

## **Biological Metal Removal In An Engineered Wetland System**

Allan Mattes  
Nature Works Remediation Inc., Trail, BC

William Gould  
CANMET, Ottawa, ON

James Higgins  
Jacques Whitford Environment Limited, Oakville, ON

### **Abstract**

Phytofiltration is the aquatic form of phytoremediation and involves such natural wastewater treatment methods as rhizofiltration (the root adsorption of dissolved metals using hydroponic and raft systems) and wastewater clean up in constructed wetlands. Engineered wetlands are semi-passive, advanced kinds of constructed wetlands in which a variety of other types of wastewater treatment processes (e.g., aerobic and anaerobic bioreactors, limestone treatment systems) are “expressed” as cells (basins) of multi-train, multi-cell wetland systems.

The Poster describes engineered wetlands and their use in cleaning up acid rock and neutral mine drainage in mining applications, and the design, construction and early operations of a demonstration scale engineered wetlands system at the Teck Cominco lead zinc smelter in Trail, BC. With this unit, which involves two large anaerobic bioreactor and three horizontal sub-surface flow cells operating in series, landfill leachate containing elevated levels of dissolved zinc, cadmium and arsenic was successfully cleaned up to very low contaminant levels in summer and winter test runs.