Exhibit 96.4

SEC Technical Report Summary

Cauchari Lithium Brine Project

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1. EXECUTIVE SUMMARY

1.1 Background

This report discloses the lithium brine mineral resource for Allkem Limited's (Allkem's) Cauchari Project (Cauchari or "the Project"). The Project is a planned lithium brine mining and processing facility that will produce lithium carbonate.

Initial studies of the Cauchari Mineral Resource and Reserves indicate the potential for a 25,000 tonne per annum (tpa) Lithium Carbonate Equivalent (LCE) processing facility with a life expectancy of 30 years. The Project is still in the Pre-feasibility study phase.

This report has been prepared in conformance with the requirements of the Securities and Exchange Commission (SEC) S-K Regulation (Subpart 1300) (the "SK Regulations"). This individual Technical Report is the initial report to be issued in support of Allkem's listing on the New York Stock Exchange (NYSE).

This report updates Project Resources, cost estimates, and economics as of the Effective Date (June 30, 2023). Cost estimates and economic assessments for the 25,000 tpa processing facility are at a AACE Class 4 +30% / - 20% level with no escalation of costs in the context of long-term product pricing estimate.

Conclusion, recommendations, and forward-looking statements made by Qualified Persons "QPs" are based on reasonable assumptions and results interpretations. Forward-looking statements cannot be relied upon to guarantee Project performance or outcomes and naturally include inherent risk.

This report was amended to include additional clarifying information in October 2023 and November 2023. The basis of the report is unchanged. The changes and their location in the document are summarized in Chapter 2.1.

1.2 Property Description and Ownership

Cauchari (latitude 23° 29' 13.19" South, longitude 66° 42' 34.30" West) is located in the Puna region, 230 kilometers west of the city of San Salvador de Jujuy in Jujuy Province of northern Argentina and is at an altitude of 3,900 meters (m) above sea level. The property is to the south near paved Hwy. 52 that connects with the international border with Chile (80 km to the west) and the major mining center of Calama and the ports of Antofagasta and Mejillones in northern Chile, both major ports for the export of mineral commodities and import of mining equipment.

The climate in the Cauchari area can be described as typical of a continental, cold, high-altitude desert, with resultant scarce vegetation. The climate allows year around project operation.

The Cauchari tenements cover 28,906 ha and consist of 22 minas which were initially applied for on behalf of South American Salars (SAS). There is an agreement between the vendors of these tenements and SAS.

SAS is a joint venture company with the beneficial owners being Advantage Lithium (AAL) with a 75% interest and La Frontera with a 25% stake. La Frontera is an Argentine company 100% owned by Orocobre Ltd. Orocobre acquired all outstanding shares of AAL on February 19, 2020, and gained full (100 %) control of the Project. Orocobre merged with Galaxy Lithium to form Allkem Limited on August 21, 2021. Allkem indirectly owns 100% of the Cauchari tenements. The Project is not subject to any known environmental liabilities.

The Cauchari property is located near (approximately 20 km) Allkem's Olaroz lithium carbonate-producing property. The Olaroz property has been extensively studied and has been producing lithium carbonate products since 2015. The Cauchari study draws inferences and approximations from the Olaroz property in terms of process design and expected performance, pond design and evaporation, and infrastructure requirements and sizing.

1.3 Geology and Mineralization

1.3.1 Geology

Based on the drilling campaigns carried out in the Salar between 2011 and 2018, six major geological units were identified and correlated from the logging of drill cuttings and undisturbed core to a general depth of over 600 m. No borehole has reached bedrock. Salar de Cauchari is a mixed-style salar, with a halite nucleus in the center of the Salar overlain with up to 50 m of fine grained (clay) sediments. The halite core is interbedded with clayey to silty and sandy layers. The Salar is surrounded by relative coarse-grained alluvial and fluvial sediments. These fans demark the perimeter of the actual Salar visible in satellite images and at depth extend towards the center of the Salar where they form the distal facies with an increase in sand and silt. At depth (between 300 m and 600 m) a deep sand unit has been intercepted in several core holes in the SE Sector of the Project area.

1.3.2 Mineralization

The brines from Salar de Cauchari are solutions nearly saturated in sodium chloride with an average concentration of total dissolved solids (TDS) of 290 g/l. The average density is 1.19 g/cm^3. Components present in the Cauchari brine are K, Li, Mg, Ca, Cl, SO_4, HCO_3, and B. Table 1-1 shows a breakdown of the principal chemical constituents in the brine including maximum, average, and minimum values, based on the 546 brine samples that were collected and analyzed from the exploration boreholes during the 2011 and 2017/18 drilling programs.

Table 1-1 - Maximum, average, and minimum elemental concentrations of the Cauchari brine.

Analyte	Li	K	B	Na	Ca	Mg	SO4	Density
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	g/cm^3
Maximum	956	8,202	2,528	135,362	1,681	2,640	62,530	1.23
Mean	512	4,349	941	105,721	504	1,323	18,930	1.19
Minimum	157	101	621	101	175	314	101	1.07
Std. Dev.	144	1,186	487	16,033	212	412	8,561	0.03

1.4 Exploration Status

Three drilling campaigns have been carried out for the Project between 2011 and 2018. The first program in 2011 by SAS (Phase I) covered the SE Sector of the Project area, and the second and third campaigns (Phase II and III) by AAL covered both the NW and SE Sectors of the Project area. The work carried out during the three drilling campaigns can be summarized as follows:

- Exploration drilling on a general grid basis to allow the estimation of "in-situ" brine resources. The drilling methods were selected to allow for:
    1) The collection of continuous core to prepare "undisturbed" samples from specified depth intervals for laboratory porosity analyses and
    2) The collection of depth-representative brine samples at specified intervals. The 2011 campaign included five (5) diamond core holes CAU01 though CAU05 and one rotary hole (CAU06). The second and third campaigns in 2017/18 included twenty (20) diamond core holes (CAU12 through CAU29).
- Brine sample collection during the drilling programs consisted of bailed and packer samples in the diamond holes, and packer and pumped samples in the rotary holes. A total of 1,946 brine samples (including 540 QA/QC samples) were analyzed by NorLab (Jujuy, Argentina) as the primary laboratory and by Alex Steward Assayers (Mendoza, Argentina) and the University of Antofagasta (Chile) as secondary QA/QC laboratories. Additional brine QA/QC analyses were carried out on centrifuged samples collected by the Geosystems Analysis laboratory in Tucson, AZ.
- HQ core was retrieved during the diamond core drilling from which some 415 primary undisturbed samples were prepared for laboratory drainable porosity and other physical parameter determinations by GeoSystems Analysis (GSA) in Tucson, AZ. Laboratory QA/QC porosity analyses (30) were undertaken by Corelabs in Houston, TX, and Daniel B Stephens & Associates laboratories (DBSA) in Albuquerque, NM.
- The 2017/18 campaign included five rotary holes (CAU07 though CAU11) which were drilled and completed as test production wells to carry out pumping tests and additional selective brine sampling. Six nested monitoring wells were installed adjacent to CAU07 and CAU11 for use during the long-term pumping tests as part of the Phase III program.

- Initial short-term (48 hour) pumping tests were carried out on CAU07 through CAU11 during 2017. Long-term pumping tests (30 days) with subsequent recovery were carried out on CAU07 and CAU11.
- A number of geophysical surveys have been carried out since 2011 in the Project area to further define basin geometry, and continuity of lithological units, and to define the brine / freshwater interface along the perimeter of the Salar. These geophysical surveys included gravity, TEM, VES, and AMT methods.

1.5 Development and Operations

1.5.1 Mineral Processing and Recovery Methods

Specific brine evaporation and metallurgical recovery test work at the Cauchari site has not progressed as of the Effective Date. The Cauchari brine has been sampled and tested with results indicating similar characteristics to the Allkem Olaroz site brine. This is expected due to the proximity (20 km) and interconnectedness of the Olaroz and Cauchari salars.

The brine variance on Mg/Li and Li/ SO_4 ratios for both Cauchari and Olaroz brines are low enough to state that Cauchari brine could be processed using similar processing technology to that applied in the Olaroz production facility. The Olaroz process design has been successfully proven to produce lithium carbonate since 2015.

1.5.2 Process Facility Design

The QPs are familiar with both the Cauchari and Olaroz basins and has visited both sites, including the Olaroz processing facilities during operation. It is the QPs opinion that the Olaroz process as described in section 1.5.2.1 Olaroz Project design approximation is a suitable approximation and has been utilized for the Cauchari process.

1.5.2.1 Olaroz Project design approximation

The Olaroz brine chemical behavior under evaporation was studied extensively in pilot scale ponds, along with the key plant process steps such as lime addition, impurity removal and carbonation. The purification process via conversion to lithium bicarbonate was pilot-tested at the University of Jujuy. Testing was conducted between 2009 and 2011.

The Olaroz project design is a conventional pond evaporation operation. After concentration brine is processed in the plant to produce lithium carbonate product.

The lithium carbonate process used by Allkem in their Olaroz plant is well proven and has been operating for several years. This process can be applied directly to the Cauchari project, given the similarity between the Cauchari and Olaroz brines.

1.6 Mineral Resource Estimate

1.6.1 Inputs and Estimation Methodology

The Cauchari resource model domain covers an area of 117.7 km^2 and is constrained by the following factors:

- The top of the model coincides with the brine level in the salar as measured in several monitoring wells and further interpreted by TEM and SEV geophysical profiles.
- The lateral boundaries of the model domain are limited to the area of the Cauchari tenements where they flank the neighboring LAC concessions and by the brine / freshwater interface along the eastern and western limits of the salar as interpreted from boreholes information and TEM and SEV profiles.

- The bottom of the model coincides with a surface created from the bottom of the boreholes. Locally, a deeper resource volume has been defined in the Lower Sand as defined by boreholes CAU11R, CAU12DA, CAU13DA, and CAU19D.

The resource model has been divided into three domains to account for the different data availability, geological knowledge, and sample support. The domains are described as follows:

- Transition Domain: Accounts for five percent of the total resources and is defined as the volume in the upper part of the salar that includes fresher water and transition into pure brine. The lithium concentrations in the transition zone increase with depth. The number of brine samples in the transition domain is low.
- Main Domain: Accounts for 83% of the total resources and has normal and reliable sample data obtained during the drilling. A kriging approach was selected for this domain due to the number of samples available.
- Secondary Data Domain: Accounts for 12% of the total resources and its lithium content was defined mostly by brine chemistry analysis on samples derived during pumping tests on CAU8, CAU9, CAU10, and CAU11. An inverse distance approach was selected because of the amount of information available.

The resource estimate was prepared in accordance with the guidelines of S-K1300 and uses best practice methods specific to brine resources, including reliance on core drilling and sampling methods that yield depth-specific chemistry and drainable porosity measurements.

The Stanford Geostatistical Modeling Software (SGeMS) was used for the Cauchari brine resource estimation. SgeMS has been used in the past for the estimation of brine resources in other areas of the Central Andes. Geostatistics is a branch of statistics specifically developed to estimate ore grades for mining operations from spatiotemporal datasets. Geostatistics goes far beyond simple interpolation methods such as nearest neighbor or inverse distance as it accounts for the spatial correlation and continuity of geological properties typically observed in the field. Based on this, the following steps were carried out to estimate the lithium and potassium resources.

- The block model geometry was adapted to represent the geological model with an appropriate block size (x=100 m, y=100 m, z=1 m).
- Generation of histograms, probability plots and box plots were conducted for the Exploratory Data Analysis (EDA) for lithium and potassium.
- Calculation of the experimental variograms with their respective variogram models for lithium and potassium in three orthogonal directions.
- Definition of the random function model and selection of the kriging method.
- Interpolation of lithium and potassium for each block in mg/l using ordinary kriging with the defined variogram models.
- Calculation of total resources using the de-clustered porosity average value for each geological unit, based on the boreholes data. Each geological unit will represent its particular porosity value.

1.6.1.1 Cut-off concentration

A lithium cut-off grade of 300 mg/l was utilized based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$ 20,000 per tonne over the entirety of the LOM and a grade-tonnage curve. Considering the economic value of the brine against production costs, the applied cut-off grade for the resource estimate (300 mg/l) is believed to be conservative in terms of the overall estimated resource. Domains in the block model with grades below the 300 mg/l cut-off grade were not considered in the resource estimate; thus, with these assumptions, a reasonable basis has been established for the prospects of eventual economic extraction.

Furthermore, the assigned 300 mg/L cut-off grade is consistent with other lithium brine projects of the same study level, which use a similar processing method. The resource is relatively homogeneous in grade (as shown in the grade-tonnage curve of Figure 11-17), and the average concentration is well above the cost of production, with brine concentrated in low-cost solar evaporation ponds.

The price estimate for Lithium Carbonate is based on information provided by industry consultants Wood Mackenzie, based on their extensive studies of the lithium market. Actual prices are negotiated by Allkem with customers, generally as contracts related to market prices.

Mr. F. Reidel AIPG (the QP) understands the lithium market will likely have a shortfall of supply in the coming few years, which will support higher than inflation-adjusted historical prices. Based on 2022 and 2023 pricing to date, the Wood Mackenzie analysis is considered a reasonable basis for pricing through to 2025. By this time, a new technical report will likely be completed, outlining details for the feasibility study.

1.6.2 Mineral Resource Classification

This sub-section contains forward-looking information related to Mineral Resource estimates for the Cauchari Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this sub-section including geological and brine grade interpretations, as well as controls and assumptions related to establishing reasonable prospects for economic extraction.

The essential elements of a brine resource determination for a salar are:

- Definition of the aquifer geometry.
- Determination of the drainable porosity or specific yield (Sy).
- Determination of the concentration of the elements of interest.

Resources may be defined as the product of the first three parameters. Aquifer geometry is a function of both the shape of the aquifer, the internal structure, and the boundary conditions (brine / freshwater interface). Aquifer geometry and boundary conditions can be established by drilling and geophysical methods. Hydrogeological analyses are required to establish catchment characteristics such as surface and groundwater inflows, evaporation rates, water chemistry, and other factors potentially affecting the brine reservoir volume and composition in-situ. Drilling is required to obtain samples to estimate the salar lithology, specific yield, and grade variations both laterally and vertically.

It is the opinion of the QPs that the salar geometry, brine chemistry composition, and the specific yield of the salar sediments have been adequately defined to support the Measured, Indicated, and Inferred Resource estimate described in Table 1-2 and Table 1-3.

Table 1-2 - Summary of Measured Indicated and Inferred Brine Resources, Exclusive of Mineral Reserves (June 30, 2023).

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/L)
Measured	**0.302**	**1.6**	**581**
Indicated	**0.321**	**1.7**	**494**
Total Measured and Indicated	**0.623**	**3.3**	**519**
Inferred	**0.285**	**1.5**	**473**

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Mineral Resources and mineral reserves estimate is Mr. F. Reidel AIPG for Cauchari Comparison of values may not add up due to rounding or the use of averaging methods.
3. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
4. The estimate is reported in-situ and exclusive of Mineral Reserves, where the lithium mass is representative of what remains in the reservoir after the LOM. To calculate Resources exclusive of Mineral Reserves, a direct correlation was assumed between Proven Reserves and Measured Resources, as well as Probable Reserves and Indicated Resources. Proven Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Measured Mineral Resources, and Probable Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Indicated Mineral Resources. The average grade for Measured and Indicated Resources exclusive of Mineral Reserves was back-calculated based on the remaining brine volume and lithium mass.
5. The cut-off grade used to report Cauchari Mineral Resources and Mineral Reserves is 300 mg/l.
6. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.

Table 1-3 - Summary of Measured Indicated and Inferred Brine Resources, Inclusive of Mineral Reserves (June 30, 2023).

