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January 21, 2020

Editorial Department of Building and Environment

Dear Sir or Madam:

I am pleased to submit this manuscript entitled "Sorption Phenomena In Transient Vapor Intrusion Scenarios" for review and possible publication in Building and Environment. This is original work and has not been previously published by any other journal or conference proceedings; the submission declaration has been complied with. We have no interests to declare.

In this work, we measured the sorption of trichloroethylene (TCE), a contaminant of concern in vapor intrusion, on a variety of materials commonly found in a house, as well as on soil. We used this data in a three-dimensional finite-element model to we explore how contaminant sorption affects contaminant transport in soils and the indoor environment, and how the efficacy of mitigation systems are impacted by desorption from indoor materials.

Some of our conclusions that we believe contribute to the state-of-the-art:

- Different materials can have dramatically different sorptive capacities, with some, like cinderblock, having the capacity to hold 41,000 times more TCE than a comparable volume of contaminated air.
- Contaminant transport can be significantly retarded by sorption, delaying change in indoor contaminant concentration to the degree that a pseudo-equilibrium can be imposed.
- After a mitigation system has been installed, desorption of TCE from indoor materials can increase the time for a certain reduction in indoor contaminant concentration to occur from a matter of hours to weeks.

We expect the topics explored and conclusions reached in our work will be of great interest to your readership.

Thank you for considering this manuscript for publication.

Sincerely,

Jonathan Ström