Society for Risk Analysis
New England Chapter

2014-2015 Event Series

MEETING ANNOUNCEMENT
Wednesday, January 14, 2015
Refreshments: 5:00 pm – 5:30 pm
Presentations: 5:30 pm – 6:30 pm
Discussion: 6:30 – 7:00 pm

AIR QUALITY AND HUMAN HEALTH IMPACTS FROM HYDRAULIC FRACTURING

PRESENTATION 1
JOHN WILHELMI, M.S.
EASTERN RESEARCH GROUP, INC. (ERG)

PRESENTATION 2
MANU SHARMA, M.S., P.E.
ARI S. LEWIS, M.S.
GRADIENT

Location
Industrial Economics, Inc
2067 Massachusetts Avenue, Fourth Floor
Cambridge, MA

Please RSVP by Thursday, January 8th to Aylin Sertkaya (aylin.sertkaya@erg.com).

Space is limited, so reserve your seat today. For more information on SRA-NE, please go to: **www.sra-ne.org**

Society for Risk Analysis
New England Chapter

PRESENTATION 1

AIR QUALITY IMPACTS FROM HYDRAULICALLY-FRACTURED NATURAL GAS WELLS

Natural gas production increased dramatically in recent years across the United States, in part due to advances in drilling and extraction technology. One such technology, hydraulic fracturing—or "fracking"—has received extensive attention in the press, advertisements, and other media outlets. Just last month, the state of New York announced a ban on high-volume hydraulic fracturing operations, based on various environmental and health concerns. But, what does "fracking" truly mean for the air that we breathe? This presentation will address this question, with a focus on air toxics. Hydraulic fracturing has been extensively used in the Barnett Shale region in north central Texas, and more than 400 active natural gas production sites are located within the City of Fort Worth. To respond to residents' concerns about air quality impacts, the City sponsored the Fort Worth Natural Gas Air Quality Study to characterize how natural gas production activities affect outdoor air quality and to evaluate whether the minimum setback provisions for these sites are adequately protective. This presentation will review the main findings from this study, in which two approaches were taken to characterize air quality impacts. First, ambient air monitoring occurred at eight locations throughout the City over a 2-month period in late 2010, with one-in-three day sampling for nearly 140 pollutants. Second, emissions were measured at, or estimated for, nearly 400 different natural gas production and processing sites between 2010 and 2011. The emission rates were then entered into a dispersion model to estimate air quality impacts at locations where, and times when, ambient air monitoring did not occur. The study identified three pollutants as being most important from a risk perspective, but did not find any significant health threats associated with air quality beyond the City's setback distances. Several recommendations were provided for further study of outdoor air quality impacts and to reduce emissions from the gas production sites found throughout the City. In addition to reviewing findings from the Fort Worth Natural Gas Air Quality Study, the presentation will briefly review findings from several additional ambient air monitoring programs conducted in other shale gas formations that were also designed to investigate natural gas production activities.

ABOUT THE PRESENTER

John Wilhelmi is a senior chemical engineer who specializes in environmental issues at the intersection of outdoor air quality and public health. He is expert in characterizing chemical emissions, assessing atmospheric dispersion, evaluating ambient air monitoring data, and assessing health implications from inhaling air contaminants. Over his last 19 years at Eastern Research Group, Inc. (ERG), he has supported the U.S. Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR) on dozens of site-specific evaluations by providing scientifically defensible and technically accurate air pathway assessments. He has characterized air emissions sources for which little guidance were available at the time (e.g., detonation of explosive ordnance, aerial application of pesticides); and he has assisted agencies with their evaluations of numerous high-profile sites, including air emissions from military training exercises at the island of Vieques, air quality assessments in support of the Fallon leukemia project, review of air monitoring plans in the wake of the World Trade Center disaster, and assessment of air quality impacts from natural gas production activity in Fort Worth. Mr. Wilhelmi holds chemical engineering degrees from Stanford University and the Massachusetts Institute of Technology.