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/l)
Measured	**0.345**	**1.85**	**527**
Indicated	**0.49**	**2.60**	**452**
Total Measured and Indicated	**0.835**	**4.45**	**476**
Inferred	**0.285**	**1.50**	**473**

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Mineral Resources and Mineral reserves estimate is Mr. F. Reidel AIPG for Cauchari
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
5. The cut-off grade used to report Cauchari Mineral Resources and Mineral Reserves is 300 mg/l.
6. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.

1.7 Mineral Reserve Estimate

1.7.1 Inputs and Estimation Methodology

A numerical groundwater flow and transport model using the FEFLOW 7.1 code was developed for the Cauchari Project in support of this PFS. The numerical model was built, calibrated, and operated by the DHI Group with the guidance of Mr. F. Reidel AIPG. The specific objectives of the model in support of this PFS are to:

- Calibrate the model to a normalized root mean squared error (NRMSE) of 10% or less under pre-mining, steady-state conditions.
- Calibrate the model in transient mode for pumping tests at wells CAU07R and CAU11R.
- Simulate brine abstraction of the wellfields located in the NW- and SE Sectors of the Project area to support an annual LCE production of 25,000 tonnes over a 30-year mine life, assuming 67 percent total lithium process recovery efficiency.
- Evaluate preliminary well-field configurations and pumping schedules to minimize the potential dilution of lithium concentrations in the discharge of the production wells.
- Prepare an estimate of Mineral Reserves for the Project.

The calibrated model was used to predict lithium extraction rates from the Salar de Cauchari during the proposed 30-year mine life with a target lithium carbonate equivalent (LCE) extraction rate of 25 kilotonnes per year (ktpy) assuming a process lithium recovery efficiency of 67%. Twenty-two (22) wells are proposed for the NW Sector wellfield in the Archibarca fan area during the first nine years of mine life. The NW production wells target the brine in the lower part of the Archibarca unit. During the initial three-year ramp-up period, the combined pumping rate increases from 168 l/s in Year 1 to 312 l/s during Year 3.

Forty-five (45) wells are proposed for the SE Sector wellfield with a pumping schedule. As for the NW wellfield, production wells are replaced on a regular basis during the LOM. The SE wellfield targets brine in the halite, clay, and Lower Sand units from Year 9 to Year 30 of operations. The proposed total pumping rate from the southeast wells is a constant 480 l/s.

The initial Li concentration in the pumped brine from the NW wellfield is 580 mg/l in Year 1 and gradually declines to 520 mg/L by Year 8. The initial Li concentration of the brine pumped from the SE wellfield gradually declines from 490 mg/l in Year 9 to 465 mg/l in Year 30. The resulting Li concentrations applied are: 580 mg/l for Years 1-5, 545 mg/l for Years 6-9, and 490 mg/l for Years 9 - 31. It is expected that through further optimization of the well-field configurations and pumping schedules, the overall LOM Li concentrations can be improved.

1.7.2 Mineral Reserve Classification

Proven Reserves were derived from the Measured Resources in the NW wellfield area during the first seven years of production (with production in the NW extending for 9 years). Lithium Reserves derived after Year 7 from the Measured and Indicated Resources in the NW and SE wellfield areas were categorized as Probable Reserves. Results of a separate model simulation to evaluate the potential effect of the proposed neighboring LAC brine production (according to LAC Updated Feasibility Study of January 2020) showed that there is no material impact on the Cauchari Reserve Estimate. Table 1-4 shows the Mineral Reserve Estimate for the Cauchari Project.

It is the opinion of the QPs that the FEFLOW model provides a reasonable representation of the hydrogeological setting of the Project area and that the model is adequately calibrated to be an appropriate tool to estimate the Proven and Probable Reserves reported hereinafter. To the extent known by the QPs, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Reserve estimate which are not discussed in this Report.

Table 1-4 - Cauchari Project Reserve Estimate (June 30, 2023).

Category	Year	Brine Vol (Mm^3)	Average Lithium Grade (mg/L)	Lithium (kt)	Li_2CO_3 Equivalent (kt)
Proven	1-7	76	571	43	231
Probable	8-30	347	485	169	897
Total	**1-30**	**423**	**501**	**212**	**1,128**

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Mineral Resources and Mineral Reserves estimate is Mr. F. Reidel AIPG for Cauchari.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
5. The cut-off grade used to report Cauchari Mineral Resources and Mineral Reserves is 300 mg/l.
6. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
7. The Lithium Reserve Estimate represents the lithium contained in the brine produced by the wellfields as input to the evaporation ponds. Brine production initiates in Year 1 from wells located in the NW Sector. In Year 9, brine production switches across to the SE Sector of the Project.
8. Approximately 25% of M+I Resources are converted to Total Reserves.
9. Potential environmental effects of pumping have not been comprehensively analyzed at the PFS stage. Additional evaluation of potential environmental effects will be done as part of the next stage of evaluation.
10. Additional hydrogeological test work will be required in the next stage of evaluation to adequately verify the quantification of hydraulic parameters in the Archibarca fan area and in the Lower Sand unit as indicated by the sensitivity analysis carried out on the model results. Mineral Reserves are derived from and included within the M&I Resources in the Resource Table 1-2 above.
11. Indicated Resources of 894,000t LCE contained in the West Fan Unit are not included in this PFS production profile. There is a reasonable prospect that through additional hydrogeological test work Inferred Resources in the Lower Sand Units will be converted to M+I Resources.

Regarding risk factors, the Brine Reserve estimate may be affected by the following:

- Assumptions regarding aquifer parameters and lithium concentrations used in the groundwater model for areas where empirical data does not exist.
- Estimated vertical hydraulic conductivity values which partially control the amount of anticipated future dilution in the NW areas where freshwater overlies brine.

1.8 Mine Design

1.8.1 Production Plan

The production plan ramps up for the first three years to the peak 25,000 tpy by year 4. Production is maintained at a steady state for years 4 - 30. Cumulated production over the life of mine is in line with the Lithium Reserve Estimate.

1.9 Infrastructure

Site infrastructure will consist of the main processing facilities including brine well fields and pumping, evaporation ponds, process plant, and waste storage. The processing facilities will be supported by services and personnel accommodation facilities.

The brine production wellfields will be located on two sectors of the Salar de Cauchari, one in the Archibarca area, near and among the initial evaporation ponds and another located south-east. Brine wells will be equipped with variable-speed drive submersible pumps and surface booster stations to deliver brine to the evaporation ponds.

The evaporation ponds will cover an area of approximately 10.5 km^2 in Years 1-5, increase to 11.3 m^2 for years 6-9, and 12.2 m^2 from year 10 onwards.

The processing plant will consist of a liming plant to support evaporation pond processes, and a lithium carbonation plant to produce the final product. The processing plant will be supported by service infrastructure such as reagents mixing, fuel and storage facility, sulfuric acid preparation, compressors and boilers, and water treatment plants.

The Project's accommodation camp will be built to the west of the lithium carbonate plant, at a reasonable distance. The camp will include several facilities of modular-type construction including dormitories, dining rooms, recreational areas, and medical facilities.

During the construction phase, additional temporary modular facilities will be employed to expand the temporary peak labor requirements.

The process facility, support services, and accommodation infrastructure are deemed adequate to support the planned facility operation and production rate.

1.10 Environmental, Social and Permitting

1.10.1 Environmental Liabilities

The Project tenements are not subject to any known environmental liabilities. There have been historical ulexite / borax mining activities adjacent to the Project in the north of the Salar. These mining operations are generally limited to within three meters of the surface, and it is assumed that these borax workings will naturally be reclaimed when mining is halted due to wet season inflows.

1.10.2 Base line studies

The Project has successfully completed various environmental studies required to support its exploration programs between 2011 and the present. The last Environmental Impact Assessment approval was in 2017 for the exploration stage.

In September 2019 the Project submitted an Environmental Baseline for the Exploitation stage which to date is under evaluation by the provincial mining authority.

All the Environmental Impact Assessments are submitted to the Provincial Mining Directorate and subject to a participatory evaluation and administrative process with provincial authorities (Indigenous People Secretariat, Water Resources Directorate, Environmental Ministry, Economy, and Production Ministry, among others) and communities of influence, until the final approval resolution is obtained.

In the case of Cauchari, the evaluation process is carried out with the participation and dialogue of the indigenous communities of Manantiales de Pastos Chicos, Olaroz Chico, Huancar, Termas de Tuzgle de Puesto Sey, Catua, Paso de Jama and Susques.

The Project has submitted an initial mine closure plan within the Exploitation Environmental Impact Assessment which is still under evaluation.

1.10.3 Permit Status

Exploration and mining activities are subject to regulatory approval following an environmental impact assessment ("EIA"), before initiating disturbance activities. The QPs understand that Allkem (previously AAL) obtained all required approvals for the exploration drilling and testing programs in the Salar.

Allkem is currently in the process of renewing and maintaining required exploration-related permits while awaiting approval of exploitation permitting. Further permits will be required once exploitation is initialized.

There are no insurmountable risks identified at this time that could cause the project to not proceed into potential exploitation.

1.10.4 Social and community requirements

Allkem has been actively involved in community relations since the properties were acquired by SAS prior to initial drilling on the Project in 2011. Although there is minimal habitation in the area of the Salar, Allkem has consulted extensively with the local communities and employs members of these communities in the current exploration activities.

The formal EIA permitting process will address community and socio-economic issues; it is expected the Project will have a positive impact with the creation of new employment opportunities and investment in the region. As part of the EIA, a comprehensive consultation was undertaken with members of the local communities, regarding the Project development and its associated opportunities for the community members.

1.11 Capital and Operating Cost Estimates

Certain information and statements contained in this section and in the report are forward-looking in nature. Actual events and results may differ significantly from these forward-looking statements due to various risks, uncertainties, and contingencies, including factors related to business, economics, politics, competition, and society. All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted.

The Cauchari Project is a stand-alone greenfield project currently in the pre-feasibility study phase considering a ±25% accuracy and 15% contingency on Capital Costs.

The financial and economic data contained in this report are derived from the fiscal year-end of June 2023. Any estimates utilized in the report are current as of July 1, 2023, commonly referred to as fiscal year 2024. Allkem functional currency is US dollars while transactional currency is local currency. For the purpose of any financial projections, all estimates have been done in US dollars denominated in real terms as of 2023.

The Cauchari Project is an updated pre-feasibility study AACE Class 4 +30% /-20% accuracy.

Cost estimates and economic assessments for the 25,000 tpa processing facility have no escalation of costs in the context of long-term product pricing estimates.

The capital cost estimate was prepared by Worley Chile S.A. and Worley Argentina S.A. (collectively, Worley) in collaboration with Allkem. The estimate includes capital cost estimation data developed and provided by Worley, Allkem, and current estimates. A summary of the estimated direct and indirect capital costs by area is presented in Table 1-5 - Capital cost estimate by area. The capital costs are expressed in an effective exchange rate shown as Allkem's actual expense.

Table 1-5 - Capital cost estimate by area.

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown US$ m
Direct Costs		
Brine Extraction Wells	645	16
Evaporation Ponds	5,854	146
Brine Treatment Plant	711	18
LCP	4,214	105
General Services	4,398	110
Infrastructure	1,591	40
Additional Camps	600	15
Total Direct Cost	**18,013**	**450**
EPCM	1,358	34
Owner Costs	1,160	29
Others	2,404	60
Contingency (15%)	3,440	86
TOTAL CAPEX	**26,376**	**659**

The total sustaining and enhancement capital expenditures for Cauchari Project over the total Life of Mine (LOM) period are shown in Table 1-6 - Sustaining and enhancement CAPEX.

Table 1-6 - Sustaining and enhancement CAPEX.

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Enhancement CAPEX	-	-	-
Sustaining CAPEX	739	547	18
Total	**739**	**547**	**18**

* Long Term estimated cost per year

1.11.1 Operating Costs Estimate

The operating cost estimate for the Cauchari Project was prepared by Worley (Chile) and supported by Allkem's management team. The cost estimate excludes indirect costs such as distributed corporate head office costs for corporate management and administration, marketing and sales, exploration, project and technical developments, and other centralized corporate services. The operating cost also does not include royalties, and export taxes to the company.

The operating costs estimate for Cauchari was rationalized through comparisons to Allkem Olaroz Project. Most of the operating costs are based on labor and consumables which are in use at the Olaroz operation.

Table 1-7 provides a summary of the estimated cost by category for a nominal year of operation.

Table 1-7 - Operation Cost: Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Variable Cost	2,425	1,794	61
Fixed Cost	1,656	1,226	40
TOTAL OPERATING COST	**4,081**	**3,020**	**101**

* Long Term estimated cost per year

1.12 Market Studies

The QPs have relied on external market consultants Wood Mackenzie for lithium market-related demand and price predictions. The lithium supply chain is expected to remain restricted in the short term (2-3 years) with gradual growth in supply in response to growing demand. This is expected to provide a positive price environment for the Project.

1.12.1 Contracts

As of the date of this Technical Report, Allkem has no existing commercial offtake agreements in place for the sale of lithium carbonate from the Cauchari Project.

1.13 Economic Evaluation Results

The Discounted Cash Flow (DCF) model is constructed on a real basis without escalation or inflation of any inputs or variables. The primary outputs of the analysis, on a 100% Project basis, include:

- NPV at a discount rate of 10%.

- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.

The financial evaluation is dependent on key input parameters and assumptions:

1. Production schedule in a Fiscal Year basis (July to June), including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule. The Cauchari nominal capacity of annual lithium carbonate is estimated to be 25,000t/year.
2. Plant recoveries and lithium grades.
3. Operating, capital, and closure costs for a 30-years operating life.
4. Operating costs related to wellfields, evaporation ponds, process plant, waste removal, site-wide maintenance and sustaining costs, environmental costs, onsite infrastructure and service costs, and labor costs (including contractors).
5. Product sales are assumed to be Free on Board (FOB) South America.
6. For the purpose of this report, the Corporate Rate was 35%.
7. The economic analysis assumes 100% equity financing.
8. All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, or financial expenses, and all financial assessments are expressed in US dollars.

The key metrics are summarized in Table 1-8 Summary of LOM annual financial projection.

Table 1-8 - Base Case Main Economic Results.

Summary Economics		
Production		
LOM	yrs	30
First Production	Date	2027
Full Production	Date	2029
Capacity	tpa	25,000
Investment		
Development Capital Costs	US$m	659
Sustaining Capital Costs	US$m per year	18
Development Capital Intensity	US$/tpa Capacity	26,376
Cash Flow		
LOM Operating Costs	US$/t LCE	4,081
Avg Sale Price (TG)	US$/t LCE	27,066
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	2,523
NPV @ 10% (Post-Tax)	US$m	1,366
NPV @ 8% (Post-Tax)	US$m	1,942
IRR (Pre-Tax)	%	32.6%
IRR (Post-Tax)	%	23.9%
Payback After Tax (production start)	yrs	3.3
Tax Rate	%	35.0%

1.13.1 Sensitivity Analysis

The sensitivity analysis examined the impact of variations in commodity prices, production levels, capital costs, and operating costs on the project's NPV at a discount rate of 10%.

The commodity price has the most significant impact on the project's NPV, followed by production levels, OPEX, and CAPEX. Price emerges as the most influential factor and a mere 10% variation in price results in a 19% impact on the NPV see Figure 1-1 Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, the Cauchari project remains economically viable.

