

Case Studies: Use of Alternate Vapour Flow Media for Vapour Management Systems for New Building Construction

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Soil gas (vapour) intrusion into buildings is increasingly being identified as a human health exposure issue. With this awareness has come heightened levels of investigation, and therefore increases in the number of sites with potential inhalation exposure issues. Frequently, the problems are not easily addressed through conventional remedial approaches, as the source areas are wide spread or relate to naturally occurring gasses. Consequently, risk management approaches involving institutional controls and site or building management controls are being increasingly used. These controls protect the occupants of buildings being constructed on brownfield sites and in many cases greenfield sites, which could otherwise not be economically developed.

The costs related to installing building protection and monitoring systems are substantially lower than full scale site remediation, nevertheless these still add a significant cost to overall building construction. The benefits of these risk management controls clearly outweigh the cost in that there is minimal disruption to the site and construction schedule and a high level of protection is offered to building occupants by reducing or eliminating potential exposure risk. An added benefit is a net reduction in the volumes of soil which would potentially enter our landfills, thereby providing a sound environmental solution without relocating the problem. Engineering teams have increasingly been involved in designing and implementing these types of systems over the past two decades. As risk management approaches become more acceptable to both the public and the regulators, engineers continually strive to develop and implement new techniques to reduce costs while still maintaining adequate levels of building protection.

This paper will outline the basics of traditional vapour management systems and then will explore recent technological changes to the vapour flow media that have been tested and implemented at several building sites in Calgary.

For the alternate vapour flow media the following issues will be discussed:

- Air flow capacity comparison under activated pilot test conditions, with the traditionally implemented systems;
- Durability of alternate flow media under “real world” installation conditions;
- Future improvements to the alternate flow media; and
- Cost savings resulting from implementation

Katie Clarke, P.Eng. and Sean Ezekiel

Katie Clarke and Sean Ezekiel are environmental engineers, each with 4 years experience in the consulting industry. They have experience in the investigation and remediation of contaminated sites across Alberta, knowledge in risk assessment of contaminated sites, and experience with regulatory controls within the province of Alberta. For the last two years, they have been heavily involved in the implementation of vapour management systems at development sites within the City of Calgary. The increase in demand for the implementation of these systems has allowed these two engineers to be at the forefront of the evolution, evaluation, improvement, and innovation of these systems.

Randy Pennell, P.Eng.

Randy Pennell is a professional engineer with over twenty years of consulting experience in the management, design and implementation of remediation and management systems for contaminated sites. He currently leads AMEC Earth & Environmental’s contaminant assessment & remediation group in Calgary, specializing in the engineering design of soil and groundwater remediation and management systems. He is a leading expert in the design and construction of building vapour management systems with over 40 building management systems across Canada in the past 19 years.