Effectively clean-up your site with an automated treatment system that continuously removes and treats contaminants. Treatment systems can be tailored to meet site-specific geological and socioeconomic constraints which makes them a practicable option for a wide range of contamination challenges.

**Systems combine various activities:**
- Extraction and treatment of groundwater
- Extraction and treatment of vapours
- Extraction and separation of NAPL
- In-situ thermal treatment
- Air Sparging and bioventing

**Benefits of Treatment Systems:**
- Cost-effective contaminant mass removal
- Continuous 24/7 automated operation
- Contaminant plume hydraulic control and reduction
- Vapour protection for sensitive receptors
- Remote telemetry monitoring

Remediate your site intelligently by asking Vertex if a treatment system is right for you!

Recognized as Canada’s leading environmental remediation specialists, Vertex installs, permits and operates in-situ treatment systems including multi-phase extraction, soil vapour extraction, pump and treat, skimmers and thermal treatment systems.

Vertex’s treatment system experts combine the latest innovative techniques with unmatched field knowledge to provide clients with cost-effective systems to meet remediation needs.
Multi-Phase Extraction (MPE) was named for its ability to simultaneously extract and treat multiple phases: contaminated vapours, groundwater and non-aqueous phase liquids (NAPL).

Installation requires an extraction well network and an above-ground treatment system. The contaminated soil vapours, groundwater and NAPL are extracted from the subsurface and transferred to the treatment system. Following phase separation, the vapours are treated and safely vented to the air, the liquids are treated and discharged to ground surface or sewer, and the NAPL is stored for off-site disposal.

Treatment systems are fully automated for 24/7 operation and can be equipped with telemetry alarms and online operation capabilities. Vertex has multiple mobile permits for operation of MPE systems in Ontario.

**Compounds Treated:**
- BTEX and Petroleum Hydrocarbons
- Volatile Organic Compounds (VOCs)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Phenols and Phthalates

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**Technology Snapshot:**

<table>
<thead>
<tr>
<th>Primary Use</th>
<th>NAPL Removal, dissolved and vapour phase treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airflow Range</td>
<td>50 to 500 CFM</td>
</tr>
<tr>
<td>Liquid Flow Range</td>
<td>1 to 30 LPM</td>
</tr>
<tr>
<td>Extraction Wells</td>
<td>1 to 50</td>
</tr>
<tr>
<td>Options</td>
<td>Telemetry remote monitoring, CATOX air treatment, NAPL recycling</td>
</tr>
<tr>
<td>Permitting</td>
<td>Vertex Mobile ECAs, Sewer Discharge Permitting</td>
</tr>
</tbody>
</table>

Below the Surface  
Beyond the Science  
519.653.8444  
www.vertexenvironmental.ca
Soil Vapour Extraction (SVE) is an approach where soil vapours are extracted and treated on-site prior to discharge to the natural environment.

Installation requires an extraction well network and an above-ground treatment system. The contaminated soil vapours are extracted from the subsurface and transferred to the above-ground system which uses various techniques (such as media adsorption or catalytic oxidation) to treat the contaminants to meet applicable standards. The treated vapours are then discharged into the atmosphere under Vertex’s mobile regulatory permits.

### Compounds Treated:
- Volatile Organic Compounds (VOCs)
- BTEX and some Petroleum Hydrocarbons

### Technology Snapshot:

<table>
<thead>
<tr>
<th>Primary Use</th>
<th>Soil vapour treatment or vapour intrusion control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Airflow Range</td>
<td>10 to 500 CFM</td>
</tr>
<tr>
<td>Extraction Wells</td>
<td>1 to 50</td>
</tr>
<tr>
<td>Options</td>
<td>Telemetry remote monitoring, CATOX air treatment</td>
</tr>
<tr>
<td>Permitting</td>
<td>Vertex Mobile ECAs</td>
</tr>
</tbody>
</table>

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Vertex's treatment system experts combine the latest innovative techniques with unmatched field knowledge to provide clients with cost-effective systems to meet remediation needs.
Pump & Treat (P&T) is an approach where pumps are used to extract groundwater and NAPL from extraction wells or an open excavation.

Extraction pumps are installed in existing wells or an open excavation, and then liquids are pumped to the above-ground P&T system which separates groundwater from NAPL. The groundwater is treated using various techniques and discharged into a sewer or the natural environment, and the NAPL is disposed of off-site; all under Vertex's mobile regulatory permits.

P&T systems are ideal for short-term excavation dewatering or long-term groundwater plume hydraulic containment and treatment.

**Compounds Treated:**
- BTEX and Petroleum Hydrocarbons
- Volatile Organic Compounds (VOCs)
- Polycyclic Aromatic Hydrocarbons (PAHs)
- Phenols and Phthalates
- Dissolved Metals

**Technology Snapshot:**

<table>
<thead>
<tr>
<th>Primary Use</th>
<th>Excavation dewatering or plume hydraulic containment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical Liquid Flow</td>
<td>10 to 500 LPM</td>
</tr>
<tr>
<td>Extraction Wells</td>
<td>1 to 20</td>
</tr>
<tr>
<td>Options</td>
<td>Telemetry remote monitoring, Air stripper treatment</td>
</tr>
<tr>
<td>Permitting</td>
<td>Vertex Mobile ECAs, Sewer Discharge Permitting</td>
</tr>
</tbody>
</table>

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Vertex's treatment system experts combine the latest innovative techniques with unmatched field knowledge to provide clients with cost-effective systems to meet remediation needs.