
# PROYECT

Maricunga salt brine
mining property.

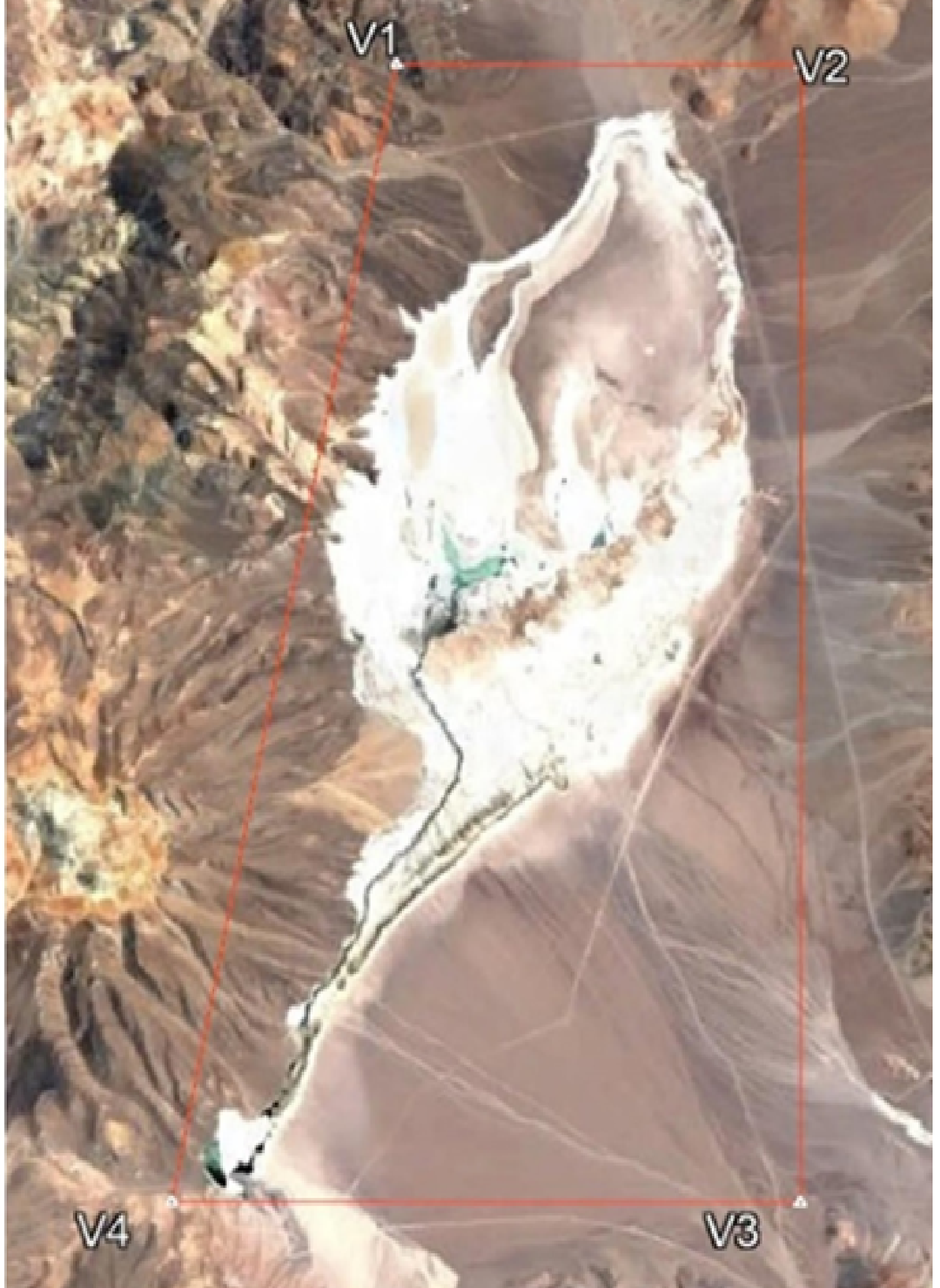
# 1.1 Access and Location

The Maricunga salt brine mining property is located northeast of the province of Copiapó, Atacama Region, in the extreme south of the Andean Altiplano and near the limit International with Argentina. The easiest way to get there is to start from the city of Copiapó following Route Ch-31 for 52 km, later the C- 341 for 18 km and finally the C-601 for 54 km, reaching the salar.

