We make the path clearer

Vapor Intrusion Services
We make the path clearer through our:

- Unparalleled Experts
- Bench Strength and Range of Capabilities
- Site Investigation and Characterization Services
- Mitigation Design and Installation Expertise
- Due Diligence Experience
Our Experts
Our world-renowned vapor intrusion experts are your best asset

Our experts continually sharpen their craft through research, teaching, authoring peer-reviewed journal articles, and shaping regulatory guidance. In the last 5 years alone they have taught thousands of people through courses given in the public and private sector.

Litigation support
Our experts have provided testimony and support on dozens of vapor intrusion cases, including major class actions, multi-party suits, cost allocation and recovery, and other matters.
- History and state of VI practice
- Clear explanations of the VI pathway
- Lateral extent of VI beyond sources
- Discerning background sources from VI
- Standard of care during VI investigations
- Standard of care during VI mitigation
- Reasonable costs of investigation and mitigation

We lead the field in applied research
With our academic and government partners in the U.S. and Canada, Geosyntec expanded the VI toolbox with peer-reviewed breakthroughs in the laboratory and field:
- Passive quantitative samplers
- Mass flux evaluation
- Advanced mitigation techniques
- High volume soil gas sampling
- Influence of seasonal variability
- Background forensic techniques
- Influence of preferential pathways
- Passive mitigation systems

Credibility
When it comes to vapor intrusion, our experts wrote the book – from the Johnson & Ettinger model to lead authors of EPA and ITRC guidance, OSWER technical guidance, ASTM standards, and hundreds of groundbreaking papers and presentations.

Our experts helped develop, and were also invited reviewers of, many state and industry guidance documents, including New Jersey DEP, California DTSC, EPRI, DoD, and many others.

With this knowledge and insight, we provide clients with:
- Rapid and clear understanding of site conditions
- Credibility with regulators and stakeholders
- Creative, cost-effective solutions
- Finding solutions outside the box
- Strong expert testimony

Ravi Arulanantham, Ph.D.
A toxicologist with more than 25 years of experience, he is one of the primary authors of California’s Low-Threat Petroleum Case Closure Policy, which provides a process for evaluating vapor intrusion assessments of petroleum release sites.

Helen Dawson, Ph.D.
A recognized leader in vapor intrusion, she was the primary author of the U.S. EPA’s Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils in 2002 and architect of the EPA’s VI database and other guidance for the Superfund program.

Robert Ettinger
With more than 25 years of professional experience focused on the fate and transport of contaminants in the unsaturated zone and human health risk assessments, he is co-author of the Johnson and Ettinger (1991) algorithm for evaluating subsurface contaminant vapor intrusion to indoor air, which is widely cited by many environmental regulatory programs and industry practitioners.

David Folkes, P.E.
The nation’s preeminent expert in VI mitigation; the architect of groundbreaking investigations at one of the first and largest VI sites in the US; contributor to EPA, state, and industry VI guidance; expert witness on over a dozen VI cases; and experience at more than 150 VI sites in North America, Europe, South America, and Australasia.

Todd McAlary, Ph.D., P.Eng., P.G.
Co-author of the first USEPA guidance on vapor intrusion in 2001, he has been a member of the USEPA Expert Panel since 2000, a primary researcher for U.S. Federal research projects on passive sampling, high volume sampling, and building mitigation system optimization, and a principal investigator for hundreds of site assessments since 1992.

Our practitioners have authored more than 100 scientific, regulatory, and guidance documents related to VI.
The Geosyntec Difference

We have solutions wherever you operate

The deepest bench strength in the business

Geosyntec has more highly experienced vapor intrusion practitioners than any other consulting firm in the world. We have created a center of excellence that draws the best and brightest minds to provide the best service available. Our staff are geographically distributed throughout our offices, but function as one coherent team within the firm. We will always provide the right person for the job, and we can handle accelerated schedules by increasing project staff allocation better than any other firm.

