

Water Quality Assessment in the Gallinas Watershed, Las Vegas, New Mexico

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PURPOSE OF STUDY

This project analyzed the water chemistry at Las Vegas National Wildlife Refuge (LVNWR) holding ponds and groundwater seeps within the Gallinas Canyon. The study assessed the accumulation of dissolved minerals, salts, metals, cations and anions and their impacts on the stream habitat along the Gallinas River. The water source for LVNWR is diverted from Gallinas River, a tributary of the Pecos River Stream System and the sole source of usable water for the city of Las Vegas, which is experiencing significant supply and water quality problems. The primary objective was to examine the changes in water quality along a groundwater flow path that originates within LVNWR storage reservoirs before surfacing as seeps along the Gallinas River.



Spring-fed creek within eastern plains region of Gallinas Watershed.



Tommy Evans sampling groundwater from shallow well within eastern plains region of Gallinas Watershed.

water quality at McCallister Lake, the largest surface water body at the Las Vegas National Wildlife Refuge. Data show elevated concentrations of calcium (402), sodium (1165), chloride (678), and sulfate (3525) as well as elevated conductivity and total dissolved solids.



Spring discharging along Gallinas Canyon, southern boundary of the Las Vegas National Wildlife Refuge.

RESULTS

- As hypothesized, the water chemistry throughout the Gallinas Watershed is degrading from the river's headwaters to lower river sites probably due to differences in the geology in the watershed.
- Calcium, sodium, chloride and sulfate increase from the headwaters to the lower river sites. Likewise, hardness, alkalinity, conductivity, and total dissolved solids are appreciably higher in the lower Gallinas River. These results demonstrate a correlation between water quality degradation and percentage of exposed sedimentary rocks with which the Gallinas River comes into contact.
- An interesting observation is the dramatic degradation in



Tommy Evans sampling surface water within eastern plains region of Gallinas Watershed.

BENEFITS

- Study results indicate the need for further study of evaporation effects as well as anthropogenic and natural aquifer contributions to water quality in order to improve water management practices within the Gallinas Watershed.
- Study results will assist the Gallinas River water master in evaluating water quality and water losses associated with the Storrie Lake Water Project.