# 1.2 Geology

The salar has an oval shape, with a kind of appendix growing towards the south up to a series of wetlands separated by about 13 km from the central structure, which It is about 17 km long on its major axis and about 10 km long its minor axis.
The geology of the basin is dominated by dacite and andesite volcanic rocks of the Cenozoic, with representation of Paleozoic to Jurassic age sequences medium, including plutonic rocks along with sedimentary rocks interspersed in volcanic sequences. On the eastern side of the salar there is a large deposit Quaternary age sedimentary. On this sequence of rocks accumulate evaporitic deposits of the salar.

The existing evaporitic deposits in the salt can be differentiated in two main. In the northwest part, deposits with chlorinated salts are concentrated while in the southeast area of the salt the salts present are of sulfated facies and boratadas. These two zones are separated from each other by a series of brackish lagoons that are oriented in northeast-southwest direction.
Next to the saline facies, there is an area formed by detritic materials in the north and the southeast of the salar. These deposits are formed by clay, silt and sand with a cement composed of salts, with an extension of up to 250 m wide, but with little thickness.



In the chlorided zone, different zones are recognized by the precipitated salts. To the East there is a layer of halite (sodium chloride) between 1.5 to 2 cm thick, formed by crystals that do not exceed 2 mm and that is deposited on the facies detritic to the south of this deposit there is a similar one, but in this case it is furrowed by channels that start from the brine more to the west and that runs towards the southeast, until, meet the inner river, which is born from the main lagoon of the salar. This unit has a composition richer in sulfates and borates with respect to the which is more to the north, with an amount of between 4 to 6% of gypsum and 8% of ulexita.

In the northwest part of the salt flat there is a flat halite crust, which limits the east directly with the volcanic basement, to the north with the limes unit and gradationally with the unit of halite blocks in the south. It's formed by halite crystals between 2 to 5 mm and with some gypsum (3%) in their composition, forming a flat, firm and thick crust, more than 15 cm thick, deep to which the water table is located. According to its distribution it is estimated that this layer it suffers from seasonal dissolution-precipitation processes, which prevents it from being a much more competent layer and larger blocks.

The transitional part from the previous unit to the one formed by blocks of halite presents hybrid characteristics between both, with 2 mm long halite crystals and polygons that begin to detach from the salt substrate to form blocks.
The flat halite block crust is found in the core of the salar. It's formed by 2 mm diameter halite crystals that form a rough crust of polygons of up to 1 m, detached from the saline substrate from 0.5 to 1 m.

The boratadas and sulphated facies are in the southeast part, with an elevation between 1 to 2 m with respect to the brackish lagoons and the chlorinated facies. His composition differs from chlorided facies because of its higher calcium content, potassium, magnesium and sulfate, together with high concentrations of boron and arsenic, while the lithium remains in concentrations similar to those existing more than north.

In the extreme southeast lies the facia boratada with plaster, which limits gradually with facies boratadas to the southeast and to the west with the internal river of the salar. It consists of fine plaster crystals that make up a relatively thin layer gross. Occasionally mounds of a few tens of centimeters are presented at 1-1.5 m in diameter formed by aggregates of calcite and detrital material, surrounded by ulexite pockets.

The face bored with halite and gypsum is found inside the salt flat and is also It is limited to the west by the river and to the east by a more sulfated facies. It is about of a mixture of 0.5 to 1 mm crystals of halite, gypsum, and a significant proportion of ulexite, in the form of added powder.

Next to the central lagoon is a borated crust with halite and little plaster, formed by some halite crystals of gypsum and ulexite. In a vertical section of 80 cm of thickness, after the first 20 cm of depth is a unit of 15 cm of ulexite with a mixture of silt and clays, 20 cm of silt cemented by salts and a layer of halite on the roof and the rest of the bottom (final 15 cm) there is a unit Massive moist ulexite with spheres of 2 to 10 cm in diameter.

Facies with higher sulphate content are located southeast of the salt flat, corresponds to a facie composed of halite with 30% gypsum and anhydrite, and to the east from the central lagoon, forms a chlorided gypsum crust with a proportion of 65/35 in favor of the plaster in front of the halite.
The water that arrives at the salt comes from the precipitations fallen directly in its surface (very scarce) and melted snow from all the surrounding heights salt, forming a hydrographic network with more than 2,500 km2 of surface.

