



Stringent Isn't Always Sustainable: Quantifying Environmental and Social Metrics When Applying Salt Guidelines

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Compared to generic environmental guidelines, applying less stringent site-specific guidelines on salt-affected sites may appear to increase exposure to environmental risk for the sole benefit of fiscal gain. However, such guidelines, if providing equivalent environmental protection, may also result in substantial environmental benefits for the site and broader net sustainability. Also, when environmental risk is properly quantified, remedial and risk management options should be considered in terms of their associated sustainability. It was proposed that for salinity sites posing substantial liability under generic guidelines, the use of various combinations of innovative efforts or tools to establish site specific guidelines where applicable could offer measurable net benefits in terms of sustainability.

Several Western-Canadian-based case studies were used to calculate and compare specific sustainability metrics. The comparison was made between generic guideline scenarios versus the most applicable rigorous site-specific guideline derivation methods. Sustainability metrics included specific financial, social, safety, and ecological variables such as road safety fatalities and injuries, greenhouse gas emissions, fuel usage, and risk to species. These metrics provided valuable context and holistic due diligence to support the application of site-specific guidelines versus applying generic guidelines that may be overly stringent for the situation.

To support efficient site and contamination management, the risk to receptors posed by salinity was better quantified using evolving combinations of tools and methods, where applicable. These tools and methods included site-specific guideline derivation, pathway exclusion through conceptual site model rationale, groundwater dilution factor calculations, regional background statistical analysis, the subsoil salinity tool, the native prairie protocol, ground elevation assessment using LiDAR, drone imagery, and risk-assessment based on enhanced versions of detailed site assessment.

Scenarios using the most applicable guideline derivation methods and associated sustainability assessment provided clear illustrations that site-specific guidelines provided improved sustainability metrics, relative to generic guidelines, while maintaining equivalent protection to receptors. These scenarios with robust site-specific guideline development and sustainability assessment resulted in regulatory closure with minimal or no remediation.

This work also encourages a shift in perspective, supporting the quantification of environmental metrics and recognizing that cost savings may be aligned with more sustainable site management practices. This benefit is amplified by the awareness that money saved on remediation can be reallocated to other projects. More specifically, when applicable, companies may consider reallocating resources and budget to address other, perhaps more impacted sites of higher environmental concern, advance a higher quantity of impacted sites, and/or advance other sustainable initiatives such as giving back to communities, improved Indigenous engagement, and energy transition.

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