

Risk-based Approach Supporting the Redevelopment of an Urban Lead-impacted Site

Sylvain Bordenave, Trace Associates Inc
Karl Bresee, Intrinsik Corporation

Multiple environmental assessments have been conducted at an urban site in relation to debris discovered from suspected historical dumping in a ravine. The debris was reportedly generated during the demolition activities of a flour mill, prior to 1950. The buried debris area was partially excavated between 2015 and 2019, and debris were separated out where possible. Some of the debris was too small to be effectively removed and was left in place. Trace Associates Inc. (Trace) conducted further soil characterization assessments in 2019, as part of a redevelopment proposal for residential use. Petroleum hydrocarbon, metals, and polycyclic aromatic hydrocarbons impacts were identified in soils at the site. Intrinsik Corp. (Intrinsik) prepared a screening level risk assessment and concluded that risk at the site was primarily driven by lead and human direct soil contact considerations and to a lesser extent by the ecological direct pathway related to metals including arsenic, chromium, copper, nickel, tin, and zinc.

The overall management strategy for the site is to remediate contaminated media to site-specific remediation objectives (SSRO) developed based on a site-specific risk assessment (SSRA) approach. Stakeholders have reported that they were not concerned with the debris remaining in the soil if contaminant concentrations meet environmental regulatory guidelines. Soil containing debris will be integrated into the development of a storm water retention pond at the site.

Targeted remediation of "hot spots" was completed for hydrocarbon- and metal-impacted soils. Trace and Intrinsik conducted an SSRA for the remaining metal-impacted soil to support the development of SSRO for the site. Remediation to SSRO based on the Tier 2 SSRA approach will limit unnecessary excavation and land fill disposal by allowing impacted soils to be left on site as they do not present a risk of adverse effect to human health and/or the environment.

Sylvain Bordenave

Dr. Sylvain Bordenave is a Principal Risk Assessor with Trace Associates Inc., and has over 15 years of experience in environmental sciences. Sylvain is a member of the Alberta Society of Professional Biologists and a Qualified Professional in Saskatchewan for the Site Assessment Corrective Action Plan Chapters. At Trace, Sylvain provides senior technical guidance for complex projects, assists the Director of Quality with technical standards, and mentors and trains staff. Sylvain's core competencies include contaminated site management, environmental site assessments, soil vapour assessments, and human health and ecological risk assessments (HHERAs). Sylvain's experience has included projects for a variety of contaminated sites within Alberta and the Northwest Territories, including commercial/industrial sites, urban sites, and upstream oil and gas facilities.

Karl Bresee

Karl Bresee specializes in human and ecological risk assessment with extensive experience in exposure modelling and risk assessments associated with contaminated sites. Over the last 20 years, Karl has been the technical lead on HHERAs of contaminated sites for Municipal, Provincial and Federal sites across Canada. Karl's role on these projects typically involves multiple pathway exposure assessment, toxicity assessment, risk characterization and public/stakeholder consultation. Karl holds a Minor in Geology, a B.Sc. in Biology, and a Post Bachelor's Diploma in Ecotoxicology. He is a member of the Alberta Society of Professional Biologists and a Qualified Professional in Saskatchewan for Risk Assessment.