

Sundine Enterprises Strategic Partner

Foremost Environmental Solutions



Office: 303.985.0609

Cell: 720.363.0548

[www.foremostsolutions.com](http://www.foremostsolutions.com)

[isolite@ix.netcom.com](mailto:isolite@ix.netcom.com)

## Retail Dry Cleaner Business – Norcross, GA

### Project Name:

Pilot Project at Shopping Center Site in Norcross, Georgia. Installed with teaming partners Pelorus EnBiotech and ESN Rocky Mtn., May, 2005

### System Type:

Anaerobic Bioreactive System to Degrade Chlorinated Solvents

### Client:

Peachtree Environmental, Inc.

### X-PeRT™ Design:

Biostimulation of identified indigenous degrading microbes identified to be capable of degrading chlorinated solvents from a Dry Cleaning business (PCE and its daughter products, TCE, DCE and VC). In May 2005, the Foremost team installed 5 BioNets™ with a total of 16 BioLuxes™ between 16.5 and 50 feet below ground surface.

### Project Description:

The design of an in situ treatment system was based on site data. This project was especially challenging because the site conditions were difficult and unusual. Data provided were incomplete and/or contradictory. Of the 16 fractures (BioLuxes™) attempted, four fractures did not take the designed fluids due to lithology or mechanical difficulties that were encountered. However, the extra nutrient-treated Isolite® CG proppant materials from incomplete or partial fractures were injected into the fractures that were accepting more fluids and solids. Some fractures received two to three times the design volumes. Although BioNets 01, 02 and 03 did not end up with the number of BioLuxes™ that were designed, each BioNet™ received at least 77% of the treated slurry that was designed for the individual BioNet™, and collectively all the BioNets were injected with 98.25% of the total amount designed for the treatment area and at desired depths.

Typically, BioNets™ are over-designed if all slurry is injected into each BioLux™, knowing that field conditions usually vary from the data provided. Although the fracture design assumes a “pancake” pattern of fracturing, the advantages of BioLuxing is that hydraulic fracturing normally follows the natural paths of least resistance, as does contaminated groundwater, and the injected slurry enhances in situ bioremediation by stimulating the indigenous microbes that are near the contamination. Hence, the key to in situ biodegradation is to increase the selected microbes in contact with the contamination wherever it goes.

After installation, the monitoring was been taken over by the client. Foremost has not received any sampling data since completion of its contract but is confident that the system is working satisfactorily. The owner was pleased.

During this project, another flexibility of BioLuxing was utilized. The data initially indicated that the site was anaerobic, so the original design was to treat it anaerobically. However, the last round of testing prior to design showed that oxygen levels were rising and might adversely impact anaerobic treatment methods. Consequently, the lead microbiologist added a significant amount of chitin in the slurry to improve the geochemistry of the treatment zones and synergistically provide an additional slow-release form of nutrients to biostimulate the indigenous anaerobic microbes.

Chitin was easily mixed and simultaneously distributed during the fracturing with the proprietary nutrient-saturated Isolite® CG and sand slurry into the low permeability soils. Chitin produces concentrations of volatile fatty acids that enhance anaerobic reductive dechlorination of the COC.

## BioLuxing Case Studies

