Vapor Intrusion: Updates on Evolving Science & Understanding  
AEHS West Coast Conference – March 21, 2017, 1:30 – 5:30 PM

Session Chair: Robert Truesdale, RTI International, Research Triangle Park, NC (www.rti.org)
Session Sponsors: Geosyntec Consultants Inc. (https://www.geosyntec.com); EnviroForensics Inc. (www.enviroforensics.com); GSI Environmental (www.gsi-net.com); CH2M HILL (www.ch2m.com); Haley & Aldrich Inc. (www.haleyaldrich.com); Sanborn, Head & Associates (www.sanbornhead.com); Golder Associates (www.golder.com)

This session reviews recent advancements in the state of the art of vapor intrusion (VI) assessment and management. Conventional methods have identified recurring challenges with spatial variability, temporal variability, preferential pathways and background sources of volatile organic compounds (VOCs) to indoor air. These challenges cause uncertainty and ambiguity that results in conservative regulatory policies, and generally increase the cost of resolving VI risk assessments. The presentations in this session are provided by national and international experts from several consultancies that have been prior participants in the VI Workshops at this conference. Several of the talks provide the most recent results of federally funded research programs or innovative and emerging technologies. All of the talks provide insights into alternative approaches that can provide more definitive VI investigation results and more efficient VI mitigation systems.

Presenter Bios

Lila Beckley, P.G., GSI Environmental, Austin, TX (lmbeckley@gsi-net.com)

Ms. Beckley is a geologist with GSI Environmental Inc., in Austin, Texas. She has extensive project experience in vapor intrusion studies, environmental site investigation, permitting and regulatory support. She has served on guidance development workgroups on a variety of topics and is currently a member of the ITRC Petroleum Vapor Intrusion classroom training team. Prior to joining GSI, Ms. Beckley worked in enforcement and remediation programs at the Texas Commission on Environmental Quality, in various roles ranging from project to program management.

Dan Carr, Sanborn Head & Associates, Inc. - Dayton, ME (dcarr@sanbornhead.com)

Daniel Carr is serving as a Principal Emeritus consultant with Sanborn Head & Associates, Inc., a geoenvironmental consulting firm. He is a registered professional engineer and geologist with over 35 years of experience. With an M.S. degree from the Groundwater Program in the Department of Civil Engineering at Colorado State University, Dan brings expertise in vadose zone processes which have been applied to many projects related to vapor intrusion. Dan served as the principal investigator on the Endicott NY Groundwater Vapor Project and a consultant/adviser on the DuPont Pompton Lakes NJ project. He is currently leading subsurface characterization work on the ESTCP project charged with demonstrating “Mass Flux Characterization for Vapor Intrusion Potential” (Project ER-201503). Dan can be reached at (207) 415-1550.

Helen E. Dawson, Geosyntec Cons., Washington, DC (hdawson@geosyntec.com)

Helen Dawson, Ph.D., is a senior consultant for Geosyntec Consultants, Inc., in the firm’s Washington D.C. Metro office. She has more than 30 years of experience in hydrogeology with a focus on contaminant transport and fate. She is a recognized expert in vapor intrusion assessment, having served as a lead in developing EPA’s 2002 draft vapor intrusion guidance as well as several EPA technical documents to support finalization of EPAs vapor intrusion guidance in 2015. She has a Ph.D. in Civil/Environmental Engineering from Stanford University, an M.S. in Geochemistry from the Colorado School of Mines, and a B.S. in Geology from Stanford.
Megan Hamilton, EnviroForensics, Indianapolis (mhamilton@enviroforensics.com)

Megan Hamilton is the Director of Vapor Intrusion and Risk Assessment for the Environmental Forensic Investigations, Inc. (EnviroForensics) team and has over 18 years of experience in environmental regulatory oversight and consulting. She develops, helps implement, and oversees the vapor intrusion investigations and mitigation for all of EnviroForensics’s projects. She is also the main contact for risk communication issues and community outreach development. Her diversified professional experience includes research, policy development, technical writing, public outreach, vapor intrusion investigation and remediation, data analysis and interpretation, human health risk assessment, and conceptual site model analysis. Ms. Hamilton served as the coordinator and team leader for the Indiana Department of Environmental Management’s Vapor Intrusion Workgroup for six years and is the principal author of the current Indiana Vapor Intrusion Guidance. Ms. Hamilton has presented at several National Conferences, is a member of the National VI Science Advisory Committee, and currently serves on the Board of Directors for the Midwestern States Environmental Consultants Association. Ms. Hamilton can be reached at (317) 972-7870.

