

Modeling the Effects of Improved Stormwater Management at a Large Open-Pit Mine¹

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Abstract: An open pit mine is currently generating elevated levels of total suspended solids (TSS) and total dissolved solids (TDS) in runoff. These elevated levels are above the permit concentrations and therefore, remediation at the site is necessary. Three general approaches were modeled; source reduction, improvements to the conveyance system, and treatment systems within and at the end of the conveyance system. A conceptual design of an integrated stormwater treatment system was developed. This design included improvements of the tailings pile, restructuring of the canals, and construction of a wet detention basin just above the discharge point. Individual model components were pulled together into an integrated model for the entire stormwater management system at the mine. The model is focused on the impact of the improvements on TSS and TDS levels as well as the quantity of water that the system receives in certain storm events. Results indicate substantial water quality improvements are possible with an integrated stormwater management approach.

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