Masters Level Research Opportunity – Joint RMC and Queens Initiative

Petroleum hydrocarbon (PHC) contamination is widespread throughout Canada, and hence remediating affected soils is an ongoing activity. We are seeking a highly motivated graduate student to undertake a research project involving the derivation of site-specific PHC guidelines for a site in Northern Ontario using native plant and invertebrate species, and to evaluate the potential of emerging technologies for more sensitive, rapid, and transferable toxicity testing. Part of the larger project involves carry out standard Environment Canada (EC) toxicity testing with two PHC-contaminated Ontario soils. The student will perform all analyses and data compilation associated with this task, allowing for the establishment of a baseline. Biomimetic methods will then be explored and validated using the site soils. Transcriptomics will be used to assess how, or if, the genomes of Folsomia candida (a springtail for which there is a custom microarray) and Picea mariana (black spruce which has about 2K genes sequenced) are affected by the Ontario site soils (and specific targeted polycyclic aromatic hydrocarbons (PAHs)). Biomimetics and genomics will help make existing standardized tests faster, more specific and more sensitive. The results of the larger project will be of significant value in the fields of environmental remediation and policy. Furthermore, this project has the potential to set a precedent in toxicity testing methodology applied across major industrial sections in Canada by providing the means to determine realistic site-specific guidelines in a cost-effective and timely manner.

Dr. Zeeb’s environmental remediation research group is located within the Department of Chemistry and Chemical Engineering at RMC. Dr. Rutter is the Director of the Analytical Services Unit at Queen’s University within the School of Environmental Studies. Students will be under the co-supervision of both professors.

Interested students should contact Dr. Barb Zeeb (zeeb-b@rmc.ca) at RMC and/or Dr. Allison Rutter (ruttera@queensu.ca) at Queens.