Ian Hers, Golder Associates, Vancouver, BC (Ian_Hers@golder.com)

Ian Hers, PhD., P.E., is a senior consultant and Principal of Golder Associates located in Vancouver, B.C., Canada with 26 years professional experience, and is the global vapour practice leader for Golder Associates. Much of his work over the past two decades has focused on the evaluation of soil vapor fate and transport, vadose zone processes, and the prediction, measurement and mitigation of soil vapour intrusion into buildings. He is highly familiar with soil gas and indoor air characterization techniques, appropriate methods to obtain high quality, defensible data, and regulatory guidance and analytical and numerical models for this pathway. He has developed guidance for numerous regulatory agencies including U.S. EPA, Health Canada, UK Environmental Agency, and several provinces and states in Canada and the U.S. He is the principal investigator for several current or recently completed applied research projects for the American Petroleum Institute, Shell Global, Health Canada, Ontario MoE and Electric Power Research Institute. Dr. Hers holds a Ph.D. in Civil Engineering (University of British Columbia), is on the Board of Directors of the Science Advisory Board for Contaminated Sites, and is a member of the Contaminated Sites Approved Professionals in British Columbia.

Chase Holton, CH2M, Denver, CO (Chase.Holton@ch2m.com)

Chase Holton, Ph.D., is an environmental engineer with CH2M in Denver, Colorado. He specializes in the assessment and mitigation of vapor intrusion (VI) and human health risk assessment. Prior to joining CH2M in June 2015, Chase was a graduate research assistant and student at Arizona State University working with Dr. Paul C. Johnson on a series of long-term VI monitoring studies at a house in Utah (Sun Devil Manor). This work included assessment of conventional indoor air sampling schemes and evaluation of controlled pressure methods for assessing the vapor intrusion pathway and resulted in several prominent publications. Chase is currently involved with a number of ongoing VI research projects for USEPA, DoD, and others.

Loren Lund, CH2M, Shelley, ID (Loren.Lund@ch2m.com)

Loren Lund, Ph.D., has over 25 years of experience in environmental risk and vapor intrusion (VI) assessments. He is the vapor intrusion practice leader at CH2M and responsible for best practices being applied. Dr. Lund is an organizing committee member, classroom instructor, session chair, and presenter for the Air and Waste Management Association (AWMA) VI specialty conferences. He is a member and internet instructor for the Interstate Technology Regulatory Council (ITRC) Petroleum VI team, co-chairs the Navy VI Focus Group, co-author of the Navy 2011 Background Indoor Air Guidance for VI, and technical leader for the Navy Environmental Sustainability Development to Integration (NESDI) VI Decision Framework database project. He has reviewed multiple national VI guidance documents, authored more than a dozen papers, and has been a session chair or featured speaker at over a dozen VI conferences or sessions since 2004. He earned a bachelor’s degree in chemistry and a Ph.D. in
biochemistry at Utah State University, and was a post-doctorate and adjunct professor in toxicology at the University of Texas in Austin.

**Todd McAlary, Geosyntec Consultants, Toronto, ON** (tmcalary@geosyntec.com)

Todd McAlary (PhD, P.Eng., P.G., CUT) has been the Vapor Intrusion Practice Leader for Geosyntec Consultants, Inc., since 1998. He has degrees in Geological Engineering, Hydrogeology and Chemistry from the University of Waterloo, where he measured and modeled vapor diffusion through unsaturated sands as his Master's Thesis and demonstrated/validated the use of passive samplers for vapor intrusion assessment as his Doctoral dissertation. Dr. McAlary has 30 years of consulting experience, primarily for Fortune 500 companies in the United States, but including assignments in 14 other countries. He has conducted site-specific investigations of vapor intrusion since 1992, co-authored or peer-reviewed over a dozen guidance documents on vapor intrusion, and has presented research in this field at over 50 conferences, workshops, and training sessions. He received the 2006 Industry Recognition Award for his contribution to the ITRC vapor intrusion guidance and has been a member of the Federal EPA Expert Panel on Vapor Intrusion since 2000. Mr. McAlary is currently managing large-scale vapor intrusion investigations for the DOD, conducting applied research for ESTCP, the Navy and the Air Force to improve vapor intrusion assessment methods and is an Adjunct Professor at the University of Toronto.

**Thomas McHugh - GSI Environmental, Houston, TX** (temchugh@gsi-net.com)

Tom McHugh, Ph.D., is a toxicologist with GSI Environmental Inc., in Houston, Texas. He is a Diplomate of the American Board of Toxicology and has over 20 years of experience in the environmental industry. Dr. McHugh has extensive project experience in environmental site investigation, site restoration, human health and ecological risk assessment, data mining, and statistical analysis. Dr. McHugh is interested in developing improved methods to manage contaminated sites and has been PI for several research projects on vapor intrusion, groundwater monitoring, and other topics. He has developed training classes on a number of topics including vapor intrusion and groundwater monitoring, and has contributed to the development of state and federal guidance documents.

