Gaps and Uncertainties Associated with PAH Soil Quality Guidelines in Canada and Challenges with Human and Ecological Risk Assessment

Karl Bresee, Intrinsik Corp.

Polycyclic aromatic hydrocarbons (PAHs) can be identified as components of fuels, oils, greases, used motor oil and in creosote or coal tar. PAHs are often found in soils and groundwater because of releases associated with anthropogenic activities (e.g., oil and gas, coal tar production and tarring facilities, coking plants, bitumen, and asphalt production plants). People may be exposed to PAHs in soil near areas where coal, wood, gasoline, oil, or other products have been burned or exposed, or near hazardous waste sites.

Most provinces rely on soil quality guidelines (SQGs) developed by the Canadian Council of Ministers of the Environment (CCME), although some provinces have developed different or additional guidelines for PAHs for various pathways of exposure. This has led to an inconsistent framework of SQGs across Canada with guidelines for specific PAHs and/or pathways missing in some provinces. Additionally, some prominent PAHs have SQGs that are characterized as interim and lack a technical basis for their development, are based on limited chemical-specific information, or use quantitative structure activity relationships or read-across data from other compounds, contrary to federal recommendations. Factors such as these make the interpretation of risks associated with guideline exceedances challenging for identification of chemicals of concern and risk assessment. This presentation will highlight the challenges with addressing PAH risks to human and ecological receptors and highlight some of the data gaps in PAH SQGs across Canada. The presentation will include a discussion of the parameter assumptions, conservatism and uncertainties associated with various PAH SQGs developed by the CCME and provincial departments. Finally, the presentation will also provide information on how to potentially deal these uncertainties and data gaps in a risk assessment.

Karl Bresee

Karl Bresee has 20 years of experience in conducting human health and ecological risk assessments for environmental impact assessments of the oil and gas, mining, oil upgrading and refining, and power generation industry. He has been the technical lead and project manager for contaminated site risk assessments in western Canada for the past 10 years. He has provided technical support at regulatory hearings, including research, consultation, and testimony. Karl holds a Minor in Geology, a B.Sc. in Biology, a Post Bachelor's Diploma in Ecotoxicology and is a member of the Alberta Society of Professional Biologists.