

GEONEWS

Newsletter of the Association of Environmental & Engineering Geologists, Carolinas Section 2009, 2011, and 2013 AEG Section of the Year

WINTER 2013

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SAVE THE DATE

Winter Meeting Gary Luce, AEG National President Wednesday, January 22, 2014 Dave & Buster's, Concord

Vapor Intrusion Conference Embassy Suites, Cary January 23 and 24, 2014

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GeoNews is a publication of f There are four issues per year cation dates listed below. We announcements, student mer and job openings. Deadlines for submittal to AE (can be flexible dep Spring – deadline March Summer – deadline March Summer – deadline Septemb Winter – deadline Decer Deadlines for submittal for th March issue – January 1 June issue – April 15 September issue – July 2 December issue – Octob	the Carolinas Section of AEG. , with deadlines and issue publi- e publish news of the profession, mber news, technical articles, CG Carolinas GeoNews <i>bending on events)</i> n 1, issue date March 21 e 1, issue date June 21 ober 1, issue date Sept 21 nber 1, issue date December 21 te National AEG News: 5 15 ber 15			
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Cover: (Alex Rutledge) Asheville Watershed: There is discussion of watersheds and wellhead protection in this issue so the editor has included our own Alex Rutledge's beautiful photograph of a watershed in North Carolina for this quarter's issue.

Corrections: The fall meeting announcement was incorrectly attributed to Rick Kolb. He did not in fact write the announcement.

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MESSAGE FROM THE CHAIR By Alex Rutledge, PG, PE Chair—AEG Carolinas Section

The Carolinas Section has been busy in the last quarter of 2013 with section meetings, outreach, conference planning, field trip planning, and sponsorship renewals . Since the last newsletter publication, we've had two section meetings. The first was a collaborative meeting with ASCE that took place in Asheville on September 20th. Dr. Larry Murdoch, a professor in the Environmental Engineering and Earth Sciences Department at Clemson, gave an excellent presentation about the *Three Faces of Frack-ing*.

The most recent section meeting on October 17 in Greensboro, NC was also a success, most notably with the student turnout. We had 28 students attend (51 attendees total), including students from Radford University, Appalachian State, UNC Charlotte, and the University of South Carolina! Dr. Richard Spruill's talk, *ASBOG (Association* of State Boards for Licensing of Geologists) – Current Activities and Future Plans, was very well received by both students and professionals. Dr. Spruill did a great job of tailoring his talk to the students, and the presentation prompted a great discussion on ASBOG and professional licensure.

Our next section meeting is planned for Wednesday, January 22nd at Dave and Busters in Charlotte, NC. Gary Luce, the current AEG President, will present at this meeting.

I am pleased to announce that Sue Buchanan, PG, has agreed to serve as Field Trip Chair for the Carolinas Section. Please read Sue's article in this issue of our newsletter to hear a little about Sue's background and her field trip plans for the coming year.

As we have done in recent years, the Carolinas Section gave away 500 Earth Science Kits at this year's North Carolina Science Teachers Association (NCSTA) meeting on November 7-9 in Charlotte. This year's conference was larger than most, because NCSTA teamed up with the National Science Teachers Association to co-host the event.

The Carolinas section is involved in two specialty conferences in early 2014. The first, *Vapor Intrusion: The Conference - Legal, Technical and Regulatory Perspectives,* will be held in Raleigh, NC on January 23-24, 2014. Led by a planning committee of seven section members and an environmental attorney, the Carolinas Section is organizing and sponsoring this event. The aim of the program is to provide broad coverage of the state of scientific understanding, state and national regulatory frameworks, and the direction of evolving science and policy efforts to address vapor intrusion. Due to recent developments in EPA, ASTM, and state regulations and guidance related to vapor intrusion, the Carolinas Section thought this would be an ideal time to hold a specialty conference on the subject. The proceeds of the Vapor Intrusion conference will benefit the Carolinas section.

Our section is also sponsoring the biennial Redox conference scheduled for March 4-5, 2014 in Raleigh, NC. The conference will provide a forum for providing the state-ofthe-art for a wide range of in situ remediation technologies. On the first day of the conference, recognized speakers from around the country will present on their area of expertise. On the second day, case studies will be provided by consultants and vendors on the application of emerging technologies, with lessons learned.

If you haven't renewed your sponsorship of the Carolinas Section for 2014, or you would like to become a sponsor, please contact Rick Kolb, who has agreed to take over the role of Sponsorship Chair for the section.

As always, I encourage you to email me or other members of the Board with your suggestions and/or concerns related to our section. We are here to serve the needs of our membership, so your feedback is vital and welcome.

Sincerely,

Alex Rutledge, P.G., P.E. frutledge@schnabel-eng.com AEG Carolinas Section Chair



Awards **AEG CAROLINAS SECTION 4Q** TREASURER'S REPORT **Recognition Plague for Outgoing Section Chair** By Dr. Briget Doyle, Section Treasurer \$58.71 AEG Carolinas Section Treasurer's Quarterly SUBTOTAL - EXPENSES \$484.41 **BALANCE As Of September 30, 2013** Report July 1, 2013 to September 30, 2013 Checking Account \$5,216.20 Savings Account \$16,677.38 TOTAL \$21,893.58 BALANCE As Of July 1, 2013 VAPOR INTRUSION CONFERENCE **Checking Account** \$4,324.61 \$16,675.28 **Savings Account** COMING TO CARY, NC JANUARY \$20,999.89 By Madeline German, Vice Chaire INCOME The AEG Carolinas Section in conjunction with NCDENR **Dinner Meetings** AEG/ is presenting Vapor Intrusion: The Conference - Legal, Technical and Regulatory Perspectives. This one and a ASCE half day event will be held at the Cary Embassy Suites Joint January 23-24, 2014. Meeting, Yao's, Vapor intrusion is a presently a major topic of discussion \$165.00 Asheville within the environmental community; with new EPA draft Section Dues \$686.00 guidance, multiple states (including NC) developing addi-Section of the Year tional guidance and ASTM including, for the first time Award ever, Vapor Intrusion as a potential contaminant source to From consider for Phase I environmental assessments. AEG National \$375.00 This conference boasts a phenomenal line-up of the who'swho in vapor intrusion with the goal to provide broad cov-GeoNews Advertiser erage of state and national regulatory frameworks, the cur-\$50.00 rent state of scientific understanding and the evolving sci-**Earth Science** ence. A small selection of speakers and topics includes Week Kits the following: \$100.00 Donation Geological Influences on Indoor Air Henry Schuver: Interest Quality and Human Health Savings John Boyer: Advances in screening and investiga-\$2.10 account tion for petroleum vapor intrusion SUBTOTAL - IN-Vapor Intrusion and Environmental Stephen R. Berlin: \$1,378.10 COME Risk Anthony Buonicore: E 2600-10 and 1527-13 Christie Zawtocki: Deciphering sources of vapor intru-**EXPENSES** Visiting Profession Lenny Siegel: What impacted communities need to sional Visits understand about vapor intrusion WCU \$108.83 Tom Hatton: New technologies and their applica-Website tions \$122.50 Design The conference will conclude with a multi-state regulatory Maintepanel including representatives from North Carolina, Virnance \$194.37 ginia, New Jersey, Tennessee and Indiana.

(Continued on page 34)





Carolinas Section

North Carolina Department Of Environment and Natural Resources

Vapor Intrusion: The Conference Legal, Technical and Regulatory Perspectives

Program Organizer:

Association of Environmental & Engineering Geologists – Carolinas Section

January 23 - 24, 2014; Embassy Suites, Cary, North Carolina

Speaker Update, November 27, 2013

Keynote speakers:

- Henry Schuver, U.S. EPA Geological influences on indoor air quality and human health
- Lenny Siegel, Executive Director of the Center for Public Environmental Oversight What impacted communities need to understand about vapor intrusion
- Rod Thompson, formerly of Indiana DEM TCE non-cancer and developmental risks: issues and needs

Other confirmed speakers include:

- Panel of state regulators: Delonda Alexander (North Carolina DENR), Kyle Newman (Virginia DEQ), Ahmet Bulbulkaya (Tennessee DEC), John Boyer (New Jersey DEP), Rod Thompson (formerly of Indiana DEM)
- Larry Schnapf, Schnapf, LLC National perspective on legal issues
- · Chris Lutes, ARCADIS Temporal variability of indoor air and soil gas
- Christie Zawtocki, Hart & Hickman Deciphering sources of vapor intrusion
- Will Service and Rob Hill, Mid-Atlantic Associates Vapor intrusion challenges on urban infill projects
- John Boyer, ITRC Vapor Intrusion Team/New Jersey DEP History of vapor intrusion in New Jersey and Petroleum Vapor Intrusion: advancements in screening and investigation

More speakers will be introduced in our weekly notices, the next on Wednesday, December 4. Registration available at www.aegcarolinas.org. Check back frequently for updated speaker lists, profiles and abstracts.



SoutheastVIConference@gmail.com





Register at: www.aegcarolinas.org

Vapor Intrusion: The Conference Legal, Technical and Regulatory Perspectives

Conference Overview

Vapor intrusion has been a major topic of discussion in the environmental industry even before the U.S. EPA published draft guidance documents last April. Several states, including North Carolina, have developed or are working on guidance as well. In addition, ASTM International has released the latest edition of the standard practice for Phase I Environmental Site Assessments, E 1527-13, and for the first time it includes vapor intrusion as a potential contaminant source to consider in these assessments. The AEG Carolinas Section believes now is a good time for a regional conference on vapor intrusion. The NCDENR Division of Waste Management will co-host this conference. We have lined up speakers from a variety of backgrounds -- professional, technical, managerial -- and a variety of locations who will present the latest information on vapor intrusion.

The conference program includes perspectives on technical, regulatory and legal aspects of vapor intrusion. The aim of the program is to provide broad coverage of the state of scientific understanding, state and national regulatory frameworks, and the direction of evolving science and policy efforts to address vapor intrusion. The target audience for the conference is environmental consultants and engineers, environmental and real estate attorneys, real estate and brownfield developers, property managers, and regulators.

Schedule

A full day of invited talks on Thursday with keynote speakers in the morning and afternoon, will be followed by an evening social. Friday's half-day program will include a keynote speaker to start the morning, followed by invited talks and a panel session of regulators from several states to end the conference.



SoutheastVIConference@gmail.com



/Vapor.Intrusion.Conference



Register at: www.aegcarolinas.org



NCDENR

Carolinas Section

North Carolina Department Of Environment and Natural Resources

Vapor Intrusion: The Conference Legal, Technical and Regulatory Perspectives

Program Organizer: Association of Environmental & Engineering Geologists – Carolinas Section

January 23 - 24, 2014 Embassy Suites, Cary, North Carolina

Program Schedule

Thursday, January 23		Торіс		
8:00-9:00	Registration/Breakfast			
9:00-9:30	Henry Schuver	Geological Influences on Indoor Air Quality and Human		
9:30-10:00	Richard Sieg	Stakeholder Review of the EPA's Draft Vapor Intrusion		
10:00-10:30	Anthony Buonicore	Vapor Migration Screening for Property Transactions		
10:30-10:45	Break, beverages only			
10:45-11:15	Grady Shields	Vapor Intrusion and Business Transactions		
11:15-11:45	Stephen Berlin	Vapor Intrusion, Risk and Other Critical Legal Issues		
11:45-12:15	Larry Schnapf	The Impact of Vapor Intrusion on RCRA and CERCLA		
12:15-1:30	Lunch			
1:30-2:00	Lenny Siegel	What Impacted Communities Understand/Need to Under- stand About Vapor Intrusion (Keynote)		

2:00-2:30	Bruce Nicholson	Vapor Intrusion in Brownfields Redevelopment
2:30-3:00	Delonda Alexander	Overview of Draft Division of Waste Management Vapor
3:00-3:30	Genna Olson	Alternative Sampling Methods Implemented at North Carolina Dry-Cleaning Solvent Act (DSCA) Program Sites: A Compilation of Noteworthy Data
3:30-4:00	Break with snacks	
4:00-4:30	Bart Eklund	Summary of State Approaches to Vapor Intrusion - 2012
4:30-5:00	Christie Zawtocki	Deciphering Sources of Vapor Intrusion
5:00-5:30	Todd Creamer	Better Data, Better Models, Better Decisions - Improving the Journey from Investigation to Mitigation at Potential Vapor Intrusion Sites
5:30-7:30	Social	
	Friday, January 24	Торіс
8:00-8:30	Breakfast	
8:30-9:00	Rod Thompson	TCE Non-Cancer and Developmental Risk: Issues and
9:00-9:30	John Boyer	Petroleum Vapor Intrusion (PVI): Advancements in
9:30-10:00	Jeffrey Tyburski	Vapor Intrusion Challenges on Urban Infill Projects
10.00-10.30		vupor intrusion chunchges on oroun initi riojeets
10.00 10.50	Robert Truesdale	Petroleum and Chlorinated Hydrocarbons - How They
10:30-11:00	Robert Truesdale Todd Kopyscinski	Petroleum and Chlorinated Hydrocarbons - How They Vapor Intrusion: An Analytical Perspective
10:30-11:00 11:00-12:00	Robert Truesdale Todd Kopyscinski Lunch	Petroleum and Chlorinated Hydrocarbons - How They Vapor Intrusion: An Analytical Perspective
10:30-11:00 11:00-12:00 12:00-12:30	Robert Truesdale Todd Kopyscinski Lunch John Boyer	Petroleum and Chlorinated Hydrocarbons - How They Vapor Intrusion: An Analytical Perspective New Jersey's Approach to Vapor Intrusion
10:30-11:00 11:00-12:00 12:00-12:30 12:30-1:00	Robert Truesdale Todd Kopyscinski Lunch John Boyer Chris Lutes	Petroleum and Chlorinated Hydrocarbons - How They Vapor Intrusion: An Analytical Perspective New Jersey's Approach to Vapor Intrusion Indoor Air and Soil Gas Temporal Variability Effects on Sampling Strategies: Evidence from Controlled and Uncontrolled Conditions in an Indianapolis Duplex
10:30-11:00 11:00-12:00 12:00-12:30 12:30-1:00 1:00-1:30	Robert Truesdale Todd Kopyscinski Lunch John Boyer Chris Lutes Thomas Hatton	Petroleum and Chlorinated Hydrocarbons - How They Vapor Intrusion: An Analytical Perspective New Jersey's Approach to Vapor Intrusion Indoor Air and Soil Gas Temporal Variability Effects on Sampling Strategies: Evidence from Controlled and Uncontrolled Conditions in an Indianapolis Duplex Energy Efficient Remotely Managed Vapor Mitigation Systems