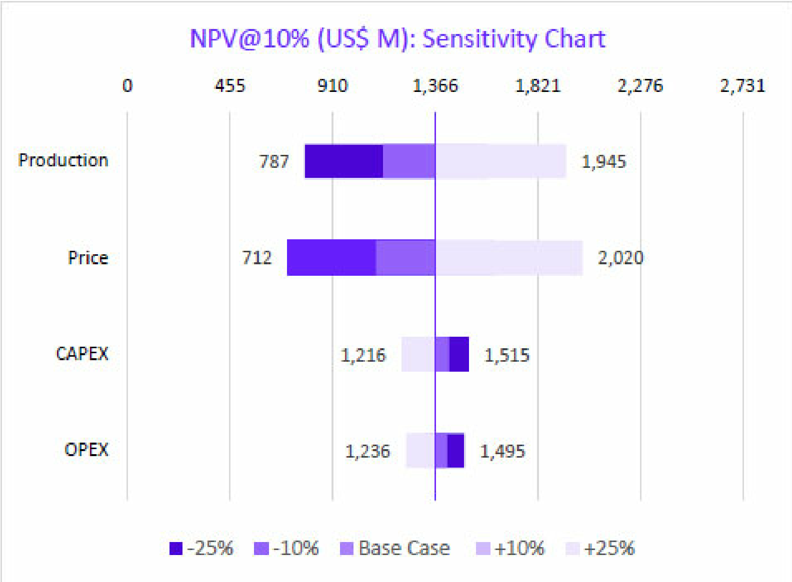


Figure 1-1 - Sensitivity Chart.

Based on the assumptions detailed in this report, the economic analysis of the Cauchari Project demonstrates positive financial outcomes. The sensitivity analysis further strengthens the project's viability, as it indicates resilience to market fluctuations and cost changes.

1.14 Conclusions and QP Recommendations

1.14.1 Conclusions

Based on the analyses and interpretation of the results of the exploration work carried out on the Cauchari Lithium Project between 2011 and 2018 and subsequent analysis, the salar geometry, brine chemistry composition and the specific yield of the salar sediments have been adequately defined to support the Measured, Indicated and Inferred Resource estimates described in Table 1-2.

It is the opinion of the QPs that the FEFLOW groundwater flow and transport model prepared for the Project provides a reasonable representation of the hydrogeological setting of the Project area and that the model is adequately calibrated to be used for the preparation of the Mineral Reserve estimate presented in Table 1-4.

Environmental Impact Assessment report was lodged with the Authorities in September 2019, with outcomes pending. No other insurmountable permitting-related risks are known that may cause the project not to proceed into exploitation.

Lithium marketing publications, such as the one that provided the prices in this study, currently acknowledge certain price profiles over the short, medium, and long term. The current pricing estimates indicate strong future demand and related price growth. The estimated CAPEX and OPEX for a 25,000 tpy conventional lithium carbonate production facility, including brine extraction, solar evaporation ponds, lithium carbonate processing, and auxiliary equipment, as well as infrastructure, is concluded and a pre-feasibility study, AACE class 4 level with a +/- 25% accuracy level. Given that Project economic results remain positive, even when enduring substantial negative variations in prices or cost drivers, it can be asserted that the Project shows reasonable economic extraction potential.

1.14.2 Recommendations

Considering that:

a) The Project’s resource base appears sufficient for the proposed production program.
b) Production of lithium carbonate from these Resources also appears feasible.
c) Project economic evaluation results appear favorable,

It is recommended that the Project proceed to the next study stage.

The trade-off study work completed during the current study indicated a preference to produce lithium carbonate on site, and a decision in this sense was taken by Allkem (previously AAL), discarding the production of lithium hydroxide or a mix of the two products. It is recommended that this assumption be reviewed and reaffirmed at the next study phase, taking the development of nearby Allkem's Olaroz plant into account.

Ongoing monitoring of market forces is recommended to ensure the economic viability of the Project remains.

It is recommended that the next study development phase include:

- Expanding the Project's Resources through the conversion of Inferred Resource in the Lower Sand unit into Indicated or Measured Resources.
- Additional hydrogeological test work in the NW and SE wellfield areas to facilitate the optimization of hydraulic parameter selection and to reduce the uncertainty associated with production and construction.
- Additional hydrogeological test work in the West Fan unit to be able to incorporate a significant amount Indicated Resources into the Project's Mineral Reserve base and production profile.
- Update the FEFLOW groundwater flow and transport model to optimize wellfield configurations, pumping schedules, optimize LOM Li concentrations, and to expand the Project's mineral reserve base.

1.15 Revision Notes

The report was prepared by the QPs listed herein.

This individual Technical Report is the initial report to be issued under the S-K §229.1300 regulations and, therefore, no revision note is attached to this individual Technical Report.

2. INTRODUCTION

This section provides context and reference information for the remainder of the report.

2.1 Terms of Reference and Purpose of the Report

This Technical Report Summary was prepared in accordance with the requirements of Regulation S-K, Subpart 1300 of the SEC.

Technical information is provided to support the Mineral Resource and Reserve Estimates for Allkem's Cauchari Project, including conducted exploration, modeling, processing, and financial studies. The purpose of this Technical Report Summary is to disclose Mineral Resources and Reserves and related economic extraction potential.

Cauchari (latitude 23° 29' 13.19" South, longitude 66° 42' 34.30" West), which is located immediately south of, and has similar brine characteristics to, Olaroz, is wholly owned by Allkem. Cauchari is located in the Puna region, 230 kilometers west of the city of San Salvador de Jujuy in Jujuy Province of northern Argentina and is at an altitude of 3,900 meters above sea level.

Initial studies of the Cauchari Mineral Resource and Reserves indicates potential for a 25,000 tonne per annum (tpa) Lithium Carbonate Equivalent (LCE) processing facility with a life expectancy of 30 years. The Project is still in the Pre-feasibility study phase.

This report updates Project Mineral Resources, cost estimates and economics as of the Effective Date (30 June 2023). Cost estimates and economic assessments for the 25,000 tpa processing facility are at a AACE Class 4 +30% / - 20% level with no escalation of costs in the context of long-term product pricing estimate.

The Report includes technical judgment of appropriate additional technical parameters to accommodate certain specific characteristics of minerals hosted in liquid brine as outlined in CIM Best Practice Guidelines for Resource and Reserve Estimation for Lithium Brines, best practice guidelines prepared for other reporting codes such as CH20.235, and as discussed by Houston (Houston et al, 2011).

This report has been prepared in conformance with the requirements of SK Regulations. This individual Technical Report is the initial report to be issued in support of Allkem's listing on the New York Stock Exchange (NYSE).

The report was amended to include additional clarifying information in October 2023 and November 2023. The basis of the report is unchanged. The changes and their location in the document are summarized as follows:

- Amended date added to title page
- QP Statement on the adequacy of the metallurgical data and a statement regarding the final forecast recovery (Chapter 10.4)
- Disclosure of the cut-off grade calculation used for mineral resource and mineral reserve estimates with an example calculation that includes all the parameters and appropriate units used to prepare this calculation. (Chapters 11 and 12)
- Disclosure of the annual numerical values and totals for the Life of Mine (LOM) production. This includes total quantities (liters) pumped from wellfields with associated solution grades, the overall process recovery, and final salable product on an annual basis (Chapter 13.1)
- QP Statement on the adequacy of the current plans for environmental compliance, permitting, and addressing issues with local individuals or groups, as well as closing and reclamation costs (Chapter 17)
- Change in reference to the decree regulating export fees (Chapter 18.2.14)
- Disclosure of a complete annual economic analysis for mineral reserve determination. More detail provided on key assumptions with a summary of the results on an after-tax basis with LOM totals. (Chapter 19.2)
- Change in cut-off grade calculation (Chapter 11.7.4 and Chapter 12.6)
- Minor typos and non-material amendments

2.2 Qualifications of Qualified Persons

2.2.1 Qualified Persons

The following serve as the Qualified Persons (QPs) for this Report in compliance with 17 CFR 229.1300:

- Marek Dworzanowski; and
- Frederik Reidel.

The QPs have prepared this Report and take responsibility for the contents of the Report as set out in Table 2-1.

Table 2-1 - Scope of Work Responsibility Matrix.

REPORT CHAPTERS		Qualified Persons
1	Executive Summary	All
2	Introduction	Marek Dworzanowski
3	Project Property Description	Frederik Reidel
4	Accessibility, Climate, Local Resources, Infrastructure, Physiography	Frederik Reidel
5	History	Frederik Reidel
6	Geological Setting and Mineralization and Deposit Types	Frederik Reidel
7	Exploration	Frederik Reidel
8	Sample Preparation, Analyses and Security	Frederik Reidel
9	Data Verification	Frederik Reidel
10	Mineral Processing and Metallurgical Testing	Marek Dworzanowski
11	Mineral Resource Estimates	Frederik Reidel
12	Mineral Reserve Estimates	Frederik Reidel
13	Mining Methods	Frederik Reidel
14	Processing and Recovery Methods	Marek Dworzanowski
15	Project Infrastructure	Marek Dworzanowski
16	Market Studies and Contracts	Marek Dworzanowski
17	Environmental Studies, Permitting, and Social or Community Impact	Marek Dworzanowski
18	Capital and Operating Costs	Marek Dworzanowski
19	Economic Analysis	Marek Dworzanowski
20	Adjacent Properties	Frederik Reidel
21	Other Relevant Data and Information	Marek Dworzanowski
22	Interpretation and Conclusions	All
23	Recommendations	All
24	References	All
25	Reliance on Information Supplied by the Registrant	Marek Dworzanowski

Frederik Reidel, AIPG, has been involved with exploration and development efforts of the Olaroz and Cauchari Salars since 2009 and visited the Cauchari area on numerous occasions. Mr. Reidel is an independent consultant to the lithium industry and a Qualified Person (QP) as defined by 17 CFR §229.1300. He is Certified Professional Geologist (# 11454) with the American Institute of Professional Geologist (AIPG) and Competent Person (# 390) with the Chilean Mining Commission (CCCRRM), and co-author of "Complementary Guidelines for Mineral Resource and Reserve Estimation in Brines" for Chilean

Code CH 20.235. He has carried out brine resource evaluation work in Salar de Maricunga, Diablillos, Centenario, Pastos Grandes, and Pocitos over the last 15 years. Mr. Reidel is not an employee of or otherwise affiliated with Allkem.

Marek Dworzanowski is an independent consulting metallurgical engineer with over 40 years of experience in the global mining industry. He holds a BSc (Hons) in Mineral Processing from the University of Leeds. He is an honorary life Fellow of the Southern African Institute of Mining and Metallurgy (FSAIMM), membership number 19594. He is a Fellow of the Institute of Materials, Minerals and Mining (FIMMM), membership number 485805. He is registered as a Chartered Engineer with the Engineering Council of the United Kingdom, registration number 485805. His expertise is an appropriate foundation for a lithium brine QP, specifically based on being the QP, since 2017, for 4 PEA studies, 3 PFS studies and 5 DFS studies. This covered one project in Chile, one project in the USA and 4 projects in Argentina. Mr. Dworzanowski is an independent consultant to the lithium industry and a Qualified Person (QP) as defined by 17 CFR §229.1300. Mr. Dworzanowski is not an employee of or otherwise affiliated with Allkem.

Allkem is satisfied that the QPs meet the qualifying criteria under 17 CFR § 229.1300.

2.2.2 Site Visits

Frederik Reidel last visited the Cauchari site in August 2019. Specific work carried out during the visit included review of the execution of QA/QC protocols for drilling, brine sampling, pump testing, and the preparation of drainable porosity samples. Drill cuttings and core were inspected and cross-checked with the Leapfrog model. Meetings with site geologists and management.

Mr. Marek Dworzanowski last visited the Cauchari Project area in July of 2018:

- July 18 - meeting to discuss project background and site visit arrangements with the Advantage Lithium project geologist.
- July 19 - there was a visit to Salar de Cauchari and to the Orocobre Olaroz operation. At Salar de Cauchari the camp was visited. The staff at the camp were asked about sampling and analysis for the Cauchari project. The Salar was visited to inspect the exploration done as well as ongoing exploration. The extent of the Salar was noted and the potential locations for future evaporation ponds and the main plant area were also visited. Permission was obtained beforehand to visit the Orocobre Olaroz operation. Given Orocobre’s part ownership of the Cauchari project and the proximity of the Olaroz operation to the Cauchari Salar, a visit was viewed as essential to understanding the Cauchari project. Unfortunately, the weather prevented any viewing of the evaporation ponds, but the lithium carbonate plant was visited. The process was explained and questions about the process and plant design were answered.

- July 20 - A further meeting / teleconference was held with the Advantage Lithium project team to discuss aspects of the Cauchari site visit and in particular the visit to Orocobre's Olaroz operation.

2.3 Effective Date

The Effective Date of this report of the Mineral Resource and Reserve estimates is June 30, 2023.

2.4 Previous Technical Reports

This SEC Technical Report Summary is the first that has been prepared for Allkem's Cauchari Project. Thus, this report is not an update of a previously filed Technical Report Summary under the SK Regulations.

2.5 Reference Reports

Previous technical reports prepared for the Project include:

- Cauchari, Update Mineral Resource Estimate; NI 43-101 Technical Report prepared for Advantage Lithium Corp prepared by FloSolutions, dated April 19, 2019.
- Preliminary Economic Assessment of the Cauchari JV Lithium Project, Jujuy Province, Argentina. NI 43-101 Technical Report prepared for Advantage Lithium Corp by Worley Parsons, dated August 31, 2018.
- Lithium and Potassium Resources, Cauchari Project, NI 43-101 Technical Report prepared for Advantage Lithium Corp by Frederik Reidel and Peter Ehren, dated June 27, 2018.
- Technical Report on the Cauchari Lithium Project Jujuy Province, Argentina. NI 43-101 Report Prepared for Advantage Lithium Corp by Murray Brooker and Peter Ehren. Effective 5th December 2016, Amended 22 December 2016.
- Technical Report on the Cauchari Project Jujuy Province, Argentina. NI 43-101 Report Prepared for Orocobre Limited. Prepared by Consulting Hydrogeologist John Houston. Effective April 30, 2010.

2.6 Sources of information

The authors were provided full access to the Allkem databases including drill core and cuttings, drilling and testing results, brine chemistry and porosity laboratory analyses, aquifer testing results, geophysical surveys, and all other information available from the work carried out on the Project between 2011 and 2019. Meetings and other communications took place between Allkem staff and the authors to facilitate the preparation of this report during June 2023. The documentation reviewed, and other sources of information, are listed at the end of this report in Chapter 24 References.

2.7 Specific Characteristics of Lithium Brine Projects

Although extensive exploration and development of new lithium brine projects has been underway for the last decade it is important to note there are essential differences between brine extraction and hard rock lithium, base, or precious metal mining. Brine is a fluid hosted in an aquifer and thus can flow and mix with adjacent fluids once pumping of the brine commences. An initial in-situ resource estimate is based on knowledge of the geometry of the aquifer, and the variations in porosity and brine grade within the aquifer.

Brine deposits are exploited by pumping the brine to the surface and extracting the lithium in a specialist production plant, generally following brine concentration through solar evaporation in large evaporation ponds. To assess the recoverable reserve, further information on the permeability and flow regime in the aquifer and the surrounding area is necessary to be able to predict how the lithium contained in brine will change over the Cauchari Project life. These considerations are examined more fully in Houston et. al., (2011) and in the Canadian Institute of Mining (CIM) and Joint Ore Reserve Committee (JORC) (Australia) brine reporting guidelines. The reader is referred to these key publications for further explanation of the details of brine deposits.

Hydrogeology is a specialist discipline which involves the use of specialized terms which are frequently used throughout this document. The reader is referred to the glossary for definition of terms.

2.8 Units of Measure & Glossary of Terms

The metric (SI system) units of measure are used in this report unless otherwise noted. Table 2-2 provides a list of abbreviations used in this Technical Report. All currency in this report is in US dollars (US$) unless otherwise noted.

Table 2-2 - Acronyms and Abbreviations.

