other techniques such as GC or GCMS for the purpose of determining whether or not contaminants are related to each other will be described. This is particularly important where there might be multiple sources potentially responsible for a particular spill and it is necessary to see whether any of them were actually responsible for the spill. In cases where the contaminant has multiple components, and the GC and GCMS data are not particularly useful for correlation purposes, relationships between source and product might only be determined through the stable isotopes of individual compounds. GCIRMS is also extremely valuable for single component contaminants, such as MTBE or PCE, where GC and GCMS will be of no use for correlation.

A number of examples will be presented to illustrate the application of the isotope approach to various environmental forensic problems. Such examples cover a wide range of problems ranging from contamination of ground water with compounds such as MTBE, PCE or BTEX where the primary emphasis is typically directed towards determination of whether or not natural attenuation is occurring, to problems involving complex PAH mixtures at MGP sites where the isotopes of the individual compounds can be used to differentiate coal tar sources vs. urban background.

## WEDNESDAY, MARCH 16

### Workshops 4 & 5

#### Workshop 4 (7:00 pm – 9:00 pm)

#### **ENVIRONMENTAL FATE OF HYDROCARBONS IN SOILS AND GROUNDWATER**

James Dragun, *The Dragun Corporation, Farmington Hills, MI*

This workshop covers predicting bulk hydrocarbons migration, the extent of adsorption of organic chemicals, chemical volatility in soil, chemical reaction rates for organic chemicals in soil, and biodegradation rates of organic chemicals in soils. The information presented is in the context of site remediation, siting disposal facilities, and analyzing potential chemical releases as part of the auditing/closure of industrial facilities. Dr. Dragun's book, *The Soil Chemistry of Hazardous Materials*, Second Edition, will be provided to registered participants, in CD format.

#### Workshop 5 (6:30 pm – 9:30 pm)

#### **OPTIMIZING INJECTION STRATEGIES FOR FULL-SCALE IN-SITU REACTIVE ZONE REMEDIATION**

Fred Payne, *ARCADIS, Southfield, MI*  
John Horst, *ARCADIS, Newtown, PA*

Successful implementation of in-situ remediation techniques, such as enhanced bioremediation, relies on achieving adequate substrate delivery throughout the area requiring treatment. Predicting how substrates will behave in the aquifer and designing the appropriate substrate injection system are key to achieving the desired substrate distribution. Specifically, a successful delivery system is dependent on (1) delivery of the injected solution within the target treatment



## WORKSHOPS

area and corresponding contaminant mass, and (2) maintaining contact of the injection solution with the contaminant mass for a length of time sufficient for destruction of the target compounds.

This course is designed to provide the site owner, practitioner, and regulator with an understanding of the scientific principles behind the successful application of in-situ remediation technologies, while presenting a practical approach for the design and implementation of these technologies at full-scale. This course will focus specifically on injection zone design to optimize delivery of injected fluid to the subsurface for remediation using In-Situ Reactive Zones (IRZs). The course will also provide a basic background on in-situ enhanced bioremediation, and will train attendees on the use of tracer tests to effectively design injection zones, including injection point spacing and frequency of injections. In addition, several methods of delivery will be discussed including push-probe injections, barrier-type applications, and bulk and automated injection systems. Monitoring strategies will be presented to characterize and manage IRZs in various hydrogeologic settings, including discussions of key monitoring parameters (hydraulic, geochemical, microbiological, and contaminant) required to document the success of the IRZ.

The course will begin with background information on basic concepts of the bioremediation technology (including biogeochemistry and microbiology), and will focus on hydraulics of reactive zones, design and evaluation of tracer studies, and design and application of full-scale systems. Case studies will be used throughout the course to provide real-world examples of these important concepts.

### THURSDAY, MARCH 17

#### Workshops 6, 7, 8, & 9

#### Workshop 6 (9:00 am – 1:00 pm)

##### IN-SITU CHEMICAL OXIDATION AND BIOSTIMULATION

William B. Kerfoot, *Kerfoot Technologies, Inc., Mashpee, MA*

Doug Carvel, *MECx, Bellaire, TX*

Philip Block, *FMC Corporation, Philadelphia, PA*

Brenda Veronda, *Carus Chemical Company, Peru, IL*

To provide up-to-date information on in-situ chemical oxidation, this workshop combines vendor presentations with professional consultant experience. Major oxidants to be considered are:

- Permanganate –  $\text{MnO}_4$
- Persulfate –  $\text{S}_2\text{O}_8^{2-}$
- Hydrogen Peroxide – Fenton's Reagent –  $\text{H}_2\text{O}_2$
- Ozone –  $\text{O}_3$

In-situ chemical oxidation using ozone, Fenton's Reagent, persulfate, permanganate or combinations can be an effective innovative technology for destroying organic contaminants within the ground water aquifer where they occur. Each oxidant requires certain design considerations for proper application. This workshop concentrates on the following topics:

- Oxidant chemistry principles
- Available oxidants/compound stoichiometry
- Oxidant selection/site evaluation
- Laboratory bench-scale tests
- Field pilot tests
- Regulatory concerns
- Case histories and time to closure

Presentations will be made by vendors who supply equipment and consulting firms with specific site experience. Case studies will be presented where design and operational issues will be discussed.