The widest range of capabilities

- VI Risk Management
  - Portfolio Audits for Vapor Intrusion
  - Due Diligence for Property Transactions
  - Risk Assessment
  - Screening Level Development
  - Stakeholder Communications
  - Regulatory Negotiations

- Focused Groundwater and Soil Vapor Investigations
  - Define and Limit VI Investigation Areas
  - Screen Out Buildings
  - Address Preferential Pathway Concerns

- Indoor Air and Sub-Slab Vapor Testing
  - Accurate and Defensible Testing
  - Passive Sampling and Building Pressure Cycling to Manage Temporal Variability
  - High Volume Sampling to Manage Spatial Variability

- Identification of Background Sources
  - Building Surveys
  - Comparisons to Typical Background Levels
  - On-Site GCMS Analysis of Indoor Sources
  - Fingerprint Analyses Using Compound Ratios and Isotopes

- VI Management Strategies
  - Site Development to Minimize VI Potential
  - Institutional Controls
  - Optimized Active Mitigation Systems
  - Combining Site Remediation and VI Mitigation
  - Passive & Sustainable Mitigation Systems
  - O&M and Exit Strategies

- Litigation Support
  - Expert Witness Testimony
  - Consulting Expert Support

Unparalleled experience

Our international VI projects include sites in Australia, Belgium, Brazil, Canada, France, Italy, Malaysia, Mexico, Sweden, and the United Kingdom.

Geosyntec has worked on several hundred VI projects around the world, including evaluation and mitigation of VI impacts from VOCs, methane, and radon at:
- Industrial business parks
- Former oil refinery sites
- Residential neighborhoods
- Commercial buildings
- Dry cleaner sites
- Military facilities
- Schools and public buildings

Geosyntec’s North American vapor intrusion projects

![Map of North American vapor intrusion projects](image)
Site Characterization
We do it right the first time

Geosyntec’s experts have resolved some of the largest and most politically-charged vapor intrusion projects in the U.S.

Soil vapor and indoor air testing may seem simple…
…but doing it correctly and accurately requires skill and experience

Our experts help you:
- Choose the right tests to meet your objectives
- Collect accurate and representative data
- Avoid mistaking background sources for VI
- Rapidly pinpoint any real VI sources
- Identify all of your management options

Vapor intrusion or background?
With the potential for human health concerns, answers cannot wait. Our techniques and forensic tools provide you with rigorous, defensible data as quickly as possible:
- High volume soil gas sampling
- Building pressurization cycling
- Real-time field tests (e.g., HAPSITE, mobile labs)
- Compound-specific isotope and molecular analysis to help distinguish the source
- Sub-slab sampling
- Passive indoor air and soil vapor tests, with tools like the Waterloo Membrane Sampler™

Public relations and stakeholder confidence
Investors and occupants have reason to worry when a building is shut down for an investigation – they want to know your plan. When your plan involves Geosyntec, you have a world-class expert with an unparalleled track record for credibility, site closure, community outreach, and regulatory advocacy.

We invent tools for faster, cost-effective assessment
Our practitioners are at the forefront of applied research and development of 3-D model capabilities to simulate the VI pathway with mitigation features added using Computational Fluid Dynamics (CFD). This kind of sophisticated modeling has never been done for mitigation before.

We can help you investigate VI threats for any scenario:
- Phase II ESAs for real estate transactions
- Voluntary cleanup site investigations at Brownfield sites
- Superfund and RCRA facility investigations
- Response to five-year remedy reviews
- Third-party claims
- Spill responses
We have more experience than any other firm designing and installing green, highly effective, and low cost Cupolex® aerated floors across the U.S.

The most efficient, innovative, green technologies on the market

The makers of Cupolex® asked us to help them develop design procedures and pioneer the use of passive and active VI mitigation systems using their 100% recycled plastic forms. This passive mitigation solution creates a continuous void space below concrete floor slabs – an aerated floor that provides better venting at lower cost than traditional systems.

From coast to coast, we lead the industry with the most Cupolex® aerated floor systems designed, installed, and operating efficiently.

Reduce disruption to facility operations

Using our advanced building characterization techniques, Geosyntec can collect mitigation system design criteria while minimizing interruptions to facility operations. We can assess areas under the slab where access is restricted by machinery or current use. Our designs result in fewer site visits, less construction material, and less effort for operation and maintenance.