1:30-2:30	Panel	State Regulatory Panel Discussion Delonda Alexander North Carolina Department of Environment and Nat- ural Resources
		John Boyer
		New Jersey Department of Environmental Protection
		Ahmet Bulbulkaya
		Tennessee Department of Environmental Conserva-
		tion
		David Hayes
		Georgia Environmental Protection Division
		Kyle Newman
		Virginia Department of Environmental Quality
		Rod Thompson formerly with the Indiana Department of Environ- mental Management

Program Abstracts and Biographies

Thursday, January 23rd 9:00 - 9:30AM

GEOLOGICAL INFLUENCES ON INDOOR AIR QUALITY AND HUMAN HEALTH - KEY-NOTE

Dr. Henry Schuver

Naturally-occurring, or man-influenced, distributions of geologic materials influence indoor air quality and human health in a number of ways. Just considering gaseous hazards, geologic materials generate and/or modify/determine the migration and transport of health-impacting hazardous constituents such as CO₂, Moisture/Mold, Radon, Sewer/Septic gases, CH₄, Chloroform, VOCs, Pesticides, SVOCs, Hg, CO, etc. In general, soil gas is different than, and typically has higher concentrations of deleterious constituents than, outdoor air and thus degrades indoor air quality. In summary, all soil gas (vapor) intrusion degrades indoor air quality and, to improve human health, should be avoided whenever possible. Over the last two decades there has been a growing recognition of volatile organic constituent (VOC) vapor intrusion, and particularly for constituents that are less likely to break down during migration in the subsurface so they are more likely to complete the pathway into indoor air as hazardous constituents, such as the chlorinated hydrocarbons, for example trichloroethylene (TCE). However, the entire class of VOCs is just one of the more recently recognized hazardous components in soil gas. Widely recognized for over three decades, the naturally occurring breakdown product of uranium, radium, which is widely distributed in many soils, generates a relatively short-lived (3.8 day) break-down product, radon, which has the uncommon characteristic of being gaseous and has been observed to migrate and intrude into the indoor air of overlying buildings. Over 50 years of modern cellular, animal, and human (occupational and residential) health studies have clearly shown the health risks of radon inhalation. Soil gas/vapor intrusion cancer risks are typically dominated by radon. Radon should be considered as a useful (qualitative/semi-quantitative) tracer and risk -driving co-contaminant in chemical vapor intrusion studies and risk-management decisions.

Biography: Henry Schuver

Dr. Schuver was originally trained as Geologist (BS (WWU), MS (ASU)) and began his environmental career in the hazardous waste program in NJDEP (1986-1989), proceeded to private consulting (1989-1995), returned to a regulatory position as RCRA case manager in USEPA Region 2 (1995-1997) and then transferred to USEPA HQ's RCRA Cleanup Program. In HQ to help meet GPRA requirements he authored the 1999 guidance for multiple pathway RCRA Environmental Indicators (EIs) for Human Health and Groundwater Under Control determinations, which Congressional budget language stipulated were to be the model for Superfund program's EI, and are still used as common metric for progress at all cleanup sites in the Agency-wide annual Report on the Environment. In the EI guidance he directed the RCRA program to evaluate indoor air at all of the high priority sites, and lead the development of the (Continued on page 10)

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2001 RCRA Vapor Intrusion (VI) guidance, which spurred the OSWER-wide 2002 draft and 201_ draft -final VI guidance efforts. In HQ he has lead annual national conferences on the science and implementation of EI &/or VI, earned his Doctorate of Public Health (DrPH) degree in Epidemiology, and is currently focused on evidence-based approaches to maximize the health benefits and cost-effectiveness of VI efforts for all parties involved.

Thursday, January 23rd 9:30 - 10:00 AM STAKEHOLDER REVIEW OF THE EPA'S DRAFT VAPOR INTRUSION GUIDANCE

DOCUMENTS *Richard Sieg, P.E., J.D.*

On April 15, 2013, the U.S. EPA issued for public comment "external review drafts" for two vapor intrusion guidance documents. One document, drafted for the Office of Underground Storage Tanks (OUST), is focused on petroleum hydrocarbons released from underground storage tanks (USTs); the second document, drafted for the Office of Solid Waste and Emergency Response (OSWER), is general guidance for all other compounds. Richard reviews the many comments received from the stakeholders, provides insight into state agency implementation of the guidelines into their regulatory programs, and discusses the current regulatory status of the draft guidelines.

Bio: Richard Sieg

Richard Sieg is an environmental attorney who focuses his practice on, among other things, the assessment and cleanup of contaminated sites. Richard's legal expertise includes cleanups under CERCLA, RCRA, TSCA and similar state programs. Richard has nearly 20 years of extensive, diverse experience working with environmental regulatory programs as the regulator, the regulated, and counsel for industry.

Richard is co-author of Construction Law Update 2013, New Developments in Environmental Law chapter. Richard authored several published articles on vapor intrusion with Bloomberg BNA, the N.C. Bar Association, EENR Section Newsletter, and Kilpatrick Townsend Legal Alert. Richard was a presenter for "Cleaning Up Our Act: New Developments in Environmental Law - 2013 Environment, Natural Resources and Energy Section Annual Meeting 2013 where he discussed the potential impact of

the newly issued EPA Draft VI guidelines on the regulated community.

Richard earned a bachelor's degree in aerospace engineering from N.C. State University in 1986 and a law degree (e.g., juris doctor) from Vermont Law School in South Royalton, Vermont in 2008. Richard served in the U.S. Navy Reserve from 1986-1991, including a Persian Gulf tour during Desert Shield and Desert Storm.

Thursday, January 23rd 10:00 - 10:30 AM VAPOR MIGRATION SCREENING FOR PROPERTY TRANSACTIONS USING TIER 1 IN ASTM E2600-10 Anthony J. Buonicore, P.E., BCEE, QEP

The ASTM E 2600-10 vapor encroachment screening standard was published in June 2010 and provides guidance on evaluating vapor migration from contaminated properties. The standard specifically focuses on screening for the likelihood of migrating vapors from nearby contaminated properties to encroach upon the subsurface of a property involved in a real estate transaction. The new ASTM E1527-13 Phase I Standard clarified that vapor migration must be addressed in Phase I environmental site assessments no differently than contaminated groundwater migration. Tier 1 in E2600-10 is an accepted methodology to accomplish vapor migration screening. The presentation will focus on how Tier 1 screening criteria were developed, the steps that may be taken to assess the area of concern, determining when a vapor encroachment condition (VEC) exists and whether or not it may represent a recognized environmental condition in the Phase I.

Bio: Anthony J. Buonicore

Anthony J. Buonicore, P.E., QEP, DEE, past president and Fellow Member of the International Air & Waste Management Association, is the Chairman and CEO of the Buonicore Group, a real estate and environmental risk management company he founded in 2006. Mr. Buonicore has been active in the environmental movement for more than 30 years. His broad career experience has involved policy planning and technical assignments in government and private industry. He has worked in the Defense Department, the chemical industry, and his own nationally recognized environmental consulting firm, which was acquired in 1990 by a New York Stock Exchange-listed *(Continued on page 11)*

(Continued from page 10) utility company.

Mr. Buonicore, a Diplomate in the American Academy of Environmental Engineers (BCEE), a certified Qualified Environmental Professional (QEP) and a licensed professional engineer, is the holder of several patents and the author of numerous papers and textbooks on environmental-pollution-control issues. He is a member of the ASTM E 50.02 Property Environmental Due Diligence committee and former chairman of its ASTM Phase I Task Group. He currently chairs ASTM Task Group E 50.02.06 that developed the U.S. standard for vapor migration/ intrusion assessment in real estate transactions. Mr. Buonicore is also a founding member of the Phase I Environmental Consultants Roundtable.

Mr. Buonicore holds both a bachelor's and a master's degree in chemical engineering from Manhattan College.

Thursday, January 23rd 10:30 - 10:45 AM

Break

Thursday, January 23rd 10:45 - 11:15 AM VAPOR INTRUSION AND BUSINESS TRANS-ACTIONS

Grady Shields, Wyrick Robbins Yates & Ponton, LLP

The North Carolina Division of Waste Management anticipates releasing a vapor intrusion guidance document in early 2014, and ASTM has released a new standard practice with respect to vapor intrusion. A general overview of the impact on these documents in the transactional context will be presented, with an emphasis on noteworthy topics, as summarized below:

- Potential impact of the documents on due diligence in real estate and corporate transactions.
- Allocation of responsibility among the parties for actual or perceived vapor intrusion issues.
- Possible insurance issues surrounding vapor intrusion.
- Educating clients regarding vapor intrusion issues.

Bio: Grady Shields

Grady Shields leads the Environmental, Regulatory and Administrative Law practice group at Wyrick Robbins Yates & Ponton, LLP in Raleigh, and has been practicing environmental law in North Carolina for almost 30 years. Mr. Shields is the Immediate Past Chair of the North Carolina Bar Association's Environment, Energy and Natural Resources Section, and is Programs Vice Chair for the ABA's Government and Private Sector Initiatives Committee. Mr. Shields is a Best Lawyers Lawyer of the Year for 2014, and a member of N.C. Business Magazine's Legal Elite Hall of Fame.

Thursday, January 23rd 11:15 - 11:45AM VAPOR INTRUSION, RISK AND OTHER CRITICAL LEGAL ISSUES

Stephen R. Berlin, Partner, Kilpatrick Townsend & Stockton, LLP

It is well known that the complexities of the vapor intrusion mechanism require conservative assumptions to adjust to risk and uncertainties. At every opportunity, the EPA approach, as evidenced by the 2013 draft guideline documents and supporting technical documents, stacks conservative assumptions upon conservative assumptions, which results in legally questionable outcomes. This presentation discusses some of these assumptions and encourages the EPA and State agencies to refine the vapor intrusion assessment to obtain more reasonable results. Steve also discusses other legal issues that attorneys should know for the representation of their clients.

Bio: Stephen R. Berlin

Stephen Berlin has significant experience in several areas of environmental law, including environmental litigation, business transactions involving environmental issues and environmental compliance matters. Since joining the firm, he has worked in most areas of environmental litigation, both in federal and state courts with an emphasis on private environmental costs recovery actions and representations of potentially responsible parties at Superfund sites and RCRA issues. Mr. Berlin has handled matters both at the trial and appellate levels in both federal and state courts. He has handled numerous matters involving plaintiff's claims of injury caused by contamination.

(Continued from page 11)

Mr. Berlin has been lead counsel for some of the largest Brownfields projects in the Southeast U.S. In recent years, he has litigated toxic tort, Resource Conservation and Recovery Act (RCRA), and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) cases in all the district courts of North and South Carolina and successfully argued a case involving the interpretation of CER-CLA to the Fourth Circuit Court of Appeals. During the course of this career, he has acted as lead environmental counsel for several multi-million dollar business transactions involving manufacturing concerns throughout the United States.

Thursday, January 23rd 11:45 AM - 12:15 PM IMPACT OF VAPOR INTRUSION ON RCRA AND CERCLA

Larry Schnapf, Principal, Schnapf, LLC

This presentation will cover recent CERCLA and RCRA case law and review the impact of vapor intrusion on toxic tort litigation. Vapor intrusion was often overlooked in the past during remedy selection, especially where groundwater was not used. However, this pathway is now often driving remedies, triggering re-openers and complicating the ability of property owners or defendants in toxic tort suits from asserting defenses. In many situations, vapor intrusion is the only completed pathway and the principal grounds for bringing RCRA 7002 actions and common law claims. In several of the important vapor lawsuits, the impacted areas are more than a mile from the source of the vapors. Moreover, a number of the high profile vapor intrusion cases involve petroleum contamination that call into question some of the assumptions about degradation of petroleum in the environment and the relatively short screening distances used by many states for petroleum vapor intrusion.

Bio: Larry Schnapf

Lawrence P. Schnapf (Larry) is an environmental attorney based in New York City and New Jersey with over 30 years of national environmental transactional experience and is the principal of Schnapf LLC. Larry has extensive experience working on vapor intrusion issues and the environmental risks accompanying it, brownfield development, assessment and cleanup of contaminated sites. Larry is an adjunct professor of environmental law at New York School of Law School and a faculty member of the NYLS Center for Real Estate Studies where he teaches "Environmental Issues in Business Transactions", "Environmental Law and Policy" and a mini-course on brownfields. He is also on the faculty of the Center for Christian Studies at Fifth Avenue Presbyterian Church where he teaches "The Bible and the Environment." Larry has also served on a number of ASTM Task Groups, including Chair of the legal subcommittee for the ASTM E1527 Phase 1 task force for the 2013 revisions to ASTM E1527-05 and was Co-Chair of the legal sub-committee for the ASTM Vapor Intrusion Task Group. Larry is well published on the issues surrounding vapor intrusion.

Thursday, January 23rd 12:15-1:30 PM

Lunch

Thursday, January 23rd 1:30 - 2:00 PM WHAT IMPACTED COMMUNITIES UNDER-STAND/NEED TO UNDERSTAND ABOUT VAPOR INTRUSION -KEYNOTE

Lenny Siegel, Executive Director of the Center for Public Environmental Oversight

Vapor intrusion investigations are complicated, and they involve concepts and terminology foreign to most people. Nevertheless, the people who live, work, study, and play above or near subsurface volatile organic compound contamination can understand how multiple lines of evidence are used to evaluate risk. They should be notified as soon as the vapor intrusion potential is identified, particularly because in many cases their cooperation is essential. Members of these communities should be informed that mitigation can reliably reduce short-term risk, but that instruments should be in place to guarantee longterm safety. Finally, because government agencies set standards to protect almost everyone, people need to realize that exposure at or just above legal thresholds does not mean that they will necessarily get sick as a result.

