

Vapor Intrusion: Something New for Delaware Brownfield Developers to Think About

Vapor intrusion, a relatively new concept, refers to the migration of volatile chemicals from the subsurface into overlying buildings. Volatile contaminants that exist in soil and groundwater can emit vapors that may migrate upward through unprotected building floor slabs and adversely affect the indoor air quality, in turn causing a risk to human health. Naturally, “vapor intrusion” is a term receiving increased attention from developers, environmental consultants, and government agencies involved in the Brownfield industry, where under-utilized land tainted from industrial or commercial use is cleaned up and redeveloped. A vapor barrier system, which is installed below the foundation slab of a building, has become an important and effective counter measure to combat the vapor intrusion risk.

Major volatile chemical contaminants associated with the need of a vapor barrier include volatile organic compounds, such as Tetrachloroethylene (PCE) and Trichloroethylene (TCE) which are used as industrial degreasers and dry cleaning agents. Chronic exposure to PCE or TCE has been shown to cause damage to the liver, the kidneys and the central nervous system. It may also lead to increased risk of cancer. Other contaminants such as petroleum hydrocarbons can also pose a risk.

As more attention is brought to this matter, government agencies are starting to take notice. Last March, the Delaware Department of Natural Resources & Environmental Control – Site Investigation and Restoration Branch (DNREC-SIRB) implemented a new Vapor Intrusion Policy affecting the investigation and remediation of Brownfield sites in Delaware. Part of the policy requires property owners to evaluate if vapor intrusion could present a risk, to conduct a vapor intrusion investigation if necessary, and furthermore, if needed, install of a vapor barrier system.

There are a variety of vapor membrane systems on the market; one type consists of a spray-applied membrane layer installed above a subsurface passive venting system. The membrane, once applied, solidifies into a rubber-like material, sealing foundation penetrations with great efficiency. Some of the major manufacturers of the spray-applied vapor barrier include CETCO Liquid Boot, Epro Services, and Land Science Technologies.

To prevent gas build-up, these systems include passive ventilation conduits located directly beneath the vapor barrier membrane, which connect to riser pipes that are installed up through the building and vent out on the roof. This is the same idea used for radon mitigation beneath a basement. The vapor barriers are polymer modified asphaltic membranes usually sandwiched between two geotextile fabrics. The membrane and geotextile fabrics are placed on top of the ventilation conduits on sub-slab stone grade directly beneath the concrete foundation slabs to be poured.

BrightFields, Inc. has had the opportunity to work on vapor barrier installations on Brownfield sites in Delaware. BrightFields has assisted in the designs, conducted oversight of the installations, and is in the process of completing the first vapor barrier installation report for DNREC. Furthermore, we are an approved applicator of Liquid Boot[®] brand vapor barrier. In the past year, there has been a noticeable upswing in the interest in vapor barrier installation, new vapor barrier products on the market, and new government policies. The bottom line is that vapor intrusion is a new issue that is here to stay, and has to be addressed when looking at all new Brownfield sites. At BrightFields, we plan on staying ahead of the learning curve.

Craig Olsen is an Environmental Analyst for BrightFields, Inc., a full-service environmental consulting and remediation services firm based in Wilmington, DE