



## CASE STUDY

# GASOLINE IN EASTERN SAUDI ARABIA

## Background

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**CLIENT:** Saudi Arabian Environmental Consulting Firm, on behalf of a major Oil & Gas Company

**DURATION:** 1 year

**LOCATION:** Eastern Saudi Arabia

**PROJECT VALUE:** \$175,000 CDN

At an active bulk fuel facility located in a highly developed urban area in eastern Saudi Arabia, historical spills and leaks had resulted in up to 2.0 metres of gasoline floating on the water table. The site and geographic location required a flexible, discrete solution with no outside energy requirements that could withstand the extreme climactic conditions without interfering with the facility's operations or the surrounding urban population.

## Approach

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A local environmental consulting firm characterized the site and completed initial sampling. On behalf of the oil & gas company, the firm tendered an initial pilot project to three companies for bid. IRSL earned the pilot project based on their price and innovative approach.

### SOLAR-POWERED PNEUMATIC SKIMMING

To meet the challenges associated with this site, IRSL recommended extracting the LNAPL (Light Non-Aqueous Phase Liquid) through solar-powered pneumatic skimmers. All power requirements would be met through the solar panels.

For the duration of the project, a full-time engineer remained on-site to continuously adjust and optimize the system.



**GEOLOGY:** Unconfined aquifer,  
Silty sand

### APPLIED TECHNOLOGIES

Free product removal was completed through extraction wells instrumented with pneumatic skimmers equipped with hydrophobic filters. The filters allowed only the LNAPL through, leaving the water behind.

### THE SYSTEM

This system system was flexible enough to fulfill a number of important criteria:

- Little infrastructure, and no outside power requirements, causing minimal disruption.
- Minimal equipment to be transported to the site and minimal maintenance on-site.
- The skimmers were portable enough to be easily moved and optimized.
- The efficiency of the filtration negated the need for a treatment system.

## Challenges

A number of conditions made this project exceptionally challenging:

- Located at a facility in a highly developed urban area, it required a small ecological footprint, both actually and perceptually.
- Maintaining project effectiveness required continuous, proactive optimization with regard to cycle length and numbers, as well as skimmer position.
- The location necessitated minimal and low-maintenance equipment as the equipment, and its replacement parts, had to be transported from North America.
- The extreme climatic conditions required uncomplicated equipment that could withstand very high temperatures, humidity, corrosion, and dust.
- The active bulk fuel facility’s rigorous health and safety regulations required all equipment to be explosion-proof and highly secured.

## Results

- Over 3,200 litres of gasoline were removed over the course of the project.
- The extracted liquid was greater than 99.99% gasoline, minimizing the need to treat extraneous water and translating into real cost savings for the client.
- The pilot project was deemed a complete success, initiating plans for several full-scale projects.



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