Bio: Lenny Siegel

Lenny Siegel has been Executive Director of the Center for Public Environmental Oversight since 1994. He is one of the environmental movement's leading experts on both military facility contamination and the vapor intrusion pathway, and for his or-*(Continued on page 13)*

(Continued from page 12)

ganization he runs two Internet newsgroups: the Military Environmental Forum and the Brownfields Internet Forum. In July 2011, Mr. Siegel was awarded U.S. EPA's Superfund Citizen of the Year award.

Mr. Siegel has served on numerous advisory and technical committees including the ITRC Vapor Intrusion Work Team, the National Research Council Committee on the Future Options for Management in the Nation's Subsurface Remediation Effort, Peer Review Panel for the VOC Historical Case Initiative, the ASTM/ISR Brownfields Steering Committee, the California Superfund Working Group and many more. Currently, Mr. Siegel serves on numerous advisory and technical committees including the ITRC Munitions Response Classification Work Team, the Moffett Field Restoration Advisory Board, the National Research Council's Committee to Review the IRIS Process, and the California Brownfield Reuse Advisory Group. Siegel is founder of the Save Hangar One Committee, working to restore and reuse Moffett Field's landmark dirigible hangar. He authored "A Stakeholder's Guide to Vapor Intrusion" (November 2009), "Stakeholders Speak Up: A Summary of Community Views at the National Forum on Vapor Intrusion" (February 2009), "A Stakeholder's Guide to 'All Appropriate Inquiries" (August 2005), "Harlem: Learning About Vapor Exposures the Hard Way and Doing Something about It" (August 2012) and many more.

Mr. Siegel has been a guest lecturer/professor at UCLA, UC Berkeley Extension and the Council of Energy Resource Tribes. From 1994-1998, Siegel was a guest lecturer at UC Berkeley Extension teaching "Strategies for Site Remediation: A Case Studies Approach."

Thursday, January 23rd 2:00 - 2:30 PM VAPOR INTRUSION IN BROWNFIELDS RE-DEVELOPMENT Bruce Nicholson, NC DENR

Because the NC Brownfields Program deals directly with the planned and actual reuse of properties impacted with volatile organics, one of the program's most common concerns in ensuring safe redevelopment is managing potential risks associated with vapor intrusion (VI). While technical guidance development on VI assessment and mitigation has and continues to be in flux, the NC Brownfields Program has had to forge a path for VI decision-making out of necessity to achieve its mission to encourage safe redevelopment, and do so at a project pace that allows for effective real estate transactions and project construction for prospective developers. This presentation will discuss the methodology for decisions for assessment, mitigation, and performance measurement of mitigation systems for the NC Brownfields Program.

Bio: Bruce I. Nicholson

Mr. Nicholson is a Program Manager for the North Carolina Division of Waste Management and a veteran of numerous waste cleanup programs related to CERCLA and state hazardous substance regulations. He has been with the Division for 25 years and has managed programs on Superfund and NPL Site Remediation, the NC Manufactured Gas Plant Cleanup Initiative, and the NC Drycleaning Solvent Cleanup Program. Mr. Nicholson has also been involved in DENR's brownfields redevelopment efforts from the early development of its authorizing legislation in 1997.

Mr. Nicholson is presently responsible for managing the state's Brownfields Program. The Program is designed to aid developers of brownfields properties by breaking environmental liability barriers to financing through a mixture of liability protection vehicles and tax incentives. In doing so, the program has facilitated cleanup and reuse of more than 270 brownfields properties across the state. Mr. Nicholson holds a B.S. degree in Chemical Engineering from North Carolina State University (1985).

Thursday, January 23rd 2:30-3:00 PM OVERVIEW OF DRAFT DIVISION OF WASTE MANAGEMENT VAPOR INTRUSION GUIDANCE DOCUMENT

Delonda Alexander, NCDENR

Principal Contact: Delonda Alexander, Remediation Unit Supervisor, Dry-Cleaning Solvent Cleanup Act (DSCA) Program, Division of Waste Management, North Carolina Department of Environment and Natural Resources, 1646 Mail Service Center, Raleigh, NC 27699, Phone (919) 707-8365, Delonda.Alexander@ncdenr.gov

The Division of Waste Management (DWM) in the North Carolina Department of Environment and Nat-(Continued on page 14)

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ural Resources (NCDENR) anticipates releasing a DWM Vapor Intrusion Guidance Document in early 2014. A general overview of the document will be presented with emphasis on noteworthy topics as summarized below:

- DWM's selection of a non-residential soil gas to indoor air attenuation factor based on over 200 paired soil gas and indoor air measurements collected at DSCA sites combined with data from EPA's Vapor Intrusion Database.
- Screening levels for soil gas, groundwater and indoor air related to vapor intrusion.
- Soil gas sampling locations, number of samples and frequency of sampling.
- Passive sample collection methodologies.
- Indoor air sampling locations, number of samples, duration and frequency of sampling.
- Lines of evidence approach to data evaluation and screening.
- Remediation, mitigations and the use of institutional controls.

Community outreach and fact sheets.

Bio: Delonda Alexander

Ms. Alexander is the Remediation Unit Supervisor of the Dry-Cleaning Solvent Cleanup Act Program in DWM. She has 27 years of experience in environmental assessment, remediation and risk assessment, serving in both the public and private sector. Ms. Alexander is a member of both the vapor intrusion and petroleum vapor intrusion teams for the Interstate Technology & Regulatory Council and serves as the state point of contact for vapor intrusion issues. She is the primary author of the Draft DWM Vapor Intrusion Guidance document.

Thursday, January 23rd 3:00 - 3:30 PM

ALTERNATIVE SAMPLING METHODS IM-PLEMENTED AT NORTH CAROLINA DRY-CLEANING SOLVENT ACT (DSCA) PRO-GRAM SITES: A COMPILATION OF NOTE-WORTHY DATA Genna K. Olson, Cardno ATC

Co-author: Delonda Alexander, NCDENR

The NC Dry-cleaning Solvent Cleanup Act (DSCA) Program has performed vapor intrusion investigations at over 250 sites. A variety of innovative sampling methods have been employed and meaningful data have been gathered during these investigations. A compilation of topics with noteworthy results will be presented as summarized below:

- Indoor air samples have traditionally been collected in Summa canisters using active methods. However, passive sampling devices can present many advantages, including reduced cost, simplicity, and longer sampling timeframes. To evaluate the reliability of passive sampling methods, the DSCA Program collected concurrent air samples using Radiello samplers and Summa canisters. A database of over 40 paired measurements was developed. The database and statistical evaluation of the results will be presented.
- The State of California issued guidance in 2011 allowing collection of soil gas samples from existing monitoring wells with exposed screen above the water table. This can represent a significant cost savings over installation of new soil gas monitoring points. To evaluate the reliability of this approach, the DSCA Program collected soil gas samples from nested monitoring wells and traditional soil gas monitoring points for comparative purposes. The results of the comparative data will be presented.
- It has long been reported that indoor air concentrations associated with vapor intrusion are commonly "worst-case" during winter conditions due to the stack effect of heating systems. However, much of the vapor intrusion data reported to date was collected in colder climates in the northeast. In the south, it is speculated that conditions may be variable due to sealed buildings during hot summer weather. The DSCA Program has collected summer versus winter sampling data at multiple sites over a timeframe of up to four years. Long-term pressure readings have also been collected to evaluate advection trends. The data will be presented with respect to seasonal variations.

Bio: Genna Olson

Genna Olson is a Senior Project Manager and Licensed Geologist in the Raleigh office of Cardno ATC. Ms. Olson has 18 years of experience in soil (Continued on page 15)

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and groundwater assessment and remediation, with a specialty focus on risk assessment and vapor intrusion.

Thursday, January 23rd 3:30 - 4:00 PM Break with Snacks

Thursday, January 23rd 4:00 - 4:30 PM SUMMARY OF STATE APPROACHES TO VAPOR INTRUSION – 2012 UPDATE Bart Eklund CIH, Principal Scientist, URS

Background/Objectives. Regulatory requirements for the evaluation of vapor intrusion (VI) vary significantly among states. For site owners and responsible parties that have sites in different regulatory jurisdictions, one challenge is to know and understand how the requirements or expectations for vapor intrusion (VI) differ from one jurisdiction to the next. Differences in requirements can make it difficult to manage sites in a consistent manner between jurisdictions. Eklund, Folkes, Kabel and Farnum published an overview of state guidance for VI in 2007 that provided a useful summary of pathway screening values and other key VI policies. Since 2007, but some states that did not have VI-specific guidance have issued new guidance documents. Other states have revised their guidance resulting in significant changes to screening values and/or evaluation procedures. This paper provides an update to the 2007 study.

Approach/Activities. For each State, the review includes tabulations of the types of screening values included (e.g., groundwater, soil, soil gas, indoor air), the screening values for selected chemicals that commonly drive VI investigations (i.e., TCE, PCE, and benzene), and the risk levels used for cancer and non-cancer risk. Federal values are included for comparison. In addition, for each state, we summarize a number of key policy decisions that are important for the investigation of VI including: distance screening criteria, default subsurface to indoor air attenuation factors, policies for evaluation of petroleum VI, and policies for evaluation of indoor sources of VOCs. dramatically different screening values for evaluation of the VI pathway. Indoor air screening concentrations commonly vary by >10x, while screening concentrations for groundwater and soil gas commonly vary by >100x. Key factors for screening values include default risk limits, default attenuation factors, and differences in toxicity factors for some VOCs.

The review of key policies provides an understanding of areas where the understanding of VI is moving towards consensus. For example, a majority of states use a distance criterion of 100 ft from a subsurface source of VOCs to identify buildings for evaluation of potential VI. In contrast, there is less consensus concerning movement of VOCs into buildings. Default sub-slab attenuation factors range from roughly 0.001 (1000x) in California to 1 (1x) in Montana.

Bio: Bart Eklund

Mr. Eklund is a Principal Scientist with URS Corporation in Austin, TX, in which office he has worked for the last 34 years. He has a BS in Chemistry from the University of Illinois-Urbana and is a certified industrial hygienist (CIH). Mr. Eklund works in the field of air quality and has performed air quality studies on six continents, ranging from measuring methane emissions at pig farms to modeling the air emissions associated with the disassembly of nuclear weapons. He is the author of approximately 100 journal articles, US government publications, and papers in conference proceedings.

Mr. Eklund is the URS Practice Leader for Vapor Intrusion (VI) and has designed field measurement programs and/or performed data evaluation to address vapor intrusion for sites in Arkansas, California, Colorado, Georgia, Hawaii, Idaho, Illinois, Kansas, Louisiana, Michigan, Montana, Nebraska, New Jersey, New Mexico, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Texas, Utah, Virginia, Washington, and Wyoming. He also has worked on VI sites in Australia, Belgium, Lebanon, New Zealand, and Sweden.

He has evaluated the VI pathway at over 75 sites for the US Air Force, US EPA, ConocoPhillips, BP, ExxonMobil, Chevron, Shell, El Paso, Dow, DuPont, Ashland, and GE. In addition, he has organized five specialty conferences on vapor intrusion and was an author of the ITRC VI guidance document, the ASTM standards for VI screening, and was the pri-

Results/Lessons Learned. States continue to use

(Continued from page 15) mary author of the ASTM D7663 standard for soil gas sampling.

Thursday, January 23rd 4:30 - 5:00 PM DECIPHERING SOURCES OF VAPOR IN-

TRUSION

Christie Zawtocki, Principal Engineer, Hart and Hickman, PC

At sites where active commercial or industrial operations currently use chemicals of concern, evaluating vapor intrusion may be very difficult. If the chemicals of concern are detected in indoor air, it may be difficult to discern the contribution from subsurface vapors versus the contribution from fugitive emissions. A common example of this is an active dry cleaner located in a strip shopping center. The North Carolina Dry-cleaning Solvent Cleanup Act (DSCA) Program has conducted vapor intrusion assessments at nearly two hundred dry-cleaning sites with many of these sites having active dry-cleaning facilities present. Multiple lines of evidence have been used to evaluate vapor intrusion at these sites.

Several techniques can be used to decipher vapor intrusion sources. Sub-slab and indoor air radon sampling can be conducted to determine sitespecific attenuation factors. Pressurization tests can be performed to determine the amount of air leakage between tenant spaces, and thermal imaging can be used to identify points of air leakage. Sampling can be performed in both the dry-cleaning facility and adjacent tenant space during active dry-cleaning operations and when dry-cleaning is not occurring. Sampling can be conducted from discrete locations using a ppb-level photoionization detector (PID) or using passive Radiello sampling devices to identify specific locations where vapors are entering a space. Sampling can also be done under different conditions, such as with the HVAC system running and with the HVAC system turned off, to provide further evidence of vapor intrusion. Case studies illustrating the use of these various techniques at DSCA Program sites will be presented.

Bio: Christie Zawtocki

Christie Zawtocki is a Principal Engineer at Hart & Hickman, PC with over 17 years of environmental consulting experience. Christie serves as the Project Director for Hart & Hickman's North Carolina Drycleaning Solvent Cleanup Act (DSCA) Program contract and has been involved with assessment activities at over 80 dry-cleaning sites. She has extensive experience evaluating and mitigating vapor intrusion (VI) at a variety of sites throughout North Carolina, including VI assessments at over 60 sites.

Thursday, January 23rd 5:00 - 5:30PM BETTER DATA, BETTER MODELS, BETTER DECISIONS – IMPROVING THE JOURNEY FROM INVESTIGATION TO MITIGATION AT POTENTIAL VAPOR INTRUSION SITES

Todd Creamer, P.G., Geosyntec Consultants, Inc.

Vapor intrusion exposure pathway assessments are often hampered by two topics: a high degree of data variability and uncertainty in distinguishing vapor intrusion from background sources. To minimize variability associated with complex site conditions, a Conceptual Site Model (CSM) that represents the physical and chemical processes affecting vapor transport and distribution should guide vapor intrusion investigations from initiation through mitigation. The CSM is a dynamic site sketch that relies on data that are sufficient to outline key physical and chemical processes.