# 1.3 Geochemical Sampling

In order to determine a correlation of brines with surface solids, AMS Asesorías Geológicas performs a preliminary reconnaissance of the sedimentary cover of Maricunga, taking 27 representative samples of different surface sectors, which were analyzed and controlled (AC / QC) by ICP in the laboratories of Activation Labs in Coquimbo according to CL17-9424 report, from which the following is extracted:

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Method Type | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS |
| Units | ppm | % | % | % | % | ppm | % |
| Limit | 0.5 | 0.01 | 0.01 | 0.01 | 0.01 | 1 | 0.01 |
| 6273 | 54,70 | 1,90 | 0,95 | 0,74 | 2,71 | 1,96 | 6,98 |
| 6274 | 34,90 | 2,05 | 1,12 | 0,63 | 2,56 | 2,02 | 7,59 |
| 6275 | 31,10 | 2,20 | 1,24 | 0,58 | 2,36 | 2,03 | 7,45 |
| 6276 | 32,90 | 2,13 | 1,19 | 0,56 | 2,69 | 1,16 | 7,85 |
| 6277 | 30,80 | 2,10 | 1,18 | 0,58 | 2,51 | 0,41 | 7,52 |
| 6278 | 36,90 | 2,53 | 1,17 | 0,60 | 2,30 | 5,04 | 7,51 |
| 6279 | 33,50 | 2,18 | 1,11 | 0,58 | 2,35 | < 1 | 6,99 |
| 6280 | 30,90 | 1,95 | 1,25 | 0,62 | 2,87 | 8,18 | 7,93 |
| 6281 | 30,80 | 1,77 | 1,10 | 0,54 | 2,38 | 3,91 | 5,57 |
| 6282 | 32,60 | 1,74 | 1,14 | 0,67 | 2,78 | < 1 | 7,50 |
| 6283 | 64,20 | 1,69 | 1,32 | 0,90 | 4,29 | 1,00 | 8,51 |
| 6284 | 119,00 | 1,53 | 0,99 | 1,09 | 4,87 | < 1 | 7,11 |
| 6286 | 43,60 | 1,71 | 1,40 | 0,70 | 3,52 | < 1 | 8,32 |
| 6287 | 52,90 | 1,63 | 1,23 | 0,74 | 3,90 | < 1 | 7,79 |
| 6288 | 78,10 | 1,02 | 1,22 | 0,63 | 8,82 | < 1 | 5,48 |
| 6289 | 55,80 | 1,59 | 1,28 | 0,71 | 4,84 | < 1 | 7,86 |
| 6290 | 141,00 | 1,41 | 1,10 | 0,87 | 8,49 | 3,39 | 5,70 |
| 6291 | 105,00 | 1,30 | 1,08 | 0,62 | 7,89 | 176,74 | 4,73 |
| 6292 | 97,70 | 1,09 | 0,82 | 0,50 | 9,16 | 42,74 | 3,33 |
| 6293 | 33,80 | 0,77 | 0,72 | 0,23 | 11,60 | 42,29 | 2,16 |
| 6294 | 49,20 | 0,56 | 1,02 | 0,12 | 12,90 | 39,95 | 1,42 |
| 6295 | 27,20 | 1,45 | 1,36 | 1,15 | 3,47 | < 1 | 8,19 |
| 6296 | 33,70 | 1,56 | 1,23 | 1,05 | 2,99 | < 1 | 8,06 |
| 6297 | 65,70 | 1,63 | 1,46 | 1,03 | 3,32 | < 1 | 8,94 |
| 6298 | 21,90 | 1,46 | 1,27 | 0,80 | 2,87 | < 1 | 8,26 |
| 6299 | 50,40 | 1,59 | 1,18 | 0,96 | 2,86 | < 1 | 8,29 |
| 6300 | 55,10 | 1,61 | 1,24 | 1,00 | 2,81 | < 1 | 8,31 |
| PROMEDIO | 53,46 | 1,64 | 1,16 | 0,71 | 4,60 | 23,63 | 6,86 |

Complementing the above, AMS Asesorías Geológicas, performs a second survey of the sedimentary cover, this time in the southern area of the Maricunga salt flat, where the ENERGÍA concessions are located, taking 42 representative samples from different surface sectors, which were analyzed and controlled (AC / QC) by ICP in the laboratories of Activation Labs in Coquimbo according to report CL18-1753 1F2 attached, from which the following is extracted:

**Illustration 12: Sampling Maricunga Sur**

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Method Type | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES |
| Limit | 1 | 0.01 | 0.01 | 0.01 | 0.01 | | 0.01 |
| Units | ppm | % | % | % | % | ppm | % |
| 6341 | 36,00 | 1,55 | 2,56 | 1,01 | 3,59 | | 8,53 |
| 6342 | 31,00 | 1,51 | 2,61 | 1,03 | 3,85 | | 8,28 |
| 6343 | 72,00 | 1,42 | 2,35 | 1,27 | 3,89 | | 8,06 |
| 6344 | 45,00 | 1,37 | 1,76 | 0,73 | 4,71 | | 7,27 |
| 6345 | 80,00 | 1,47 | 1,57 | 0,91 | 3,01 | | 7,40 |
| 6346 | 98,00 | 1,73 | 1,93 | 1,09 | 3,00 | | 8,15 |
| 6347 | 40,00 | 1,72 | 2,11 | 0,73 | 2,68 | | 8,11 |
| 6348 | 39,00 | 1,92 | 2,18 | 0,74 | 2,85 | | 8,11 |
| 6349 | | | | | | | |
| 6350 | 39,00 | 1,62 | 2,31 | 0,49 | 2,41 | | 4,18 |
| 6351 | 31,00 | 1,72 | 2,04 | 0,64 | 2,74 | | 7,43 |
| 6352 | 33,00 | 1,94 | 2,21 | 0,66 | 2,69 | | 7,84 |
| 6353 | 37,00 | 1,65 | 2,18 | 0,72 | 2,80 | | 7,79 |
| 6354 | 38,00 | 1,74 | 2,33 | 0,76 | 2,86 | | 8,33 |
| 6355 | 38,00 | 1,73 | 2,22 | 0,75 | 3,03 | | 7,96 |
| 6356 | 55,00 | 1,90 | 2,24 | 0,87 | 3,08 | | 8,41 |
| 6357 | 60,00 | 1,64 | 1,83 | 0,79 | 4,13 | | 6,94 |
| 6358 | 38,00 | 1,76 | 2,25 | 0,78 | 2,85 | | 8,08 |
| 6359 | 30,00 | 2,06 | 2,33 | 0,68 | 2,31 | | 7,90 |
| 6360 | 46,00 | 1,59 | 2,17 | 0,68 | 3,05 | | 4,74 |
| 6361 | 37,00 | 1,53 | 2,26 | 0,64 | 2,89 | | 6,68 |
| 6362 | 38,00 | 1,84 | 2,08 | 0,74 | 2,85 | | 7,44 |
| 6363 | 34,00 | 1,98 | 2,30 | 0,89 | 2,95 | | 7,93 |
| 6364 | 30,00 | 2,19 | 2,23 | 0,64 | 2,51 | | 7,94 |
| 6365 | 39,00 | 1,69 | 2,15 | 0,74 | 3,09 | | 8,08 |
| 6366 | 46,00 | 1,76 | 2,03 | 0,79 | 2,42 | | 8,14 |
| 6367 | 36,00 | 1,93 | 2,32 | 0,74 | 2,63 | | 8,37 |
| 6368 | 39,00 | 1,51 | 2,10 | 0,75 | 2,59 | | 8,43 |
| 6369 | 77,00 | 1,40 | 1,75 | 1,06 | 3,43 | | 7,72 |
| 6370 | 125,00 | 1,50 | 1,79 | 1,23 | 4,00 | | 7,92 |

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Method Type | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES |
| Limit | 1 | 0.01 | 0.01 | 0.01 | 0.01 | | 0.01 |
| Units | ppm | % | % | % | % | ppm | % |
| 6371 | 112,00 | 1,37 | 1,62 | 1,21 | 4,87 | | 7,42 |
| 6372 | 65,00 | 1,54 | 1,99 | 0,91 | 2,72 | | 8,51 |
| 6373 | 38,00 | 1,78 | 2,15 | 0,77 | 2,92 | | 8,05 |
| 6374 | 26,00 | 1,28 | 2,27 | 0,83 | 7,66 | | 6,80 |
| 6375 | 40,00 | 1,20 | 1,88 | 0,69 | 7,16 | | 6,89 |
| 6376 | 121,00 | 1,21 | 1,12 | 0,95 | 8,91 | | 5,85 |
| 6377 | 87,00 | 1,61 | 1,86 | 0,93 | 3,86 | | 7,74 |
| 6378 | 46,00 | 1,53 | 2,06 | 0,70 | 2,68 | | 4,70 |
| 6379 | 40,00 | 1,64 | 2,07 | 0,63 | 2,64 | | 6,69 |
| 6380 | 70,00 | 1,39 | 1,58 | 0,71 | 3,50 | | 7,13 |
| 6381 | 41,00 | 1,62 | 1,94 | 0,65 | 2,63 | | 7,47 |
| 6382 | 82,00 | 1,44 | 1,68 | 0,84 | 3,84 | | 7,60 |
| PROMEDIO | 52,56 | 1,63 | 2,06 | 0,81 | 3,47 | | 7,49 |