#### Workshop 7 (9:00 am – 1:00 pm)

##### ENVIRONMENTAL FORENSICS FUNDAMENTAL TOOLS (CONTAMINANT SUBSURFACE FATE AND TRANSPORT, ANALYTICAL CHEMISTRY, STATISTICS)

Tim Buscheck, *ChevronTexaco, Richmond, CA*

Mark Weiner, *Del Mar Analytical, Irvine, CA*

Yue Rong, *California Regional Water Quality Control Board, Los Angeles, CA*

The portion of the workshop in fate and transport of subsurface contaminants will review those principles that govern fate and transport of subsurface contaminants. The application of a Conceptual Site Model will be used as the framework for site assessment and remediation decisions. Processes that contribute to natural attenuation of dissolved contaminants will be described. Contaminant mass flux estimates will also be introduced as a tool for natural attenuation and remediation decisions.

The portion in analytical chemistry will present an overview of different analytical techniques used for the analysis of environmental samples, including the basic theory behind preparation and chromatography for the analysis of

volatile and non-volatile organics, and spectroscopy for the analysis of metals. It will also include a review of quality assurance and quality control (QA/QC) measurements common in the laboratory as well as a discussion about the analysis of some emerging chemicals of concern in California.

The portion in statistics will present four commonly used statistical methods for environmental data analysis and discuss potential pitfalls associated with application of these methods through real case study data. The four statistical methods are percentile and confidence interval, correlation coefficient, regression analysis, and analysis of variance (ANOVA). The case studies will show that one may draw very different conclusions based on statistical analysis if the pitfalls are not identified.

#### Workshop 8 (8:30 am – 12:00 pm)

##### USING INTEGRATED FORENSIC GEOCHEMICAL APPROACHES TO EVALUATE SOURCES OF CONTAMINATION IN THE ENVIRONMENT

Richard W. Hurst, Ph.D., *Hurst & Associates, Inc., Thousand Oaks, CA*

This workshop will introduce attendees to methods employing a variety of geochemical techniques to discriminate among sources of hydrocarbons, perchlorate, heavy metals (lead, arsenic, chromium), salinity, nitrates, and chlorinated compounds in the environment. Specifically, the course will cover, through case studies, combined applications of gas chromatography, standard mineral analyses, isotope ratio mass spectrometry, and statistics to investigate:

- Sources of Chromium and Lead at the Portsmouth Naval Shipyard
- Ages and Sources of Gasoline Contamination (3 U.S. locations)
- Migration of PCE/TCE in a Karst Terrane
- Issues Involving Perchlorate in Southern California Groundwater
- Sources of Nitrate in La Conchita, CA
- Sources of Salinity at the Dominguez Gap Seawater Intrusion Barrier

Each case study investigates how the integration of routine analytical techniques with stable isotope ratio mass spectrometry (SIRMS; carbon, nitrogen, strontium, lead) was used to resolve issues surrounding the source(s) and/or age of contamination at the site. The course will also cover basic principles of SIRMS and basic isotope geochemistry.

#### Workshop 9 (9:00 am – 1:00 pm)

##### ENVIRONMENTAL FORENSIC TEAM APPROACHES AND APPLICATION TO BROWNFIELD SITES

##### Interdisciplinary Team Strategies, Legal Rules of the Road, Practical Considerations, and New Forensic Techniques

Richard G. Opper, *Opper & Varco LLP, San Diego, CA*

J. Michael Sowinski, JD, EIT, *DPRA, Inc., San Marcos, CA*

Robert D. Morrison, PhD, *DPRA, Inc., San Marcos, CA*

Larry R. Froebe, PhD, *MACTEC Engineering and Consulting, Inc., Irvine, CA*

The Honorable Robert P. Dahlquist, *Superior Court Judge, County of San Diego, San Diego, CA*

Environmental Forensics refers to the collection and evaluation of environmental data, in order to provide an evidentiary basis for environmental decisions. Environmental Forensics often plays an important role in environmental litigation, but may also support contaminated property redevelopment, and other environmental projects. Because environmental forensic techniques provide an improved picture of environmental contamination, and its source, age, and fate, it provides an improved understanding of environmental issues, the ability to effectively communicate knowledge about the environment, and a superior means to identify the source of impairments and the costs and methods of environmental repair.

This half-day workshop will address some of the practical and theoretical issues that arise during the work of interdisciplinary environmental forensic teams. In such teams, professionals of diverse disciplines, such as environmental scientists, engineers, accountants, archival experts and lawyers blend their knowledge to make sure that environmental investigations result in reliable conclusions that are admissible in court or otherwise provide a solid evidentiary basis for negotiations or other environmental-related decision making.

Relaying the experience of seasoned attorneys and experts, the first session will highlight "best" and "worst" practices of environmental forensic teams, including means to allow geographically diverse experts to share a desktop, avoiding the "expert ambush," and other practices. The second session, with useful reference materials included, will overview some of the legal "rules of the road" for consulting or testifying environmental forensic experts, including the legal rules of discovery, evidence, conflict of interest, and ethics. Finally, building upon the environmental forensic fundamentals of earlier talks, the final session will address the real-world application of environmental forensic techniques to brownfield site redevelopment.

PENDING CLE APPROVAL

# POSTER PRESENTATIONS

Posters may be viewed throughout the day on Tuesday, March 15th and Wednesday, March 16th. Authors will be available at their posters from 3:00 pm - 6:00 pm on their assigned day. Please refer to the schedule below. Refreshments and light hors d'oeuvres will be served during the poster sessions.

