

## **GROUNDWATER SALINITY EVALUATION AT THE IRRIGATION DISTRICT 014, RÍO COLORADO, MEXICO**

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Groundwater quality of the Irrigation District 014, Río Colorado, has experienced a serious deterioration during the last decades due to the salts increase coming from several sources and to the lack of drainage. In this work we describe the main results of an IMTA project which main objective was to evaluate the impact of the superficial and subterranean sources that contribute to the elevated groundwater salinity. Two exploration wells were drilled for this task: one in the saturated zone, called "La Palma", and the other in the unsaturated zone of a parcel located in the confluence of the Sánchez Mejorada and Wellton Mohawk channels. The exploration wells were used to characterize on the vertical the pore waters and the shallow groundwater up to 30 m depth. Additionally, the Sánchez Mejorada, Wellton Mohawk and San Luis channels as well as from the deep wells located in the vicinity of La Palma, were monitored. The integration of the analytical results showed that shallow groundwater of La Palma are the result of a mixture of deep groundwater used to irrigate the Module 1 of the Irrigation District 014, as well as water coming from the three channels mentioned above. The soluble salts are accumulated in the first 23 m of the soil profile and they mainly come from the irrigation returns. The salts that predominate in the remanent solution, after evapotranspiration and infiltration, are:  $\text{CaSO}_{4\text{aq}}$ ,  $\text{MgSO}_4$ ,  $\text{NaSO}_4$ ,  $\text{CaHCO}_3$ ,  $\text{MgHCO}_3$  and  $\text{NaHCO}_{3\text{aq}}$ . Finally, the irrigation returns experience a vertical and horizontal movement due to the high aquifer transmissivities and the deep groundwater abstraction.