**Illustration: Sampling Maricunga Sur**

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Units | ppm | % | % | % | % | ppm | % |
| 1º Campaña | 53,46 | 1,64 | 1,16 | 0,71 | 4,60 | 23,63 | 6,86 |
| 2º Campaña | 52,56 | 1,63 | 2,06 | 0,81 | 3,47 | | 7,49 |
| PROMEDIO | 53,01 | 1,64 | 1,61 | 0,76 | 4,04 | 23,63 | 7,18 |

**In order to analyze, the results are summarized according to the following:**
**Illustration 13: Sampling summary**

It is observed that the superficial anomaly by potassium is important (1.64%), and that the concentration by lithium exceeds a normal anomaly (> 40 ppm), which explains the existence of containing brines of Li and K, in the salt flat.
In order to correlate, it must be remembered that the studies carried out by the former CORFO Mixed Sales Committee, in 35 brine samples classified the values by rank, obtaining the weighted average by the number of samples per range, according to the following:

**Table 4: Samples Classification**

| Range | Quantity | K(g/l) |
|---|---|---|
| K<5 | 3 | 4,33 |
| 5<k<10 | 18 | 7,48 |
| 10<k<15 | 11 | 12,12 |
| k>15 | 3 | 18,33 |
| **K Average** | **35** | **9,60** |
| Range | Quantity | Li(g/l) |
| Li<0.5 | 1 | 0,48 |
| 0.5<Li<1.0 | 15 | 0,79 |
| 1.0<Li<1.5 | 14 | 1,29 |
| 1.5<Li<2.0 | 5 | 1,73 |
| **Li Average** | **35** | **1,12** |

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Method Type | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES | ICP-OES |
| Limit | 1 | 0.01 | 0.01 | 0.01 | 0.01 | | 0.01 |
| Units | ppm | % | % | % | % | ppm | % |
| 6371 | 112,00 | 1,37 | 1,62 | 1,21 | 4,87 | | 7,42 |
| 6372 | 65,00 | 1,54 | 1,99 | 0,91 | 2,72 | | 8,51 |
| 6373 | 38,00 | 1,78 | 2,15 | 0,77 | 2,92 | | 8,05 |
| 6374 | 26,00 | 1,28 | 2,27 | 0,83 | 7,66 | | 6,80 |
| 6375 | 40,00 | 1,20 | 1,88 | 0,69 | 7,16 | | 6,89 |
| 6376 | 121,00 | 1,21 | 1,12 | 0,95 | 8,91 | | 5,85 |
| 6377 | 87,00 | 1,61 | 1,86 | 0,93 | 3,86 | | 7,74 |
| 6378 | 46,00 | 1,53 | 2,06 | 0,70 | 2,68 | | 4,70 |
| 6379 | 40,00 | 1,64 | 2,07 | 0,63 | 2,64 | | 6,69 |
| 6380 | 70,00 | 1,39 | 1,58 | 0,71 | 3,50 | | 7,13 |
| 6381 | 41,00 | 1,62 | 1,94 | 0,65 | 2,63 | | 7,47 |
| 6382 | 82,00 | 1,44 | 1,68 | 0,84 | 3,84 | | 7,60 |
| PROMEDIO | 52,56 | 1,63 | 2,06 | 0,81 | 3,47 | | 7,49 |

**Illustration: Sampling Maricunga Sur**

| **Analyte** | **Li** | **K** | **Na** | **Mg** | **Ca** | **B** | **Al** |
|---|---|---|---|---|---|---|---|
| **Units** | ppm | % | % | % | % | **ppm** | % |
| 1º Campaña | 53,46 | 1,64 | 1,16 | 0,71 | 4,60 | 23,63 | 6,86 |
| 2º Campaña | 52,56 | 1,63 | 2,06 | 0,81 | 3,47 | | 7,49 |
| PROMEDIO | 53,01 | 1,64 | 1,61 | 0,76 | 4,04 | 23,63 | 7,18 |

**In order to analyze, the results are summarized according to the following:**
**Illustration 13: Sampling summary**

The face bored with halite and gypsum is found inside the salt flat and is also It is limited to the west by the river and to the east by a more sulfated facies. It is about of a mixture of 0.5 to 1 mm crystals of halite, gypsum, and a significant proportion of ulexite, in the form of added powder.