Abbreviation	Definition
AA	atomic absorption
AACE	Association for the Advancement of Cost Engineering
AISC	all-in sustain cost
AMC	Argentina Mining Code

Abbreviation	Definition
Andina	Andina Perforaciones S.A.
BG	battery-grade
CAGR	Compound annual growth rate
CAPSA	Compañía Argentina de Perforaciones S.A.
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CRP	Community Relations Plan
DCF	discounted cashflow
DIA	Environmental Impact Assessment (Declaración de Impacto Ambiental)
EIR	Environmental Impact Report
Energold	Energold Drilling Inc.
ERH	Evaluation of Hydric Resources (Evaluación de Recursos Hidricos)
ESS	stationary energy storage
EV	electric vehicles
EVT	evapotranspiration
FEED	Front End Engineering Design
FOB	free on board
G&A	General and Administrative
GBL	gamma-butyrolactone solvent
GHB	general head boundary
GIIP	Good International Industry Practice
GLSSA	Galaxy Lithium (Sal de Vida) S.A.
GRI	Global Reporting Initiative
Hidroplus	Hidroplus S.R.L.
HSECMS	Health, Safety, and Environmental Management System
ICP	inductively coupled plasma
IRR	Internal rate of return
IX	ion exchange
JORC	Joint Ore Reserve Committee (Australia)
KCl	potassium chloride
Kr	hydraulic conductivity in the radial (horizontal) direction
Kz	hydraulic conductivity in the vertical direction
LC	lithium carbonate
LCE	lithium carbonate equivalent
LFP	lithium-iron-phosphate
Li	lithium
LOM	life of mine
MCC	motor control centre
NI	Canadian National Instrument
NPV	net present value
NaCl	Halite Salts
OSC	Ontario Securities Commission

Abbreviation	Description
OIT	Operator interface terminal
PG	Primary-grade
PPA	power purchase agreement
QA/QC	quality assurance/quality control
QP	Qualified Person
RO	reverse osmosis
RC	reverse circulation
SRM	standard reference material
SX	solvent extraction
TDS	total dissolved solids
TG	technical-grade
VFD	variable frequency drive

Table 2-3 - Units of Measurement.

Abbreviation	Description
°C	degrees Celsius
%	percent
AR$	Argentinean peso
US$	United States dollar
dmt	dry metric tonnes
g	grams
GWh	Gigawatt hours
ha	hectare
hr	hour
kg	kilogram
L	liters
L/min	liters per minute
L/s	liters per second
L/s/m	liters per second per meter
kdmt	thousand dry metric tonnes
km	kilometer
km^2	square kilometers
km/hr	kilometer per hour
ktpa	kilotonne per annum
kVa	kilovolt amp
M	million
m	meters
m^2	square meter
m^3	cubic meters
m^3/hr	cubic meters per hour
m bls	meters below land surface
m btoc	meters below top of casing
m/d	meters per day
min	minute
mm	millimeter
mm/a	millimeters annually
mg	milligram
Mt	million tonnes
MVA	megavolt-ampere
ppm	Parts per million
ppb	parts per billion

Abbreviation	Description
t	tonne
s	second
Sy	Specific yield or Drainable Porosity unit of porosity (percentage)
Ss	Specific Storage
tpa	tonnes per annum
µm	micrometer
µS	microSeimens
V	volt
w/w	weight per weight
wt%	weight percent
yr	year

3. Property Description

3.1 Property Location, Country, Regional and Government Setting

3.1.1 Location

Cauchari (latitude 23° 29' 13.19" South, longitude 66° 42' 34.30" West), which is located immediately south of, and has similar brine characteristics to, Olaroz, is wholly owned by Allkem. Cauchari is located in the Puna region, 230 kilometers west of the city of San Salvador de Jujuy in Jujuy Province of northern Argentina and is at an altitude of 3,900 meters above sea level. The Cauchari tenements cover 28,906 ha and consist of 22 mining concessions. Cauchari was acquired by Orocobre in 2020 following the completion of a statutory plan of arrangement with AAL, and then Cauchari was acquired by Allkem in 2021 pursuant to the Galaxy/Orocobre Merger. Refer to Figure 3-2.

The Project site is situated to the south of paved Hwy. 52 that passes through the international border with Chile, approximately 80 km west (Jama Pass) and continues on to the major mining center of Calama and the ports of Antofagasta and Mejillones in northern Chile, both major ports for the export of mineral commodities and import of mining equipment.

3.1.2 Government Setting

The Project is subject to the governing laws of Argentina, and provincial laws of Jujuy province.

Figure 3- 1 - Regional position of the Cauchari project (Source: Allkem, 2023).

3.1.3 Licenses & coordinate system

The location of the Allkem licenses is shown in Figure 3-3. Co-ordinates are given in the Argentine coordinate system, which uses the Gauss Krueger Transverse Mercator projection and the Argentine Posgar 94 datum. The properties are located in Argentine GK Zone 3. All other map co-ordinates used in this report are Posgar 94 except where noted.

Two tenement types exist in the Argentine mining regulations. Cateos (Exploration Permits) are licenses that allow the holder to explore the tenement for a period of time that is proportional to its size. An Exploration Permit of 1 unit (500 hectares) is granted for a period of 150 days. For each additional unit (500 hectares) the period is extended by 50 days. The maximum allowed permit size is 20 units (10,000 hectares) and which is granted for a period of 1,100 days. The period begins 30 days after granting the permit.

A relinquishment must be made after the first 300 days, and a second one after 700 days. The applicant should pay a canon fee of $1,600 Argentine pesos per unit (500 hectares) and submit an exploration work plan and environmental impact assessment.

Minas (Mining/exploitation Permits) are licenses which allow the holder to exploit the property (tenement) subject to regulatory environmental approval. Minas are of unlimited duration, providing the property holder meets its obligations under the Mining Code. These include:

- Paying the annual rent (canon).
- Completing a survey of the property boundaries.
- Submitting a mining investment plan.
- Meeting the minimum investment commitment.

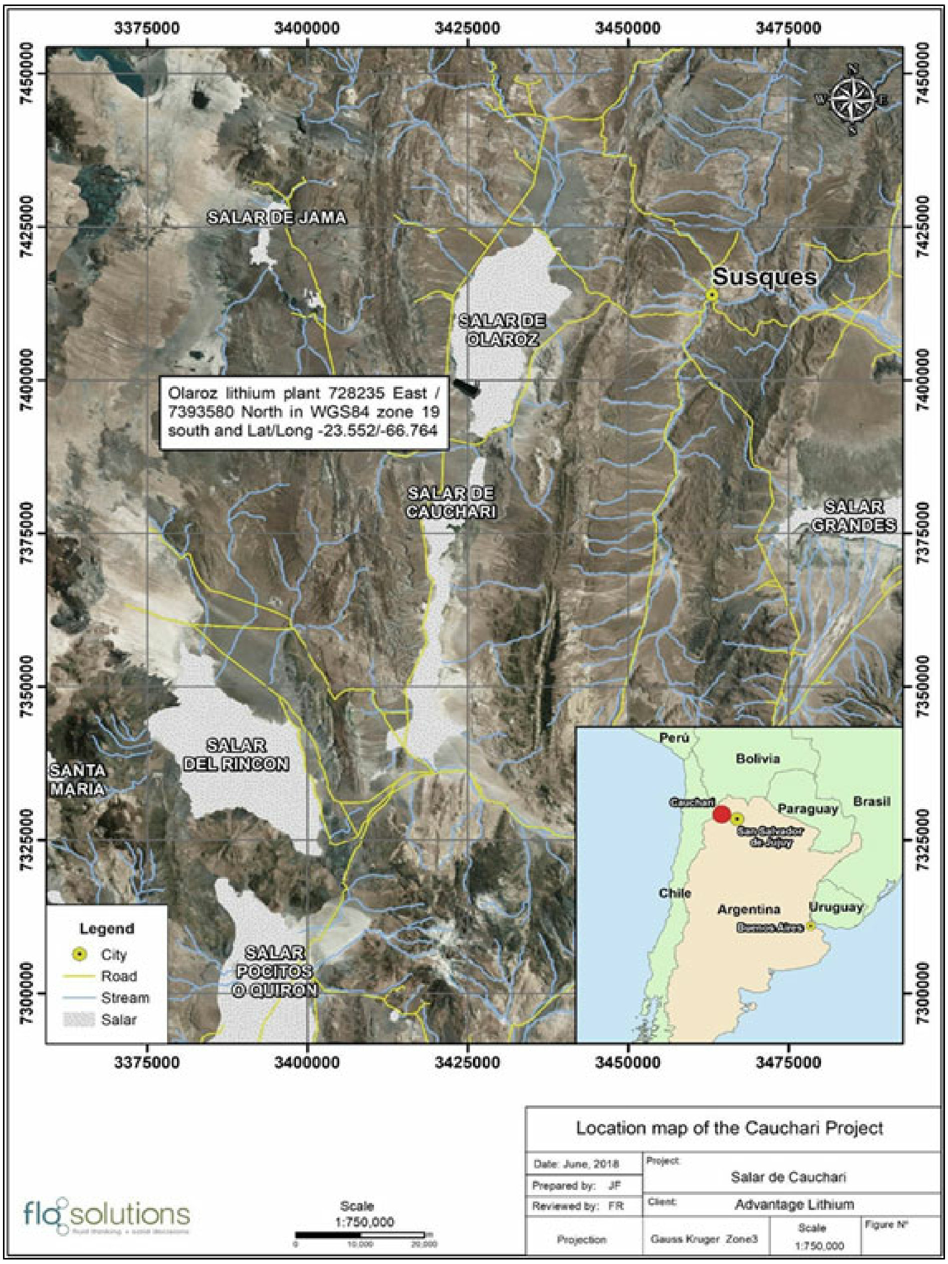


Figure 3-2 - Local map of the Cauchari Project.

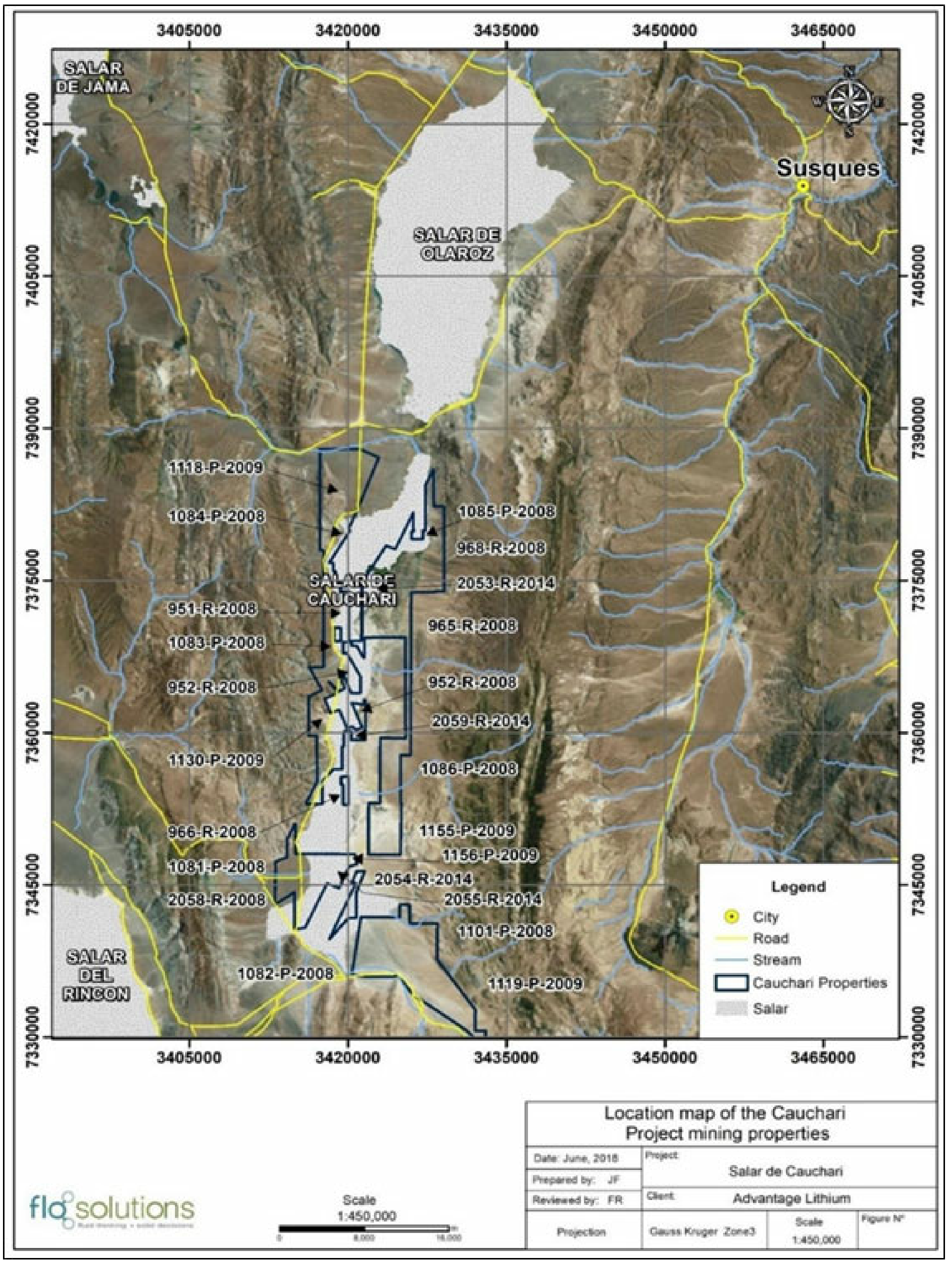


Figure 3-3 - Location map of the Cauchari properties.

The Cauchari properties are now all held as applications for mines.

- The investment commitment is 300 times the annual rent payment, to be spent over a five-year period and payable within five years of the filing of a capital investment plan.
- During each of the first two years the amount of the investment shall not be less than 20% and the rest of the investment (60 %) freely distributed during the remaining three years.
- The annual tenement tax varies according to the mineral commodity. For brines it is $3,200 Argentine pesos/yr per 100 hectares.

Mining properties (of both types) must specify the type of mineral the holder is seeking to explore and exploit. The canon fees are dependent on the class of minerals applied for. Properties cannot be over-staked by new properties specifying different minerals; adding a new mineral species to a properties file is a relatively straightforward procedure and may require payment of a different canon fee.

All Cauchari properties are in the process of being granted as minas/exploitation permits, replacing the Cateos previously held by SAS. Provided that the title holder fulfils the legal requirements, in due time the pertinent exploitation license/property should be granted. An independent legal review has confirmed the property obligations have been met and that the properties are in good standing.

3.1.4 The Cauchari Tenement Package

The Cauchari tenements cover approximately 28,906 hectares in the province of Jujuy. These consist of 22 minas which were applied for on behalf of SAS. There is an agreement between the vendors of these properties (tenements) and SAS. The legal report prepared by independent Argentine registered lawyer Mr. Santiago Saravia Frias (dated August 12, 2016) showed that these properties were originally owned by Silvia Rodriguez and were transferred to SAS (effective date October 9, 2015).

Table 3-1 - Surface rights of Cauchari Project tenements.

