

PATENTED LOW-COST REMOVAL OF PETROLEUM IMPACTS IN GROUNDWATER

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Releases of petroleum products to groundwater present major risks to human health and the environment. These products are often very mobile and can remain untreated for decades until sufficient funding is available and effective remediation technologies are applied. Many petroleum-related compounds of concern, either as free product or dissolved in groundwater, are volatile enough to transfer into the gas phases. However, the phase transfer often does not occur at a sufficient rate because groundwater is not naturally exposed to ambient air or conditions that promote transfer to the gas phase. Active physical transfer of petroleum-related volatile organic compounds to the gas phase has long been recognized and applied to remove these compounds from groundwater (e.g., air sparging or soil vapor extraction). In contrast, passive physical removal of these compounds, while less expensive and easier to apply than the active process, is not currently widely used.

The EcoBox® is a patented, innovative aerobic remedial process (US 6,258,273 B1) that can be implemented as a passive removal device directly installed in an impacted zone or operated simply as an above-ground extension to an existing monitoring well or larger treatment well located in a groundwater plume. The process provides effective removal of dissolved-phase, volatile organic compounds as well as free-phase fuel products through abiotic aeration and aerobic biodegradation at a cost that is significantly less than current in-situ chemical, biological, or physical techniques. This paper presents the field installation and application results of the EcoBox® process at a diesel fuel release site in New Jersey and several other configurations with associated costs and removal rates.

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