

Review of Vapor Intrusion Notice of Audit Findings, FY 2017

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For FY2017, the LSPA's Loss Prevention Committee reviewed 43 Notices of Audit Findings (NOAFs) from MassDEP (the Department) on the topic of vapor intrusion: 21 from Northeast Region, 14 from Central Region, 7 from Western Region, and 1 from Southeast Region. The number of NOAFs for the Northeast Region is similar to the 19 NOAFs issued relative to vapor intrusion in FY2016. Of those receiving NOAFs from the Northeast Region, 11 were also issued a Notice of Noncompliance (NON), 2 were issued an Administrative Consent Order with Penalty (ACOP), and one was issued an NON and then an ACOP.

The most significant issue identified during reviews of vapor intrusion-related NOAFs was the improper operation and reporting of Active Exposure Pathway Mitigation Measures (AEPMMs). Many of the NONs issued for vapor intrusion violations were related to AEPMMs. The most common AEPMM violation was the failure to notify MassDEP of a shutdown test; other violations included AEPMM malfunction (e.g., faulty mechanics or electronics) and failure to notify MassDEP that the AEPMM had a remote telemetry system. In cases involving shutdown tests, MassDEP required the PRP to follow the relevant steps on the AEPMM guidance web page. See <https://www.mass.gov/service-details/remote-telemetry-for-active-exposure-pathway-mitigation-measures-aepmm>. The website lists the steps necessary to select, register, and test an AEPMM, and includes the Telemetry Device Registration Form and a Q&A about remote telemetry.

Other issues that were addressed in the NOAFs as they relate to vapor intrusion included:

- The need to address a potential Critical Exposure Pathway (CEP),
- Insufficient indoor air sampling (e.g., no sampling conducted in the winter months),
- Termination of Downgradient Property Status because it was not adequately supported by the evidence,
- Insufficient characterization of nature and extent to define the limits of the Disposal Site, and
- Issues obtaining site access (which were eventually addressed via the involvement of MassDEP).

There were also issues identified related to risk assessment and vapor intrusion. In one case, a risk characterization in support of a Permanent Solution did not evaluate a residential receptor for the indoor air exposure pathway (it evaluated a resident for exposure to soil and a commercial worker, the current use, for exposure to indoor air); therefore, MassDEP said that it was inappropriate to conclude that a condition of No Significant Risk for unrestricted use existed. In another case, an Activity and Use Limitation (AUL) (with AEPMM) implemented at one property was used to justify a conclusion of No Significant Risk at an adjacent property where the AUL was not implemented. MassDEP stated that "an AUL imposed on [one property] cannot be used to achieve or maintain a condition of No Significant Risk at [another property], as the owner of that property has no control over the operation of the SSDS." In other words, if an SSDS is being used to justify a conclusion of No Significant Risk for a property (even if that SSDS is not located on the subject property), there must be an AUL implemented for that property that documents that fact.

Three examples of NOAFs with NONs relative to vapor intrusion are as follows:

- An NON was issued to the owner of an industrial site where a historic release of chlorinated volatile organic compounds (CVOCs) occurred. Between 1997 and 2007, trichloroethylene (TCE)

was detected in groundwater samples from five monitoring wells at concentrations that exceeded MCP Method 1 GW-2 standards. TCE was also detected in three soil gas samples collected in March 2007. Two of the soil gas samples exceeded the commercial/industrial Sub-slab Soil Gas Screening Value of 130 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). Although TCE was not detected above the analytical Reporting Limit (RL) of $2.68 \mu\text{g}/\text{m}^3$ in two indoor air samples collected in the western wing of the facility in 2007, the RL was above the Department's commercial/industrial Threshold Value of $1.8 \mu\text{g}/\text{m}^3$, and the documentation submitted for this site did not provide adequate information regarding exactly where and how these samples were collected. The evaluation of potential indoor air risks stated that "TCE was not detected in corresponding soil gas indoor air samples," which is an incorrect statement with respect to soil gas. Therefore, because of various uncertainties regarding (a) the current levels of TCE in groundwater, soil gas, and indoor air, particularly within the footprints of the newly constructed buildings; (b) whether the concentrations in any of these media exceed the GW-2 standard and soil gas and indoor air screening values specified above; and (c) whether the thickness of the concrete foundation slabs and moisture barriers constructed at each building location were adequate to block the migration into indoor air of TCE vapors present in soil gas at one or both properties, the Department could not yet concur with the conclusion in the Permanent Solution Statement that a condition of No Significant Risk existed at these properties. To address these issues, MassDEP required that a revised risk characterization and Permanent Solution Statement be submitted once the uncertainties were addressed.

- In an NOAF with an ACO and NON issued for a Class A-3 Response Action Outcome (RAO) Statement submitted for a release of CVOCs on commercial and residential properties, MassDEP found that the RAO did not adequately evaluate the extent of releases in all media. Specifically, the vapor intrusion pathway was not adequately evaluated at residential and commercial properties within the site boundaries; the horizontal extent of CVOCs in the groundwater at the site, particularly in the bedrock aquifer, was not adequately evaluated; site activities and uses were not adequately evaluated; Exposure Point Concentrations were improperly calculated; and fencing was used to limit soil exposure to achieve a Permanent Solution.
- A residential property that eliminated a sump was cited for violations and issued an NON. The Potentially Responsible Party (PRP) contended that a sump located in the basement of a residence within the site boundary was sealed by the property owner, and that the sealing of this source was not conducted as an MCP response action. MassDEP's position was that the sealed sump acted as a barrier for the migration of CVOCs into the indoor air of the residence and sealing of the sump was an exposure pathway elimination measure, thereby requiring an Activity and Use Limitation (AUL). However, an AUL was not filed for the property. MassDEP required the PRP to retract the Class A-3 RAO and terminate three AULs that were previously recorded because they either restricted a current use or relied upon a fence to limit exposure and achieve a Permanent Solution.

Conclusion

Overall, no specific patterns of noncompliance related to vapor intrusion were identified during this review. However, as more and more disposal sites rely on AEPMMs to address a vapor intrusion pathway to achieve a Permanent Solution, more MassDEP audits will likely be conducted to assess AEPMM compliance. Vapor intrusion cuts across many other response action areas, including nature and extent evaluation, risk characterization, application of remedial additives, and requirements for Temporary and Permanent Solutions. Accordingly, it is important that LSPs stay up to date and understand the latest regulations and guidance and how they relate to the vapor intrusion pathway. Furthermore, MassDEP's VI Guidance can be useful when considering sampling needs related to a potential VI pathway and what reporting limits should be achieved when collecting these samples.