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
1	OLACAPATITA I*	1082-P-2008	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	1.500,00	Termas de Tuzgle de Puesto Sey
2	OLACAPATITA II*	1101-P-2008	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	1.245,22	Termas de Tuzgle de Puesto Sey
3	OLACAPATITA II*	1119-P-2009	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	1.765,95	Termas de Tuzgle de Puesto Sey
4	SAN GERARDO	1118-P-2009	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium and others	495,38	Catua - Manantiales de Pastos Chicos - Olaroz Chico

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
5	ANTONITO I	1155-P-2009	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	445.74	Termas de Tuzgle de Puesto Sey
6	SAN GERARDO II	1130-P-2009	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,468.87	Catua - Olaroz Chico
7	SAN FRANCISCO SUR I	965-R-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	2,483.91	Manantiales de Pastos Chicos
8	SAN FRANCISCO NORTE	968-R-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	2,492.22	Manantiales de Pastos Chicos
9	SAN GABRIEL NORTE	1084-P-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,996.95	Catua - Manantiales de Pastos Chicos
10	SULFITA I	1086-P-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	117.71	Termas de Tuzgle de Puesto Sey
11	JUAN PABLO II	2055-R-2014	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,922.64	Termas de Tuzgle de Puesto Sey - Catua
12	SAN CARLOS ESTE	966-R-2008	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	1,028.73	Termas de Tuzgle de Puesto Sey - Catua
13	SAN FRANCISCO ESTE	1085-P-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,344.98	Manantiales de Pastos Chicos
14	SAN JOAQUIN I	952-R-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	797.12	Termas de Tuzgle de Puesto Sey - Catua
15	PAPA FRANCISCO I	2053-R-2014	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	1,526.80	Manantiales de Pastos Chicos
16	JUAN PABLO I	2058-R-2014	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,445.57	Termas de Tuzgle de Puesto Sey - Catua
17	GEORGINA I	1081-P-2008	Exploitation Concession	Not yet granted.	Borate, Lithium and Potassium	912.34	Termas de Tuzgle de Puesto Sey - Catua - Manantiales de Pastos Chicos

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
18	SOLITARIA I	1156-P-2009	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	2,395.69	Termas de Tuzgle de Puesto Sey - Catua
19	SAN GABRIEL SUR	1083-P-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,261.75	Manantiales de Pastos Chicos
20	SAN GABRIEL X	2059-R-2014	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	487.59	Catua
21	JUAN XXIII	2054-R-2014	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	54.55	Termas de Tuzgle de Puesto Sey - Catua
22	SAN GABRIEL I	951-R-2008	Exploitation Concession	Not yet granted.	Disem. Borate, Lithium, and others	1,716.63	Manantiales de Pastos Chicos

*Are partially affected by the Cauchari Photovoltaic Park established by the Province of Jujuy.

3.1.5 Mineral Rights and Permitting

Authorizations are required to commence mining activities, primarily the submission and approval of a full Environmental Impact Assessment for the Cauchari Project. Allkem has submitted the last environmental impact assessment in 2019 for exploitation phase included necessary infrastructure such pumping wells, construction of the processing plant, gas pipeline and aqueduct lines, camp, among other activities. The approval of this Environmental Impact Assessment must be issued by the provincial mining authority and can be renewed by SAS for up to two years thereafter, if not sooner.

To date, Allkem has obtained in 2017 the exploration phase permit and, in addition to this mining approval, there are other environmental permits described below.

3.1.6 Agreements and Royalties

The Argentine federal government regulates the ownership of Mineral Resources, although mining properties are administered by the provinces. Therefore, and in accordance with the Jujuy Provincial Constitutional Law, Provincial Law 5791/13, Resolution 1641-DPR-2023 and other related regulatory decrees and complementary rules, SAS will be required to pay monthly royalties as consideration for the minerals extracted from its concessions. Monthly royalties are equivalent to 3% of the mine head value of the mineral extracted, calculated as the sales price less direct cash costs related to exploitation and excluding depreciation of fixed assets.

SAS expects to pay the Province of Jujuy a royalty of the type once the approval of the Exploitation Environmental Impact Assessment has been approved and the exploitation and production activities have effectively started.

Table 3-2 - Summary of Mining EIA Situation, fees, and investment.

Id.	Title		Environmental Impact Assessment Status	Status		
	Name	File #		Semi-annual canon fee*	Pithead Royalty**	Others Royalty
1	OLACAPATITA I*	1082-P-2008	Exploitation EIA under evaluation (filed on Sep.19)	Does not yet apply	Does not yet apply	None
2	OLACAPATITA II*	1101-P-2008		Does not yet apply	Does not yet apply	None
3	OLACAPATITA II*	1119-P-2009		Does not yet apply	Does not yet apply	None
4	SAN GERARDO	1118-P-2009		Does not yet apply	Does not yet apply	None
5	ANTONITO I	1155-P-2009		Does not yet apply	Does not yet apply	None
6	SAN GERARDO II	1130-P-2009		Does not yet apply	Does not yet apply	None
7	SAN FRANCISCO SUR I	965-R-2008		Does not yet apply	Does not yet apply	None
8	SAN FRANCISCO NORTE	968-R-2008		Does not yet apply	Does not yet apply	None
9	SAN GABRIEL NORTE	1084-P-2008		Does not yet apply	Does not yet apply	None
10	SULFITA I	1086-P-2008		Does not yet apply	Does not yet apply	None
11	JUAN PABLO II	2055-R-2014		Does not yet apply	Does not yet apply	None
12	SAN CARLOS ESTE	966-R-2008		Does not yet apply	Does not yet apply	None
13	SAN FRANCISCO ESTE	1085-P-2008		Does not yet apply	Does not yet apply	None
14	SAN JOAQUIN I	952-R-2008		Does not yet apply	Does not yet apply	None
15	PAPA FRANCISCO I	2053-R-2014		Does not yet apply	Does not yet apply	None
16	JUAN PABLO I	2058-R-2014		Does not yet apply	Does not yet apply	None
17	GEORGINA I	1081-P-2008		Does not yet apply	Does not yet apply	None
18	SOLITARIA I	1156-P-2009		Does not yet apply	Does not yet apply	None
19	SAN GABRIEL SUR	1083-P-2008		Does not yet apply	Does not yet apply	None
20	SAN GABRIEL X	2059-R-2014		Does not yet apply	Does not yet apply	None
21	JUAN XXIII	2054-R-2014		Does not yet apply	Does not yet apply	None
22	SAN GABRIEL I	951-R-2008		Does not yet apply	Does not yet apply	None

3.2 Environmental Liabilities

The Cauchari tenements are not subject to any known environmental liabilities. There have been historical ulexite / borax mining activities adjacent to the Cauchari in the north of the salar. These mining operations are generally limited to within three meters of the surface, and it is assumed that these borax workings will naturally reclaim when mining is halted due to wet season inflows.

3.3 Other Significant Factors and Risks

Several normal risk factors are associated with the exploration and development of the Cauchari JV. These risks include, but are not limited to:

- Mining properties may not be renewed by the provincial authorities.
- Final environmental approvals may not be received from the necessary authorities.
- Obtaining all necessary licenses and permits on acceptable terms in a timely manner or at all.
- Changes in federal or provincial laws and their implementation may impact planned activities.
- Potential flooding in the salar could temporarily delay planned exploration and development activities.
- The company may be unable to meet its obligations for expenditure and maintenance of property licenses.
- Activities on adjacent properties having an impact on the Cauchari.

4. ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES, AND INFRASTRUCTURE

This section discusses the environment and geographical phenomena associated with the project site.

4.1 Accessibility

The Project site is reached by paved and unpaved roads from either the Salta or Jujuy Provinces. The distance between San Salvador de Jujuy and the Project is approximately 230 km and takes about 4 hours by car. The access from Jujuy is via Hwy RN 9 for approximately 60 km to the town of Purmamarca, from there Hwy RN 52 for a further 150 km, passing the village of Susques to RP 70 along the west side of Cauchari. The Cauchari JV is accessed directly from RP 70.

The Project is reached from the city of Salta, capital of Salta Province, via the town of Campo Quijano, then continuing along Hwy RN 51 through Quebrada del Toro, the town of San Antonio de los Cobres and a further 130 km to the junction with RP 70 on the west side of Salar de Cauchari. Total driving time from Salta to the Project is approximately 5 hours.

Both Jujuy and Salta have international airports with regular flights to Buenos Aires. The Project is located 20 km to the south of Orocobre's Olaroz lithium plant which has full infrastructure available including water, gas, and electricity. The Puna gas pipeline crosses to the north of Salar de Olaroz. Orocobre has constructed a connection to this pipeline for the Olaroz Project. A railway line connecting northern Argentina to Chile passes along the southern end of Salar de Cauchari, approximately 40 kilometers to the south of the Project site.

4.2 Topography, Elevation, Vegetation and Climate

4.2.1 Physiography

The Altiplano-Puna is an elevated plateau within the central Andes (see Figure 4-2 below). The Puna covers part of the Argentinean provinces of Jujuy, Salta, Catamarca, La Rioja, and Tucuman with an average elevation of 3,700 masl (Morlans, 1995; Kay et. al., 2008).

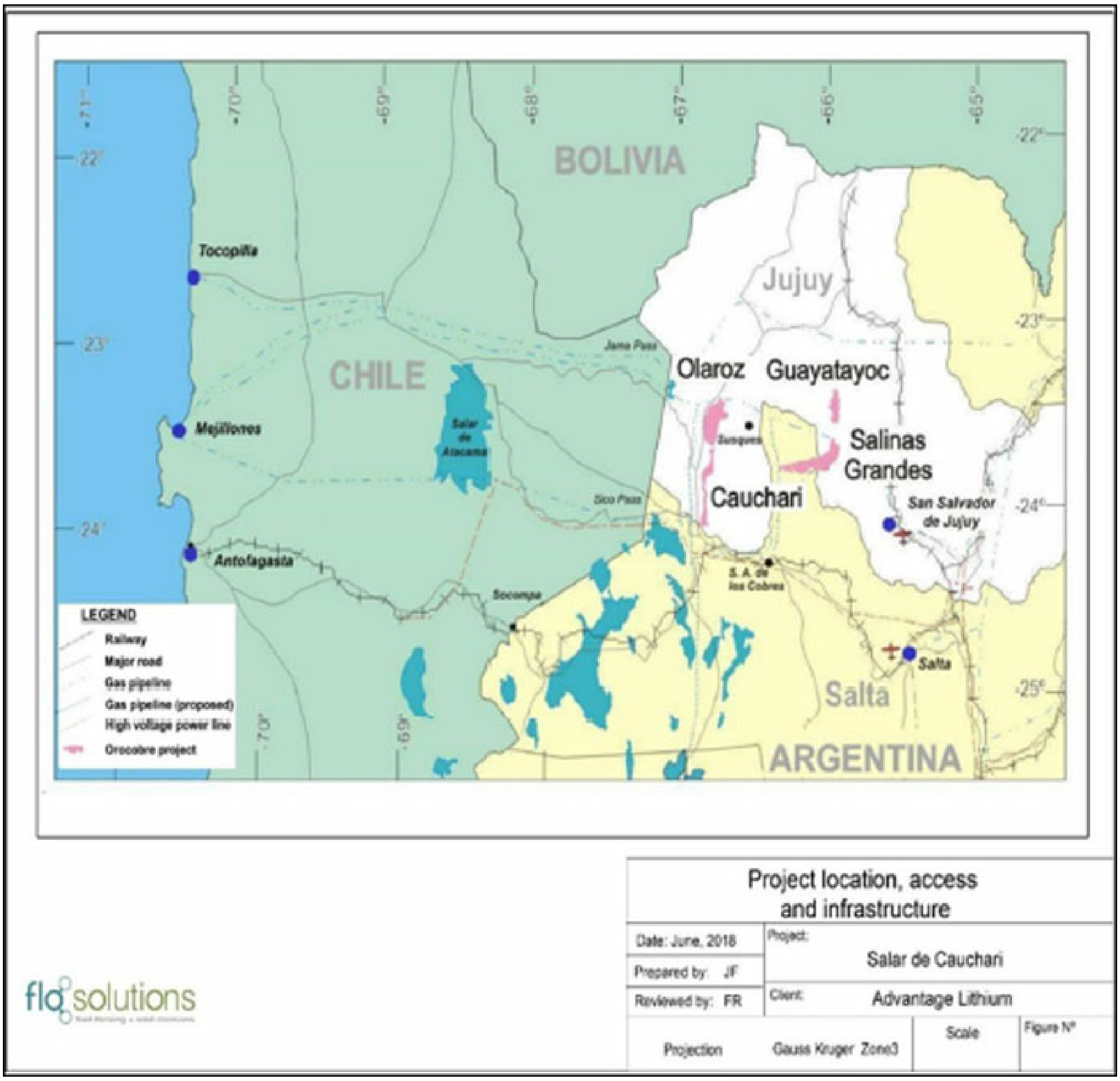


Figure 4-1 - Project location, access, and infrastructure.

The Altiplano-Puna Volcanic Complex (APVC) is shown on Figure 4-2 and is associated with numerous stratovolcanoes and calderas. Investigations have shown that the APVC is underlain by an extensive magma chamber at 4-8 km depth (de Silva et al., 2006).

The physiography of the region is characterized by generally north-south trending basins and ranges, with canyons cutting through the Western and Eastern Cordilleras. There are numerous volcanic centers in the Puna, particularly in the Western Cordillera, where volcanic cones are present along the border of Chile and Argentina.

Dry salt lakes (salars) in the Puna occur within many of the closed basins (see Figure 4-2 below), which have internal (endorheic) drainage. Inflow to these salars is from summer rainfall, surface water runoff and groundwater inflows. Discharge is though evaporation.

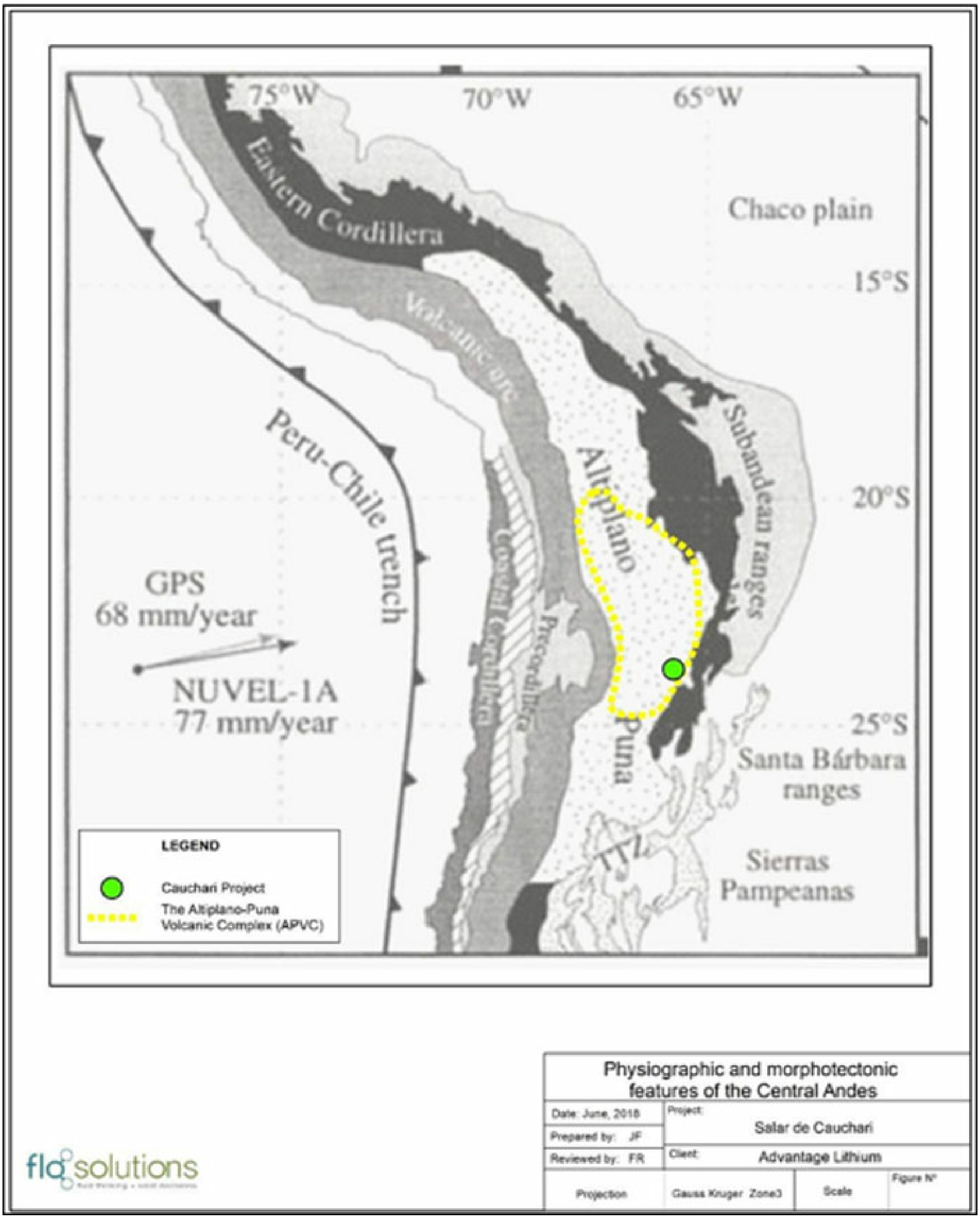


Figure 4-2 - Physiographic and morphotectonic features of the Central Andes.

