# WATERSHED
# UNCOMPAHGRE RIVER BASIN SELENIUM PHYTOREMEDIATION

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Contract Period: 2000 – 2005
NPS Funding: $105,409
Matching Funds: $ 88,941

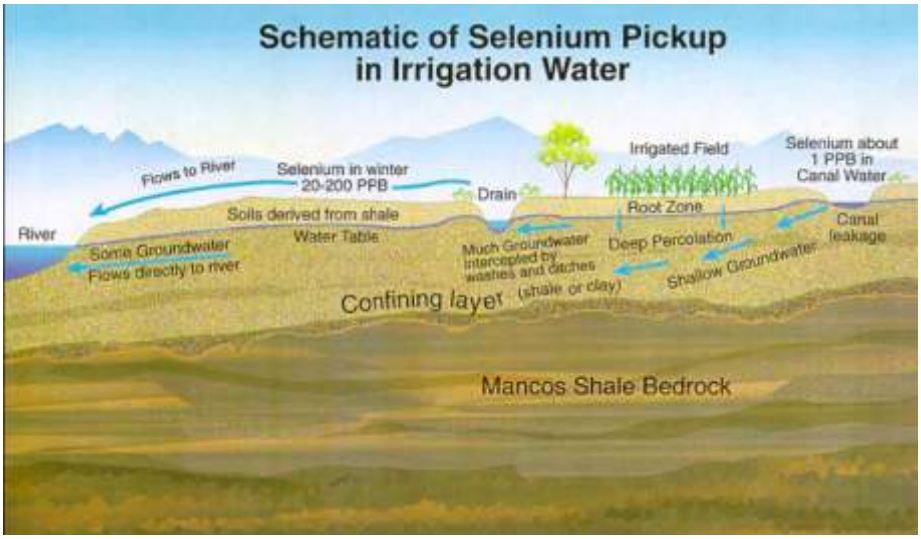
Downstream from the larger towns and major irrigated areas in the lower Gunnison and Uncompahgre River Basins selenium concentrations in the rivers are often exceed 5 ppb. Selenium loading in the Uncompahgre River increases about 96 percent between the towns of Ouray and Delta.

Agriculture is the main industry within the basin and irrigation practices provide one of the main means for transport of the selenium in the soils to waters in the basin. However, recent trends toward more urbanization, and smaller farm operations, have created additional sources of selenium loading, including septic systems, ponds, urban runoff, lawns, golf courses, parks and cemeteries.

The goal of this project was to demonstrate the feasibility of using selected agriculture crops and trees with economic value to remove selenium from soils and water, thereby reducing selenium loading from irrigated lands, to underground drainage waters, and ultimately, to waters of the Uncompahgre and Gunnison Rivers.

Hybrid Poplar trees

Using crops to remove selenium already contained in the soil and groundwater, called phytoremediation, is a relatively slow process that can be applied over large areas. It is probably best utilized in the Uncompahgre River Basin in conjunction with other techniques that directly reduce selenium loading by managing surface waters. One example is the piping or lining of irrigation water supply canals that cross Mancos shale outcrops and soils to prevent water seepage from a canal from getting into the deep ground water.




Compared to piping, phytoremediation is inexpensive and can be incorporated into large or small agriculture operations and is an ideal method for small acreages where trees and forage are often desired.

The population of the Uncompahgre River Basin is growing and many larger properties are being subdivided into smaller acreages. Many of these smaller properties would benefit from establishment of woodlots and improved forage for recreational livestock grazing. These could be readily supplied by a combination of hybrid poplar woodlots and pastures of tall fescue/birdsfoot trefoil forage.

Methods to utilize trees or forage crops used for removal of selenium from soils and waters require further study. At the time of the study, there was a market for the harvested poplar. Further exploration of forage crops utilization, appropriate crops and markets for any products need to be pursued.