Next to the central lagoon is a borated crust with halite and little plaster, formed by some halite crystals of gypsum and ulexite. In a vertical section of 80 cm of thickness, after the first 20 cm of depth is a unit of 15 cm of ulexite with a mixture of silt and clays, 20 cm of silt cemented by salts and a layer of halite on the roof and the rest of the bottom (final 15 cm) there is a unit Massive moist ulexite with spheres of 2 to 10 cm in diameter.

Facies with higher sulphate content are located southeast of the salt flat, corresponds to a facie composed of halite with 30% gypsum and anhydrite, and to the east from the central lagoon, forms a chlorided gypsum crust with a proportion of 65/35 in favor of the plaster in front of the halite.
The water that arrives at the salt comes from the precipitations fallen directly in its surface (very scarce) and melted snow from all the surrounding heights salt, forming a hydrographic network with more than 2,500 km2 of surface.

# 1.3 Geochemical Sampling

In order to determine a correlation of brines with surface solids, AMS Asesorías Geológicas performs a preliminary reconnaissance of the sedimentary cover of Maricunga, taking 27 representative samples of different surface sectors, which were analyzed and controlled (AC / QC) by ICP in the laboratories of Activation Labs in Coquimbo according to CL17-9424 report, from which the following is extracted:

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Method Type | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS | TD-MS |
| Units | ppm | % | % | % | % | ppm | % |
| Limit | 0.5 | 0.01 | 0.01 | 0.01 | 0.01 | 1 | 0.01 |
| 6273 | 54,70 | 1,90 | 0,95 | 0,74 | 2,71 | 1,96 | 6,98 |
| 6274 | 34,90 | 2,05 | 1,12 | 0,63 | 2,56 | 2,02 | 7,59 |
| 6275 | 31,10 | 2,20 | 1,24 | 0,58 | 2,36 | 2,03 | 7,45 |
| 6276 | 32,90 | 2,13 | 1,19 | 0,56 | 2,69 | 1,16 | 7,85 |
| 6277 | 30,80 | 2,10 | 1,18 | 0,58 | 2,51 | 0,41 | 7,52 |
| 6278 | 36,90 | 2,53 | 1,17 | 0,60 | 2,30 | 5,04 | 7,51 |
| 6279 | 33,50 | 2,18 | 1,11 | 0,58 | 2,35 | < 1 | 6,99 |
| 6280 | 30,90 | 1,95 | 1,25 | 0,62 | 2,87 | 8,18 | 7,93 |
| 6281 | 30,80 | 1,77 | 1,10 | 0,54 | 2,38 | 3,91 | 5,57 |
| 6282 | 32,60 | 1,74 | 1,14 | 0,67 | 2,78 | < 1 | 7,50 |
| 6283 | 64,20 | 1,69 | 1,32 | 0,90 | 4,29 | 1,00 | 8,51 |
| 6284 | 119,00 | 1,53 | 0,99 | 1,09 | 4,87 | < 1 | 7,11 |
| 6286 | 43,60 | 1,71 | 1,40 | 0,70 | 3,52 | < 1 | 8,32 |
| 6287 | 52,90 | 1,63 | 1,23 | 0,74 | 3,90 | < 1 | 7,79 |
| 6288 | 78,10 | 1,02 | 1,22 | 0,63 | 8,82 | < 1 | 5,48 |
| 6289 | 55,80 | 1,59 | 1,28 | 0,71 | 4,84 | < 1 | 7,86 |
| 6290 | 141,00 | 1,41 | 1,10 | 0,87 | 8,49 | 3,39 | 5,70 |
| 6291 | 105,00 | 1,30 | 1,08 | 0,62 | 7,89 | 176,74 | 4,73 |
| 6292 | 97,70 | 1,09 | 0,82 | 0,50 | 9,16 | 42,74 | 3,33 |
| 6293 | 33,80 | 0,77 | 0,72 | 0,23 | 11,60 | 42,29 | 2,16 |
| 6294 | 49,20 | 0,56 | 1,02 | 0,12 | 12,90 | 39,95 | 1,42 |
| 6295 | 27,20 | 1,45 | 1,36 | 1,15 | 3,47 | < 1 | 8,19 |
| 6296 | 33,70 | 1,56 | 1,23 | 1,05 | 2,99 | < 1 | 8,06 |
| 6297 | 65,70 | 1,63 | 1,46 | 1,03 | 3,32 | < 1 | 8,94 |
| 6298 | 21,90 | 1,46 | 1,27 | 0,80 | 2,87 | < 1 | 8,26 |
| 6299 | 50,40 | 1,59 | 1,18 | 0,96 | 2,86 | < 1 | 8,29 |
| 6300 | 55,10 | 1,61 | 1,24 | 1,00 | 2,81 | < 1 | 8,31 |
| PROMEDIO | 53,46 | 1,64 | 1,16 | 0,71 | 4,60 | 23,63 | 6,86 |