There is a range of field methods for sample collection, and each may contribute its own bias that adds to data variability. To minimize variability associated with sampling, systematic protocols designed to verify sample quality in the field should be used. When data quality is carefully controlled, vapor behavior is predictable, and the assessment process can be resolved with much less uncertainty.

Recommended steps to generate reliable, defensible and repeatable (i.e., high quality) data will be discussed, including developing and updating CSMs, a survey of investigation tools available to vapor intrusion practitioners, scoping investigations to meet data quality objectives, collecting independent data to verify data quality in real-time, and collecting multiple lines of evidence. The speaker will also review options available for vapor intrusion pathway mitigation, and considerations for improving the effectiveness of monitoring to demonstrate system performance.

Bio: Todd Creamer

Todd Creamer is an Associate based in New Hampshire. He has 17 years of experience in environmental (Continued on page 17)

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consulting services, surface water hydrology, and oil and natural gas exploration and production, a BA in Geology from the University of Rochester and an MS in geology from North Carolina State University. Go WolfPack!

Todd's work has focused on site characterization and remedial strategy development for industrial and residential properties impacted by chlorinated solvents and petroleum hydrocarbons throughout the nation. Specializing in subsurface vapor intrusion of volatile compounds to indoor air and LNAPL behavior in porous media, his technical experience includes development of soil gas sampling field methods; construction of CSMs for large, complex sites; LNAPL mobility modeling, and site characterization using hydrogeologic and advanced geophysical methods.

Friday's Schedule

Friday, Jan. 24, 2014 8:00 - 8:30 AM Breakfast

Friday, Jan. 24, 2014 8:30 - 9:00 AM TCE NON-CANCER AND DEVELOPMENTAL RISK: ISSUES AND INTERIM RESOLUTION - KEY-NOTE

Rod Thompson, Toxicologist, Risk Options, LLC

The practical application of the recently updated USEPA Trichloroethylene Reference Concentration (TCE RfC) and Inhalation Unit Risk (IUR) presented in the USEPA Risk Integrated Information System (IRIS) has created many new regulatory and risk management challenges. Principal among these challenges are risk management decisions for both long and short term non-cancer TCE exposure risks. Past approaches to risk management decisions have primarily involved use of the cancer risk range. Now however, non-cancer risk is likely to be the risk driver at many sites.

The general science and science policy surrounding non-cancer risk will be addressed. Long term risk will be addressed using the definition and application of the RfC order of magnitude range as defined by IRIS and known science policy, the regulatory limitations and applications of the common algorithms used to assess non-cancer risk, and the risk of exposures slightly above the chronic RfC. Short term exposure risks will be addressed by clarifying acceptable exposure levels for developmental fetal heart malformations and other toxic effects using guidance from national and international health agencies, and by exploring the known weight of evidence and margin of safety information. Recommendations on interim short term exposure assessment and sampling issues and concerns are addressed along with insight into common risk communication needs.

Bio: Rod Thompson

Rod is a regulatory toxicologist who worked with Indiana's Risk Based Closure program for over twenty-five years. During that time, he helped develop risk based closure policy and was the architect of Indiana's Screening and Closure Level Tables and their application. Rod became involved with TCE in the early 2000s, developing and publishing Slope Factors which were used by Indiana until IRIS issued in 2011. He was principal in the development of the recent TCE non-cancer guidance from the Alliance for Risk Assessment for weight of evidence, margin of safety and practical application of the TCE RfC. Rod has also been involved with Vapor Intrusion (VI), developing Indiana's initial VI program and a team member in the development of the ITRC VI guidance. He has commented extensively and made presentations to USEPA and other regulatory entities on the various EPA VI drafts and States' programs for practical application issues and their potential resolution.

Friday, Jan. 24, 2014 9:00 - 9:30 AM PETROLEUM VAPOR INTRUSION (PVI): AD-VANCEMENTS

IN SCREENING AND INVESTIGATION

John E. Boyer, New Jersey Department of Environmental Protection

It is widely understood that the behavior of petroleum in the subsurface is markedly different than that of other chemicals such as chlorinated solvents. The Johnson & Ettinger (J&E) model has been the principal tool in assessing human risk from the Vapor Intrusion (VI) pathway since it was released in 1991. While the J&E model has been shown to be broadly

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applicable for chlorinated hydrocarbons, it does not account for aerobic biodegradation of petroleum vapors. Thus, for petroleum hydrocarbons (e.g., gasoline or petrol, heating oil, aviation fuel, crude oil), the J&E model is overly conservative. Many environmental agencies and responsible parties utilize vast resources on petroleum vapor intrusion (PVI) evaluations that may not be necessary due to the lack of a proper understanding of biodegradation.

Recently, the USEPA prepared an empirical database from petroleum sites in the United States and Australia utilizing groundwater and soil gas paired results. Based on this 2013 USEPA report, a reasonable and scientifically-based approach has been developed that recognizes the differences between PVI and other VI sites and provides a mechanism to screen out sites where the potential for petroleum vapors to reach a receptor are improbable. Mr. Boyer will provide insight into the advancements in screening and investigation for PVI.

Bio: John E. Boyer

John E. Boyer is an Environmental Scientist at the New Jersey Department of Environmental Protection in Trenton, New Jersey. John has worked with the NJDEP since 1988 providing technical support involving all aspects of site remediation. He is a principal in developing vapor intrusion policy for NJDEP and is currently Chair of the NJDEP/ Stakeholder VI Guidance Committee.

John is co-author of the NJDEP Vapor Intrusion Guidance (2005) and the updated NJDEP Vapor Intrusion Technical Guidance (2013). As Co-Leader for the Interstate Technology and Regulatory Council (ITRC) Vapor Intrusion Team, John was a primary writer for the ITRC companion documents, Vapor Intrusion Pathway: A Practical Guideline and Vapor Intrusion Pathway: Investigative Approaches for Typical Scenarios (2007). He is currently Co-Leader for the ITRC's Petroleum Vapor Intrusion Team.

John earned a bachelor's degree in biology from Belmont Abbey College in Belmont, North Carolina in 1980 and a master's degree in environmental science (human toxicology concentration) from Drexel University in Philadelphia, PA in 1985. john.boyer@dep.state.nj.us. 609-984-9751

Friday, Jan. 24, 2014 9:30 - 10:00 AM VAPOR INTRUSION CHALLENGES ON UR-BAN INFILL PROJECTS

Jeffrey Tyburski, Mid-Atlantic Associates, Inc.

Co-authors: Rob Hill and Will Service

Mid-Atlantic will discuss various vapor intrusion (VI) assessment and VI mitigation system (VIMS) challenges we've encountered on recent infill/ redevelopment projects. Our presentation will touch on the following issues and concerns of interest to attendees, including case study examples:

Assessment criteria - is VIMS warranted? VIMS selection - which is best for the site? Integrating a VIMS into a Brownfields Redevelopment project Critical redevelopment team communications Post-construction testing - is the VIMS working as designed?

Bio: Jeffrey Tyburski

Mr. Tyburski is a Senior Licensed Geologist with Mid-Atlantic. Jeff has worked with Mid-Atlantic over 12 years and has been in the environmental field for over 25 years. He is also Director of Business Development and is a Registered Site Manager. His primary area of expertise is the assessment and cleanup of contaminated soil and groundwater. He has worked on a variety of sites including Superfund, industrial, commercial, and urban infill redevelopment projects. He also has experience with asbestos containing materials, lead-based paint, radon, mold, and a variety of indoor air quality issues. Jeff is a 1987 graduate of the University of Rochester with a Bachelor's Degree in Geology. He served on the Town of Apex's Planning Board from August 1998 to January 2002 during the town's major years of growth. He also donates his time to the Healing Place of Wake County which is a non-profit recovery and rehabilitation facility for homeless people with alcohol and drug dependency, located in Raleigh, NC.

Friday, Jan. 24, 2014 10:00 - 10:30 AM

PETROLEUM AND CHLORINATED HYDRO-CARBONS – HOW THEY DIFFER IN VAPOR INTRUSION INVESTIGATIONS

Robert Truesdale, Senior Research Geologist, RTI International

Co-authors: Heidi Hayes, Eurofins Air Toxics Inc.; Ian Hers, Golder Associates Ltd.

EPA has addressed potential vapor intrusion (VI) from petroleum hydrocarbons differently from chlorinated volatile organic compounds (CVOCs), primarily because petroleum compounds degrade readily in the subsurface and CVOCs do not. Using a database of measurements from petroleum sites across North America and Australia, EPA's Office of Underground Storage Tanks has worked with state regulators and industry to develop the concept of safe separation distances for screening petroleum sites from further VI investigation when a sufficiently thick layer of clean aerobic (i.e., aerated) soil occurs between the contaminants and the buildings. Another important difference is that CVOC sites are usually contaminated by single chemical solvents, resulting in only a few contaminants of concern, while petroleum sites are contaminated by hundreds of chemicals that make up gasoline, diesel, jet fuel, and other petroleum products that are released from leaking underground storage tanks. Total petroleum hydrocarbons (TPH) is a term used for any mixture of the hundreds of hydrocarbon compounds that are found in petroleum or petroleum contaminated environmental media. Before using TPH to evaluate VI at petroleum contamination sites, it is important to understand how TPH measurements are made in different media, especially the air phase methods used in soil gas and air. This presentation describes how EPA uses the PVI database to justify the separation distance concept. It also compares and contrasts the various TPH measures in the PVI database in terms of compounds represented in each TPH measurement and the relative ratios of TPH to benzene, toluene, ethylbenzene, and xylenes (BTEX). The presentation will also explore the significance of TPH measurements with respect to estimating risks from volatile petroleum hydrocarbons at petroleum contamination sites, and will provide considerations for practitioners using TPH methods in VI assessments.

Bio: Robert Truesdale

Robert Truesdale is a Senior Research Geologist with RTI International's Water and Ecosystem Management Center. Mr. Truesdale has worked in support of U.S. EPA research on multimedia environmental pollution issues for over 30 years, with work ranging from sampling and analysis to risk assessment. He 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 9 consecutive vapor intrusion technical workshops and two 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 1975. He has worked at RTI since 1978.

Friday, Jan. 24, 2014 10:30 - 11:00 AM VAPOR INTRUSION: AN ANALYTICAL PER-SPECTIVE

Tod Kopyscinski, Research and Development Director, Con-Test Analytical Laboratory

Vapor Intrusion is a high profile topic currently in the environmental arena. Vapor intrusion is the migration of volatile chemicals from the subsurface into overlying buildings. Vapor intrusion requires three components: a source, a building, and a pathway from the source to the inhabitants. Vapor intrusion has become a significant environmental issue for regulators, industry leaders, and concerned residents. This presentation focuses on sampling, analytical methodology, analytical instrumentation and quality assurance/control. Sampling techniques will include use of Summa canisters/ flow regulators, thermal desorption tubes and polyurethane foam (PUF). Sampling techniques include grab sampling, integrated sampling and restricted sampling. Discussions on indoor air sampling, ambient air sampling, sub-slab sampling and soil gas sampling will be covered. We will also discuss sampling hardware focusing on Summa canister techniques, problems and pitfalls associated with sampling and possible solutions. Analytical methods will include EPA Method TO-17 (volatile organic thermal desorption method), TO-15 (volatile organic Summa canister method), TO-14 (volatile organic Summa canister method), TO-13 (semi-volatile PUF method), TO-10 (PCB in air), Massachusetts Air- Phase Petroleum Hydrocarbon method (MA APH) and various other air sampling methods (such as tubes, cassettes). Most of these (Continued on page 20)

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methods are all part of the EPA Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air. Also, will discuss compound lists and detection limits associated with various methods, projects or regulatory criteria. General analytical instrumentation from sample introduction to final quantitative analysis and data review. Instrumentation includes Gas Chromatograph /Mass Spectrometers, cryogenic concentrators, dynamic dilutor systems, thermal desorption technology and autosamplers. Canister cleaning procedures will be discussed from batch certified, individually certified canisters and individually certified sampling trains using state-of-the-art technology, heat and molecular drag pumps. Quality Assurance/Control includes review of analytical performance criteria.

Bio: Tod Kopyscinski

Mr. Kopyscinski directs and provides oversight for the research and development program, evaluating efficiency, productivity gains and green technology for the laboratory. Mr. Kopyscinski is instrumental in the implementation of new technologies, procedures and policies in line with the continual improvement philosophy of the company. He is highly skilled in gas chromatography and mass spectrophotometry and has extensive experience in and knowledge of organic chemistry and air testing.

Friday, Jan. 24, 2014

11:00 - 12:00 noon Lunch

Friday, Jan. 24, 2014

12:00 noon - 12:30 PM NEW JERSEY'S APPROACH TO VAPOR IN-TRUSION

John E. Boyer, New Jersey Department of Environmental Protection

The Department's Vapor Intrusion Technical Guidance (March 2013) provides the framework for investigating and mitigating the vapor intrusion pathway in New Jersey. The guidance document discusses the conceptual site model, which is essential in preparing and executing a vapor intrusion investigation. The role of data evaluation and multiple lines of evidence are explained in determining whether the vapor intrusion pathway is complete and thus requires the implementation of mitigation. In addition, the Department has developed Vapor Intrusion Screening Levels that cover groundwater, soil gas, and indoor air, as well as rapid action levels (for immediate environmental concern). Mr. Boyer will provide insight for New Jersey's approach for managing vapor intrusion issues.

The NJDEP Vapor Intrusion Technical Guidance (March 2013) can be found at: <u>http://www.nj.gov/</u><u>dep/srp/guidance/vaporintrusion/vig_main.pdf</u>.

Mr. Boyer's Bio is provided after his first abstract above.

Friday, Jan. 24, 2014 12:30 - 1:00 PM INDOOR AIR AND SOIL GAS TEMPORAL VARIABILITY EFFECTS ON SAMPLING STRATEGIES: EVIDENCE FROM CONTROLLED AND UNCONTROLLED CONDITIONS IN AN INDI-ANAPOLIS DUPLEX

Chris Lutes, Associate Vice President and Principal Scientist, ARCADIS U.S.