PRESENTATION 2

HUMAN HEALTH RISK EVALUATION FOR HYDRAULIC FRACTURING FLUID ADDITIVES

Studies to understand potential effects of hydraulic fracturing on human health and the environment are currently being done at the state and federal levels, however, none have included a human health risk assessment. We have undertaken a human health risk evaluation, specifically focusing on potential risks to drinking water in basins underlain by shale and other tight oil- and gas- bearing formations. Potential risks are evaluated for accidental surface spills and their impact on surface water or groundwater and potential leakage from the target formation upward through bedrock and into an overlying drinking water aquifer. One of the key challenges is the lack of established human health criteria for many of the compounds used in HF fluids. As part of the risk assessment, we developed a hierarchy for the selection of toxicity criteria, including development of criteria de novo when no criteria have been developed by an authoritative agency. Our approach uses a probabilistic (Monte Carlo) framework to assess the likelihood of releases and chemical transport. This analysis considers a broad range of environmental settings (e.g., soil thickness/permeability, distance to drinking water wells, accidental spill volumes), thus providing some much-needed perspective on the overall plausibility of the migration scenarios and associated risks.

ABOUT THE PRESENTERS

Manu Sharma, M.S., P.E., Principal

Mr. Sharma consults on a wide range of environmental sciences topics, including water quality, contaminant fate and transport modeling, risk assessment, hazardous waste site cleanups, and environmental response cost liability/allocation. With more than 25 years of consulting experience, he has successfully applied these skills to solve a range of complex problems, from assessing health risks associated with chemicals in products to developing cost-effective remedial solutions at both small and extremely large contaminated sites. He has led investigations, risk assessments, and remedial actions at Superfund, RCRA, and state sites, and/or for mergers and acquisitions at: chemical plants, MGPs, mineral mining/processing, landfills, Brownfields, dry cleaners, and manufacturing facilities in the US and abroad. Mr. Sharma has worked extensively with chlorinated solvents, NAPLs, pesticides, PCBs, dioxin, petroleum hydrocarbons, and mercury. He has served as an expert on cases related to multi-PRP liability assessment and cost allocation, contaminant transport, remedial investigation and design, standard of care, and water resource development.

Ari S. Lewis, M.S., Environmental Health Principal Scientist

Ms. Lewis is an environmental toxicologist and manager of the Toxicology team. Her expertise in toxicology and risk assessment allows her to lead and contribute to a variety of projects, including, product safety evaluations, regulatory comment, green chemistry assessments, and litigation support. She also has particular expertise in metal and pesticide risk assessment – specifically arsenic. In this capacity, Ms. Lewis has both published and presented extensively on the carcinogenic risks of arsenic and provided direct input to US EPA on arsenic regulatory issues. Ms. Lewis also has expertise in developing quantitative human health risk criteria for chemicals with limited toxicity data. Ms. Lewis earned her M.S. at Cornell University.

Society for Risk Analysis
New England Chapter

GETTING TO THE EVENT

Directions to Industrial Economics: http://www.indecon.com/iecweb/FindUsDriving.aspx and http://www.indecon.com/iecweb/FindUsDirections.aspx

From the MBTA Subway (on foot):

Take the Red Line train to Porter Square. Exit the T Station to the right and cross the street. Turn left and proceed northwest along Massachusetts Avenue, keeping the Porter Square Shopping Center to the right. Continue northwest approximately 0.2 miles to the Henderson Carriage Building, which is located at the corner of Massachusetts Avenue and Hadley Street. IEc is on the fourth floor.

By Bus:

The 77 and 83 bus routes stop in front of the building. Other bus routes that stop nearby include the 88, 87, and 96.

Driving Directions:

From I-95/Route 128: Take Exit 29 for "Route 2 East - Cambridge." Follow Route 2 East approximately 6.4 miles to the first set of lights, located at the intersection of Route 2 and Routes 3 and 16. Bear left at the intersection onto Route 3 North/Route 16 East, following the signs for Arlington and Medford. Proceed approximately 0.3 miles to the next set of lights. Turn right onto Massachusetts Avenue/Route 2A and proceed southeast approximately 0.9 miles, to the intersection of Rindge Ave. and Massachusetts Ave. Continue on Massachusetts Ave. through the Rindge Ave. intersection, then take the first left onto Russell Street. The entrance to the Henderson Carriage Building parking lot is between the second and third private residences on the right, approximately 50 yards down Russell Street.

From Harvard Square: Follow Massachusetts Ave. north approximately 1.1 miles to the Porter Square T Station. Continue on Massachusetts Ave. another 0.2 miles to the Henderson Carriage Building, which is located at the corner of Massachusetts Avenue and Hadley Street. Turn right onto Hadley. The entrance to the Henderson Carriage Building parking lot is on the left, immediately behind the building.

Parking is available along Massachusetts Avenue (meter parking). There may also be spaces available in the lot behind the Henderson Carriage Building.