



Managing and Reducing Environmental Liabilities at the Town of Slave Lake: A Sustainable Salt Remediation Strategy

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The Town of Slave Lake (TOSL) faced a legacy of environmental contamination from decades of storing pickled sand (road salt mixed with sand) directly on unprotected gravel surfaces at its public works yard. This practice led to significant soil and groundwater salinity impacts, threatening adjacent lands including Sawridge First Nation territory and the nearby Lesser Slave Lake watershed.

Thurber Engineering Ltd. (Thurber) provided TOSL with a long-term, economically sustainable remediation strategy that prioritized environmental protection and operational continuity at the site. The approach included multiple phases of assessments, development of a conceptual site model, and implementation of a risk management plan. Strategies included a subsurface groundwater recovery system integrated with existing infrastructure, seasonal gypsum applications to restore soil health, and protective infrastructure upgrades such as an asphalt pad, runoff management, and covered storage.

To date, the project has removed over 1,100 m³ of salt-impacted water and 8,500 kg of chloride, reducing the contaminant plume by more than 50%. Substantial liability reduction has been achieved at a fraction of the cost of traditional dig-and-dump methods (approximately \$500,000 spent versus an estimated \$8 million) while maintaining full operation of the public works facility.

This case study demonstrates a replicable model for municipalities and transportation agencies managing salt-impacted sites. The project's success highlights the importance of collaborative planning, adaptive remediation, and stakeholder engagement in achieving sustainable environmental outcomes.

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Zion is an Associate at Thurber Engineering Ltd. and currently serves as Assistant Branch Manager for their Edmonton office. He completed his B.Sc. in Environmental Engineering and M.Eng. in Geoenvironmental Engineering, both from the University of Alberta. Zion has been at Thurber for his entire 14 year career in environmental consulting. His focus is primarily in assessing and managing contaminated sites for the oil and gas industry. He is always seeking ways to overcome barriers to progress sites towards closure. Outside of engineering, Zion has a three year old daughter and four year old Bernedoodle who actively keep him on his toes.