

ASSESSMENT AND RECLAMATION STRATEGIES FOR CONTAMINATED IRRIGATED MEADOWS ALONG THE ARKANSAS RIVER¹

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Abstract. Drainage from the Leadville mining district has contaminated portions of the Upper Arkansas River watershed for most of the last century. During this time, landowners have used water from the Arkansas River and the California Gulch tributary for irrigation of hay meadows. Contamination of the irrigated meadows has necessitated investigations into the extent of contamination and the extent of associated phytotoxicity. Using GIS and multiple regression techniques, the areas of contamination, the degree of phytotoxicity and the relevant soil chemistry parameters contributing to phytotoxicity were identified. Additionally, the results of this investigation were used to develop amendment strategies that have been applied to replicate test plots in areas of distinctly different soil chemistries. Soil chemistry and plant growth data have been collected for the last 2 years from these plots. The success of the plots was mixed. Amendments applied to the most impacted soils showed the greatest improvement in plant growth, but high levels of cadmium were present in the new growth. High variability in the distribution of metals confounded interpretation of plant growth results from the lesser impacted soils, but generally improvements were observed. The methods used in this investigation have proven to be efficient for assessing large areas for potential phytotoxicity while simultaneously gathering information needed for selecting appropriate soil amendments.

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