Co-authors: Brian Cosky (ARCADIS), Brian Schumacher (USEPA), John Zimmerman (USEPA), Robert Norberg (RTI), Blayne Hartman (Hartman Environmental Geoscience), and Robert Truesdale (RTI)

Management of vapor intrusion (VI) sites can be complicated by temporal variability in indoor air and subslab soil gas concentrations. We will present observations and statistical analysis of thousands of VOC and radon measurements in indoor air and soil gas, collected over three years (including parts of four winter seasons) along with ancillary data (meteorological, differential pressures, and other related variables) at an intensively monitored but unoccupied pre-1920 duplex. The primary indoor air dataset was collected with 7 day integrated passive samples, but data from a field GC sampling from 14 indoor and subsurface locations every 150 minutes is also available. Groundwater data have also been collected. The house was recently fitted with a typical subslab depressurization (SSD) system, which was cycled on and off for several multiweek periods during the winter of 2012-2013.

We will use this data set to address these key questions: (1) On what time scales can indoor air (and soil gas) temporal variability affect site management de-*(Continued on page 21)*

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cisions and how does this affect sampling strategies? (2) How can we best characterize the upper tail of the temporal distribution for short term exposure and risk management; are there cost-effective surrogates? (3) Is temporal variability controlled by SSD?

Results to date show that:

- Indoor air concentrations from continuous monitoring with 7 day integrated passive samplers indicate that while the expected pattern of higher vapor intrusion during winter is observed, there is substantial variability within a given winter and between successive winters.
- The subslab depressurization system is having a significant and rapid effect on soil gas VOC distributions at depths up to 13 ft bls, 7 ft below the SSD system.
- The behavior under mitigation for radon and VOCs is markedly different with SSD performance being substantially better for radon than for VOCs.
- Cold temperatures and snow/ice events/covers tend to increase vapor intrusion while rainfall events have little effect.

Christopher C. Lutes and Brian Cosky, ARCADIS, 4915 Prospectus Drive, Suite F, Durham, NC 27705. Phone 919-544-4535, Clutes@arcadis-us.com. Brian Schumacher and John Zimmerman, US EPA/ORD/ NERL, Las Vegas, NV, 944 East Harmon Ave., Las Vegas, NV 89119, Phone: 702-798-2242, schumacher.brian@epa.gov. Robert Norberg and Robert Truesdale, RTI International, 3040 East Cornwallis Road, Research Triangle Park, NC 27709, Phone 919-541-6152, RST@rti.org. Blayne Hartman, Hartman Environmental Geoscience, 717 Seabright 92075. Lane. Solana CA Beach. blayne@hartmaneg.com.

Bio: Christopher Lutes

Christopher Lutes (Chris) is an Associate Vice President and Principal Scientist with ARCADIS. He has over twenty years of experience managing technology evaluations, remediation projects, pollutant fate and transport studies, and air emissions characterizations for ARCADIS. He was a lead author for the EPA engineering issue on Vapor Intrusion Mitigation and has authored more than 100 other publications. He has worked with EPA to conduct several research studies of the uses of radon as a tracer for vapor intrusion, temporal variability and passive sampling methods. Mr. Lutes holds a B.S. in Chemistry from the University of Virginia and an M.S. in Environmental Science and Engineering from the University of North Carolina at Chapel Hill.

Friday, Jan. 24, 2014 1:00 - 1:30 PM ENERGY EFFICIENT REMOTELY MAN-AGED VAPOR MITIGATION SYSTEMS Thomas Hatton, CEO Clean Vapor LLC

Viewers of this presentation will gain a deeper understanding of vapor intrusion mitigation and the emerging technologies associated with mitigation and longterm management of mitigation systems. Designing efficient systems along with the feasibility and functionality of remotely controlling vapor mitigation systems will be discussed. Additionally the presentation will provide an in depth view into energy reducing and cost saving dynamic control systems that can be integrated with traditional mitigation methods. We will share technologies that are ushering the future remotely managed and monitored Vapor Intrusion Mitigation Systems focusing on telemetric surveillance, status messaging and automated quarterly O&M reports to meat client and regulatory requirements.

Bio: Thomas Hatton

Tom has twenty-eight years of experience in the design and installation management of radon and vapor intrusion mitigation systems totaling approximately 10,500 combined commercial and residential properties. He has published papers on applying dynamic controls and active remote monitoring and management of vapor mitigation systems. Tom has overseen the design and construction of soil depressurization systems in approximately forty new schools and existing commercial buildings. For the last five years, his focus has been on precision building diagnostics, plan design and the integration of energy efficient dynamic controls and remote management and monitoring technology.

Thomas E. Hatton, CEO-Project Director Clean Vapor LLC, thatton@cleanvapor.com Phone: (908) 362-5616, Fax: (908) 362-5433

GeoNews - News of the Profession

Friday, Jan. 24, 2014 1:30 - 2:30 PM

1:30 - 2:30 PM

STATE REGULATORY PANEL DISCUSSION

Delonda Alexander, Remediation Unit Supervisor, North Carolina Department of Environment and Natural Resources

- John Boyer, Environmental Scientist, New Jersey Department of Environmental Protection
- Ahmet Bulbulkaya, Project Manager, Tennessee Department of Environmental Conservation

David Hayes, Environmental Engineer, Georgia Environmental Protection Division

Kyle Newman, Risk Assessor, Virginia Department of Environmental Quality

Rod Thompson, formerly with the Indiana Department of Environmental Management

Biographies for Delonda Alexander, John Boyer, and Rod Thompson previously shown.

Bio: Ahmet Bulbulkaya

Ahmet Bulbulkaya is a Risk Assessor with the Division of Remediation of the Tennessee Department of Environment and Conservation. He graduated from Duke University in 1995 with a Master's in Environmental Toxicology. Since then, after a brief stint with private consulting, he has worked for state government, primarily as a risk assessor with the Virginia Department of Environmental Quality (VDEQ) and most recently with the Tennessee Dept. of Environment and Conservation (TDEC). He has been with TDEC for approximately three years and is currently team leader of the TDEC Vapor Intrusion Workgroup, a workgroup that is developing a vapor intrusion investigation process for Tennessee.

Bio: David Hayes

David Hayes works as an Environmental Engineer with the Georgia Environmental Protection Division (EPD), Land Protection Branch, Response and Remediation Program. His work includes regulatory oversight of sites that are listed on Georgia's Hazardous Site Inventory (i.e., state superfund), Brownfield sites, and sites in Georgia's Voluntary Remediation Program. He serves as the coordinator of a vapor intrusion workgroup that brings together representatives from various regulatory programs within the EPD Land Protection Branch. He holds bachelor's degrees in civil engineering and physics, and a master's degree in civil engineering from Auburn University.

Bio: Kyle Newman

Kyle Newman is a Risk Assessor for the Virginia Department of Environmental Quality with over ten years of experience evaluating environmental risk assessments and investigations in the public, private, and non-profit sectors. He holds a B.S. in Biology and an M.S. in Environmental Studies from Virginia Commonwealth University and is currently active in the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) working on issues related to Federal facilities, community involvement, and munitions cleanups.



Vapor Intrusion: The Conference

Legal, Technical and Regulatory Perspectives

January 23-24, 2014; Embassy Suites, Cary, North Carolina

Conference cost:



North Carolina Department General registration (non-member)..... \$299 Of Environment and AEG member \$249 Natural Resources Full-time student (ID required at check-in) \$25 Booth/exhibit table (registration also required) Available; information to follow Total for all checked boxes\$

Registration includes continental breakfasts and breaks on both days, lunch and an evening social with light appetizers on Thursday. Cancellation policy: fully refundable up to one week prior to the event, less an administrative fee of \$25.

Registration information:

Attendee Name			1	-		
Title/Position				to pre	-register:	
Company/Organization				Mail:	AEG, P.O.	Box 460518,
Address				Fam	Denver, C	0,80246
City/State/Zip				Phone	· (303) 757	-4840
Phone				Email:	Send scar	ned form to
Email					aeg@aeg	web.org
Payment method:						
Check (payable to AEG)	Credit card:	MC	Visa		AmEx	Discover
Card number		Exp. date	s, 22.	CVV	# (3-4 digit	ts)
Cardholder Name						
Card billing address						
City/State/Zip						

Hotel Information:

The conference will be held at the Embassy Suites Raleigh-Durham/Research Triangle at 201 Harrison Oaks Boulevard in Cary, NC (http://embassysuites3.hilton.com/en/index.html). The hotel is one exit away from the Raleigh/Durham International Airport on I-40. A block of rooms has been reserved at a discounted rate of \$124 per night.

SoutheastVIConference@gmail.com



@SE VI Conf

www.aegcarolinas.org

Sponsor/Exhibitor Registration for

Vapor Intrusion - The Conference:

Legal, Technical and Regulatory Perspectives

January 23-24, 2014; Embassy Suites; Cary, North Carolina

Cost:

Silver Sponsor	\$ 500
Exhibitor	\$ 750
Gold Sponsor	\$1,000
Platinum Sponsor	\$1,500
Break Sponsor (2)	\$ 500
Breakfast Sponsor (2)	\$ 750
Lunch Sponsor (2)	\$1,000
Networking Social Sponsor (2)	\$1,000





North Carolina Department Of Environment and Natural Resources

Registration includes continental breakfasts and breaks on both days, lunch and an evening social with light appetizers on Thursday, and lunch on Friday. Cancellation policy: fully refundable up to one week prior to the event, less an administrative fee of \$100.

Registration information:

Attendee Name		Top	e-register	
Title/Position		10 pi		450540
Company/Organization		Mail:	AEG, P.O. B	0X 460518, 80246
Address		Fax:	(720) 230-4	846
City/State/Zip		Phon	e: (303) 757-2	926
Phone		Emai	: Send scanne	ed form to
Email			aeg@aegwe	eb.org
Payment method:				
Check (payable to AEG) Credit card:	MC	Visa	AmEx	Discover
Card number	Exp. date		CVV # (3-4 digi	ts)
Cardholder Name				
Card billing address				
City/State/Zip				
Cardbolder signature				

Hotel Information:

The conference will be held at the Embassy Suites Raleigh-Durham/Research Triangle at 201 Harrison Oaks Boulevard in Cary, NC. A block of rooms has been reserved at a discounted rate of \$124/night.

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	Sponsor and Exhibitor Perquisites AEG Vapor Intrusion Conference January 23-24, 2013 Embassy Suites; Cary, North Carolina		
Quantity Available	What Level	Price	Perquisites
10	Silver Sponsor	\$ 500	Company logo and web address on web publications Company logo on program schedule 1 logo screen for slideshow
15	Exhibitor	\$ 750	Exhibit table and one registration Logo and web link on Exhibitors page of conference website
6	Gold Sponsor	\$1,000	1 registration Company logo and web address on web and printed publications 2 logo screens for slideshow Attendee list
4	Platinum Sponsor	\$1,500	1 registration Company logo and web address on web and printed publications 3 logo screens for slideshow between talks and on breaks Attendee list Verbal thank you from podium during event
2	Break Sponsor	\$ 500	Logo sign on break tables Verbal thank you from podium before break
2	Breakfast Sponsor	\$ 750	Company logo signs at food and drink tables during breakfast Verbal thank you from podium after breakfast/before talks start
2.	Lunch Sponsor	\$1,000	Company logo sign on lunch tables Verbal thank you before and after lunch Two minutes at microphone after lunch
2	Networking Social	\$1,000	Company logo signs at bars and food table during social Verbal thank you and announcement at end of day one Two minutes at microphone at end of day one, before social

EDITOR'S NOTE: Adventures in Geology By Jennifer B. Thomas, PG

Geology is a profession that lends itself to adventures since we travel around to job sites seeing things and meeting people. Maybe you are an academic geologist out studying how the world works. Maybe you go to construction sites or spend time in the woods.

I was working in the woods one day. I think I was taking some measurements of a stream. I felt something sting. I looked down and the biggest red ants I had ever seen were flooding up my leg from an anthill I was standing in. I managed to gasp rather than scream. I then proceeded to remove my boots and peel off my jeans with a great deal of hopping and brushing off of ants. So I was there in the woods in my underwear but thankfully ant-free and alone. The ants lost interest in my boots and jeans quickly after I wasn't in them so I dressed quickly and went on my way.

For the next issue, I would love to run stories from AEG Carolinas members. It can be humorous, frightening, thought-provoking...whatever you want. I look forward to reading about your adventures wherever your practice has taken you.



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WELLHEAD PROTECTION By Harry LeGrand

A well's area of water contribution Comes from an outward reach of distribution When the well is pumped, it beckons, For the water to come from all sections.

A pumped well causes a stir in the water table The disturbed water reacts as it is capable A pumping cone of depression is developed And a local circle of water is enveloped.

We can see that a well needs space To have ample, pure water in every case. Regulators require a zone of wellhead protection The site of the well must have careful selection.

Permeable rocks and a high-yielding well May cause the cone of depression to outward swell. Under opposite conditions, the cone may be steep And the cone may not have a great outward leap.

On up-slope parts of the cone in the water table The natural flow of ground water is able To enter the cone and contribute More water for a sustained supply to suit.

So, if the well were able to talk It would inevitably balk If the contributing area is much too small



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The American Geosciences Institute organizes the Geoscience Congressional Visits Day, which is held each year in September in Washington, D.C. COO Becky Roland has attended these typically in the past, but she felt strongly that practicing geologists would be the best advocates for our profession. The Advocacy Committee has taken her recommendation, recruited AEG members to attend, and provided financial support for the expenses to attend. For the past few years, I (Brad Worley) of the Carolina Section have participated. I returned to the Geoscience CVD on September 17 and 18 and this year I was accompanied by COO Becky Roland, and by CVD firsttimers Phyllis Steckel of the St. Louis Section, and Ken Neal of the Washington Section. Below are my thoughts and impressions from the CVDs. If you are interested in attending a future Geoscience CVD, and the Science-Engineering-Technology CVD held in the spring in Washington, D.C., email Advocacy Co-chairs Dan Vellone at Daniel.vellone@ma.usda.gov or Rick Kolb at rick.kolb1@gmail.com.

