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Estimation of Lithium Content in Brines of La Union Salt Flat, Located in Ahumada, Chihuahua, Mexico

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Lithium was defined as a critical element for the energy transition, and despite being present in the upper continental crust at a concentration of 30.5 ± 3.6 ppm, only certain geological contexts contain deposits that could be profitably exploited. Lithium brine deposits represent more than half of the global lithium source. In Mexico, several government agencies and mining companies have explored the presence of lithium in the country. The Mineral Resources Council detected 283 ppm of lithium in water samples from the evaporation ponds of La Unión Salt Flat, but no subsequent studies were conducted. The site of interest is in El Barreal Playa Lake, a closed basin with characteristics associated with lithium brine deposits such as arid climate, tectonic subsidence, suitable lithium source rocks, and an aquifer with a high degree of salinity. The magmatism of the area is related to the migration of a Cretaceous-Cenozoic magmatic arc, derived from the subduction of the Farallon plate beneath the North American plate. The rhyolitic tuff outcrops in the study area correspond to the Oligocene. The objective of this project is to estimate the amount of lithium in brine. The methodology includes the identification of the aquifer horizons with possible brine accumulations through the interpretation of previous geohydrological studies and multiparameter well surveys in the study area. Additionally, it involves the determination of the concentration of lithium in brine through sampling of wells and evaporation ponds of the La Unión Salt Flat, for subsequent ICP-MS analysis. This contribution to knowledge of the region is considered relevant, since it provides additional information about the site, which would be useful for subsequent studies.