# Optimization of Drainable Limestone Beds for Treatment of Acid Mine Drainage[1]

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**Abstract:** Acid mine drainage (AMD) generated from mining activities can influence water chemistry in surrounding rivers and streams. The mining exposes iron sulfide minerals (i.e., pyrite) to oxidation reactions that generate a low pH and metal rich solution known as AMD. Drainable limestone beds (DLBs) can be used to treat AMD with a wide variety of solution chemistries by increasing solution pH and precipitating oxyhydroxides within the limestone bed. Over time, these oxyhydroxides can clog the limestone and reduce alkalinity generation. Therefore, DLBs are equipped with effluent valves that can be programmed to empty the system quickly, facilitating high scour velocities that can remove the precipitated iron and aluminum oxides. There are few studies that explore how AMD drainage chemistry and scour velocity during flushing events influences the long-term treatment performance of DLBs. We hypothesize that the concentration and ratio of iron to aluminum in AMD can influence the performance of DLBs and the flushability of precipitated ox-hydroxides from these systems. Therefore, lab-scale DLBs were constructed to evaluate how the flushing velocity and concentrations/ratios of iron and aluminum influence the performance of DLBs. Results will be used to understand and optimize DLBs for treating AMD.

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