

## Site Remediation and Hazardous Waste Management with Presumptive Remedies under BC Regulatory Provisions using Cement-Based Solidification / Stabilization

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Management of hazardous wastes and remediation of contaminated sites in British Columbia can benefit from a range of available methods and technologies. Site contaminants range widely and can include light and heavier-end petroleum hydrocarbons, polycyclic aromatic hydrocarbons, chlorinated phenols from wood treatment, polychlorinated biphenyls, metals from various industrial and commercial processes, salts, etc. Hazardous wastes are often moved out of province to expedite waste management or site cleanup since delisting as required for in-province disposal requires significant time. Other soil contaminants at sites are often simply excavated and hauled for disposal at a landfill, or in the case of petroleum hydrocarbons, for treatment and disposal. Solidification or stabilization is widely used in other jurisdictions and in the US is a “presumptive remedy”, a proven and preferred technology. Several factors encourage further consideration of solidification / stabilization in BC. For hazardous wastes, regulatory pre-qualification and one or more delisting protocols for cement-based solidification / stabilization are being developed for greater acceptance, reduced time requirement and controlled costs. For contaminated site remediation, regulatory acceptance is also being sought by establishing performance criteria and developing protocols for specific types of sites. Technical information for delisting cement-based solidification / stabilization and the regulatory steps are discussed in the paper. Experience regarding remediation at selected sites and steps toward establishing solidification / stabilization as a presumptive remedy are outlined. Much wider, fundamental, regulatory acceptance of onsite management of contaminants was recommended by a Minister’s Advisory Panel in BC several years ago, for situations where risks do not compel removal from sites. Sustainable development, a reduced carbon footprint, reduced greenhouse gas emissions, etc. are objectives that have rapidly gained prominence. Excavation and transport for offsite disposal, often for significant distances, is costly and impacts the

environment. Where onsite use of soils or fill with contaminants can be completed in a manner that protects the environment as well as the health and safety of site users, multiple objectives can be met. The Cement Association of Canada, assisted by SLR Consulting (Canada) Ltd. is identifying opportunities and seeking to satisfy regulatory processes in BC so that expanded use and acceptance of cement-based solidification / stabilization can aid hazardous waste and contaminated sites remediation in a manner that recognizes environmental sustainability goals.

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John has 13+ years experience consulting to land development, oil & gas, chemical manufacturing, waste management, forestry and agriculture industries, 18+ years experience in technical advisory and regulatory policy, procedures & legislation development for the Province of BC, and 2+ years as a University of BC faculty member & researcher in water resources management, environmental chemistry and soil science. He has conducted wide-ranging surveys and assessments of soil, surficial geology, water/ watershed conditions & impacts, and waste management (liquid, solid & hazardous waste) practices & opportunities. John has conducted, supervised and advised on all phases of assessment & remediation of sites with metals, petroleum hydrocarbon, wood preservative, insecticide & herbicide, and industrial chemical contaminants. Within SLR Consulting (Canada) Ltd. John is Technical Director, Site Assessments for contaminated lands investigation and remediation, and advises on contaminated sites, environmental protection & waste/hazardous waste regulatory matters and permitting. He provides peer reviews, expert opinion & advisory services. He is an Approved Professional under the Roster established by the Director of Waste Management in BC under the *Environmental Management Act*.