Having attended CVDs for years now, I can say that each year has its own unique feel, depending on the current political climate in D.C. Being on the verge of a government shutdown, I wondered how we geoscientist would be received on "the Hill" this year. I was surprised that each office still slowed down, even if only for a few minutes, to listen to the visiting geoscientists.

Tuesday's activities always provide CVD veterans a chance to catch up with AGI acquaintances and DC regulars. More importantly, Tuesday's sessions centered on current budget concerns and introduced newcomers to the core "message" that we would carry onto the Capitol Hill the following day. As others have mentioned above, AE-

G's core message to Congress is that steady Federal investments for earth and space sciences will provide for public health and safety as well as support economic and national security. This seems broad, but CVD participants are taught to first deliver the core message and after that introduction, try to "bring the message home" and explain why and how continued funding of geoscience-related programs will help the Congress member's home state and district. At the end of each visit, each Congressional office visited is left the GEO-CVD "leave behind" materials. Each AEG member at CVD included the AEG "one pagers" that describe both the geoenvironmental and geotechnical aspects of AEG as well as contacts for the Association.

Being from North Carolina, I was accompanied by the only other North Carolina GEO-CVD attendee, Dr. David Lindbo from NC State University. Dr. Lindbo is also the national president of the Soil Science Society and a fellow CVD veteran. The two of us were accompanied by Ms. Rachel Jankowski, Administrative Assistant in the Soil Science Society's Washington, DC, office. We were scheduled for five meetings. We met with Michael Thornberry, legislative assistant to Rep. Richard Hudson (NC-8, R). This was GEO-CVD's first visit to Rep. Hudson's office and I have to say that their office was very receptive and they were happy to gain the contact information for geoscience-related issues. Next we met with Mr. Adam Wood, legislative assistant to Rep. Renee Ellmers (NC-2, R). I've visited Rep. Ellmers' office during a previous CVD and left feeling our message was not well received. This year, Mr. Wood was very happy to have gained contact information where their office might ask questions about geoscience-related legislation. The third meeting of the day was with Mr. Dennis Sills, legislative assistant to Rep. G.K. Butterfield (NC-1, D). This was the GEO-CVD's first visit into Rep. Butterfield's office and the office was very open to our primary message and offered continued support for geoscience initiatives. Our fourth meeting was with Ms. Shaniqua McClendon, legislative aide to Senator Kay Hagan (NC, D). Geoscientists are always well received in Senator Hagan's office since her daughter has a Ph.D in the geosciences and works in the oil industry.

(Continued on page 12)



(Continued from page 27)

Our fifth meeting was with Mr. James Hunter, legislative assistant to Rep. David Price (NC-4, D). Rep. Price represents the district within NC containing a part of the Research Triangle, as well as several large universities. Their office always welcomes geoscientists and eager to get any updated contact information for the AGI member associations. Our last visit of the day was with Mr. Alex Olah, staff assistant for Rep. Mike McIntyre (NC-7, D). Due to recent redistricting, I now live in NC Congressional District 7 and GEO-CVD had never visited their office. I was glad to visit and offer our services as contacts for any geoscience issues they may encounter. We were well received and I'm glad we were able to introduce them to AEG's services.

In the past I have often been the only AEG representative attending the GEO-CVD, so I was thrilled to have Ken, Phyllis, and Becky in DC as well. I really enjoyed their company during the week. More importantly it meant that more than 30 Congressional offices, from different parts of the US, met someone from AEG and were given AEG contact information. This is a vast improvement over past CVDs! It is important that AEG members continue to attend Congressional Visits Day. This is one of the best ways to bridge the gap between practicing scientists and legislators. In the future it would be great to see some AEG members from different parts of the country walking "the Hill" on behalf or AEG and AGI. A NEW GEOSCIENCE COMPANY By Jennifer Bauer

This December marks the two year anniversary for Appalachian Landslide Consultants, PLLC. It's hard to believe two years have already gone by since Stephen Fuemmeler and I took the plunge into consulting business coownership. We met while working together as geologists with the NC Geological Survey's landslide hazard mapping program. When that program lost its funding in July 2011, we saw there was a continued need for landslide information. We decided to offer these landslide mapping and site evaluation services as a private Woman-owned small business.

Over these past two years we have built relationships in the community which have paid off personally and professionally. We have been fortunate enough to work with some very dedicated non-profit organizations in Haywood County, NC. Through our partnership and private grant funding, we have completed the Geologic Stability Inventory map for Jonathan and Richland Creek watersheds in Haywood County. We are now working on Phase II of that project, preparing the landslide hazard models for the same area.

(Continued on page 29)



GeoNews - News of the Profession

Winter 2013

(Continued from page 28)

With the help of our non-profit and county partners, we have picked up where the NC Geological Survey left off in Jackson County. We are working to complete landslide inventory mapping in the Wayahutta Creek watershed near Western Carolina University. Our partners continue to pursue additional funding to map the remainder of the County.

In addition to the broader scale mapping, we have worked with Real Estate agents and their clients that are looking to purchase or sell homes or land. Our site evaluations provide information about the slopes around the property to help them make prudent decisions.

We've also worked as subcontractors to several consulting firms, providing our unique geologists' eye to their engineering problems and solutions.

Stephen and I are fortunate to have integrated our passion with our work. We are dedicated to increasing awareness about landslides with the hopes of helping people protect themselves, their families, and their investments from these hazards



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GEORAMBLINGS By Charles Welby

Introduction

During the first week in August I wandered to Portland, OR to attend the Annual Water Resources Conference of the American Water Resources Association. There were a number of interesting papers on a variety of subjects, ranging from the cost of Beach Protection to the Social and Political aspects of managing water resources. Many of the issues and problems related to managing water resources are, of course, closely tied to the geologic environment within which we humans wish to exist and to manage in many instances. So in passing, it seemed appropriate to mention a few of the concerns and problems as rambling thoughts.

Domestic Use

The big concern world wide is, of course, the need for water for domestic use: simple existence needs. As most of us are aware, there are international efforts to improve the water supplies of people of relatively limited developed civilizations and cultures. Arising out of that need is the need for the ability to catch the water through either dams or wells. From the need for domestic use come dams across rivers to create lakes (often multipurpose) for water supply energy generation, irrigation, and flood control. Out of some of these purposes also comes the need to use water in industrial programs. Although we as scientists generally recognize the limits to the water supply, to others the supply seems unlimited -- and therein arises the social and political problems related to the management of the water resource.

One of the bigger needs related to the use of water is the need for treatment of the water after use, a big requirement for the use of energy.

Ecologic Uses and Needs

As has often been noted, publicized, arm-waved about, there is the need for support of our botanic world and our world of aquatic species, some of the foodproviding type. For dams there arises in many cases the need for structural details to allow fish to migrate upstream for spawning. In recent years some dams have been taken out to permit the migration. But then there is the concern about the limits to the fishing because of the limited size of the population that manages to migrate to spawning grounds.

Conversions of Reservoirs

If we look at the history of the development of reservoirs, there are cases where the dam and the subsequent reservoir were touted as an engineering way of controlling floods; thus the reservoir becomes managed to control down-stream flooding. Then the desire to "grow" the economy takes over and the need for the water in the lake becomes a focal point of political action and the lake becomes a water supply lake with little protection against water quality degradation from the upstream growth, often in the form of housing development. (If you happen to read various newspapers, you will recall the debate about the present water quality and water use in Lake Jordan which in its early promotion was touted as a "flood control" feature. Then came the changing of the North Carolina law to permit interbasing transfer of the water to be used for the growth of nearby cities and villages; then came the most recent concern about the change in the water quality in the lake and the "scientific" opinion of members of the NC Legislature that perhaps some stirring of the water might decrease the amount of algae -- but no consideration of the long run cost."

So often there is a plea from some of the citizenry for a more scientific understanding of what goes on, but out there in the woods there are some bears who do their double-entry bookkeeping in strange ways.

So there is much more rambling and wandering on water resources and their management and limits to their management, including the need to factor in to the cost of the project the depreciation and eventual need to replace the project, and perhaps some needs for maintenance.

QED

Charles W. Welby

Dr. Charles W. Welby is a former Section Chair for AEG Carolinas and a regular contributor to this newsletter. He may be reached at cww_ral@hotmail.com.



GARY LUCE TO SPEAK AT WINTER SECTION MEETING

Gary C. Luce (M-GB) – Geologist/Geotechnical Engineer, Knight Piésold and Company, Elko, NV 2012-present: Executive Project Manager of the Elko Office. Knight Piésold is an international geotechnical and environmental consulting practice specializing in mining and energy projects. Gary began his career after graduating with a geology



degree in 1979 as a minerals exploration geologist primarily working in the basin and range. He graduated a second time in 1992 with a Masters and undergraduate degree in Geologic Engineering. While obtaining those degrees he was the UNR student section chair 1989 to 1992. He is a licensed Civil Engineer in Nevada and California. Primary responsibilities include site characterization, tunnel investigations, rock mechanics evaluations, slope stability - rockfall investigations and mitigation design, fault studies, heap leach construction and tailings dam evaluations. He also provides marketing support and oversees business operations. He chaired the Great Basin Section in 1997 and the Capital Branch of ASCE in 1996. He co-chaired both the 2002 Annual meeting in Reno and the 2009 meeting in Lake Tahoe. He has chaired the K-12 Education Committee and is currently a member of the Annual Meeting Advisory Committee. Other affiliations include the American Rock Mechanics Association, Society of Metallurgy and Exploration, Nevada Geological Society, Nevada State Railroad Museum Foundation, Northern Nevada Railway Foundation, and the Fourth Ward School Foundation.

WINTER SECTION MEETING DETAILS:

- Place: Dave & Buster's, Concord Mills Mall, Concord, North Carolina
- Date: Wednesday, January 22, 2014
- Time: 5:30 socializing begins/ cash bar; 7:00 dinner; 8:00 talk
- Program: AEG President Gary Luce: Tailings Dams vs Hydro Dams, Design and Construction
- Cost: AEG members \$25, non-members \$30, students FREE with college ID; Teachers are \$10.
- Reservations: Please make reservations with Madeline German

Email: madeline@smithgardnerinc.com



AEG CAROLINAS SECTION BOARD MEETING MINUTES By Madeline German

Roll Call 3:30PM –Alex Rutledge (Chair), Madeline German (Vice-Chair), Briget Doyle (Treasurer), Paul Weaver (Past-Chair), Sue Buchanan (Field Trip Chair), Rick Kolb (Advisor),

4 members of the Carolinas Section Board of Directors were present – Quorum obtained

Section Treasure's Report – Briget Doyle

Current Accounting:

\$4,586.42 (checking) + \$11,678.50 (savings) \$16,264.92 (total)

No sponsor renewals have been sent out yet. Rick is revising the renewal letter to provide incentive for companies to sponsor both the upcoming Vapor Intrusion Conference and the section.

A budget has yet to be established. Briget is going to work on this before the next board meeting.

Activities Update

- a. NCSTA conference Charlotte: Alex delivered 500 earth science kits. Members of SME handed out the earth science and rock sample kits. Due to the large number of volunteers already available no-one from AEG Carolina's Section was able to participate.
- b. Greensboro meeting (October 17, 2013 Natty Greens): Well attended, especially by students. Richard Spruill did an excellent job allowing time for discussion. He would also like to come talk about his research at a later date.

Charlotte Section Meeting

Gary Luce proposed Wednesday January 22, 2014 as a date for the January meeting. The overall thought is a Wednesday meeting should not impact attendance. Briget will not be able to attend a Wednesday meeting. Dave and Busters is available for that date. First notice will be sent out as soon as the venue and Gary are confirmed.

Section Field Trip Chair – Sue Buchanan

Sue presented excellent choices for potential AEG field trips for 2014 as follows:

Raleigh area trip options for the Spring 2014: Hosts are Tyler Clark, Phil Bradley, and Skip Stoddard

Portions of the Falls Lake Trail

(Continued on page 33)

Hike in Eno River State Park

Potential parking and logistical issues will need to be finalized. Additionally, we may try to have Adam organize a social event for the evening of the field trip.

Asheville area trip options for the Fall 2014: Hosts are Rick Wooten and others at NCGS Asheville

- Slope stability and geology along the Blue Ridge Parkway (a specific location was not noted by Rick W.)
- Gorges State Park geology and flood deposits from the 1916 dam failure
- Peeks Creek debris flow 10 years later what we have learned
- Also Rick W. wouldn't mind adding stops along the way that Jenn and Stephen of ALC have been doing some landslide hazard mapping

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- Peeks Creek debris flow 10 years later what we have learned
- Also Rick W. wouldn't mind adding stops along the way that Jenn and Stephen of ALC have been doing some landslide hazard mapping

Sponsor Renewals

Sponsor renewals have not been sent out yet, however Rick is hoping to get something together to go out this week. Renewal requests will likely tie in the Vapor Intrusion Conference sponsor request as well.

Credit Card Hardware/Software for Accepting Credit Card Payments

Briget has received the device and made a test payment. It is very easy to use. The first planned use will be at the January AEG Section meeting in Charlotte. A line will be added to the announcements that credit cards are now accepted.

Annual meeting in Asheville, 2019

Paul had no updates since the last meeting; he plans to nail down the venue by the spring 2014.

Management of section e-mail list

Alex temporarily took over management of the e-mail distribution list for Tami Idol; once having more knowledge of the process he thought it would be an excellent job for the section Secretary. Alex and Susan discussed this and she agreed. All call participants also agreed it would benefit the section for the Secretary to take over this responsibility.

Vapor Intrusion Conference

The vapor Intrusion Conference is scheduled for January 23 & 24, 2013, at the Embassy Suites in Cary. The agenda is planned for 1.5 days of talks including a panel with regulators from multiple states. The program

> includes perspectives on technical, regulatory and legal aspects of vapor intrusion. Sponsor requests have not been sent out, but are expected to go out soon. The first announcement was sent out Thanksgiving week. National is handling registration.



