

Evaluating the Ecotoxicity of PHC F3 in Peat Soils vs. Mineral Soils

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The Canada-Wide Standards (CWS) for Petroleum Hydrocarbons (PHCs) in Soil were developed through toxicological studies that were conducted on an artificial mineral soil composed of 70 % silica sand, 20 % kaolinite clay, and 10 % Sphagnum peat with an organic matter content of 9%. Recent toxicity tests however, suggest that earthworms may be less sensitive to the presence of PHCs in organic-rich soils as compared to mineral based artificial soils. The focus of this proposal is to evaluate the toxicity of the F3 distillate of federated crude oil in low organic content (artificial mineral soil) and high organic content (peat) soils. The F3 fraction is selected for this work based on it's abundance in both crude oil and diesel, and its slow degradation relative to lighter fractions. The chronic toxicity bioassays would include two invertebrate reproduction tests and three definitive plant growth tests. The species and endpoints used would be the same as were used to

develop the PHC CWS guidelines. The results of this study could identify the need for development of PHC CWS F3 guidelines to address high organic content soils if F3 toxicity is found to be significantly lower in peat vs. artificial mineral soil. CWS guidelines specific to organic soils could decrease the need for remediation of marginally contaminated sites.