Key physiographic observations regarding salar de Cauchari include:

- The drainage divides between the Cauchari salar to the south and salar de Olaroz to the north is coincident with the international Hwy RN 52 crossing between these salars and continuing west to link Argentina to Chile at the Jama pass.
- The large Archibarca alluvial fan is present on the western side of Salar de Cauchari. The eastern side of the salar hosts smaller alluvial fans entering the basin.
- Rio Tocomar enters from the south into the Cauchari basin and flows north towards the nucleus of the salar. Hot springs are reported in the head water of the river in the southeastern extent of the basin.
- Rio Ola enters the Cauchari-Olaroz drainage basin from the west and sits on top of the Archibarca Fan.
- Rio Rosario enters the Salar de Olaroz from the north and flows south towards the center of the Salar.
- The Cauchari - Olaroz drainage basin covers some 6,000 km^2 with the nucleus of Salar de Cauchari covering approximately 250 km^2 as shown in Figure 4-3.

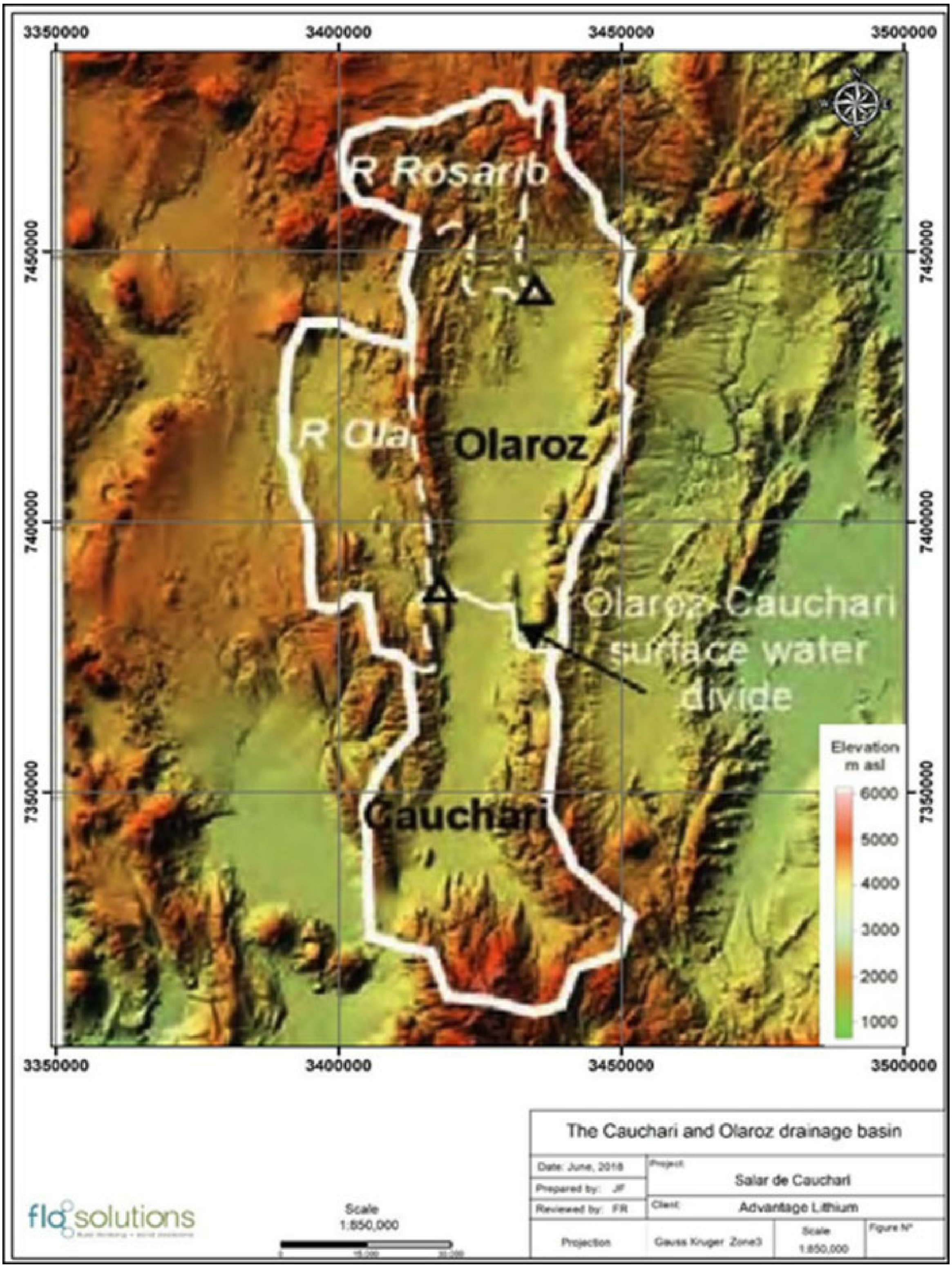


Figure 4-3 - The Cauchari and Olaroz drainage basin.

4.2.2 Climate

The climate in the Project area is severe and can be described as typical of a continental, cold, high-altitude desert, with resultant scarce vegetation. Daily temperature variations may exceed 25°C. Solar radiation is intense, especially during the summer months of October through March, leading to high evaporation rates. The rainy season is between the months of December to March. Occasional flooding can occur in the salar during the wet season.

SAS has had access to three operating weather stations since 2012, one station located in Salar de Cauchari, and two stations located further north in Salar de Olaroz. The stations maintain a continuous record of temperature, atmospheric pressure, and liquid precipitation, among other meteorological variables of interest. There is no continuous record of direct evaporation measurements, and therefore evaporation is calculated indirectly from other parameters.

In addition to these stations, the National Institute of Agricultural Technology INTA has historical monthly rainfall data in northwestern Argentina, for the period 1934-1990 (Bianchi, 1992), of which three stations are located within the Cauchari-Olaroz basin.

The locations of the relevant weather stations for the Project are shown in Figure 4-4 and Table 4-1 provides summary information for each of the stations.

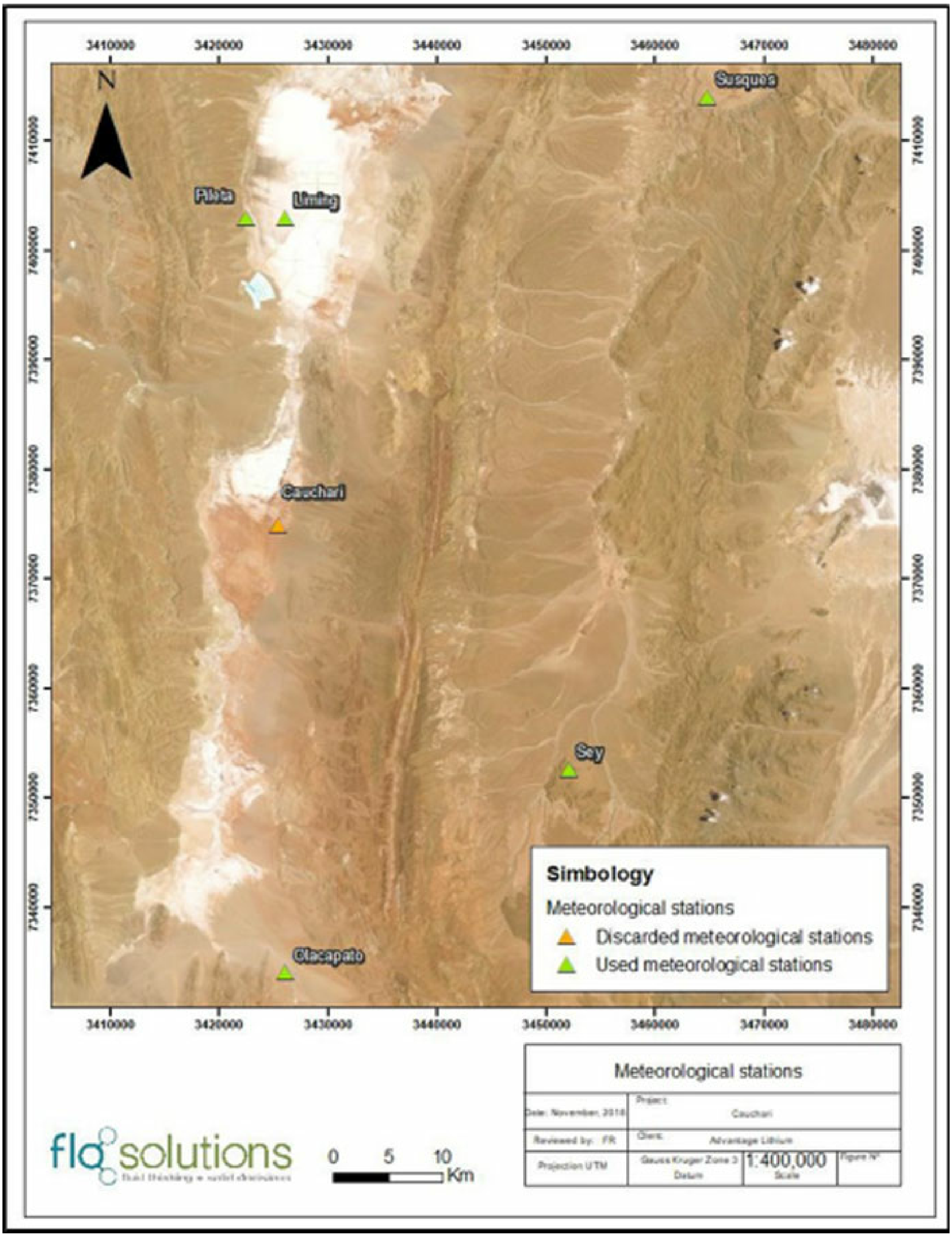


Figure 4-4 - Location map of the relevant weather stations for the Project.

Table 4-1 - Summary information for the relevant weather stations for the Project (Gauss- Kruger, zone 3 Projection).

Station	East	North	Elevation (masl)	Initial yr	Final yr	Source
Olacapato	3,426,174	7,333,969	3,920	1950	1990	INTA
Sey	3,452,179	7,352,543	3,920	1973	1990	INTA
Susques	3,464,901	7,413,940	3,675	1972	1990	INTA
Pileta	3,422,504	7,402,921	3,904	2012	2018	SAS
Liming	3,426,177	7,402,921	3,904	2012	2018	SAS
Cauchari	3,425,501	7,374,878	3,918	2012	2018	SAS

4.2.3 Precipitation

The rainy season is between the months December and March when most of the annual rainfall occurs often in brief convective storms that originate from Amazonia to the northeast. The period between April and November is typically dry. Annual rainfall tends to increase towards the northeast, especially at lower elevations. Significant control on annual rainfall is exerted by ENSO (El Niño-Southern Oscillation) (Houston, 2006a) with significant yearly differences in rainfall linked to ENSO events. Table 4-2 shows the average monthly rainfall data for the six relevant weather stations for the Project area and Figure 4-5 shows an isohyet map. The average annual precipitation is approximately 75 mm for the Project site. Figure 4-6 shows the average monthly precipitation distribution throughout the year.

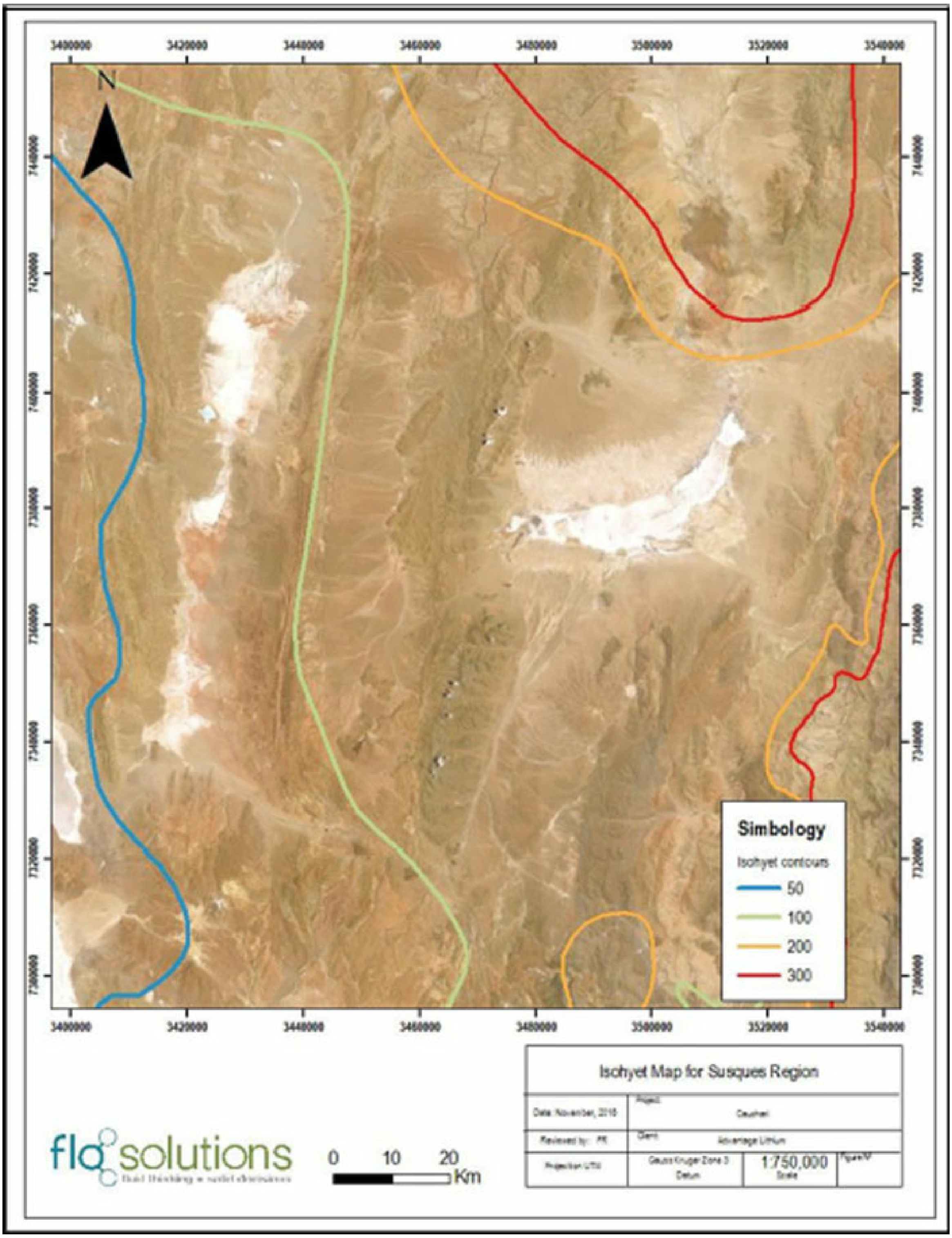


Figure 4-5 - Isohyet map for the Susques Region (Bianchi, 1992).

Table 4-2 - Average monthly precipitation (mm).