## TUESDAY, MARCH 15

### Urban Runoff Treatment Facility Removes Organics, Bacteria and Viruses

George Alther, *Biotin, Inc., Ferndale, MI*

### Microbial Community Characterization of Rhizosphere Soil from Plants Grown in Aged PAH Contaminated Soil

Ian N. Balcom, *University of California, Riverside, Riverside, CA*

### Intercalibrative Measurements of Heavy Metals Concentration in Soil Under the Foliage of Pine Tree

Edita Baltreinaite, *Institute of Environmental Protection, Vilnius, Lithuania*

### Effect of Additives and *Sphingomonas/ Mycobacterium* Populations on the Bio-availability of PAHs in Weathered Soil

Leen Bastiaens, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### Former Laredo AFB Environmental Investigation, Texas Size Project Wrangled by the Web?

Zach F. Baumer, *Malcolm Pirnie, Inc., Houston, TX*

### Time-Tracking of Natural Attenuation of Chlorinated Solvent Plume Compared to Pump and Treat System

Gina M. Calderone, *EA Engineering, Science and Technology, Newburgh, NY*

### Stakeholder Involvement in the Redevelopment of a BRAC Site with Contaminated Sediments

Julie A. Carver, *Matrix Environmental Services, LLC, Denver, CO*

### Use of CPT/MIPS to Determine Optimal ISCO Injection Zones

William Cutler, *ERM-West, Honolulu, HI*

### On Site Dynamics of an Oligotrophic Microbial Community in a BTEX Contaminated Groundwater Plume

Winnie Dejonghe, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### In-Situ Mesocosmos Socks and Molecular Ecology Techniques for Monitoring On Site Colonization of Carrier Materials

Winnie Dejonghe, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### Remediation of Sites Contaminated by Heavy Metals: Sustainable Approach for Saturated Zones

Ludo Diels, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### Preconcentration of Rare Earth Element and Ultra Trace Determination by Spectrophotometry-chemometrics Method

Faten Divsar, *Tarbiat Moallem University, Tehran, Iran*

### Impact of Lead and Zinc on Humans and the Environment Due to 300 Years of Activity at the Mezica Mine in Slovenia

Branko Druzina, *University of Ljubljana, Ljubljana, Slovenia*

### Automated Data Capture - from Soil Borings to Real-Time Analysis

Mitra Fattahipour, *Bechtel National, Inc., San Diego, CA*

### Numerical Analysis Simulation of Leaching Hexavalent Chromium From Cement Treated Soil

Kazushi Furumoto, *Public Works Research Institute, Tsukuba, Ibaraki-ken, Japan*

### Sediment Biobarriers for Chlorinated Aliphatic Hydrocarbons in Groundwater Reaching Surface Water

Kelly Hamonts, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### Laboratory Study of Factors Controlling Growth of *Spirodela Polyrrhiza*

Peng-liang Huang, *College of Professional Technologies, Liuzhou, Guangxi, China*

### Non-ionic Surfactant Remediation of LNAPL & DNAPL Contamination Using Selective Phase Transfer (SPT) Technology

George Ivey, *Ivey International, Inc., Newington, CT*

### Immobilization of Lead in Small Arms Firing Range Soil Using Emulsions, Lime & Other Additives

Michael A. Jones, *Engineering Research & Development Center, Vicksburg, MS*

### Directional Rotational Sparging

William B. Kerfoot, *Kerfoot Technologies, Inc., Mashpee, MA*

### Electrokinetic Remediation of 2,4-Dinitrotoluene Contaminated Soils

Amid P. Khodadoust, *University of Illinois at Chicago, Chicago, IL*

### A Membrane Interface Probe Integrated with a Gas Chromatograph for In-Situ Screening of BTEX

Pradeep U. Kurup, *University of Massachusetts, Lowell, Lowell, MA*

### Automated Data Capture - from Environmental Fieldwork to Real-Time Data Analysis

Toni Kuzmack, *Bechtel National, Inc., San Diego, CA*

### Uptake and Transformation of Aromatic Hydrocarbons by Plants

George Kvesitadze, *Durmishidze Institute of Biochemistry and Biotechnology, Tbilisi, Georgia*

### Study of Natural Attenuation of Chlorinated Benzenes in Groundwater

Kuyen Li, *Lamar University, Beaumont, TX*

### Effectiveness of Hydrogen Peroxide Injection

Chin Man Mok, *Geomatrix Consultants, Inc., Oakland, CA*

### Decontamination of Pollutants in Aquatic System: 2. Improving the Efficiency of Certain Bacteria Strains for Organophosphorus Pesticides Degradation

Ayman H. Mansee, *Alexandria University, Alexandria, Egypt*

### Carbon-Ceramic Sorbents for Water Treating from Toxic Elements

Zulkhair Mansurov, *Al-Farabi National University, Kazakhstan*

### Tetrachloroethene Bioremediation in a Complex Geologic Setting

Gene L. Murray, *Whitehead & Mueller, Inc., Plano, TX*

### Effect of Land Use and Cover Changes on Soil Properties on the Mt. Elgon Slopes

Clare Mutumba Nantumbwe, *Makerere University, Kampala, Uganda*

### Metal Contaminated Soil Recycled for Use in Parking Lot Construction at NSA, Mechanicsburg, Pennsylvania

Kenda Neil, *NFESC, Port Hueneme, CA*

### Challenges of Urban Water Supply and Management in Developing Countries

Kwasi Nsiah-Gyabaah, *Sunyani Polytechnic, Sunyani, Brong Ahafo Region, Ghana*

### Mild-Solvent Extracted Fractions of PAHs as a Predictor of the Extent of Their Disappearance in Sewage Sludge-Amended Soil