It is observed that the superficial anomaly by potassium is important (1.64%), and that the concentration by lithium exceeds a normal anomaly (> 40 ppm), which explains the existence of containing brines of Li and K, in the salt flat.

In order to correlate, it must be remembered that the studies carried out by the former CORFO Mixed Sales Committee, in 35 brine samples classified the values by rank, obtaining the weighted average by the number of samples per range, according to the following:

| Range | Quantity | K(g/l) |
|---|---|---|
| K<5 | 3 | 4,33 |
| 5<k<10 | 18 | 7,48 |
| 10<k<15 | 11 | 12,12 |
| k>15 | 3 | 18,33 |
| **K Average** | **35** | **9,60** |
| Range | Quantity | Li(g/l) |
| Li<0.5 | 1 | 0,48 |
| 0.5<Li<1.0 | 15 | 0,79 |
| 1.0<Li<1.5 | 14 | 1,29 |
| 1.5<Li<2.0 | 5 | 1,73 |
| **Li Average** | **35** | **1,12** |

**Source: Valorización propiedades mineras Maricunga Sur, 2018**

The potassium concentration is 9.6 grams per liter in brine (g / l), equivalent to 0.96% by volume, whereas the surface area is 1.64% K by weight, which is higher, than dissolves in time due to the effect of leaching water, drains and concentrates in the saline basin, guaranteeing the replacement of the element before an eventual exploitation.

The concentration of lithium is 1.12 grams per liter in brine (g / l), equivalent to 1120 ppm by volume, while the surface is 53.46 ppm Li by weight, less than the solution of lithium on the surface It has been intense, which justifies Li's concentration in the salar.

# 1.4 Resources Estimation

In order to estimate the resources from the available information, what is done by the former CORFO Mixed Salts Committee is taken into consideration as follows:

1. In the area studied, a surface of the salt flat of approximately 60 km2 was covered in the order of 1.7 million tons of potassium, equivalent to 3.25 million tons of potassium chloride (KCl), which when considered a 50 % recovery, is obtained in the order of 1.6 million tons of recoverable KCl.

2. In the same way, in an area of the order of 70 km2, the existence of 232,000 tons of lithium in brine was calculated, of which it could be recovered in the order of 93,000 tons of lithium, 40% of the total, which become in approximate 493,000 tons of lithium carbonate (Li2CO3).

**Table 5: Resources according to the former CORFO Mixed Salts Committe**

| ÍTEM | SUPERFICIE CUBIERTA (hás) | RECURSOS TOTAL (ton) | RECURSOS RECUPERABLE (ton) | RAZÓN (ton/ha) |
|---|---|---|---|---|
| Potasio | 5.945 | 1.705.310 | 852.655 | 287 |
| Litio | 7.053 | 231.928 | 92.771 | 33 |
| Cloruro de Potasio | | 3.251.638 | 1.625.819 | |
| Carbonato de Litio | | | 493.742 | |

**Source: Valorización propiedades mineras Maricunga Sur, 2018**

In addition, it must be taken into consideration, that according to what was published by Lithium Power, the resources of lithium carbonate and potassium chloride increased 3.75 and 3.80 times respectively, mainly when finding strata with greater porosity and permeability, and the perforations reached greater depth.

**Table 6: Lithium Power estimation**

| ESTIMACIÓN | ELEMENTO | Lithium Power g/l | Lithium Power ton | ESPECIE |
|---|---|---|---|---|
| Exploración Base | Li | 1,25 | 574.064 | Li2CO3 |
| | K | 8,97 | 1.500.000 | KCl |
| Exploración avanzada | Li | 1,16 | 2.150.000 | Li2CO3 |
| | K | 8,50 | 5.700.000 | KCl |
| Proporción | Li | 0,93 | 3,75 | Veces |
| | K | 0,95 | 3,80 | Veces |

**Source: Valorización propiedades mineras Maricunga Sur, 2018**

Originally, both the Salar de Atacama and the Maricunga salt brine mining property, CORFO evaluated them considering a 10% embalming and a brine column of 30 meters and sensitized to 60 meters, which is what is expected in Maricunga, which would double (x2) the dammed volume, therefore, the difference (3.75 - 2 = 1.75 times) when considering the smaller jump, would be attributed to the porosity and permeability. This is; 1.75 x 10% = 17.5% cavity.

