



## CASE STUDY

# Removal of LNAPL, Sao Paulo, Sao Paulo



## Background

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<b>DURATION:</b>	8 months
<b>LOCATION:</b>	Sao Paulo, Brazil
<b>CLIENT:</b>	Gas Station
<b>PROJECT VALUE:</b>	485,000 reals

At an active gasoline retail station in Sao Paulo, historical spills of gasoline resulted in the accumulation of light non aqueous phase liquids (LNAPL) on the shallow groundwater. Based on API estimates, approximately 800 litres of recoverable LNAPL was present. ASR was retained by the facility's owner to extract the LNAPL. ASR developed a remedial plan that minimized the system's footprint while also minimizing energy requirements and generation of noise.

## Approach

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The site owner along with their environmental consultant worked with ASR to develop a remedial work plan based on meeting the remedial objective of recovering as much of the LNAPL as technically feasible. After reviewing the geology, hydrogeology and geochemistry of the site, ASR developed a plan that used multiphase extraction (MPE) to recover the LNAPL. The MPE system recovered over 92% of the estimated LNAPL using extraction of groundwater, LNAPL and vapor. The liquid phases were treated with gravity separation, organoclay and activated carbon whereas the air phase was treated using catalytic oxidation.

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.



## Challenges

A number of conditions at the site made this project challenging including:

- Heterogenetic aquifer
- Underground infrastructure including piping and USTs
- Active site
- Traffic and pedestrians
- Noise concern

## Results

The results of the remedial program included:

- Over 725 litres of LNAPL recovered in the air, NAPL and water phases
- Reduction of BTEX concentrations within the groundwater of greater than 78 percent
- Reduction of gasoline range concentrations greater than 61 percent
- Injection program completed on budget and on schedule

