

PASSIVE TREATMENT FOR HEAVY METAL REMOVAL BY CONSTRUCTED WETLANDS¹

by

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Abstract. A pilot constructed wetland was designed and built for passive treatment of the heavy metal mine drainage at the Big Five Tunnel, one of several CERCLA sites within the Idaho Springs-Central City mining district in Colorado. The objectives were to raise the pH and remove the heavy metals from the mine drainage. In addition, much was expected to be learned about competing removal processes in a wetland. Constructed wetlands can be designed to maximize one or two processes over all of the processes that occur in a natural wetland. The Big Five wetland was designed to maximize sulfate reduction followed by sulfide precipitation as the major metal removal process. Since the original construction in 1987 and subsequent modifications in 1988 and 1989, removal of metal contaminants has been consistently achieved. Some treatment cells were designed to operate in either an upflow or a downflow configuration. The removal efficiencies of the two flow systems appear to be similar with nearly complete removal of Fe, Cu, and Zn, approximately 25% removal of Mn, and an increase in pH from below 3 to above 6.

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