Human Health Risk Assessment of Treated Oil Sands Mine Waters to the Lower Athabasca River

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The HHRA was part of a larger study that was commissioned by Alberta Environment and Protected Areas to develop a watershed environmental risk assessment to investigate the risk of potential effects on human health and the environment from the discharge of oil sands mine waters (OSMW) to the Lower Athabasca River (LAR). The work is ultimately intended to provide guidance on future regulatory environmental management policies as the Government of Alberta considers the option of permitting the release of treated OSMW into the LAR.

The work was reviewed and informed by the OSMW Team, which was composed of scientific and technical experts representing Indigenous communities, industry, academia and provincial and federal environment and health departments.

While the study considered risks to human health, terrestrial wildlife and aquatic life, the presentation will focus on the HHRA. The HHRA followed standard risk assessment protocols and guidance established by health agencies such as Alberta Health, Health Canada and the United States Environmental Protection Agency. Key objectives of the HHRA were to provide quantitative estimates of risk to potentially exposed populations that reside in the study area of the LAR (within the Treaty 8 Territory), and to inform recommendations for filling remaining knowledge/data gaps, monitoring plans and/or risk management approaches.

The HHRA was based on the results of a predictive water quality modelling assessment, focusing on the area at and downstream of hypothetical discharge locations along the Athabasca River immediately south of Fort McMurray and north to the Old Fort Monitoring Station. The water quality modelling considered different discharge scenarios, with the HHRA characterizing the risks for those scenarios associated with the greatest magnitude of (potential) exposure. A screening process was undertaken to focus the HHRA on a list of contaminants of potential concern (COPC) that included metals, hydrocarbons, PAHs, naphthenic acids and phenols. The HHRA sought to account for the traditional use of the LAR by regional Indigenous people. In doing so, it was assumed that Indigenous people who consume traditional foods and rely on the LAR for sustenance would receive a higher exposure to the treated OSMW than non-Indigenous individuals who may reside and recreate in the area. As such, the HHRA focused on those exposure pathways and consequent risks applicable to the Indigenous users of the LAR.

The approach, results and recommendations of the HHRA, along with the overall review process, will be described in the presentation.

Bart Koppe

Bart Koppe was the project manager and technical lead of the Human Health and Ecological Risk Assessment of Treated Oil Sands Mine Waters to the Lower Athabasca River. Bart leads Intrinsik's environmental group in Canada, which includes staff in British Columbia, Alberta, Ontario and Nova Scotia. He has more than 20 years of experience assessing the potential health risks of a broad range of chemicals. He has been the technical lead on multiple human health risk assessments (HHRAs), including complex large-scale contaminated areas and environmental impact assessments. Bart sat on the Technical Advisory Group for the BC Ministry of Health's Guidance on Prospective Human Health Risk Assessments in the Province of BC. He also acted as the project manager and technical lead on the BC Ministry of Health's regional HHRA of oil and gas activity in northeastern BC; a project which involved extensive stakeholder engagement and ongoing consultation with senior government officials from various ministries. Throughout the course of his career, Bart has either worked for or alongside First Nations communities in remote areas of western and northern Canada.