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Olacapato	34	23	4	0	0	0	0	0	0	0	0	10	71
Sey	60	66	18	0	0	0	0	0	0	0	4	22	170
Susques	70	45	20	0	0	0	0	0	0	0	8	34	177
Pileta	20.76	41.68	4.95	0	0.42	0.25	1.52	0	2.29	0.17	0	1.86	73.91
Liming	38.52	30.65	6.96	0.86	0.36	0.41	0.1	0	0	0.56	0	3.98	82.4

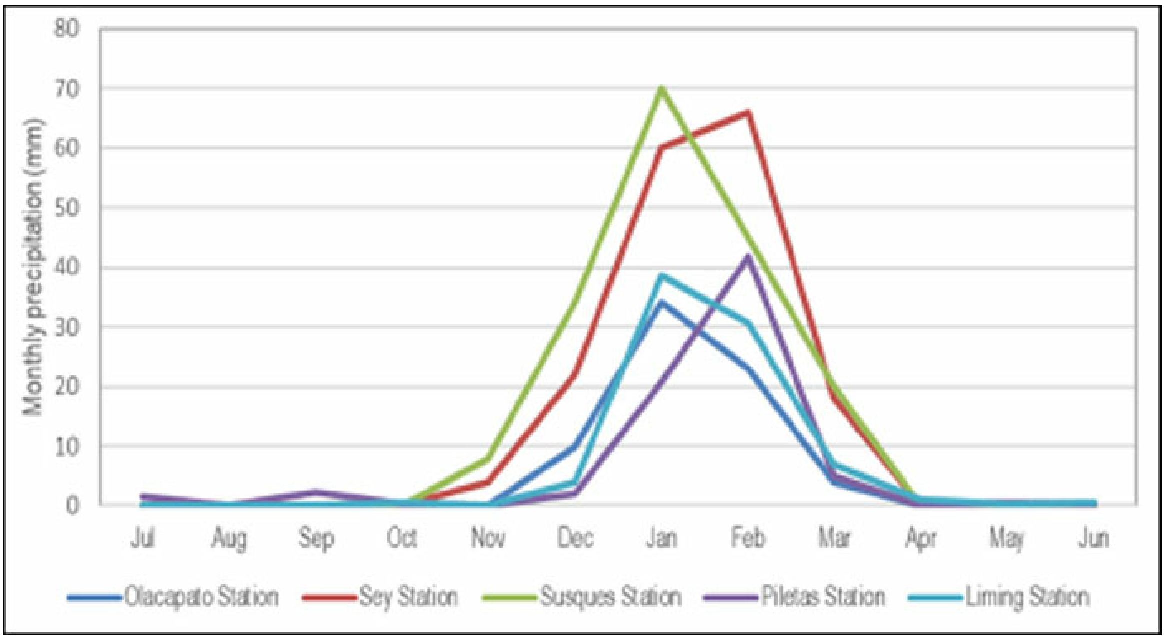


Figure 4-6 - Average monthly precipitation distribution.

4.2.4 Temperature

Temperature records are available from the Liming and Pileta stations since 2012. Average monthly temperature data are available from the Olacapato, Susques and Sey stations for the period between 1950 and 1990. Table 4-3 shows the average monthly temperature for the five stations in the Project area and Figure 4-7shows the average monthly temperature distribution throughout the year. Figure 4-8 shows the average minimum, median monthly temperature distribution for the Liming and Pileta stations.

Table 4-3 - Average monthly temperature (°C).

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Olacapato	10.8	10.70	9.9	7.5	4.2	2.2	1.6	3.9	5.9	8.2	9.9	10.6
Sey	10.2	10.10	9.40	7	3.7	1.8	1.3	3.4	5.4	7.6	9.2	9.9
Susques	11.3	11.2	10.5	8.1	4.9	3	2.5	4.6	6.6	8.9	10.4	11.1
Pileta	11.12	10.6	10.03	7.26	3.83	1.9	1.22	2.82	5.71	7.08	8.36	9.77
Liming	10.69	10.36	9.33	6.19	2.56	0.48	-0.26	1.69	4,58	6.88	8.41	10.73

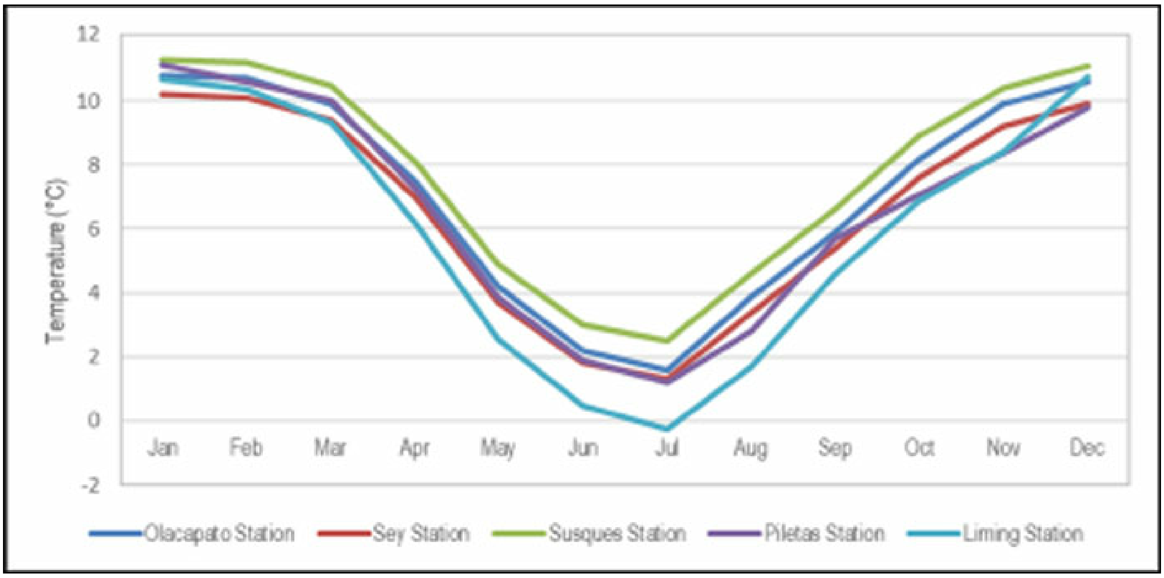


Figure 4-7 - Average monthly temperature (°C).

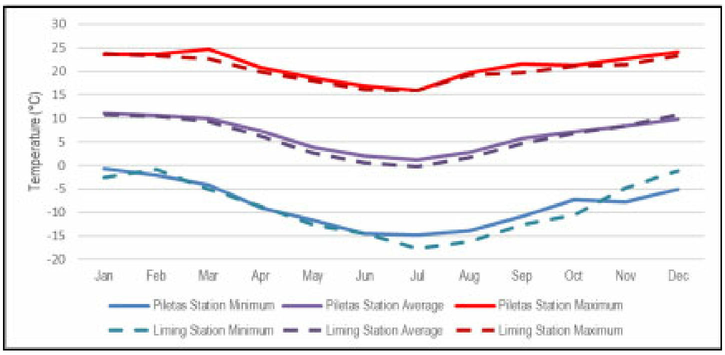


Figure 4- 8 - Minimum, average, and maximum temperatures for the Liming and Pileta stations in Salar de Olaroz.

4.2.5 Evaporation

Evaporation test work has not been carried out at the Cauchari Project location. A detailed evaporation test work plan was carried out at the Salar de Olaroz, situated within 30 km. Mr. F. Reidel AIPG (the QP), is of the opinion that the Olaroz test work is a suitable approximation for the Cauchari Project site.

Various approaches have been carried out to determine the evaporation for Salar de Olaroz and these approaches can be extrapolated to Salar de Cauchari. Measurements for Salar de Olaroz include sampling and monitoring of fresh water and brine Class A evaporation pans since 2008. Table 4-4 shows the results of the Olaroz work.

Table 4-4 - Class A fresh water and brine pan evaporation data (mm) for Salar de Olaroz(Source: Flosolutions, 2018).

Density (g/cm^3)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1	383	331	356	307	201	213	221	242	332	461	421	433	**3,900**
1,198	248	173	234	208	133	162	173	180	236	327	276	265	**2,614**

The pan evaporation data are plotted in Figure 4-9 and show that the maximum evaporation rates occur during October, November, and December. During the summer months, a decrease in wind speed and increase in cloud cover tend to decrease the effective evaporation. The minimum evaporation takes place during the winter months, when lower temperatures have a direct impact on evaporation. The data also shows that the evaporation of brine is lower than freshwater with differences of 21% in winter months and up to 47% in the summer months.

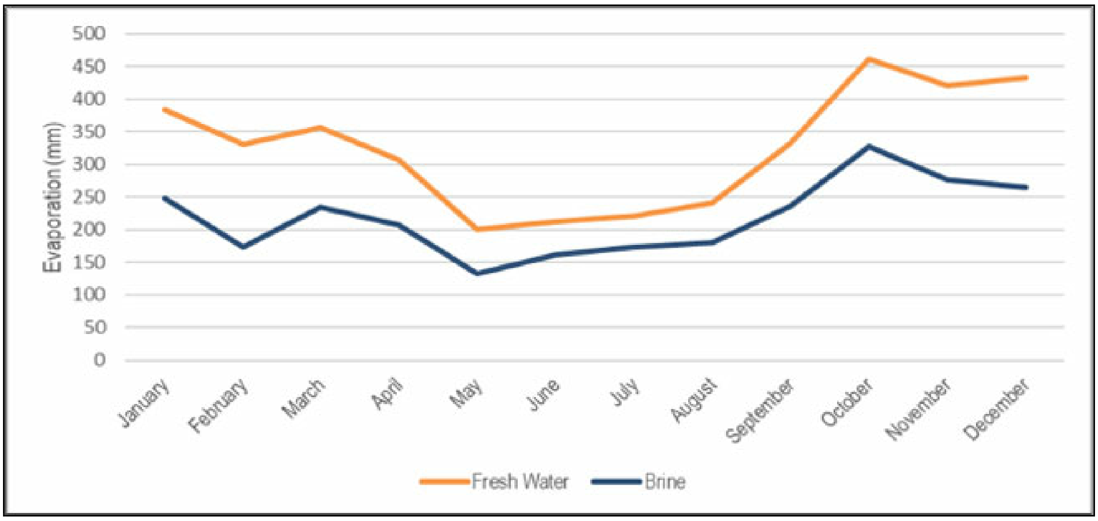


Figure 4-9 - Average monthly Class A brine and fresh water pan evaporation data from Salar de Olaroz.

4.2.6 Vegetation and Wetlands

Due to the extreme weather conditions in the region, the predominant vegetation is of the high-altitude xerophytic type adapted to high levels of solar radiation, winds and severe cold. The vegetation is dominated by woody herbs of low height from 0.40 - 1.5 m, grasses, and cushion plants. With high salinity on its surface, the nucleus of the salar is devoid of vegetation.

In compliance with local regulations, Allkem has completed biannual environmental monitoring with the last survey completed in April 2019.

4.3 Local Infrastructure and Resources

There are several local villages within 50 kilometers of the Project site. These include: Catua 37 km southwest, Pastos Chicos and Puesto Sey to the east and Olaroz Chico 34 km north and Olacapato 50 km south. The regional administration is located in the town of Susques (population ~2,000) some 60 km northeast of the Project site. Susques has a regional hospital, petroleum, and gas services, and several hotels. A year-round camp exists at the Project site and provides all services and accommodations for the on-going exploration program.

5. HISTORY

This section describes historical exploration activities at the Project site.

5.1 Historical Exploration and Drill Programs

Salars in the Puna have historically been exploited for salt (halite) and for borates (typically ulexite); Salar de Cauchari was no exception. Exploration and exploitation efforts were generally limited to the upper three meters of the salar surface. Historical production levels of borates were generally not documented and therefore are unknown. Lithium and potassium have not been exploited on the Project mineral properties.

Fabricaciones Militares (an Argentine government agency) carried out sampling of brines from the Argentine salars in the Puna during the 1970's. The presence of anomalous Li values was detected at that time when only salt and borates were exploited.

Initial evaluation of the mineral potential of salars in Northern Argentina was also documented by Igarzábal (1984) as part of the Instituto de Beneficios de Minerales (INBEMI) investigation carried out by the University of Salta. This investigation involved limited sampling of Li, K, and other elements; Salar de Cauchari showed some of the highest lithium values of 0.092% Li (and 0.52% K).

5.2 History of Cauchari Ownership

The following is an overview of the history of the ownership of the mineral properties that now comprise the Cauchari JV:

- Historic borate mining was carried out in the Cauchari Salar by Borax Argentina, which is now owned by Orocobre.
- The Cauchari properties were acquired by Mr. Miguel Peral and Mrs. Silvia Rodriguez through direct property staking (not through third-party purchases).
- Peral and Rodriguez subsequently contributed these properties to the formation of South American Salars Pty Ltd (SAS) in return for a 15% ownership in this Australian registered company. SAS is majority owned by Orocobre (85%).
- Orocobre and SAS agreed to a joint venture with Advantage Lithium Corp (AAL) in November 2016.
- Orocobre acquired all outstanding shares of ALL on February 19, 2022.
- Orocobre and Galaxy lithium merged on 25 August 2021 to form Allkem Ltd (Allkem). Allkem owns 100% of the Cauchari project through the mentioned subsidiaries.

5.3 2009-2011 SAS Exploration

- Geochemical sampling in 2009 consisting of 134 brine samples from 105 pits showed that the northern part the salar had the most elevated lithium concentrations.
- 2009 geophysical surveys undertaken by Orocobre in Cauchari consisted of three coincident gravity and AMT lines aimed at mapping the basin geometry and depth.
- Five diamond holes and one rotary hole were drilled in the SE Sector of the Cauchari JV to a maximum depth of 248 m in 2011. Drilling equipment did not perform as required, with two of the holes abandoned at <100 m depth and only one hole reaching the target depth for the program.
- An initial inferred resource of 470,000 t of lithium carbonate equivalent (LCE) was defined from the 2011 drilling program with a NI 43-101 technical report issued in December 2016 outlining the results of the previous exploration.
- Exploration work by AAL under the joint venture agreement with Orocobre was started in 2017.

6. GEOLOGICAL SETTING, MINERALIZATION AND DEPOSIT

6.1 Regional Geology

Salar de Cauchari is located towards the center of the Puna Plateau. The Puna is an elevated plateau in northern Argentina which has been subject to uplift along thrust systems inverting earlier extensional faults. The Puna is host to numerous large ignimbrites and stratovolcanoes. A summary evolution of the Puna is shown in Figure 6-1 after Houston (2010b).

6.1.1 Jurassic-Cretaceous

The Andes have been part of a convergent plate margin since the Jurassic with both a volcanic arc and associated sedimentary basins developed as a result of eastward dipping subduction. The early island arc is interpreted to have formed on the west coast of South America during the Jurassic (195-130 Ma), progressing eastward during the mid-Cretaceous (125-90 Ma) (Coira et al., 1982).

An extensional tectonic regime existed through the late Cretaceous, generating back-arc rifting and grabens (Salfity & Marquillas, 1994). Marine sediments of Jurassic to Cretaceous age underlie much of the Central Andes.

6.1.2 Late Cretaceous to Eocene

During the late Cretaceous to the Eocene (~78-37 Ma), the volcanic arc migrated east to the position of the current Precordillera (Allmendinger et al, 1997). Significant crustal shortening occurred during the Incaic Phase (44-37 Ma), (Gregory-Wodzicki, 2000) forming a major north-south watershed, contributing to the formation of coarse clastic continental sediments.

Initiation of shortening and uplift in the Eastern Cordillera of Argentina around 38 Ma, contributed to forming a second north-south watershed, with the accumulation of coarse continental sediment throughout the Puna (Allmendinger et al., 1997).