**Jay Peters - Haley & Aldrich, Inc., Bedford, NH**

Jay is the practice leader for risk assessment at Haley & Aldrich, Inc. He holds a Bachelor’s degree in Toxicology from Northeastern University and a Master’s degree in Environmental Health from Tufts University. Jay has 25 years of experience as a risk assessor. He has developed risk-based regulatory closure strategies and managed risk assessment projects for Superfund Sites, Resource Consenstion and Recovery Act sites, and brownfield redevelopment and property transfer sites, under the regulatory frameworks of more than twenty state cleanup programs and seven Environmental Protection Agency regions. Jay’s two-plus decades of experience across this range of regulatory frameworks has allowed him an in-depth insight into the growth and maturation of the vapor intrusion and indoor air risk assessment practices, as well as contemporary positions that regulatory agencies are taking on various initiatives. He has developed numerous presentations and publications on these topics, and routinely communicates with community and regulatory stakeholders on these issues.

**Gina Plantz - Haley & Aldrich, Inc., Berkley CA** (GPlantz@haleyaldrich.com)

Gina is a Principal Consultant with Haley & Aldrich, Inc. and holds a Bachelor of Science degree in Chemistry from Widener University. Gina has extensive experience in management and oversight of vapor intrusion investigations at sites contaminated with chlorinated solvents, manufactured gas plant (MGP) residues and petroleum hydrocarbons with focus on stakeholder engagement and risk communication. She has lectured on the topics vapor intrusion sampling and data evaluation, forensic chemistry, stakeholder engagement and risk communication. For the past 8 years, Gina has been directing a large investigation and remediation program for a California utility company. This complex, multi-stakeholder program includes evaluating the vapor intrusion pathway.
Richard J. Rago, Haley & Aldrich, Inc., Rocky Hill, CT (RRago@haleyaldrich.com)

Richard Rago serves as Lead Scientist and Vapor Intrusion Practice Leader for Haley & Aldrich, Inc. in Rocky Hill, Connecticut. Since joining Haley & Aldrich in 1991, Rich has long been recognized for contributions to regulatory agencies and professional organizations, including for his support for numerous state and federal vapor intrusion guidance and analytical data quality documents. Rich has also directed independent research studies in support of improved environmental characterization, including false positives in analytical quantitation of metals, potential bias in petroleum hydrocarbons measurements, indoor air sampling intervals, soil gas long term temporal stability, and indoor air background in residences, offices, and schools. Rich has a professional background in environmental analytical chemistry with a CT Department of Public Health Environmental Laboratory Directorship Certification. Rich participates on the environmental laboratory advisory committees of several states, the NELAC Institute National Environmental Field Activities Program, as well as serves as vapor intrusion instructor for ITRC (Petroleum Vapor Intrusion), AWMA, and Princeton Groundwater.

David Shea, P.E., Sanborn, Head & Associates, Concord, NH (dshea@sanbornhead.com)

David Shea has more than 25 years of experience as an environmental and site remediation engineer, with a particular focus on vapor intrusion assessment and mitigation design for residential, commercial, and industrial buildings. He has been the Principal Investigator for RCRA Facility Investigations of vapor intrusion at multiple large commercial/industrial campuses involving over 40 buildings comprising millions of square feet of building footprint. He is a Principal Engineer with Sanborn, Head & Associates in Concord, New Hampshire, where he is responsible for leading vapor intrusion and environmental remediation projects throughout the US and abroad. He is a licensed professional engineer in 15 states. He holds a B.S. in Civil Engineering from Princeton University and a M.S. in Civil Engineering from M.I.T.

Robert S. Truesdale, RTI International, Durham, NC (rst@rti.org)

Robert Truesdale is a Senior Research Geologist with RTI International. Mr. Truesdale has supported of U.S. EPA research on multimedia environmental pollution issues for over 35 years, with work ranging from sampling and analysis to modeling and risk assessment. One of the principal technical authors of EPA’s Soil Screening Guidance, Mr. Truesdale has been involved in vapor intrusion research and regulatory development since 2000, including work for the Indiana Department of Environmental Management and EPA’s ORCR, ORD, and OUST. He has managed and organized 12 consecutive vapor intrusion technical workshops and three stakeholder forums for EPA ORCR and ORD. He received a B.A. in Geology from Duke University in 1975 and a M.S. in Geologic Sciences from the University of Maine in 1977, where he conducted research on diatoms as indicators of the impact of climate change on Antarctic paleoecology. Mr. Truesdale has worked at RTI since 1978.