



## Engineering Sciences Section – 2005

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### **C56 Case Studies in Indoor Air Quality: It's Not Always What You Think**

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After attending this presentation, the participant will be better prepared to plan, conduct, and evaluate investigations of indoor air quality ("IAQ"). Dr. Smith will describe a preferred approach to the planning and conduct of IAQ investigations. Dr. Smith will use three case studies of IAQ assessment in schools, where the IAQ assessment was confounded by polychlorinated biphenyl ("PCB"), chlorinated volatile organic, or volatile petroleum hydrocarbon ("VPH") compounds, to illustrate common problems in the evaluation of IAQ.

This paper has three objectives: 1) to describe a useful approach for the investigation of indoor air quality ("IAQ"), 2) to identify common problems associated with IAQ investigations; and 3) to illustrate how the preferred approach was used in IAQ investigations at three elementary schools.

There are many potential sources of indoor air pollution, including vapors emanating during the cooking of foods, operation of heating and air conditioning systems ("HVAC"), off gassing of vapors from deteriorating furnishings and building materials, stored materials, as well as vapors and particulate from a large variety of outdoor sources (i.e., dusts, pollens, molds, automobiles, etc.) and personal life-style choices (i.e., smoking, perfumes, hobbies, etc.). The potential for any single source agent(s) to cause adverse health effects in people depends on the magnitude of exposure, personal sensitivity to the agent, and the agent's inherent ability to cause an adverse effect (i.e., toxicity).

Over the last 5 years, people have become very much more aware of the potential for agents in indoor air to adversely impact their health. Recent news stories have focused on the potential for second hand smoke, mold, asbestos, and fine airborne particulates to adversely affect health. U.S. Environmental Protection Agency ("U.S. EPA") ranks Poor IAQ as one of the greatest potential health threats within the home. Poor IAQ has been used to justify the abandonment of homes and the closure of schools and businesses. In the last couple of years, regulatory Agencies like the U.S. EPA has devoted significant resources to IAQ issues. Yet, with all this attention, regulatory Agencies have provided very little guidance to ensure that IAQ investigations are properly conducted.

Indoor air quality investigations often begin as the result of a general health complaint linked to the perception of poor indoor air quality. Dr. Smith describes a simple phased approach to the investigation of indoor air quality that includes the identification of potential confounders of IAQ analysis, focused sampling and analysis, and a little common sense. This presentation provides a road map for the phased evaluation of IAQ problems. Dr. Smith uses three case studies of IAQ investigations at elementary schools to illustrate how the phased approach was used to successfully identify IAQ problems requiring remedial action, while eliminating common confounders.

#### **Air, Quality, Confounders**