

Phytoremediation as an On Site Ex-Situ Remediation Option

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In fine-grained soils, in situ remediation techniques such as extraction (water, vapour, or multi-phase) or chemical oxidation can often be impractical, leaving excavation as the primary option. In the event that impacted soil is to be excavated, there are alternatives to landfill disposal as the ultimate fate of this soil.

This presentation briefly explores options for ex situ treatment of hydrocarbon-impacted soils and presents an on site phytoremediation approach. Beginning with a brief introduction to phytoremediation, the presentation then shows a case study of a successful phytoremediation project. The project is a former fuel distribution facility (cardlock and retail) in southern Manitoba. Extensive hydrocarbon impacts were present in the tank nest and pump island areas, extending down to the water table, at approximately 4 m depth, and laterally toward the site boundary. The presentation details the bench-top pilot test and subsequent field implementation. Interim and final results of the soil conditions and plant growth metrics are shown, culminating in a file closure from Manitoba Conservation. The total project took less than one year, from bench-scale work to file closure from the regulator. Additionally, employing phytoremediation eliminated the need for any decommissioning or reclamation work, dramatically reducing the “back-end” costs for this remediation project.

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Gary Millard is an Environmental Geologist for Shell Canada Products, managing assessment and remediation of downstream facilities in the prairies. Gary has more than 9 years experience in environmental assessment and remediation, including several years in consulting.

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Bruce M. Greenberg is trained as a chemist and biochemist. He is a Professor at the University of Waterloo and President of a spin-off company, Waterloo Environmental Biotechnology Inc., that specializes in innovative phytoremediation solutions. He has over 20 years of experience in environmental biology and chemistry, and more than 140 published papers.