

QUALIFICATIONS



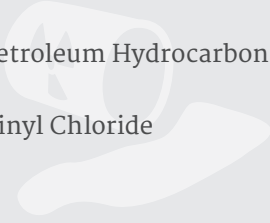
AIR SPARGING & BIOSPARGING



EXPERIENCE

InSitu Remediation Services Ltd (IRSL) is one of Canada’s most experienced firms in the design, implementation, operation, and optimization, of Air & BioSparging programs for the treatment of contaminated soil and groundwater.

WE HAVE DIRECT EXPERIENCE WITH THE FOLLOWING:

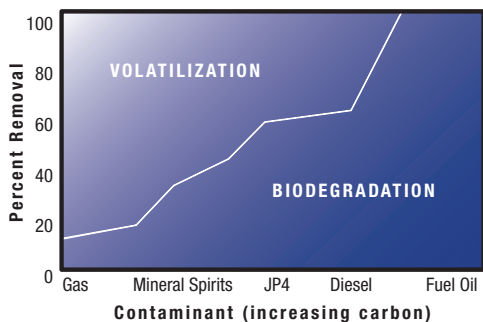
GEOLOGY ADDRESSED	TREATMENT TRAINS USED	CONTAMINATES MITIGATED
<ul style="list-style-type: none"> Alluvial Deposits Fill Materials Fluvial Deposits Glacial Till 	<ul style="list-style-type: none"> Air Carbon Dioxide Hydrogen Oxygen Ozone 	<ul style="list-style-type: none"> Benzene, Toluene, Ethylbenzene & Xylenes Volatile Organic Compounds (VOCs) Chlorinated Ethenes (including PCE & TCE) Chlorinated Ethanes (including TCA) Petroleum Hydrocarbons Vinyl Chloride 



Approach

Air Sparging is the process of blowing a gas, such as oxygen, air, etc., directly into the groundwater. As the bubbles rise, the contaminants are separated from the groundwater by physical contact with the air (i.e., stripping) and carried up into the unsaturated zone, where they are often removed via Soil Vapour Extraction. Depending on the gas injected, enhanced biodegradation can also occur.

We've built our solid reputation based on our proven ability to confidently innovate and deliver technically superior, cost-effective solutions that work better—on time and on budget.



Considerations

Comprehensive Understanding of Site Hydrogeology, Geology & Geochemistry

Effective air sparging and biosparging systems require a comprehensive understanding of the constraints of the site's hydrogeology and geochemistry to ensure effective treatment and removal. Geochemical factors, such as the presence of dissolved iron, can cause significant issues for injection wells, as well as affecting the pH of the groundwater due to oxidation reactions.

Careful Monitoring & Optimization

Air sparging and biosparging systems require careful evaluation to ensure that the process is optimized and not creating preferential or unforeseen pathways for contaminant-laden vapour. Continual monitoring and adjustments of air flow and pressures at individual well points can lead to superior contaminant removal rates in less time.

Effectiveness

Air and biosparging is most effective for contaminants with higher Henry's Law constants, such as benzene, toluene, ethylbenzene and xylenes, TCE and PCE. However it can be used to target less-volatile compounds by enhancing the biodegradation of the compounds.

IRSL has the tools, knowledge, and experience, to complete the analytical, numerical, and field studies, necessary to effectively choose the right approach and optimize remediation throughout your project.



InSitu Remediation Services Ltd. (IRSL) is one of Canada's most experienced remediation companies. Our team has designed, implemented, and optimized soil and groundwater remediation programs in diverse geological environments in North, Central, and South America, Asia, Europe and the Middle East.

We confidently implement innovative solutions, based on sound knowledge, using seasoned field staff. Our pragmatic, flexible approach reduces effort, cost to our clients, and environmental risk.