Brownfield Award Winning Vapor Intrusion/Mitigation Site

Medical Supply Warehouse
Detroit, Michigan

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Vapor Intrusion Mitigation

What is Vapor Intrusion Mitigation (VIM)?
Vapor Intrusion Mitigation

Why Mitigate?

• Identified VI risk at site
• VI standards constantly evolving
• Avoid further investigation and evaluation
• Remediation alone may not eliminate VI risk
• Commence construction sooner
• Mitigation cost is low compared to relative property value
• Protect client’s investment and avoid future liability
Pre-emptive vapor intrusion mitigation is often implemented at sites in which even a low potential exists for vapor intrusion

• Gaining traction with regulators, financial (lending) institutes, and larger corporations
• Reduces liability concerns
• Overall protective of property
**Potential for VI on a Brownfield Site?**

• VI or the potential for VI on Brownfield Redevelopment Sites is quite common;

• Designing the appropriate approach to address the VI situation is crucial to the development both from an environmental and a budget aspect.
Award Winning VI Brownfield Site

Medical Supply Warehouse – Detroit, Michigan

- CVOC, Petroleum, and mercury VI risk
- 275,000 sq. ft.
- Sub-slab passive venting and VI barrier system
- Award winning
Medical Supply Warehouse

Location: Southeast Michigan

Site Conditions:

• 98 separate parcel (6 city blocks) acquisition and merger, many with existing or potential for existing environmental concerns, including VI.

• Numerous investigations identified CVOC and petroleum with multiple source areas.

• Concentrations of CVOCs, Petroleum VOCs and mercury above VI screening levels.

• Michigan Department of Environmental Quality (MDEQ) Brownfield Site

• 275,000 sq. ft. Medical Supply Warehouse
Brownfield Redevelopment

Multifaceted Site

• Parcel acquisitions and mergers, many with existing or potential for existing environmental concerns

• Significant demolition, including residential and commercial buildings, underground storage tank (UST) removals, numerous road abandonments and reclassifications

• 2/3’s of the site had been occupied by industrial use at some point, which included railyard areas, spurs, tunnels, pits, and vaults

• Numerous “source areas” identified petroleum and chlorinated volatile organic compounds (VOCs) within soil and soil vapor.
Brownfield Redevelopment

Forward Progression

• Despite the numerous reasons to negate redevelopment of these parcels, based on the location and proximity to local hospitals and other city components, the Fortune 500 company moved forward with their project.

• Innovative partnership between many “Players”

• MDEQ $1 Million grant

• $1.5 Million loan

• Detroit/Wayne County Port Authority provided a $915,000 loan
Vapor Intrusion Mitigation System Evaluation

Environmental consultant evaluated multiple VIM systems and approaches including:

- Active venting
- Building pressurization
- and passive VI barrier system

Based on overall cost, schedule and effectiveness of the VIM approaches listed above, the environmental consultant and MDEQ reviewed and approved the installation of a passive VI barrier system.
Vapor Intrusion Mitigation

• Passive ventilation system that included sub-slab venting, vent risers, and testing ports was identified as most cost effective and appropriate for site
  • Use of MDEQ Brownfield funding’s required “Buy in” by MDEQ on remediation and mitigation proposed
    • Sensitive receptor (medical building)
    • Cost analysis of mitigation
    • Need for VIM based on VOCs sporadic across the site with multiple sources areas.

• Contaminant vapor barrier across the entire building footprint

• VIM System Work Plan submitted to MDEQ for approval
Vapor Intrusion Mitigation

Geo-Seal® Bond (HDPE)
Geo-Seal® Core (Spray Applied)
Geo-Seal® Base (HDPE)
Geo-Seal® Vapor Vent System
Vapor Barrier Thickness

<table>
<thead>
<tr>
<th>Agency</th>
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<tr>
<td>United States Environmental Protection Agency</td>
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Vapor Intrusion Mitigation

Vapor Mitigation System Design

- Passive ventilation system includes sub-slab vents, vent risers, and test ports
- Vapor barrier across entire footprint
- Work Plan detailing design submitted to MDEQ for approval
- Bidding process
  - Received bids from multiple certified installation contractors
  - Review and approval of bids were confirmed with MDEQ
  - Geo-Seal™, product of Land Science Technologies, was proposed by lowest bid contractor (MTN, Inc. – Littleton, Colorado)
Vapor Intrusion Mitigation
Vapor Intrusion Mitigation
Smoke Testing
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Vapor Intrusion Mitigation
Vapor Intrusion Mitigation

• Recognized successful VI Brownfield Site
• Multiple Brownfield Awards
Conclusion

With an innovative and determined approach successful Brownfield Redevelopment can revitalize once blighted areas.