



# Impacts of Lithium Mining to the Santa Rosa Lagoon Lacustrine System, Salar de Maricunga



Consolidated Report Prepared by HGA  
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## **Executive Summary:**

Two lithium mining projects currently have an Environmental Qualification Resolution from the Chilean government to mine the lithium-enriched brine from the core of the northern part of the Salar de Maricunga. The El Bolo Colla Community, an Indigenous community downstream from the Salar de Maricunga, has been monitoring the potential impacts of these projects to the lacustrine systems of the Santa Rosa Lagoon, in the southern part of the salt flat, and the Central Lagoon.

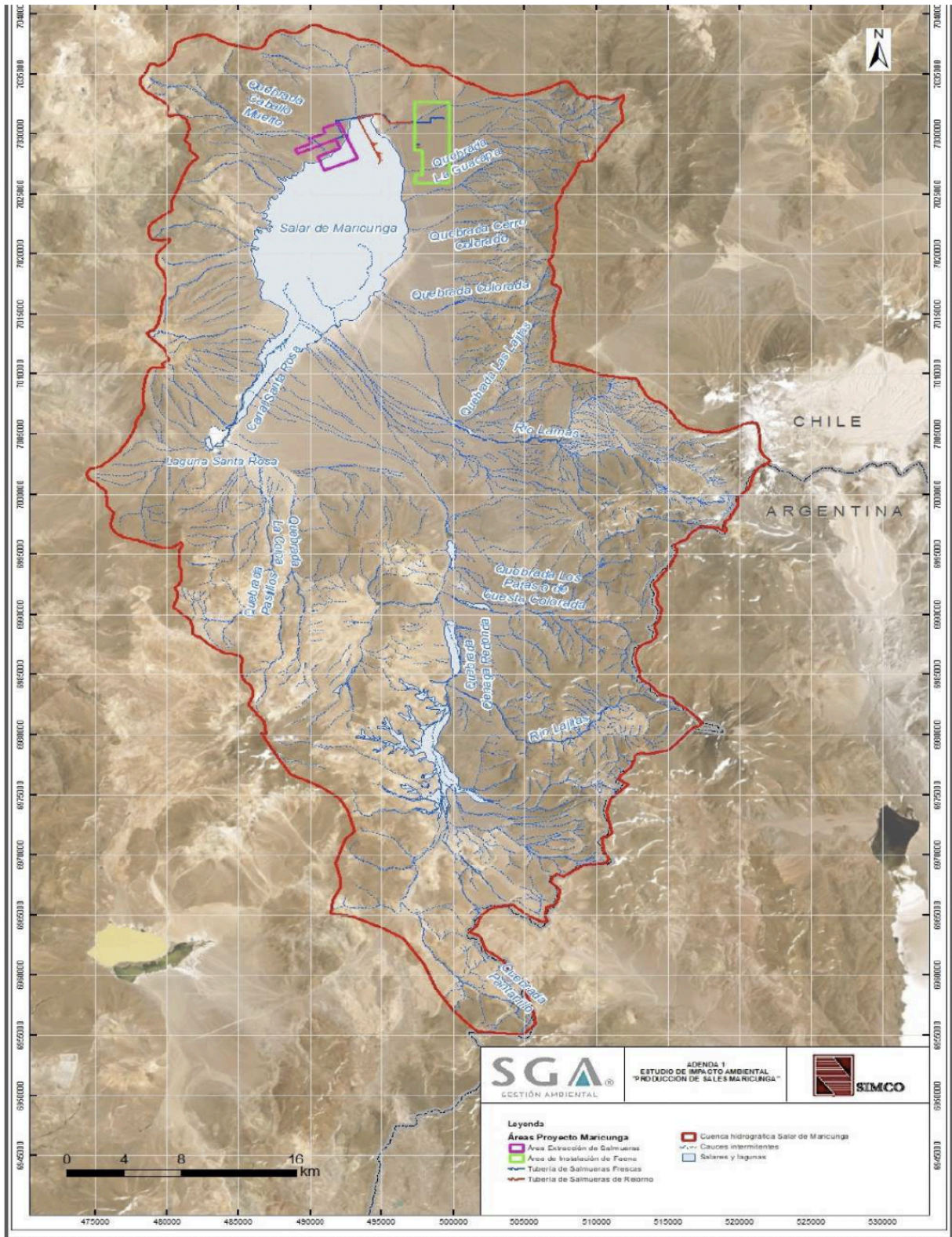
The community has commissioned several studies with the aim of creating a hydrogeological conceptual model of the lake system of the Santa Rosa Lagoon. This report presents the findings of an electromagnetic geophysical survey, with the objective of gathering data on the salt flat's subsurface to help create a hydrogeological conceptual model of the southern sector of the salt flat, using both existing data and the data generated by this study.

A hydrogeological conceptual model is a tool that models geological, hydrological and hydrogeological characteristics to determine the hydrological functioning of a specific area. A hydrogeological model of the southern part of the salt flat will allow for the: identification of the recharge and discharge mechanisms of the lacustrine system, verification of the continuity of the hydrogeological units in the south with the central and northern parts of the salt flat, and the identification of possible recharge of the Salar de Maricunga to the streams located to the east,

specifically to the Paipote Stream which supports the activities of the Colla Community of Copiapo downstream.

The key findings are the following:

1. The Environmental Impact Assessments (EIA) identify a clay core that has continuity throughout the salt flat. The EIA claims that this impermeable clay unit separates the lower aquifer with brine from the evaporites in the upper aquifer, which support the lacustrine systems. It claims that the clay layer will protect the flora and fauna of the lacustrine systems. This study hypothesizes that the clay core is actually a unit composed of intercalated sand, gravel, clay, and paleo-evaporites saturated in brine. Given this hypothesis, the superficial lacustrine systems, such as the Santa Rosa Lagoon and Central Lagoon, are vulnerable to the effects of brine extraction from aquifers since there is not an impermeable barrier.
2. The integration of hydrochemical, isotopic and geophysical findings support the hypothesis that there is a hydrogeological unit that is 200 meters thick and has a low homogenous resistivity in the lacustrine system of the Santa Rosa Lagoon, which could correspond to a large aquifer saturated in brine.
3. There could be significant volumes of water that flow from the Santa Rosa Lagoon lacustrine system into the aquifers and streams of the Paipote subbasin. If these connections exist, any impacts to the Santa Rosa Lagoon lacustrine system would have an impact on the water flow to the Paipote Stream and to the springs for which the community has water rights.
4. The hydrological balances (recharge/discharge) presented in the EIAs establish that the superficial water that drains from the Santa Rosa Lagoon lacustrine system to the Central Lagoon system discharges through evaporation. However, there is not enough data or modeling to ensure that there will not be significant overflow recharge to the core (north) of the salt flat, in addition to recharge from subsurface and subterranean water flow.



The red line outline shows the Salar de Maricunga water basin.