



GO TRATCH

Team experience:

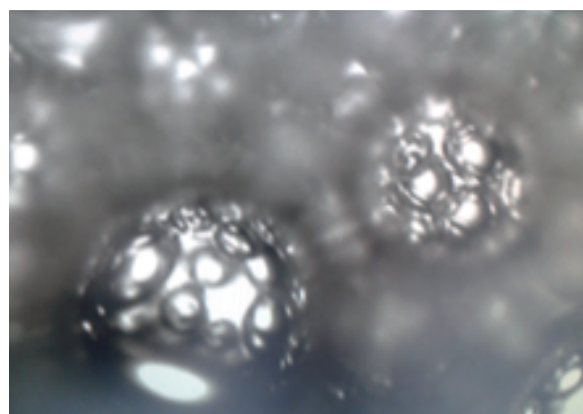
Geologists, geophysicists, engineers and biologists, more than 300 Diagnosis and Monitoring Projects developed for Petrobras and more than 200 sites recovered with Redentis/Fentox technology for in situ remediation of soil and groundwater.

Go Tratch has proprietary technology of soil and groundwater remediation by oxidation in situ, ISCO (In Situ Chemical Oxidation), using the atomized injection (REDENTIS® and FENTOX®).

The atomized remediation process consists of a number of techniques which comprise in situ production and injection of a stable mix of liquid reagents associated with a gaseous core in nanobubbles.

This technology allows for higher (exponential) dissolution rates of reagents in the mass of contaminants, greatly increasing the oxidation reaction and thus its efficiency in destruction of the mass contaminants, due to the stability of nanobubbles coupled to the exponential increase of the reaction surface of the provided by them.

In nanotechnology, sizes of the injected particles are below the smallest pores generally found in silt loam soil (about 2 microns). Thus, the injected reagent is able to access pores in very fine-grained soils, increasing its reach, even in geological environments where traditional technologies are not able to penetrate, or penetrate with difficulty.



Microscope – nanobubbles encompassing contaminant

The remediation process begins with the injection of an atomized solution of

IN SITU REMEDIATION OF SOIL AND GOUNDWATER

surfactants which, when contacting the contaminant adsorbed to the grains and/or in its free phase is able to break the surface tension, transfer the contaminants mass to its dissolved phase and create emulsions with contaminant nanoglobules. Thus, ISCO processes based on modified Fenton reaction (FENTOX®) associated with the atomizing technology and stabilization in situ, result in an efficiency surpassing conventional techniques, including in complex situations, such as remediation in clayey soils (poorly permeable horizons) and are able to ensure reaction at ambient temperature.

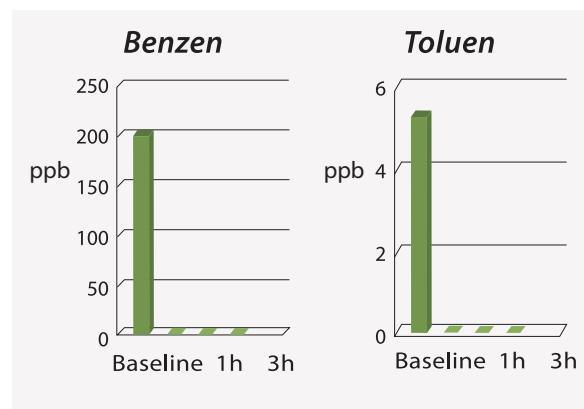


Injection - System Redentis / Fentox in Operation



NAPL (Non-Aqueous Phase Liquid) before and 7 days after Redemtis/Fentox injection

The main advantages of this process over conventional ones relate to its efficacy, its spatial radius or larger area of operation, the time of the contamination decay, the ease of deployment, since it does not require prior infrastructure and no local power for pumping - our mobile units have their own generators - apart from safety, because the process does not require an operator or assistance after injection, except in sparse events related to the collection of samples for monitoring the contamination attenuation after injection.



Before and after - example of contaminant attenuation

It is also worth noting that the application of REDENTIS®/FENTOX® does not depend on soil moisture and water level variation.

This set of factors results in a considerable reduction in the cost of remediation for the contractor.