Patryk Oleszczuk, *Institute of Soil Science and Environmental Management, Lublin, Poland*

### Background Contamination of Soil and Freshwater Sediments by Heavy Metals and Caesium-137, Sakhalin Island, Russia

Tatjana Paramonova, *Moscow State Lomonosov University, Moscow, Russia*

### Use of Regenerative Thermal Oxidation in Soil Vapor Extraction

Mark J. Passarini, *TriHydro Corporation, Anaheim, CA*

### Automated Data Capture - from Field to Web Analysis

Richard M. Pawlowicz, *Bechtel National, Inc., San Diego, CA*

### The Study of an Influence of Microorganisms on the Interaction of Heavy Metals Compounds with Soil Minerals

Leonid Perelomov, *Tula State University, Tula, Russia*

### Integrated Electrochemical Remediation of Heavy Metal and PAH-Contaminated Sites

Krishna R. Reddy, *University of Illinois, Chicago, IL*

### Alkali Activated Fly Ash for the Remediation of Water Contaminated with Lead

Hossein Rostami, *Philadelphia University, Philadelphia, PA*

### Hydrological Modeling of the Effects of River Valley Rewetting on Extreme Events in Belgium

Mark Henry Rubanayeva, *Katholieke Universiteit Leuven, Heverlee, Belgium*

### Structural-Functional Changes in Plant Cell as a Result of Aromatic Hydrocarbons Penetration

Tinatini Sadunishvili, *Durmishidze Institute of Biochemistry and Biotechnology, Tbilisi, Georgia*

### Thermal and Biological Methods of Processing and Cleaning of Oil Contaminated Soils

Zhanay Sagintayev, *Al-Farabi National University, Almaty, Kazakh Republic*

### MTBE Spills Deteriorates Soil Streptomyces

Gholam H. Shahidi Bonjar, *Bahonar University of Kerman, Iran*

### Treatability Study: Two-Phase Extraction of Dissolved- and LNAPL-Phase Petroleum Hydrocarbons from a Fractured Bedrock

Joel Sheldon, *Earth Tech, Inc., Long Beach, CA*

### Decolorization and Degradation of Acid Orange - 6 and Acid Orange - 7 in Sequential Batch Biofilm Reactor

Poonam Singh, *University Kanpur, Kanpur, India*

### Mercury in Some Lakes of the Southern Ural - Mercury Time Bombe

Yury G. Taty, *Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow, Russia*

### Technogenous Oozes as a New Type of Modern River Bed Sediments

Yury G. Taty, *Vernadsky Institute of Geochemistry and Analytical Chemistry, Moscow, Russia*

### Surfactant Enhanced Washing of Drilling Fluids: Effect of Salts Addition

Luis G. Torres, *IUNAM, Coyoacan, Mexico*

### Temporal Changes in Chemical Water Quality of Streams in Response to Land Use Practices

Teferi D. Tsegaye, *Alabama A&M University, Normal, AL*

### Characterization of the Microbial Ecology in the Surroundings of an Iron Barrier

Thomas Van Nooten, *Vito (Flemish Institute for Technological Research), Mol, Belgium*

### Experimental Investigation of the Process of Contaminant Migration in Porous Soil

Huang Wei, *Wenzhou University, Wenzhou, Zhejiang, China*

### Stabilization of Toxic Heavy Metals and Organics in Soil

Alan Weston, *Conestoga-Rovers & Associates, Niagara Falls, NY*

### Application of Rhizoremediation on Soils Contaminated by PAHs

Lei Yang, *National Sun Yat-sen University, Kaohsiung, Taiwan*

### Investigation of Microbes in the Rhizosphere for Phytoremediation of Soils Contaminated by Heavy Metals

Lei Yang, *National Sun Yat-sen University, Kaohsiung, Taiwan*

### Using Sludges From Tannery Wastewaters Decontamination

Gabriel A. Zainescu, *National R&D Institute for Textile and Leather, Bucharest, Romania*

### Sources and Distribution of Polycyclic Aromatic Hydrocarbons in New Orleans and Detroit Soils

Qiang Zhang, *Xavier University of Louisiana, New Orleans, LA*

## WEDNESDAY, MARCH 16

### Studies on the *Pseudomonas fluorescens* Strain Capable of Detoxifying the Major Water Pollutants in India

Masood Ahmad, *AMU, Aligarh, India*

### Antioxidant Enzymes in *Allium cepa* as Biomarkers of Heavy Metal Pollution in Water System

Masood Ahmad, *AMU, Aligarh, India*

# POSTER PRESENTATIONS

## New Chemical Coatings Technology that Converts Lead Based Paint (LBP) Coated Building Materials into Non-RCRA Hazardous Materials

