

Useful Concept of Geo-pollution to Clean Up the Brown Fields

¹Nirei H., ¹Suzuki Y., ²Kusuda T., ²Kazaoka O., and ³Iwamoto H.

¹Center for Water Environmental Studies, Ibaraki University, Itako, Ibaraki Prefecture, 331-2402 Japan; ²Research Institute of Environmental Geology, Chiba, 261-0005 Japan; ³Tecno-earth corp., 661 Mobara, Mobara, 297 Japan

Geo-pollution is a more correct term to use, considering how to reach the clean up goal of the brown field. We can show the following example of geo-pollution due to such organochlorine solvents as PCE, TCE and TCA..

Organochlorine solvent has specific gravity greater than that of water and it does not dissolve easily in water. Therefore, when the organochlorine solvent seeps into the ground, it fills the spaces between sedimentary particles by displacing ground air and ground water, covers sedimentary particles, or is absorbed by sedimentary particles. This is called “sedimentary strata pollution”. Also, a part of the organochlorine solvent contained in the contaminated sedimentary strata below the ground water level dissolves into the groundwater, and this is called “groundwater pollution”. Furthermore, since organochlorine solvent volatilizes easily, it volatilizes from the contaminated sedimentary strata above the ground water and from the surface of the contaminated ground water into ground air. This is “ground air pollution”. Geo-pollution is composed of the three types of pollution above mentioned..

A large number of the brown fields polluted by organochlorine solvents are distributed in each country, few of the fields can, however, reach the clean up goal. Because, although organochlorine solvents seeped into underground cause to make the three types of geo-pollution, it is poor to prove the mechanism of geo-pollution composing of the three types in case of the site characterization and remediation.