

In-situ chemical oxidation (ISCO) application for soil remediation

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Keywords: ISCO oxidation COHV permanganate

Chlorinated solvents (COHV) such as trichlorethylene or tetrachlorethylene (perchlorethylene) compounds are heavily used in the industry since the beginning of last century. They are mainly used in degreasing of mechanical parts, dry cleaning of textiles or in the process of manufacture of adhesives, lubricants, paints, varnishes, pesticides. Since chlorinated solvents and their degradation products are dangerous (e.g., trichloroethylene has been classified in the EU as a category 2 carcinogen (R45)), their use is increasingly regulated and controlled. However, their intensive use coupled with a random environmental management have resulted in many impacted soils and groundwater fields. Thus, an important part of the problems of contamination of the underground in France is linked to chlorinated solvents.

The problems generated by COHV can be very diverse and include the geology and hydrology of the site, the constraints related to existing structures or the immediate environment (housing, drinking water supply,...). Remediation technologies have evolved to cope with these situations. In addition to proven techniques such as pumping, sparging / venting or off-site management, new techniques have emerged such as soil mixing, the reduction by zero-valent iron, or controlled biodegradation. Among these techniques, the in-situ chemical oxidation (ISCO) has particularly attracted the stakeholders on contaminated land issues when it emerged in France.

To clarify the reasons for this enthusiasm, and especially to assess the relevance, the theoretical basis of ISCO and its positioning against other techniques will be briefly discussed. The combined experience of COLAS Environnement after implementation of ISCO on various sites will be developed, and a field study case will be detailed.