- Alex has received inquiries regarding speakers and will forward them along to Rick. As of the initial announcement there was a full schedule of talks.
- Alex will present the opening remarks on the first day of the conference.

REDOX Conference

The REOX Remediation conference presented by REDOX TECH, LLC will be held March 4 & 5, 2014 at the Renaissance Hotel in North Hills, Raleigh. The presentations will include case studies and industry advancements in remediation technology. AEG will have a booth and help with advertising.

Proposed donation to NC Museum of Natural Science

- Rick proposed our section make a donation each year to the Annual Education Drive for the NC Museum of Natural Science. He feels it is part of AEG's job to help educate the public and to support the museum and its mission to expose visitors to the natural sciences.
 - Briget felt that since the Carolina's section includes both North and South Carolina that we could not only support a NC museum. She is going to look into museums in South Carolina and determine if there is a natural science museum or if we can make a donation to the natural science department in the South Carolina State Museum.
 - Rick motioned and Bridget seconded for AEG to donate \$200 annually to the NC Museum of Natural Science and the Natural Science department in the South Carolina State Museum. There were zero dissenting votes.

Employment opportunities on the section website

- This service has been added on the AEG National website. It is set up similar to typical job search websites. National and international positions will be posted here.
- Carolinas Section still feels a job page geared to local (NC & SC) would be beneficial. Rick volunteered to manage the posts to keep formatting uniformity as well as manage expiration dates. This will be a free service. Brad will be responsible for posting job announcements on the website.

Board Meeting Call Times

It has become increasing difficult to schedule afternoon meetings, due to work load, field work and other obligations. Options for either lunch of after-hours meetings were discussed. The next meeting is proposed for a 5PM start time, to hopefully alleviate scheduling conflicts.

Continued from page 17)

Engineering Geology

Recent activity by the engineering licensing board towards companies who advertised engineering geology services on their webpages is to be handled by the NC Board for Licensing Geologists DOJ representative. In North Carolina if you use the term engineering in any fashion you must have a P.E.

The call ended at 4:35 PM.

(Continued from page 4)

Registration forms are on <u>Page 5</u>. Or register online at <u>www.aegweb.org</u> or on the AEG Carolinas Section page at <u>www.aegcarolinas.org</u>.

Sponsorship and exhibitor opportunities are still available, but are going quickly. Forms are located on <u>Page 8</u>. Please contact Rick Kolb (<u>rick.kolb1@gmail.com</u>) with questions.



NEW FIELD TRIP CHAIR By Sue Buchanan

Hello, my name is Sue Buchanan and I will be the Field Trip Chair for the AEG Carolinas Section. I have been a member of AEG for about five years and have not yet had the opportunity to participate in an AEG field trip. However, this past fall, I attended two field trips, one to the Blue Ridge Parkway in the Peaks of Otter Region of central Virginia (led by the Virginia Geological Field Conference) and the other in central North Carolina, south of Salisbury (led by the Carolina Geological Society). Going into the field and learning about the structure, mineralogy/ lithology, and stratigraphy of the rocks, and to be educated by the experts of these rock formations is what excites me about being and growing as a geologist. I am not a North Carolina native, and so I have found these field trips to be most beneficial to my understanding of the Carolinas geology. Reading books and articles is one thing, but seeing it out in the field is another, and as a geologist who is a visual learner - these field trips are the golden ticket!

We are in the early stages of planning one or two one-day field trips for 2014. The locations for these field trips is still preliminary, but will likely be north of Raleigh in the eastern Piedmont Province, and the other west or south of Asheville in the Blue Ridge Province. I hope to plan a field trip for either the Spring and/or the Fall so that students will have the opportunity to join these field trips.

Participation is important to the success of these field trips. So announcements of the date and trip location will be made as soon as possible on the AEG Carolinas webpage. We hope you can come and enjoy the day learning about the local geology, taking in the beautiful sights of the Carolinas, and meeting other professionals in your field.



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EDUCATION SECTION

EDUCATION NEWS FROM THE NORTH CAROLINA GEOLOGICAL SURVEY

By Randy Bechtel, North Carolina Geological Survey

The monetary sponsorship from the Carolinas Section of AEG and other sponsors (The Mining Committee of the Mining and Energy Commission, Carolinas Section of SME, N.C. Aggregates Association) provide an impressive \$750 to EACH winner! The significance of the cash award was emphasized to me during the award ceremony at the NSTA/NCSTA conference – I was acknowledging the sponsors prior to presenting the OEST and OESE awards. When I mentioned the monetary part of the award, there were audible gasps and "wows!" from the attendees – professional teachers and educators. It is that type of reaction and recognition that will grow these awards in the future. Thank you for the support of these awards which allow the geoscience community to recognize and assist deserving teachers and educators.

The 2013 National Science Teachers Association and North Carolina Science Teachers Association combined conference

The conference is scheduled for November 7-9 in Charlotte, NC.

Rachel Grimes of the Society for Mining, Metallurgy, and Exploration (SME) and Randy Bechtel of the North Carolina Geological Survey (NCGS) coordinated the Rock Giveaway event. Also integral to the planning and running of this event were George Piegols of PCS Phosphate and Mark Davies from CEMEX. Both volunteered during the entire event and provided rock samples from their respective companies. Mark supplied 1,500 sample bags and George used his knowledge and enthusiasm to educate and entertain the teachers with animated descriptions of how the rock samples were used.



Thanks also to Vulcan Materials Company and Hedrick Industries that supplied and delivered rock samples from four North Carolina locations. Thanks also goes to the N.C. Aggregates Association for providing guidance during the initial stages of planning this event.

Rachel Grimes provided numbers for this and previous events for comparison:

The final attendance tally for the 2013 NSTA Charlotte: 2,526

The number of those who visited the rock Giveaway booth: 679

That's 27% of the attendees, which is in line with other conferences and great numbers for outreach!

For comparison, following are the numbers of teachers that visited the SME Rock Giveaway booth at other NSTA conferences:

465 in Louisville, KY;

1,047 in Atlanta, GA;

and 466 in Phoenix, AZ.

The numbers really vary depending on travel budgets for schools and other conferences being held each year.

Carolinas Section of AEG Earth Science Week (ESW) distribution

Alex Rutledge, President of the Carolinas Section of AEG delivered the ESW kits to the Conference. This year we were very limited in the number of volunteers allowed in the exhibit area, so volunteers with the Rock Giveaway distributed the kits along with the samples. All of the 500 kits were distributed along with all of the rocks samples, SME materials and EarthScope materials. I think the ESW kits are particularly good this year, if you get a chance get one for yourself and check it out (you never know when a teacher may need assistance with the materials in the kit).

JennTec, LLC Jennifer Thomas Environmental Contracting

P.O. Box 30334 Charlotte, NC 28230

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Phase I ESA Phase II ESA/UST State Trust Fund Geotechnical Investigations

jenthomaso8@live.com www.jenntecllc.com

EDUCATION SECTION

Additional Resources for Teachers

The newly formed Mining Education Coalition (MEC) has great classroom materials that you may want to let teachers in your area know about or you may use them the next time you visit a class.

From MEC: For more information on the importance of minerals and mining in everyday life, visit www.MineralsEducationCoalition.org. Download free SMART board lessons, mini-lessons, activities, and teaching ideas. View "Copper In Our Electrical World" video to learn how copper is extracted and processed, its physical properties and applications in our everyday lives.

The MEC is the result of the successful merger of SME's Mineral Information Institute (Mii) and Government, Education and Mining (GEM) programs.

ANNOUNCEMENTS

News from AE Drilling

AE Drilling Services has acquired the drilling division of Marion & Moultrie Marine Contractors of North Carolina. Martin Johnson P.G., President of Marion & Moultrie, has joined AE Drilling Services as Vice President & will oversee AE Drilling's growing domestic & international marine work. Mark Lassiter, founder & long term President of AE Drilling, will be retiring at the end of 2013. Mark will continue to be associated with AE Drilling on a limited basis on special projects. Mark wishes to express his gratitude to all of the AEG members who have supported AE Drilling with their work over the years, & fervently hopes that Martin Johnson, Bill Barnes & the rest of the AE Drilling crew will continue to enjoy your support.

AE is looking forward to working with Schnabel in early 2014 on the Lake Purdy Dam project in Birmingham, Alabama. Extensive & complex drilling is scheduled for this seasoned concrete structure, which forms Birmingham's water supply reservoir.





Aggressive Fluid Vapor Recovery Trailer (AFVR)

Enviro-Equipment, Inc. (EEI) is pleased to announce the construction of another Aggressive Fluid Vapor Recovery (AFVR) Trailer, also referred to as Dual Phase Extraction (DPE) and Mobile Multi-Phase Extraction (MMPE). While we have sold AFVR Trailers to clients in the past, we now plan to stock AFVR Trailer units for rental or subcontracting. Clients have the option for as little or as much assistance from EEI as they require. Options range from renting and operating the system yourself to subcontracting EEI to do your entire AFVR event.

Key Features of our AFVR Trailers Include:

- Dekker Oil Sealed Liquid Ring 300 SCFM @ 25"HG
- Epoxy Coated KO Tank with Float Tree for Automatic Transfer Pump Operation
- Progressive Cavity Transfer Pump with Manifold and Totalizing Flow Meter
- Manifold allows pumping from KO Tank to Storage Tank AND Pumping From Storage Tank through Totalizing Flow Meter to discharge point simply by adjusting valves
- Vapor Phase Carbon Drum for Off Gas Treatment.
- Ultra Silent Diesel Generator, 230volt 3 Phase, Push Start, Auxiliary 115 and 230V Outlets
- Galvanized Steel Inlet Manifold, 3" Header, (7) 2" Zones with Ball Valve and Vacuum Gauge
- Multiple Sampling Ports
- UL Listed Control Panel

EEI also carries all of the necessary accessories for AFVR events including "tanker truck" cam lock hoses, vapor phase granulated activated carbon media, thermo anemometers, photoionization detectors (PID), flame ionization detectors (FID), well head assemblies and stinger piping.

EEI is your one stop shop for rental of pilot test equipment or full scale remediation systems. We also custom build remediation systems on skids, in trailers or in buildings to your specifications. EEI is a Met Lab Certified Control Panel shop.

Enviro-Equipment, Inc. is your full service center for AFVR Trailers. We build them, so we can maintain and repair them. Whether it's a unit we built, you built or someone else built, we are your one stop service center. Contact Evan Chew at our Remediation Division 1-868-655-8267 or email us at remediation@enviroequipment.com.

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CALENDAR OF EVENTS - 2013

Geological Events in the Carolinas

Courtesy of AEG Carolinas Section – <u>www.aegcarolinas.org</u>. Last updated October 2, 2013 Send updates/corrections to Rick Kolb, Duncklee & Dunham, <u>rick.kolb1@gmail.com</u> *Meeting Date, Time, and Location are Subject to Change – Please Verify Prior to the Meeting*

Date: Tuesday, January 7, 2014

- Event: Quarterly meeting of the North Carolina Board for the Licensing of Geologists
- Location: Starts at 9:00 AM at Upton Associates, 3733 Benson Dr. in Raleigh; morning session open to the public
- Contact: ncblg@bellsouth.net or Rick Kolb, rick.kolb1@gmail.com

Date: Tuesday, January 7, 2014 (meetings are held monthly on the first Tuesday of the month)

- Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter
- Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 300; Raleigh
- Dinner afterwards at Chili's, 6324 Glenwood Avenue
- Contact: Sarah Kahn, <u>snkahn@gmail.com;</u> http:// rtpewb.com

Date: Wednesday, January 22, 2014

Event: AEG Carolinas Section Winter Meeting (see the announcement on page 15)

Speaker: AEG President Gary Luce

Location: 5:30-9:00 PM, Dave & Buster's, Concord, North Carolina

Contact: Madeline German madeline@smithgardnerinc.com

Date: Thursday and Friday, January 23 and 24, 2014

Event: Vapor Intrusion – The Conference: Legal, Technical and Regulatory Perspectives Location: Embassy Suites, Cary, North Carolina

Information: <u>www.aegcarolinas.org</u>

Date: Tuesday, February 4, 2014 (meetings are held monthly on the first Tuesday of the month)

Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter

- Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 300; Raleigh
- Dinner afterwards at Chili's, 6324 Glenwood Avenue

Date: Tuesday, March 4, 2014 (meetings are held monthly on the first Tuesday of the month)

- Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter
- Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 300; Raleigh
- Dinner afterwards at Chili's, 6324 Glenwood Avenue
- Contact: Sarah Kahn, <u>snkahn@gmail.com</u>; http:// rtpewb.com

Date: Tuesday and Wednesday, March 4 and 5, 2014

Event: Redox Tech and AEG Carolinas Section presents the Fourth Biennial Southeastern In Site Soil and Groundwater Remediation Conference 2014

Location: Renaissance Marriott, North Hills, Raleigh Contact: <u>conference@redox-tech.com</u> or <u>http://</u> <u>www.redox-tech.com/About/remediation-</u> <u>conference.html</u>

Date: Friday, March 7, 2014

Event: ASBOG Geology Exam Location: McKimmon Center, NC State University, Raleigh

Contact: <u>www.ncblg.org</u>

Date: March 2014 – date to be determined

Event: Spring Meeting, Ground Water Professionals of North Carolina

Speaker: To be announced at www.gwpnc.org Location: 6:00 social, 7:00 dinner, 8:00 presentation

(Continued on page 41)

Contact: Sarah Kahn, <u>snkahn@gmail.com;</u> http:// rtpewb.com

(Continued from page 40)

Date: Tuesday and Wednesday, March 25 and 26, 2014

Event: Science-Engineering-Technology Congressional Visit Days

More information: <u>http://setcvd.org/about-</u> <u>setcvd</u>

Location: Washington, D.C. Contact: Rick Kolb, AEG Advocacy Committee, rick.kolb1@gmail.com

Date: Week of March 24, 2013

Event: AEG Carolinas Section spring meeting Speaker: 2013-14 Jahns Lecturer Greg Hampen Location: To be announced

Date: Tuesday, April 4, 2014 (meetings are held monthly on the first Tuesday of the month)

- Event: Engineers Without Borders monthly meeting, Research Triangle Park Professional Chapter
- Location: 6:30-8:00 PM at the offices of Camp Dresser & McKee; 5400 Glenwood Avenue, Suite 300; Raleigh
- Contact: Sarah Kahn, <u>snkahn@gmail.com;</u> http:// rtpewb.com

Date: April 10-11, 2014

- Event: Southeastern Section, GSA 63rd Annual Meeting – Elevating Geosciences in the Southeastern U.S.: New Ideas about Old Terranes
- Location: Inn and Conference Center, Virginia Tech; Blacksburg, Virginia

Details: <u>http://www.geosociety.org/sections/</u> se/2014mtg/

Date: March 28-April 12, 2014

Event: North Carolina Science Festival Location: Events across the state Details: www.ncsciencefestival.org

Date: April 15, 2014

- Event: Quarterly meeting of the North Carolina Board for the Licensing of Geologists
- Location: Starts at 9:00 AM at Upton Associates, 3733 Benson Dr. in Raleigh; morning session open to the public
- Contact: ncblg@bellsouth.net or Rick Kolb, rick.kolb1@gmail.com

Date: September 2014 (Dates TBD)

Event: Geosciences Congressional Visit Days More information: <u>http://www.agiweb.org/gap/</u> events/geocvd/

Location: Washington, D.C.

