



Site Remediation of Hydrocarbon Contaminated Soil Post- Excavation

A BioNorth Solutions Case Study

Client Problem: After years of operating, a light industrial site in Thunder Bay, Ontario had accumulated a considerable number of hydrocarbons in the soil. The site was excavated, leaving behind some contamination at the edge of the property and extending under the building. Areas with visible contamination are unable to be excavated.

Solution: BioNorth Solutions and the client determined that Microbiate SG™ should be applied post excavation, prior to backfilling and repaving, around the perimeter of the excavation site. Particular attention was paid to the areas with visible contamination. Samples of groundwater were to be tested for BTEX and PHCs on an annual basis. This evaluation would exemplify the use of bioremediation with Microbiate SG™ in concert with excavation strategies.



Analysis of Groundwater from a Site Treated with Microbiate SG™

Sample ID	Date	Benzene	Ethylbenzene	Toluene	Xylenes	F1-BTEX	F2 (C10-C16)	F3 (C16-C34)	F4 (C34-C50)
MW103	28-11-17	<0.5	<0.5	<0.5	>0.5	<25	<100	330	<250
MW103	19-10-18	<0.5	<0.5	<0.5	>0.5	<25	<100	<250	<250
MW103	11-10-19	<0.5	<0.5	<0.5	>0.5	<25	<100	<250	<250
MW103	11-09-20	<0.5	<0.5	<0.5	>0.5	<25	<100	<250	<250
MW103	28-10-21	<0.5	<0.5	1.64	1.78	<25	<100	<250	<250
MECP Table 3 Criteria		44	2300	18000	4200	750	150	500	500

The table above displays the results of groundwater sampling and subsequent analysis by ALS Laboratories. Microbiate SG™ was applied once post-excavation but prior to backfilling the contaminated site, and samples were taken and analyzed on an annual basis. Units are in micrograms per litre (µg/L).

Results: Groundwater quality is assessed based on the Ontario Ministry of the Environment, Conservation and Parks, Soil, Ground Water, and Sediment Standards (2011) (MECP) Table 3 Criteria. As shown in the above table, the concentrations of BTEX and PHCs in the groundwater samples were all below detectable laboratory levels and/or below the applicable MECP Criteria. Therefore, the concentrations in the groundwater samples are acceptable.

Contact Us:

807-344-1601

info@bionorthsolutions.com

Conclusion: Application of the Microbiate SG™ was effective at reducing hydrocarbon contamination in the soil, thereby improving downgradient groundwater quality. The concentrations of BTEX and PHCs have decreased from a measurable concentration of PHC Fraction F3 in 2017 to non-detectable levels from 2018 to 2020. Measurable concentrations of toluene and xylenes were detected in 2021, but the levels remain well below MECP criteria. In conclusion, the remediation of the contaminated soil at the site has resulted in improved downgradient groundwater quality. The site had areas that were unable to be excavated due to visible contamination; Microbiate SG™ was able to complete the remediation.