James M. Barthel, *Metals Treatment Technologies, LLC (MT2), Wheat Ridge, CO*

## New Technology for Small Arms Ranges Enhanced Maintenance and Management of Lead and Copper Contaminants

James M. Barthel, *Metals Treatment Technologies, LLC (MT2), Wheat Ridge, CO*

## Innovative Integrated Technology Process for Treating Hydrocarbon and Heavy Metals In Sediments Contaminants

James M. Barthel, *Metals Treatment Technologies, LLC (MT2), Wheat Ridge, CO*

## SVE Design, 21-Acre Area - Pore Gas Velocity Considerations

Donald T. Bradshaw, *LFR Levine-Fricke, Emeryville, CA*

## Removal of Depleted Uranium from Contaminated Soils

Christine Chin Choy, *Stevens Institute of Technology, Hoboken, NJ*

## Removal of Depleted Uranium from Groundwater Using Nanocrystalline Titanium Dioxide

Christine Chin Choy, *Stevens Institute of Technology, Hoboken, NJ*

## Air Toxics Emissions from Combination Wood Fired Boilers and Related Health Risk Assessment

Tapas K. Das, *Washington State Department of Ecology, Olympia, WA*

## Phytoremediation of Lead Contaminated Soil from an Abandoned Dumpsite in Ibadan, South-West Nigeria

Johnson O. Etaghene, *Delta State School of Health Technology, Ughelli, Nigeria*

## Bacterial Groundwater Contamination by Amghara Landfill in Kuwait

Amr A. Fadlilmawla, *Kuwait Institute for Scientific Research, Safat, Kuwait*

## Analysis of Polybrominated Diphenyl Ethers by GC/MS with Large Volume Injection

Jeff Grindstaff, *Columbia Analytical Services Inc., Kelso, WA*

## Low Level Determination of N-nitrosodimethylamine by GC/MS with Large Volume Injection

Jeff Grindstaff, *Columbia Analytical Services Inc., Kelso, WA*

## Simultaneous Spectrophotometric Iron Speciation with 2-(5-bromo-2-pyridylazo)-5-diethylaminophenol Using Partial Least Squares Regression

Javad Hashemi, *Tehran Tarbiat University, Mofateh, Tehran, Iran*

## In-Situ Chemical-Biological Treatment of PCB-Contaminated Sediment

P.K. Andrew Hong, *University of Utah, Salt Lake City, UT*

## Uptake of <sup>14</sup>C-atrazine by Prairie Grasses in a Phytoremediation Setting

Yuliya Khrunyk, *University of Alaska Fairbanks, Fairbanks, AK*

## Accelerated Bioremediation with Oxygen Release Compound-Advanced (ORC-A<sup>TM</sup>): Evolution of Time-Release Electron Acceptors

Stephen S. Koenigsberg, *Regenesys, San Clemente, CA*

## AOPS for Treatment of Wastewater Contamination by Chlorinated Hydrocarbons

Natalija Koprivanac, *University of Zagreb, Zagreb, Croatia, Hungary*

## Polycyclic Aromatic Hydrocarbons (PAHs) In Sediment of Guanabara Bay, Rio de Janeiro, Brazil

Andrea Mao, *Ca' Foscari University of Venice, Venice, Italy*

## Heavy Metals In Sediment From a Tropical Estuary Affected by Anthropogenic Discharges: Guanabara Bay, Brazil

Andrea Mao, *Ca' Foscari University of Venice, Venice, Italy*

## Biodegradation of Perchlorate in Laboratory Groundwater Reactors

Agnes B. Morrow, *Environmental Research and Development Center, Vicksburg, MS*

## Groundwater Characterization Impacted by Petroleum Production Operations: Maritime Terminal of Dos Bocas, Tabasco, Mexico

Manuel Muriel, *Instituto Mexicano del Petroleo, Cd. Del Carmen, Cam., México*



## Dissolution Kinetics of Metallic Tungsten in the Presence of Common Alloying Elements

Adebayo Ogundipe, *Stevens Institute of Technology, Hoboken, NJ*

## Reactive Material Systems for In-Situ Capping of Contaminated Sediments

James T. Olsta, *Colloid Environmental Technologies Company (CETCO), Arlington Heights, IL*

## Isotope Evidence on Groundwater Salinization Sources, Ugarteche, Mendoza, Argentina

Héctor A. Ostera, *Instituto de Geocronología Isotópica, Buenos Aires, Argentina*

## Evaluation of the Plant Capability for Absorbing Carbon Dioxide and its Application to Office Space

Takashi Oyabu, *Kanazawa Seiryō University, Kanazawa, Japan*

## Port Valdez Sediment Coring Project

Tony Parkin, *Prince William Sound Regional Citizens Advisory Council, Valdez, AK*