According to the gravimetric map two nuclei are observed, one main in the north central part, with center of gravity N-7,025,000, E-495,000 which was recognized by CORFO, and another minor correlated partially from the results of AMS, in the southern part of the salar, covered by sedimentary fill with center of gravity N-7,007,000, E-498,000.
The highest concentrations are in the core of the salt, which decreases towards the contours of the exposed salt basin or covered with sedimentary fill.

**Illustration 14: Maricunga's lithium nucleus**

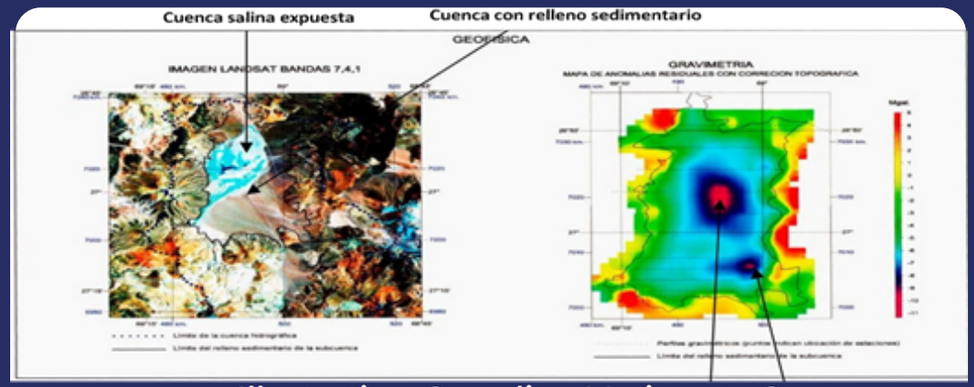



**Illustration: Sampling Maricunga Sur**

| Analyte | Li | K | Na | Mg | Ca | B | Al |
|---|---|---|---|---|---|---|---|
| Units | ppm | % | % | % | % | ppm | % |
| 1º Campaña | 53,46 | 1,64 | 1,16 | 0,71 | 4,60 | 23,63 | 6,86 |
| 2º Campaña | 52,56 | 1,63 | 2,06 | 0,81 | 3,47 | | 7,49 |
| PROMEDIO | 53,01 | 1,64 | 1,61 | 0,76 | 4,04 | 23,63 | 7,18 |

**In order to analyze, the results are summarized according to the following: Illustration 13: Sampling summary**

Considering that the concentrations decrease gradually as the point moves away from the nucleus, the weighted factor that best adjusts is the inverse of the distance (1 / d), which gives greater value to the concessions close to the corresponding nucleus and decreases as it moves away from such position.

Resource K Concession i = 502 ton / ha / distance (di) x Concession area i (ha)
Resource Li Concession i = 58 ton / ha / distance (di) x Concession area i (ha)
When applying the relation on each concession in the saline and sedimentary basin, considering domain rings for each kilometer with respect to the nearest nucleus (di), the resources of the concession group are calculated, generating the following inventory:

**Table 8: Resource estimation by property.**
**Source: Valorización propiedades mineras Maricunga Sur, 2018**

| CONCESIONES | CANTIDAD Pertenencias | SUPERFICIE hás | K ton | Li ton |
|---|---|---|---|---|
| Salar Azul | 73 | 5.110 | 626.674 | 71.841 |
| Ladera Azul | 0 | 880 | 28.883 | 3.311 |
| King Li | 34 | 2.174 | 115.425 | 13.232 |
| ENERGÍA | 54 | 5.080 | 308.978 | 35.421 |
| Rosita | 6 | 425 | 15.276 | 1.751 |
| San Francisco | 1 | 200 | 14.342 | 1.644 |
| Salmuera | 102 | 200 | 75.298 | 8.632 |
| | **270** | **14.069** | **1.184.875** | **135.832** |

With this background, the bet is to validate the base of 1.2 million tons of potassium and the order of 136,000 tons of lithium, to produce potassium chloride and lithium carbonate respectively.