



Treatment of concrete wash wastewater from ready-mix concrete operations

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ABSTRACT

Wash wastewater generated from ready-mix concrete (RMC) drums poses major environmental problems due to its high alkalinity and elevated heavy metal contents that need to be removed prior to disposal. The present study aims at developing a technology that will be able to reduce chromium and strontium concentrations as well as effluent pH to acceptable disposal levels set by various environmental agencies. Representative samples of wash wastewaters from RMC trucks were prepared and different treatment technologies were evaluated for their efficiencies of removing chromium and strontium present in solution. Sample characterizations indicated that the alkaline wash wastewater contained elevated concentrations of chromium and strontium at levels of 2.59 and 12.26 mg/l, respectively. Treatment of wash wastewater with barium chloride lowered the chromium to non-detectable limits. Whilst treatment with disodium hydrogen phosphate lowered the strontium to less than 0.063 mg/l, it is then hypothesized that sequence treatment of barium chloride, disodium hydrogen phosphate, and carbon dioxide bubbling will result in an effluent solution with acceptable disposal characteristics that satisfy regulatory bodies.

Keywords: Wash wastewater; Ready-mix concrete; Chromium; Strontium; Chemical precipitation; Ion speciation; Saturation index; Mineral formation

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