## A Model for Perchlorate Accumulation in Plant Products

Richard M. Peekema, *San Jose, CA*

## Sorption of As(V) and As(III) by Nanocrystalline TiO<sub>2</sub>

María E. Pena, *Stevens Institute of Technology, Hoboken, NJ*

## Effect of pH on the Adsorption of Heavy Metals onto Straw

Robert W. Peters, *University of Alabama at Birmingham, Birmingham, AL*

## Biosolubilization of Metals from Some Mine Tailings from the Black Sea Coast

Ioana G. Petrisor, *DPRA, Inc., San Marcos, CA*

## Greenhouse Experiments for Revegetation of Sulphidic Mine Tailings: Microbial Communities Involved

Ioana G. Petrisor, *DPRA, Inc., San Marcos, CA*

## Advantages and Shortcomings of BIOCHLOR and NAS Models Used to Evaluate Groundwater Remedial Strategies

Vladimir M. Prilepin, *Tetra Tech EM Inc., Rancho Cordova, CA*

## Remediation of Chlorinated Volatile Organic Compounds at a Former Industrial Site in San Diego, CA

Robert T. Quarles, *GeoSyntec Consultants, San Diego, CA*

## Liability Management at a Petroleum Pipeline Release Site

Christina Robinson, *ENTRIX, Inc., Houston, TX*

## Automated Data Capture - INEEL Real-Time Systems Used for Characterization of Closure Site Soil Remediation Projects

Lyle G. Roybal, *Idaho National Laboratory, Idaho Falls, ID*

## The Use of Freeze Drying in Organic Sample Preparation

Gregory Salata, *Columbia Analytical Services Inc., Kelso, WA*

## Assessment of Ecological Safety of the Objects Located in the Territories Contaminated with Chernobyl Radionuclides

Andrey V. Saltanov, *National Academy of Sciences of Belarus, Minsk, Belarus*

## Decision Matrix for Selecting Off-Gas Treatment Technologies for Recalcitrant Compounds

Cannon F. Silver, *Parsons, Pasadena, CA*

## Insurance Coverage Issues Pertaining to Environmental Remediation

Eric J. Sinrod, *Duane Morris LLP, San Francisco, CA*

## Iodine-131: A Short-lived, Anthropogenic Radionuclide Tracer in Urbanized Estuarine Systems

Joseph P. Smith, *University of Massachusetts, Boston, MA*

## Reduction of Organic Pollution in Soils and Sediments by High Power Ultrasound

Andrea P. Sosa Pintos, *University of Western Sydney, Penrith South, NSW, Australia*

## Geochemical Evaluations to Identify Metals Contamination in Groundwater

Karen Thorbjomsen, *Shaw Environmental, Inc., Knoxville, TN*

## Land Application of Coalbed Natural Gas Co-Produced Waters

George F. Vance, *University of Wyoming, Laramie, WY*

## In-Situ Metals Remediation with Metals Remediation Compound (MRC<sup>®</sup>)

Anna Willett, *Regenesys, San Clemente, CA*

## Rapid Biological Treatment of Residual DNAPL with Slow Release Electron Donor HRC-X<sup>TM</sup>

Anna Willett, *Regenesys, San Clemente, CA*

## Results of a Successful Enhanced Reductive Dechlorination Project Under the US EPA SITE Program

Anna Willett, *Regenesys, San Clemente, CA*

## In-Situ Strategies for the Sequestration of Zinc in Contaminated Sediments

Aaron G.B. Williams, *U.S. EPA, Cincinnati, OH*

Sponsored by U.S. EPA, ORD

## Redox Modification of Sediments, Testing of the ECGO Process at the Sediment Testing Facilities Coleraine MN

J. Kenneth Wittle, *Electro-Petroleum, Inc., Wayne, PA*

## Natural Resource Damages: Awakening a Sleeping Giant

Alborz A. Wozniak, *Johnson Wright Inc., Lafayette, CA*

## Uptake of Molybdate and Tetrathiomolybdate by Pyrite and Goethite

Nan Xu, *Stevens Institute of Technology, Hoboken, NJ*

## Enhanced In-Situ Bioremediation Evaluation of a Jet-A Fuel Spill

Alex E. Yiannakakis, *Hydro Geo Chem, Inc., Tucson, AZ*

## Study on the Sorption of Pb<sup>2+</sup> by Fly Ash, Clay and Bentonite

Xi Yong-hui, *Tongji University, Shanghai, China*

## Quantification of Montmorillonite by Rietvelt

Wanchun Yuan, *Stevens Institute of Technology, Hoboken, NJ*

# GENERAL INFORMATION

## REGISTRATION INFORMATION

Advance and on-site registration includes admission to all platform sessions, poster sessions, the exhibit area and coffee breaks. Workshops and lunches are NOT included in the full registration fee, but may be purchased separately on the conference registration form. The conference registration form is included in this program and is also available on-line at [www.aehs.com](http://www.aehs.com).

Full payment must accompany pre-registration. Non-compliance will result in a \$25.00 processing fee for any resulting billings. Phone-in registrations will not be accepted.

**PURCHASE ORDERS** will be accepted from institutions and agencies for the purpose of pre-registration only. Payment in full must be received in our office by March 7, 2005.

**CANCELLATIONS** received In WRITING by March 1, 2005 will receive a full refund minus a \$50.00 processing fee. NO REFUNDS WILL BE ISSUED FOR CANCELLATIONS AFTER MARCH 1, 2005. You may substitute a conferee rather than cancel the registration entirely.

**SPONSORS AND SUPPORTERS** are eligible for complimentary registrations, according to respective guidelines. Employees of sponsoring and supporting organizations may register at the reduced rate of \$295. You must clearly indicate on your registration form that you are affiliated with a sponsoring or supporting organization in order to qualify for the reduced rate.

**REGULATORY** personnel: Employees of any State, County, Regional, Municipal, or Federal REGULATORY agency qualify for a registration rate of \$100.00 - however you MUST PRE-REGISTER in order to receive this special rate.