Include world class experts on your team

Our internationally recognized experts lead the field in mitigation design, including:

- Mitigation projects on five continents
- Instructors for ITRC VI training programs, including the mitigation section
- Co-authors of ITRC VI and petroleum VI guidance documents
- Leaders in sustainable mitigation system R&D, including multiple ESTCP awards to create guidance

We have more experience than any other firm designing and installing green, highly effective, and low cost Cupolex® aerated floors across the U.S.

Vapor Intrusion Management
Mitigation Design and Installation
Mitigation, site remediation, institutional controls

Thinking beyond standard mitigation systems

With thousands of commercial, industrial, and residential buildings mitigated by our experts within the last 20 years, we know where to find cost saving opportunities while maintaining or improving system effectiveness.

- We use new technologies and passive systems to reduce operating costs, and we offer real time system monitoring
- When mitigation is necessary, we use focused designs to minimize the system footprint and energy use, reduce iterative system testing, and lower overall life cycle costs
- There are creative ways to redevelop sites, including administrative controls that reduce or eliminate the need for mitigation, and advanced technologies like aerated flooring

Lower cost solution, higher returns – we clear the way

At the 250,000-square-foot Campus for Jewish Life in Palo Alto, California, Geosyntec experts designed and built a passive sub-slab depressurization system. The site has high levels of VOCs in soil gas and groundwater, but the system we designed has operated effectively to eliminate the vapor intrusion pathway for 8 years running.

We have more experience than any other firm designing and installing green, highly effective, and low cost Cupolex® aerated floors across the U.S.

Services

- One stop for evaluation of vapor control options, including remediation, mitigation, and institutional controls
- Diagnostic testing to improve design efficiency and effectiveness
- Expert design and installation of sub-slab depressurization, sub-slab venting, and other systems
- Ongoing system operation, maintenance, and monitoring

 protects human health
Meeting Due Diligence Needs

Management of vapor intrusion issues during a fast-paced property transaction requires a partner who understands remediation, mitigation, institutional controls, regulatory compliance, and risk communication.

Vapor intrusion is not for beginners

Avoid missing a VI concern, or over-stating the VI risk when it really isn’t a problem. Even when VI risks are present, we can help you identify practical solutions at reasonable cost – so the deal can still go through.

Your property transaction cannot wait 180 days for seasonal sampling

We have strategies to perform assessments in days, rather than weeks or months:
- Apply a wide range of advanced tools
- Use strategic approaches to delineate risk
- Quickly develop and oversee remedial measures to mitigate risk

I commend Geosyntec’s excellent work at our former manufacturing facility. Geosyntec managed the remediation of the site, which was technically challenging because of infrastructure constraints, multiple chemicals, complex controls for mitigating potential worker exposures, and innovative technologies. Equally important, Geosyntec was very professional during our recent sale of the factory and represented our interests very well in meetings with the purchaser, and their environmental consultants and lawyers.

– Robert Burgholzer Jr., The Gillette Company

There is no “one size fits all” for large-scale, time critical transactions

Our vapor intrusion practitioners can help you design customized and comprehensive due diligence programs for large- and multi-location mergers, acquisitions, and divestitures; develop “cost to cure” assessments for environmentally impaired properties; and provide expert witness and litigation support for cost recovery actions associated with mergers, divestitures, and acquisitions.

Our clients include developers, owners, investors, and insurance companies who rely on our combined understanding of complex vapor intrusion mitigation and risk management.

VI issues can impact sales prices, insurability, and the ability to obtain loans. Geosyntec can guide you through:

- ASTM 2600 vapor encroachment assessments
- ASTM E1527 Phase I Environmental Site Assessments, including the potential for VI to be a recognized environmental condition
- Multiple site assessments during the merger/acquisition due diligence process

Clear strategies, clear solutions

- Specialized testing to confirm or rule out VI potential
- Realistic testing and mitigation cost estimates for escrow accounts
- Rapid preemptive mitigation
Geosyntec is a specialized consulting and engineering firm helping private and public sector clients address their new ventures, complex problems, and vital studies involving our environment, natural resources, and civil and industrial infrastructure.

geosyntec.com
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