

Summary of Discussion Topics – Issues & Questions

Vapor Intrusion Stakeholder Group Meeting - June 6, 2018

Commercial/Industrial Mitigation BMP Development

A. BMP Applicability

The stakeholder group discussed building use categories and how buildings are categorized as either residential or commercial/industrial. This is important because building use determines the appropriate set of intrusion screening values (ISVs) that should be used to evaluate the building for potential vapor intrusion risk (i.e. residential ISVs versus commercial/industrial ISVs).

1. What criteria are used to define a building use as commercial/industrial?
 - Building is used by adult workers
 - Children do not spend a significant amount of time in the building
 - Schools and day care centers are considered residential because children typically spend a significant amount of time in these buildings
 - No part of the building is used for residential occupancy
2. Are there different mitigation approaches that may be feasible for a new construction building compared to existing buildings?

Yes, mitigation approaches could be different for new construction versus existing buildings in part, because there are typically more building control options with new construction. The different options are currently being explored as part of this BMP development.

B. Passive Mitigation

The group discussed the role of passive mitigation systems as an option for new construction buildings. Passive systems may be more effective for new construction buildings because connectivity beneath the slab can be incorporated into the system design, in contrast to existing buildings where conditions and connectivity beneath the slab is unknown and can be inconsistent.

1. Are passive mitigation systems an option for mitigating a new construction commercial/industrial building?

MPCA will be evaluating and considering the effectiveness of passive mitigation systems in conjunction with a vapor barrier and additional verification testing to ensure their long-term effectiveness in preventing vapor intrusion.

2. Are passive mitigations systems effective at preventing vapor intrusion?

Passive mitigation systems can be effective at preventing vapor intrusion under certain atmospheric conditions. However, there are limitations to their effectiveness include changing

atmospheric conditions and the need for more long-term verification testing to ensure they are working as intended. The ability of a passive system to provide coverage beneath an entire building slab is much easier to achieve and verify for a new construction building compared to an existing building.

3. Sub-slab venting is a type of passive mitigation that includes the introduction of “fresh” or ambient outdoor air into the system to help “vent” the sub-slab. How and when could sub-slab venting be used?
 - Sub-slab venting could potentially be incorporated as part of a passive mitigation system; however, the details around design and verification testing need to be refined.

C. Vapor Barriers

The group discussed the possibility of using a vapor barrier only for new construction building mitigation under lower level risk vapor intrusion scenarios. A request was made to produce a risk matrix to determine the appropriate mitigation approach.

1. Are vapor barriers alone an option for mitigating a commercial/industrial building (new construction)?

No. There are unanswered questions about long-term effectiveness of vapor barriers. Because of this, a secondary mitigation option is prudent. If a passive mitigation system is installed in conjunction with the vapor barrier, the passive system could be relied on for secondary mitigation and be made active as necessary.

2. What would be appropriate technical specifications and installation requirements for a vapor barrier if approved as part of a mitigation approach?

Criteria for vapor barrier materials, installation and verification is under development. Vapor barrier verification concepts discussed included; construction verification during/post installation, post-installation smoke/tracer testing and thermal imaging.

D. Underground Parking (Under Construction)

Group discussion included what should trigger air exchanges for the parking garage and that the current application of using underground parking as a mitigation system option is currently not refined enough. Additional information is needed to understand how parking garages are designed and operated to control vapors (i.e. vehicle exhaust). MPCA is working on a Request for Proposal to obtain the necessary information regarding underground parking garage design and operation.

E. Mitigation System Verification Testing

1. What is sufficient verification testing for passive mitigation and vapor barriers to meet the standards outlined in the Vapor Intrusion Guiding Principles?

MPCA will continue to require that mitigation effectiveness is verified using two different means of verification.

Options discussed for post mitigation verification testing included:

- Construction verification for vapor barriers
 - Connectivity/diagnostic testing beneath floor slab for both active and passive mitigation systems
 - Analytical testing including paired sub-slab and indoor air, along with ambient outdoor air
2. Do the current verification testing requirements for active sub-slab depressurization systems need to be reevaluated?

The current verification testing includes post-mitigation diagnostic and analytical testing to verify system effectiveness. This two-tiered verification approach is consistent with the Vapor Intrusion Guiding Principles.

3. Can I avoid drilling through a building slab and/or vapor barrier of new construction for confirmation testing?

Yes, if sample/monitoring points are installed through the slab during construction similar to utility conduits. Sub-slab conditions (pressure and contaminant concentrations) must be evaluated as part of post-construction verification. Options other than installing sample points or drilling through the slab have not been fully evaluated.

4. Can discharge stack samples be used for verification testing?

Currently discharge stack samples are not included as part of the verification testing. However, in the future, large volume sampling techniques may be explored where stack sampling/monitoring could be utilized.

F. Air permitting/pre-treatment for mitigation systems (Under Construction)

We discussed changing air emissions standards and how they may impact mitigation systems when sub-slab concentrations are very high.

1. What evaluation is needed for a discharge from a mitigation system?
 - Undetermined
2. When is pre-treatment needed?
 - Undetermined

G. HVAC for Mitigation (Under construction)

HVAC discussions included; continuous operation vs. cycling, positive pressure measurements, air exchanges per hour, performance criteria, timing of air exchanges, and how many people will have access to the controls.

HVAC is currently a mitigation option for commercial/industrial buildings. Verification requirements are similar to active SSD systems including post-mitigation diagnostics that exhibit PFE across the VI AOC beneath the building and analytical testing (paired sub-slab and indoor air, along with ambient outdoor air). There was a suggestion to establish performance standards and let the verification process work itself out.

1. What are the minimum requirements for using heating, ventilation and air conditioning (HVAC) controls as a mitigation approach?

- Building construction and use – HVAC controls for mitigation are less effective if occupants can open windows in building at will and/or if there are large bay doors present that are opening/closing routinely.

2. Is positive pressurization of a building an acceptable mitigation technology?

- Yes, it can be with appropriate verification and monitoring

3. Would the HVAC need to be operated continuously, only during business hours?

- Continuous operation of HVAC system is most effective

H. Indoor Air Filtration (Under construction)

1. Under what conditions would indoor air filtration be an acceptable mitigation technology?

- Indoor air filtration is typically used as an interim mitigation approach when indoor air exceedances are identified and until a more permanent mitigation approach can be implemented and verified.

I. Active Mitigation

1. Under what conditions could a remediation system also serve as a building mitigation system?

If a remediation system provides effective pressure field extension beneath the building, it is in effect acting as a mitigation system. It also must conform to SSDS confirmation and verification requirements.

2. Are sub-slab ventilation systems considered active mitigation?

An active system must operate continuously and not have interruptions. If the sub-slab ventilation system meets those criteria, it would be considered active.

3. Can fans operate intermittently?

No. If the fan is not running continuously (see above), it is not considered active.