Vapour Intrusion and Indoor Air Quality – Assessing IAQ Impacts, Understanding Building Factors, Strategies for Mitigation.

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Much of the work around vapour intrusion (VI) has focused on reworking or developing mathematical models to understand the potential for Indoor Air Quality (IAQ) impacts, exposure potential, and human health risk. There has been a great deal of debate as to the relevance of the more popular VI models, and the robustness of alpha ratios when using groundwater concentrations or soil vapour concentrations to predict indoor air concentrations. Factors such as varying soil conditions, contaminant characteristics, construction type and era, and ventilation exchange rates can all foil otherwise reliable models. This talk will approach vapour intrusion from a more practical aspect, and emphasize the value of site specific, accurate, and precise indoor air quality measurements used to establish the need for mitigation. Measurement of actual IAQ conditions to assess health (and calibrate models), and confirmation of mitigation strategies through testing is often the best strategy to satisfy key stakeholders, including both the community and the regulators. Building construction, indoor sources, and other confounding factors will be reviewed along with the potential pitfalls of high resolution IAQ test methods, sampling apparatus, and laboratory analysis. SUMMA canister and sorbent tube techniques, vapour probe installation, and quality control procedures will be reviewed through specific examples. The value of site specific IAQ data will also be discussed in terms of risk communication value and public consultation.

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Paul MacKinnon is a partner with EHS Partnerships Ltd.., an employee-owned environmental health consulting firm operating in Western Canada and the Western United States. Paul holds a Master of Science degree in Environmental Health and a Bachelors degree in Chemistry. He is certified as an Industrial Hygienist by the American Board of Industrial Hygiene. Mr. MacKinnon has over fifteen years of experience addressing environmental health and indoor air quality issues. His work in the field of vapour intrusion includes assessing and mitigating indoor air quality in institutional facilities, commercial buildings, and private residences. Using risk derived criteria, he has been involved in implementing sub-slab depressurization and other unique controls in contaminated communities with chlorinated solvent and petroleum hydrocarbon vapour impacts.