**WORKSHOPS** (Not included in conference registration fee. Must purchase separately on registration form.)

Early registration is encouraged as space is limited and materials must be prepared in advance. Please check the workshop schedule carefully when selecting workshops - same day workshops may run simultaneously.

**POSTER SESSIONS** Posters may be viewed in the designated areas throughout the day on Tuesday, March 15th and Wednesday, March 16th. Authors will be available at their posters from 3:00-6:00 pm, on their assigned day. Refreshments will accompany the poster sessions.

**EXHIBIT INFORMATION** An exhibition of relevant technologies and services will be in the exhibition hall on Monday, March 14th from 5:00 pm – 7:00 pm, Tuesday, March 15th and Wednesday, March 16th from 9:00 am - 5:00 pm. A limited number of booths are available. See our website ([www.aehs.com](http://www.aehs.com)) or call 413-549-5170 for exhibitor information.

**LOCATION AND TRAVEL INFORMATION** The conference will be held at the Mission Valley Marriott in San Diego, CA, just 10 minutes from San Diego International Airport. Delight in a world of sight-seeing pleasures--miles of white-sand, sunny beaches, charming Old Town, the Gaslamp District, the San Diego Zoo, Sea World, Wild Animal Park, U.S. Navy facilities and Qualcomm Stadium. A taste of Mexico is just a short drive south in Tijuana.

The hotel does not provide a shuttle, however many ground transportation options are available directly from the airport. "Cloud Nine Shuttle" is \$7.50 per person. Reservations are not necessary – simply cross the street upon exiting baggage claim at the airport. Cloud Nine Shuttle will be available for hire near the taxis and other ground transportation. (1-800-9SHUTTLE or [www.cloud9shuttle.com](http://www.cloud9shuttle.com))

Onsite parking is available at the Marriott for the special "AEHS RATE" of \$6.00 per day (Self Park) or \$13.00 per day (Valet). The same rates apply for overnight parking.

**ACCOMMODATION INFORMATION** The hotel has 17 floors and 350 guest rooms --all with multiple PC data ports with high-speed Internet access. Enjoy casual all-day dining at Café Del Sol or unwind at The Cantina, the hotel's on-site happy hour bar.

Special conference group room rate: Single/Double (\$135) per night, if reserved by February 18th, 2005.

### The Mission Valley Marriott,

8757 Rio San Diego Drive, San Diego, CA 92108

Tel: 619-692-3800 or 800-842-5329 Fax: 619-692-0769

You can also visit their comprehensive website

[www.marriotthotels.com](http://www.marriotthotels.com)

**Attendees are responsible for their own hotel arrangements. Please note the cut-off date of February 18th – reservations must be made by February 18th to receive the group rate.**

### CONFERENCE COORDINATOR

Brenna Lockwood, AEHS, 413-549-5170, [brenna@aehs.com](mailto:brenna@aehs.com)

## Mission Valley Marriott, San Diego (Reservation Form)

8757 Rio San Diego Dr., San Diego, CA 92108 For reservations, mail this form or contact the hotel directly by telephone 619-692-3800 or 800-842-5329 or fax 619-692-0769. **Do not send hotel reservations to AEHS**

Guest Name \_\_\_\_\_

Address \_\_\_\_\_

City/State/Zip \_\_\_\_\_

Telephone \_\_\_\_\_

Arrival Date \_\_\_\_\_ Departure Date \_\_\_\_\_

Please Reserve \_\_\_\_\_ Single @ \$135.00

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Room tax is an additional 10.6%

Sharing with \_\_\_\_\_

Special requests \_\_\_\_\_

Group Name: Fifteenth Annual AEHS West Coast Conference on Soils, Sediments and Water

Group # \_\_\_\_\_ Group Dates Arr. \_\_\_\_\_ Dep. \_\_\_\_\_

Cut Off Date: February 18, 2005

### CREDIT CARD GUARANTEE

Credit Card Type \_\_\_\_\_ Exp. \_\_\_\_\_

Credit Card No. \_\_\_\_\_

Name of Cardholder \_\_\_\_\_

All reservations must be accompanied by a first night room deposit or guaranteed by credit card for first night room. Reservations may be cancelled at no penalty up until 6pm on the date of arrival. Cancellation after 6pm will result in a charge for one night's room and tax.

### PLEASE READ

It is your responsibility to confirm that your reservation has been made. Please contact the hotel at the number above.

# REGISTRATION FORM

ON-LINE REGISTRATION IS AVAILABLE AT [www.AEHS.com](http://www.AEHS.com)

## 15th Annual AEHS Meeting and West Coast Conference on Soils, Sediments, and Water

Name  Mr.  Ms.  Dr. \_\_\_\_\_

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### 1. ADVANCE REGISTRATION FEES (Postmarked or received on or before March 1, 2005)

Regular Conference Registration .....	\$545.00	_____
AEHS Member .....	\$375.00	_____
Student .....	\$155.00	_____
AEHS Student Member .....	\$ 75.00	_____
Sponsor/Supporter (additional registrants) .....	\$295.00	_____
Exhibitor (additional registrants) .....	\$195.00	_____
Platform Presenter .....	\$100.00	_____
Platform Co-presenter .....	\$195.00	_____
Poster Presenter .....	\$150.00	_____
Municipal, State or Federal REGULATORY Personnel .....	\$100.00	_____

