Sustainable Remediation - More Ways Than One

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A sustainable remediation strategy was developed and implemented at a former bulk fuel plant and cardlock facility that was impacted with various hydrocarbons, including petroleum and dyed diesel fuels. The objective of the remediation system is to recover light non-aqueous phase liquids (LNAPLs) and accelerate attenuation of hydrocarbons both in situ (within the area of the trench) and ex situ (within the biopiles).

An interceptor trench was installed to capture and remediate hydrocarbons that are present in the soil and groundwater at the site. Impacted soil from the trench is treated in biopiles on the site, which have been amended with electron acceptors, and incorporated with phytoremediation and mycoremediation.

Several different sustainable methods are used to accelerate biodegradation of hydrocarbons, including aeration with a double diaphragm windmill, LNAPL skimming with a solar powered skimmer system, and dewatering and water treatment with a

solar powered submersible pump system.

Recovery of the groundwater also draws groundwater with elevated nutrients from surrounding agricultural cropland through the impacted soils in the area of the former cardlock fuel pumps, which accelerates attenuation of hydrocarbons and nitrate in the groundwater.

The treated groundwater is used to irrigate biopiles that have been seeded with alfalfa (east biopile) and oyster mushrooms (west biopile). Benzene, toluene, ethylbenzene, and xylenes in the soil in the biopiles were reduced to below detection limits, and petroleum hydrocarbon F2 and F3 were reduced by approximately 90% within the first year of operation.

Michael Lakustiak

Michael is a Partner and Principal Environmental Engineer at Trace Associates Inc. (Trace) with over 28 years of experience in environmental consulting across Western Canada. At Trace, Michael is primarily responsible for providing senior technical environmental engineering guidance on environmental site assessment (ESA), remediation, monitoring, environmental liability, and risk management projects and investigations.

Michael is committed to helping our clients achieve their commitments of continual improvement of their environmental performance and prevention of pollution to the environment through the use of innovative and cost-effective practical solutions. His in-situ remediation experience has included enhanced bioremediation, the utilization of dual- phase vacuum extraction (DPVE) technology enhanced with nutrient injection, chemical oxidation, horizontal extraction wells, and pneumatic fracturing of formations to accelerate the remediation of sites.

Alexis Harvey

Dr. Alexis Harvey, Ph.D., A.Ag., is a Senior Environmental Advisor, responsible for managing impacted sites in Saskatchewan, with Federated Co-operatives Ltd. (FCL). Alexis routinely designs and implements investigations, analyzes, and interprets environmental toxicological data. Prior to FCL, Dr. Harvey worked as an environmental risk assessor to manage and mitigate unacceptable human and ecological risks.

Andre Podevin

Andre Podevin, P.Tech. is a Senior Environmental Scientist and project manager, with Trace Associates Inc. Andre has over 12 years of experience in environmental consulting across all market sectors. Andre is responsible for providing technical guidance for environmental programs, managing project teams, conducting a variety of environmental investigations, preparing technical reports and work plans, project management, and client relations.