Contact: Rick Kolb, AEG Advocacy Committee, rick.kolb1@gmail.com

Date: September 20-28, 2014

Event: AEG Annual Meeting

Location: The Doubletree Scottsdale in Scottsdale, Arizona

Details: <u>http://www.aegweb.org/about-aeg/events/</u> aeg-annual-meeting/2014-scottsdale

Date: October 19-22, 2014

Event: Geological Society of America Annual Meeting

Location: Vancouver, British Columbia, Canada

Information: <u>http://www.geosociety.org/</u> meetings/2014/



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FOURTH BIENNIAL SOUTHEASTERN IN SITU SOIL AND GROUNDWATER REMEDIATION CONFERENCE 2014

Redox Tech, with sponsorship from the Association of Environmental & Engineering Geologists (AEG) Carolinas Section, is again organizing the Biennial Southeastern *In Situ* Soil and Groundwater Remediation Conference.

The conference will be held on March 4th and 5th 2014 in Raleigh, North Carolina, returning to the Renaissance Marriott at North Hills.

Past attendance at this conference has exceeded 200. The conference will provide a forum for providing the state of the art for a wide range of in situ remediation technologies. On the first day of the conference, recognized speakers from around the

CONFERENCE DETAILS

Pre-registration will be available Monday the 3rd from 6 to 8 pm. Display booths will be set up during this time also.

DAY ONE AGENDA:

7:30 to 9:00 a.m.	Breakfast (provided with
	registration) and Registration
9:00 a.m. to Noon	Morning Invited Speakers
Noon to 1:00 p.m.	Lunch provided
1:00 to 4:30 p.m.	Afternoon Invited Speakers
4:30 to 6:00 p.m.	Evening Social and Poster
	Session

DAY TWO AGENDA:

Breakfast (provided with
registration)
Morning Accepted Speakers
Lunch Provided
Afternoon Accepted Speakers

country will present on their area of expertise. On the second day, case studies will be provided by consultants and vendors on the application of emerging technologies, with lessons learned.

The Conference provides a valuable opportunity for groundwater professionals to keep abreast of recent developments in remediation technologies, while potentially earning continuing education credits. Be sure to visit the AEG Carolinas Section booth or visit the following website to join AEG online or print a membership application http://www.aegweb.org/

COST

The cost of registration for the conference is \$250, and includes continental breakfast, coffee and tea at breaks, and lunch. The evening social is a cash bar. but light snacks will be provided. Discounts are available for AEG members, students or State Employees (reduced rate of \$200). Each participant will be responsible for their own dinner and lodging. Redox Tech is the promoter and main sponsor of the conference, with AEG Carolinas Section as co-sponsor, none of whom are directly profiting from the conference. The cost covers direct costs such as the conference room, lunch, beverage, snacks, and A/V equipment rental. Participation is limited to the first 250 registrants. Registration is fully refundable up to one week prior to registration, less an administrative fee of \$25. If you cannot attend, your registration may be transferred to another participant. Single day registrations are not available. Your credit card will be charged at the time of registration.

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ABSTRACT SUBMISSION

Limited spots are available for presentations by vendors and consultants. Abstracts must be submitted by November 22, 2013 in electronic format to <u>abstract@redox-tech.com</u>. Notification of acceptance will be made by December 13, 2013. To be included in the program, presentation materials for selected abstracts must be provided by February 21, 2014.

SPONSORSHIP AND DISPLAY BOOTHS

Display booth areas are available on a first-come basis for \$950. The cost includes two registrations with full access privileges. We have room for 15 booths and they are available on a "first come" basis. The exact layout has not been determined. We are seeking sponsors for the social hour, breakfast and lunches. Sponsorship cost is \$300 and includes prominent display of your company name and logo. Sponsorships are available on a first-come basis. There will be an end-of-day raffle, and we are seeking gifts to raffle from vendors and consultants. Display booths will be charged to credit cards at the time of reservation.

HOTEL

The conference is being held at the Marriott Renaissance Raleigh Hotel in North Carolina -<u>Conference Group Rate</u>. The hotel is a reasonable drive from the Raleigh Durham Airport (RDU). The hotel does not offer free shuttle service, but it does have free parking. A block of rooms has been reserved at a discounted pre-registration rate of \$169 per night. Simply use the link above, check availability, and the discounted rate will appear. You can also call and ask for the "Redox Tech" rate for those dates. The block of rooms is being held until February 14, 2014. There are other hotels in the area, but if you need a room, reserve early because they may be limited

REGISTRATION INFORMATION

Name	
(Name as you wish it to appear on your badge) Company	
Address (City, State, Zip)	
Phone (office) Fax	MAIL completed
Email	registration form to:
BoothFull RegistrationDiscounted Registration	Redox Tech, LLC 200 Quade Drive Cary, NC 27513
PAYMENT METHOD (Payment MUST accompany this registration form)	TAX
Payor : Company Individual	of FAX to: 919-678-0150 Attn: Conference
Check (Payable to REDOX TECH, LLC)	or FMAIL to:
Credit card: Mastercard Visa Corporate card?	conference@redox-tech.com
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MEMBERSHIP APPLICATION



ASSOCIATION OF Environmental & Engineering Geologists

MEMBER:

New Member Dues – \$95.00 First year of membership only.

Full Member Dues - \$140.00*

Applicants for Member Class, including Full and New Members, shall hold a degree in geology, engineering geology or geological engineering, or a degree in a related professional field with 30 semester-hours of credit in the geosciences. In addition, the applicant shall be practicing in the field of Engineering Geology, Environmental Geology or Hydrogeology.

*Section Dues - Section dues are charged to all Full Members, invoiced separately. More information regarding Section dues can be found at www.aegweb.org.

AFFILIATE:

Affiliate Dues - \$100.00

Applicants for Affiliate Member Class shall be scientists or engineers who work with engineering geologists, or persons interested in environmental and engineering geology.

TEACHER:

Teacher Dues - \$35.00

Applicants for Teacher Member Class shall be engaged in full-time teaching at the Primary, Secondary or post-secondary level in the area of Earth Science education or a related subject.

STUDENT:

Annual Dues - FREE

Applicants for Student Member Class shall be full-time students enrolled in an academic program in the geosciences or in a related field in engineering.

INTERNATIONAL:

International Member Dues – \$35

Applicants shall hold the same requirements as for Member Class. International Members receive (online ONLY) the E&EG Journal, Annual Directory, Annual Meeting Program with Abstracts and the AEG NEWS.

AEG memberships are based on the calendar year. Applications received after October 1 will be entered for the following calendar year.



APPLICATION FORM

Please complete this form and mail it with your Annual Dues payment to the Association's Headquarters office for processing. New member applicants do not pay Section dues for their initial year of membership.

Name:

(Please print your name as you would like it shown on your membership certificate.)

Date of Birth: Required to authorize payment

Preferred Address: Home Work School

Preferred Phone: Home Work School Mobile

Preferred E-mail: Home Work School

Alternate Address: Home Work School

Alternate Phone: Home Work School Mobile

Alternate E-mail: Home Work School

Desired Class of Membership:

Annual Dues Amount*:

*Section Dues not included. A separate invoice will be mailed to you.

Payment Method:

Check Enclosed

Visa Master Card Discover AMEX

Name on Card:

Cardholder Address: Home Work School Other (If not provided above, please provide card address)

Card Number:

Expiration Date:

Certification/Authorization:

(Signature)

My signature attests that, to the best of my knowledge, I meet the academic and practice requirements for the membership class I have requested and that all entries on this application are true and correct. I also authorize AEG to charge my credit card for the dues payment, if I selected the credit card payment option.

SUBMISSION: Send this form with your check or credit card authorization to: Association of Environmental & Engineering Geologists • PO Box 460518, Denver, CO 80246 Phone: 303-757-2926 • FAX: 720-230-4846 aeg@aegweb.org • www.aegweb.org



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Let the Association of Environmental & Engineering Geologists (AEG) show you the great benefits to being a part of the geology profession! AEG is geology in practice. Join us and see why our members LOVE their jobs!

Benefits of Student Membership Include:

•Eligibility for Scholarships that provide funding for field camp, field studies, academic studies and travel to present at national meetings.

•Discounts for attending AEG's Annual and local Section Meetings, field trips, and short courses (sometimes you can attend for FREE).

•Networking opportunities to potentially meet YOUR future employer! One member noted, "Every job I have had was a result of shaking hands at an AEG event!"

•Free online access to Environmental & Engineering Geoscience, co-published with the Geological Society of America, AEG NEWS, and AEG's Annual Meeting Program with Abstracts.

•STUDENT MEMBERSHIP IS FREE!

•PLUS, as AEG's gift to you for graduating, your first year of Professional Membership is FREE!

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AEG CAROLINAS SECTION – SPONSOR INFORMATION

The Carolinas Section of AEG supports many of its activities with financial assistance provided by our sponsors. Our activities include quarterly meetings, periodic field trips and seminars, a quarterly newsletter, and email announcements about our meetings and geoscience related activities. In addition, we donate large quantities of educational resources to science teachers.

We offer several levels of sponsorship, but they all have one goal: to keep the sponsor's name in front of our members and to bring you business. We have a real commitment to connecting our sponsors to potential buyers and

will do all we can to help you build your business. Most of our members are practicing professionals with responsibility for selecting subcontractors, so our group is a great place to find new customers and to catch up with existing clients in an informal setting.

Our sponsors provide the financial support that allows us to have reasonably priced dinner meetings, host seminars, provide discounted dinner meeting costs for students and teachers, underwrite the cost of newsletters and our web site, provide geoscience mentors for students and young professionals, and support science education tools to our teachers and in our schools. All costs listed below are per year and end in December. New sponsorships received after October will continue to December of the following year.

Silver Sponsor (\$250):

GeoNews Newsletter: Business card size ad (2°) high x $3-1/2^{\circ}$ wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign-in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at one meeting. Cost of meeting waived for one person on the exhibit date.

Email Announcements: Listing of your company name on each AEG Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, <u>www.aegcarolinas.org</u>, with a link to your site.

Gold Sponsor (\$375):

GeoNews Newsletter: Quarter-Page ad (4-1/2" high x 3-1/2" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibits: Space for tabletop display at two meetings. Cost of meeting waived for one person on the exhibit date. Email Announcements: Listing of your company name on each

AEG Carolinas Section email announcement (our email list is currently over 1,000 people) Wab Bagg: Acknowledgement on the AEG Carolines Section

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, <u>www.aegcarolinas.org</u>, with a link to your site.

Platinum Sponsor (\$500):

GeoNews Newsletter: Half-page ad (4-1/2" high x 7" wide), four times per year.

Meetings: Listing on a Sponsor Poster, located at sign in table. Verbal acknowledgement by name in Chairman's introductory comments.

Meeting Exhibit: Space for tabletop display at three meetings. Cost of meeting waived for one person on the exhibit date. Email Announcements: Listing of your company name on each AEG - Carolinas Section email announcement (our email list is currently over 1,000 people)

Web Page: Acknowledgement on the AEG Carolinas Section Web Page, <u>www.aegcarolinas.org</u>, with a link to your site.

Platinum PLUS Sponsor (\$600):

Same as Platinum, but with a FULL PAGE ad in GeoNews. Limited to 2 Sponsors per year.

GeoNews Newsletter Sponsorship Only

Businesses or individuals can also advertise in GeoNews without being a full sponsor. The annual rates for advertising in GeoNews are as follows:

Business Card	\$ 40.00
Quarter Page	\$ 60.00
Half Page	\$ 100.00
Full Page	\$ 200.00

Please complete the form below and mail to Jane Gill-Shaler, AEG Carolinas newsletter editor. Please call or email if you have any questions (contact information below).

AEG Carolinas Section Sponsorship Form

Please begin our sponsorship of the Carolinas Section of the Association of Engineering Geologists. Our sponsorship level is:

	rialinum r LOS Section Sponsorsinp, \$000/year
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	Gold Section Sponsorship, \$375/year
	Silver Section Sponsorship, \$250/year
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Please enclose a business card or email ad in jpg, pdf, or doc to Jane Gill-Shaler at janehgillshaler@gmail.com.

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Rick Kolb, Duncklee & Dunham, 511 Keisler Drive, Suite 102, Cary, North Carolina 27518 (Modified 7/11/13

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Thank You, AEG Carolinas Sponsors!!

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Frank Amend, 257-937-2552, frank.amend@geobrugg.com, Deborah Johnson, 252-937-2552, deborah.johnson@geobrugg.com; Geobrugg North America is a premier supplier of engineered rockfall protection and slope stabilization systems. Our wirework-based, unobtrusive, and ecology-friendly systems blend well with the natural surroundings. Well-proven anti-corrosion processes permit achieving a useful life up to 100 years and our installed systems require virtually no maintenance.

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