### 2. LATE REGISTRATION FEES (Received after March 1, 2005 or processed at the conference) .....ADD \$50.00

### 3. WORKSHOP FEES (please check schedule closely – workshops run concurrently)

If you are NOT registering for the conference and are only registering for a workshop .....ADD \$100.00

#### Monday, March 14, 2005

1.\* Integrating Observed & Modeled Vapor Attenuation (9:00 am – 5:00 pm) ..... Free

#### Tuesday, March 15, 2005

2. Application of Classic and Emerging Techniques in Environmental Forensics: Successful Case Studies (7:00 pm – 9:00 pm).....\$ 95.00

3. Use of Stable Isotopes in Environmental and Forensic Geochemistry Studies (6:30 pm – 9:30 pm) .....\$ 95.00

#### Wednesday, March 16, 2005

4. Environmental Fate of Hydrocarbons in Soils & Groundwater (CD version of book included) (7:00 pm – 9:30 pm).....\$135.00

5. Optimizing Injection Strategies for Full-Scale In-Situ Reactive Zone Remediation (6:30pm – 9:30pm) .....\$ 95.00

#### Thursday, March 17, 2005

6. In-Situ Chemical Oxidation and Biostimulation (9:00 am – 1:00 pm) .....\$ 95.00

7.\*\* Environmental Forensics Fundamental Tools (9:00 am – 1:00 pm).....\$ 95.00

8. Using Integrated Forensic Geochemical Approaches to Evaluate Sources of Contamination in the Environment (8:30 am – 12:00 pm) .....\$ 95.00

9. Environmental Forensic Team Approaches and Application to Brownfield Sites (9:00 am – 1:00 pm) .....\$ 95.00

\*Free to a limited number of attendees who register by February 21st, 2005. Additional registrants may be accepted at the rate of \$95.00. Check the space to enroll.

\*\*Free to municipal, state and federal REGULATORY personnel registered for the conference. Check workshop you are interested in to reserve your space.

### 4. MEALS

Lunch, Monday, March 14, 2005 .....\$ 28.00

Lunch, Tuesday, March 15, 2005 (includes speaker) .....\$ 28.00

Lunch, Wednesday, March 16, 2005 (includes speaker) .....\$ 28.00

Lunch, Thursday, March 17, 2005 .....\$ 28.00

### 5. NORTH ISLAND TOUR Tuesday, March 15, 2:30 pm - 5:00 pm

I am interested in the NORTH ISLAND Tour. Please reserve a space in my name. *Limited space available, first come first serve*

### 6. TOUR OF PETCO PARK AND THE EAST VILLAGE REDEVELOPMENT PROJECT Wednesday, March 16, 2:30 pm - 5:00 pm

I am interested in the PETCO/EAST VILLAGE Tour. Please reserve a space in my name. *Limited space available, first come first serve*

### 7. TOTAL CONFERENCE FEES ..... \$ \_\_\_\_\_

#### Please indicate method of payment

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Encumbered purchase orders will be accepted from institutions and agencies for the purpose of pre-registration only. Full payment must be received in our office by March 7, 2005. Non-compliance will result in a \$25.00 processing fee for any resulting billings. Cancellations will be assessed a \$50.00 fee (see cancellation policy under General Information).

### 8. ONE YEAR MEMBERSHIP TO AEHS, FREE TO ATTENDEES WHO REGISTER BY MARCH 1ST, 2005

In order to claim this benefit, please choose which journal you would like to receive (one of the following journals comes with membership)

Soil & Sediment Contamination: An International Journal

International Journal of Phytoremediation

More information on these journals may be found at [www.AEHS.com](http://www.AEHS.com)

**Please fax or mail completed form with full payment BY MARCH 1ST TO AVOID LATE FEE and RECEIVE FREE MEMBERSHIP:**

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# The Association for Environmental Health and Sciences

The Association for Environmental Health and Sciences was created to facilitate communication and foster cooperation among professionals concerned with the challenge of environmental protection and cleanup.

Experience over the past decades has revealed the need for a constant and reliable network for the exchange of information derived from multiple sources and disciplines among people who, because of different disciplinary affiliations and interests, may not have easy access to significant portions of the information map.

AEHS provides the network. AEHS members represent the many disciplines involved in making decisions and solving problems affecting environmental cleanups including chemistry, geology, hydrogeology, law, engineering, modeling, toxicology, regulatory science, public health, and public policy.

AEHS recognizes that widely acceptable solutions to the problems of environmental contamination can be found only through the integration of scientific and technological discovery, social and political judgement, and hands-on practice.

AEHS activities include:

- National Workshops
- International Workshops
- Seminars
- Conferences
- Publications including:
  - Soil & Sediment Contamination: An International Journal
  - International Journal of Phytoremediation
  - The Journal of Environmental Forensics
  - Human & Ecological Risk Assessment (HERA)
  - Journal of Children's Health
  - Nonlinearity in Biology, Toxicology and Medicine



**FREE 1 Year Membership to AEHS for Attendees who Register Before March 1st**

**MEMBERSHIP BENEFITS INCLUDE:**

- A full year subscription to your choice of the *International Journal of Phytoremediation* or *Soil & Sediment Contamination: An International Journal*
- Discount on Taylor & Francis books purchased through AEHS
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