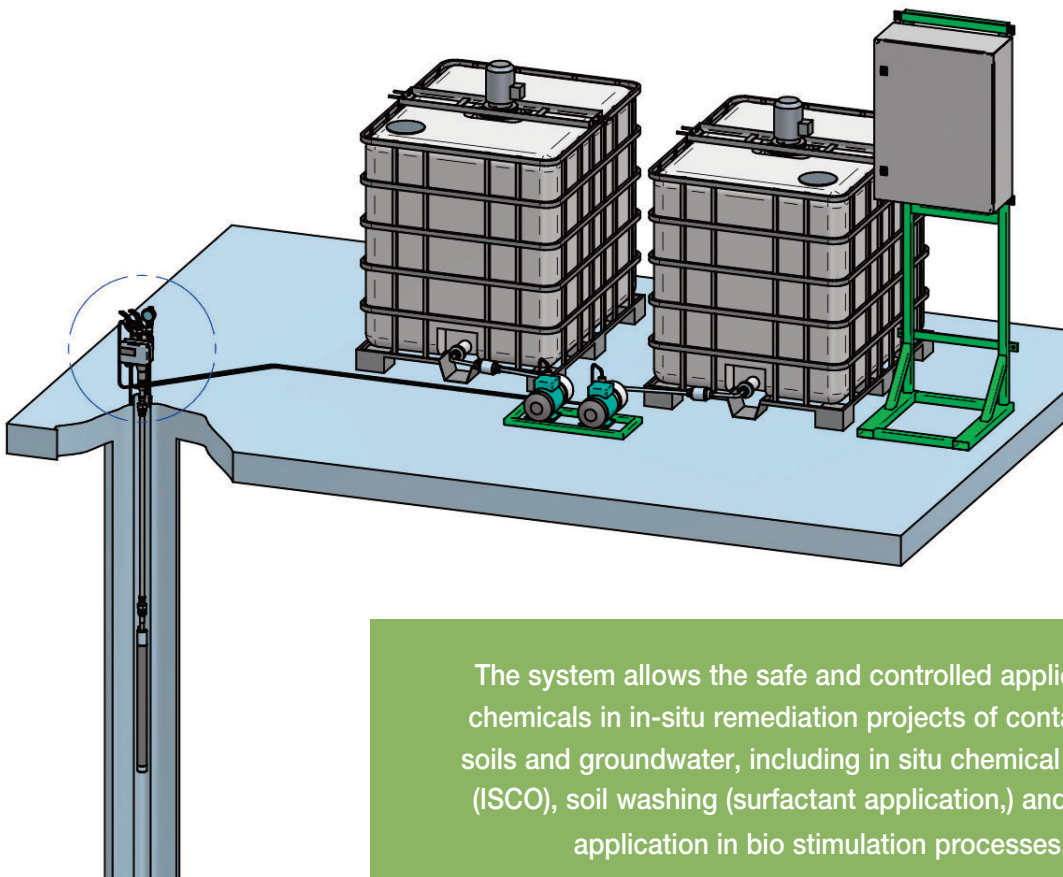




New chemical reagent injection system

Our in-situ Remediation Department, together with the Envirotechnics Technical Office, have developed a chemical reagent injection system according to the needs of our customers.



The system allows the safe and controlled application of chemicals in in-situ remediation projects of contaminated soils and groundwater, including in situ chemical oxidation (ISCO), soil washing (surfactant application,) and nutrient application in bio stimulation processes.

During In-Situ Chemical Oxidation (ISCO) projects, some parameters such as pressure and temperature must be controlled during the application, and safety measures also must be taken care during product handling.

In this case, oxidizing agents are applied underground using two different injection methodologies:

- 1) **by gravity** through the injection boreholes.
- 2) **at low pressure** (by packers) through injection boreholes, depending mainly on:
 - the thickness of the unsaturated zone
 - the type of lithology
 - the organic matter content present in the soil matrix.

"The designed system allows the application of reagents both by gravity and at low pressure".

New chemical reagent injection system

Our products

OXIDANTS

sodium
PERMANGANATE

activated sodium
PERSULFATE

combined
ISCO REAGENT

ENVIROperox

BIOESTIMULANTS

ENVIROactiv

ENVIROnutri

SURFACTANTS

ENVIROsurf

ENVIROkreosote

The injection system is equipped with sealed heads that allow the injection of different types of reagents **in a safe and controlled way, monitoring the injection flow rates as well as the injection pressure and the temperature.**

The elements in contact with the reagents are made of stainless steel, PVDF materials that are resistant to corrosive substances and strong oxidants (permanganate, percarbonate, hydrogen peroxide, etc.). The equipment is designed to facilitate the use of it by a field technician by reducing the associated chemical risks.

The injection system consists of the following elements:

- Electrical control panel. Optional portable electric generator.
- Positive displacement pump (or similar), capable of producing a flow rate of at least 80 litres per minute, with a pressure of up to 5 bar.
- Mixing and injection piping system.
- Two 1.000 litre mixing and injection tanks equipped with PVDF agitators.
- Pumps for recirculation, for dosing, and transfer of reagents from the mixing tank to the injection tank.
- Low pressure injection head connected to a pneumatic packer, equipped with two independent pipes and a mixing cell that allows the incorporation of the oxidant and the catalyst for its reaction during the injection process. The head is equipped with a pressure gauge, a temperature sensor and a set of threaded stainless-steel rods that allow the oxidant to be applied at the desired depth.

TECHNICAL TEAM

Envirotechnics has a technical team specialised in the injection of oxidizing agents (Fenton, persulfate, percarbonate, permanganate, etc.) that ensure the correct application of the reagents at industrial sites and petrol stations.

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