6.1.3 Oligocene to Miocene Volcanism

By the late Oligocene to early Miocene (20-25 Ma), the volcanic arc switched to its current location in the Western Cordillera. At the same time, significant shortening across the Puna on reverse faults led to the initiation of separated depo-centers (Figure 6-1). Major uplift of the Altiplano-Puna plateau began during the middle to late Miocene (10-15 Ma), perhaps reaching 2,500 m by 10 Ma, and 3,500 m by 6 Ma (Garzione et al., 2006). Coutand et. al. (2001) interprets the reverse faults as being responsible for increasing the accommodation space in the basins by uplift of mountain ranges marginal to the Puna Salar basins. This is confirmed by the seismic section across Olaroz to the north of Cauchari (Figure 6-1).

Late Miocene volcanism at 5-10 Ma in the Altiplano-Puna Volcanic Complex (APVC) between 21o-24o S (de Silva, 1989), erupted numerous ignimbrite sheets, with associated caldera subsidence, and the formation of andesitic to dacitic stratovolcanoes. This volcanic activity was often constrained by NW-SE trending crustal mega-fractures, which are particularly well displayed along the Calama-Olacapato-El Toro lineament passing to the south of Salar de Cauchari (Salfity & Marquillas 1994; Chernicoff et al., 2002).

6.1.4 Oligocene to Miocene Sedimentation

During the early to middle Miocene red bed sedimentation is common throughout the Puna, Altiplano and Chilean Pre-Andean Depression (Jordan & Alonso, 1987). This suggests continental sedimentation was dominant at this time. With thrust faulting, uplift and volcanism intensifying in the mid to late Miocene, sedimentary basins between the thrust sheets became isolated by the thrust bounded mountain ranges. At this stage the basins in the Puna developed internal drainages, bounded by major mountain ranges to the west and east.

Sedimentation in the basins consisted of alluvial fans forming from the uplifting ranges with progressively finer sedimentation and playa sands and mudflat sediments deposited towards the low energy centers of the basins. Alonso et.al., (1991) note there has been extensive evaporitic deposition since 15 Ma, with borate deposition occurring for the past 7 to 8 Ma.

Hartley et al., (2005) suggest Northern Argentina has experienced a semi-arid to arid climate since at least 150 Ma as a result of its stable location relative to the Hadley circulation (marine current). Most moisture originating in Amazonia was blocked due to Andean uplift, resulting in increased aridity in the Puna from at least 10-15 Ma.

The high evaporation level, together with the reduced precipitation, has led to increased aridity and the deposition of evaporites in many of the Puna basins.

6.1.5 Pliocene-Quaternary

During the Pliocene-Pleistocene tectonic deformation took place as shortening moved east from the Puna into the Santa Barbara fault system. Coincident with this change in tectonic activity climatic fluctuation occurred with short wetter periods alternating with drier periods.

As a result of both, reduced tectonic activity in the Puna and the predominant arid conditions, reduced erosion led to reduced sediment accumulation in the isolated basins. However, both surface and groundwater inflows into the basins continued the leaching, dissolution transportation and concentration of minerals. Precipitation of salts and evaporites occurred in the center of basins where evaporation is the only means of water escaping from the hydrological system.

Evaporite minerals (halite, gypsum) occur disseminated within clastic sequences in the salar basins and as discrete evaporite beds. In some mature salars such as Salar de Hombre Muerto and Salar de Atacama thick halite sequences have formed.

Stratovolcanoes and calderas, with associated ignimbrite sheet eruptions, are located in the Altiplano and Puna extending as far south as Cerro Bonete and the Incapillo caldera. The Altiplano-Puna Volcanic Complex (APVC), located between the Altiplano (Bolivia) and Puna (Argentina), is associated with numerous of these stratovolcanoes and calderas. De Silva et al., (2006) have shown the APVC is underlain by an extensive magma chamber at 4-8 km depth.

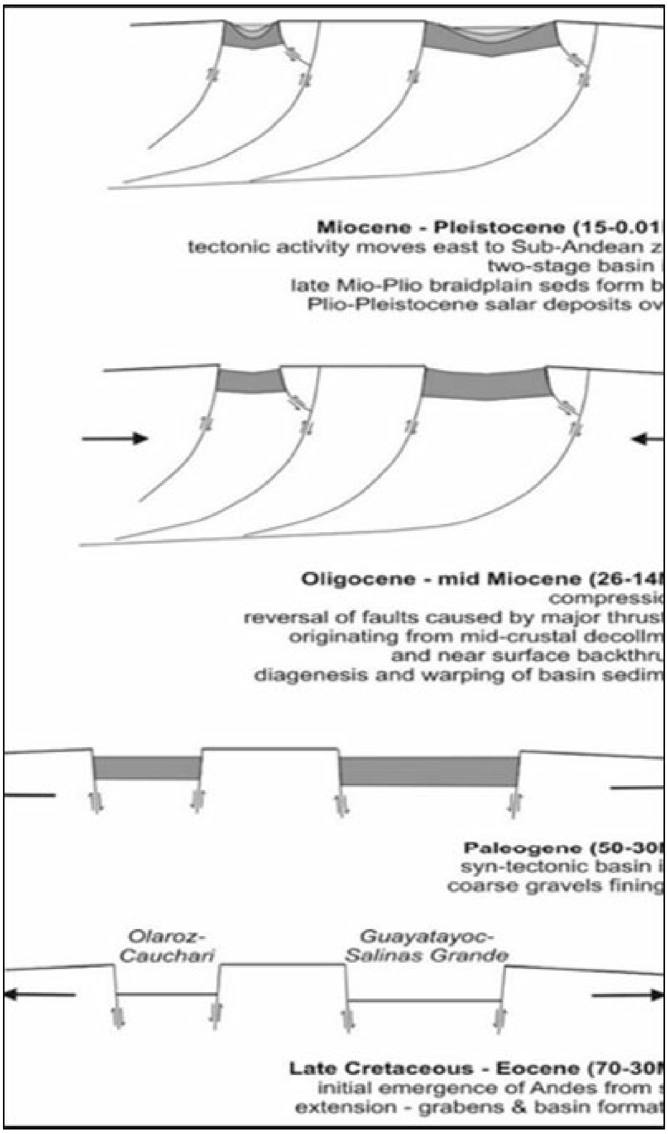


Figure 6-1 - Generalized structural evolution of the Puna basins.

Silicic magmas in the volcanoes Ojos de Salado (W of the Antofalla Salar), Tres Cruces and Cerro Bonete reflect crustal melting and melting in the thickening mantle wedge after the passage of the Juan Fernandez ridge. Volcanics of Pliocene to Quaternary age are present in the Project area.

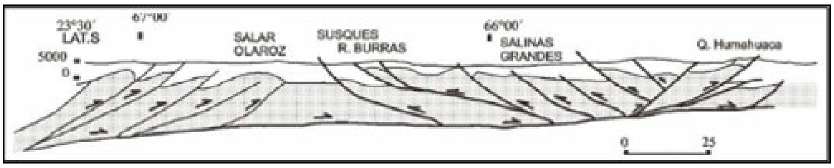


Figure 6-2 - Structural section between Olaroz Salar and Salinas Grandes Salar.

6.2 Local and Property Geology

This section summarizes the deposit and geological setting of the Project.

The published geological maps covering the Cauchari area are shown in Figure 6-3, with north-south trending belts of Ordovician and Cretaceous sediments forming the higher mountain ranges on the basin margins and younger Tertiary terrestrial sediments further within the basin, closer to the Cauchari Salar. A description of individual geological units in the Cauchari basin is provided in the stratigraphic column in Table 6-1.

The information obtained from the detailed logs of the boreholes drilled during the 2011 and 2017/18 campaigns was used to prepare the geological sections shown in Figure 6-4 and Figure 6-5 The geological model is based on the interpretation of the logging that followed an internal classification system. Six major lithological units were identified and are included in the geological conceptual model as shown in Figure 6-4.

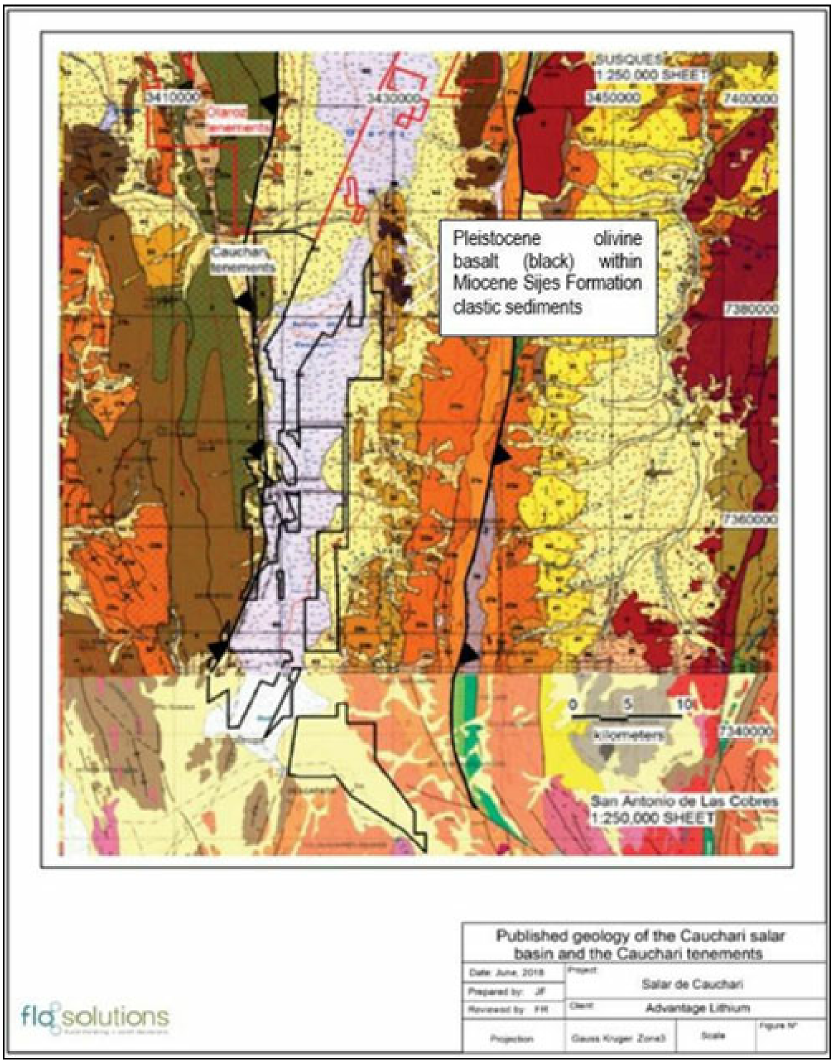


Figure 6-3 - Published geology of Salar de Cauchari.

Table 6-1 - Stratigraphic units in the Cauchari basin and their correlation across different published geological maps.

	Age period	Ms	Rocktypes	Geological environment	Tectonic events	1:250000Map Sheet	
						Susques (2366-III)	San Martin (23664)
Quaternary	Holocene	0	Alluvial deposits, salars	Closed basins, salars	Post Quechua deformation	Salar deposit, lacustine, collwial and alluvial sediments (40-44)	Salar deposits, lacustine, collwial and alluvial sediment (250-30)
	Pleistocene	2.6	Alluvial, colluvial, lacustrine, ignimbrites	Closed basins, fan deposit, volcanic centres	NE -SW shortening (from 0.2Ma)due to stake slip faulting continuing to present day	Tuzgle ignimbrite (38-39)	Alluvial and glacial deposits (5a,25b,26)
Neogene	Plocene	5.3	Continental sediments +/ignimbrites	Some volcanic complexes developed in continental sediments	Major volcanic centers and calderas 8-6Ma	Jama volcanic rocks (36-37).Andesite, thick layers ignimbrites: Atana ignimbrite	Malmar, Uquia and Jujuy Formations. Continental sediments -sandstone ,conglomerate +/-mudstone (19,22-24)
	Miocene		Andesitic to dacitic volcanics	Volcanic complexes in continental sediments		Volcanic complexes (35)	Formations Oran (18Ma -0.25Ma). Callegua, Formation Agua Negra .Continental sandstones, with clay interbeds (19,20.21)
			Ignimbrites			Coyaguayma &Casabindo dacite Ignimbritin (33&34)	
			Continental sediments &tuffs		Start of thrusting ,with WNW -ESE directed thrusting from 13-4Ma	Sijes Formation (32)-7-8.5Ma sandstones, mudstorm and tuffs	
			Continental sediments, tuft, volcanic breccias		End of Quechua phase event finished by 9-15Ma, with associated folding	Chimpa volcanic complex (31) and esibr & dacites, lavas /lignimbribm .Pastos Chicos Fm -10-7Ma with unnamed tuff 9.5.	
			Dacite domes, pyroclastics, intrusives			Yungara dacite domes (30)&subvolcanics (SE side Olaroz)	
			Rhyolitic, dacitic volcanic complexes, continental sediments			Volcanic complexes (23-29), Cerro Morado, San pedro, Parque, cerro bayo and Aguilia, pucara formation. Andesite to dacite lavers, domes, and ignimbrites. Susques Ignimbrite -10Ma	
			Continental sediments			Vichacera Superior (22b). Sandstones and conglomerates, with tuft &ignimbribt	
		23.8				Vichacera Inferior (22a). Sandstones and interbedded claystones	

	Age period	Ms	Rocktypes	Geological environment	Tectonic events	1:250000Map Sheet	
						Susques (2366-III)	San Martin (23664)
Paleogene	Cligocene	33.9	Continental sediment	Red bed sequences	Incaic Phase II .Compression resulting in folding	Rio Grande Fmn Superior (21b). Red aeolian sandstorm	Casa Grande and Rio Grande Formations (18).Continental sandstones, conglomerates, sillstones and clay stone
	Eocene					Rio Grande Fmn Inferior (21a). Altemating coarse conglomerates and red sandstorm	
		55.8	Continental sediments, locally marine and limey	Local limestone development local marine sequences		Santa Barbara subgroup. Flwial and aeolian alternating conglomerates and red sandstones	Santa barbara subgroup (17) continental limy sandstorm, siltstorm, claystones
							Balbuena subgroup (18).-see below
	BASEMENT - PRE TERTIARY UNITS (MARINE)						
Mesozoic	Cretareous		Continental sediments, locally marine and limey		Peruvian phase extension and deposition of marine sediments	Balbuena Subgroup (19). Sandstorm, calcareous sandstorm ,limestones. mudstom (Marine).	Balbuena subgroup (18) ContinentaVmarine calcareous sandstorm
			Continental sediment			Piruga Subgroup (18). Alluvial and fluvial sandstone & conglomerate	Piruga subgroup (15). Red sandstones, sity claystones and conglomerates
						Granite, syenitor, granodionte (15,17,18)	Granites, monzogranite (11-14)
	Carboniferous Silurian		Marine sediments	Marine platform and turbidite deposit	Isoclinalfolding on NWISE trending axes extending to early Cretaceous	Upper Paleozoic marine sediments 04)	Machareti and Mandiyuti Groups (10). Sandstones, conglomeratic sandstones .sitsones and diamictites .Silurian Lipeon & Bante Formations (9). Clay stone and diamicties.
						Multiple Paleozoic intrusive suibt (8.13)	El Moreno Formation (8). Porphyritic dacite
Paleozoic	Ordovician		Marine sediments	Marine della and volcanic deposit /domes		Ordoviciansandstones (3-5), volcaniclastic sediments & Ordovician turbidites	Guayoc Chico Group (7) & Santa Victoria Groups (8). Marine sandtones, mudstonw and limey units
	Cambrian			Marine sediments		Meson Group (2) sandstones and mudstones	Meson Group (5). Marine sandstones
	PreCambrian	540	Schist, phyllite	Metamorphosed turbidibles		ncovis caner Formation (1) tubidit es	Puncoviscana Formation (1) tubidites metamorphosed and intruded by plutons

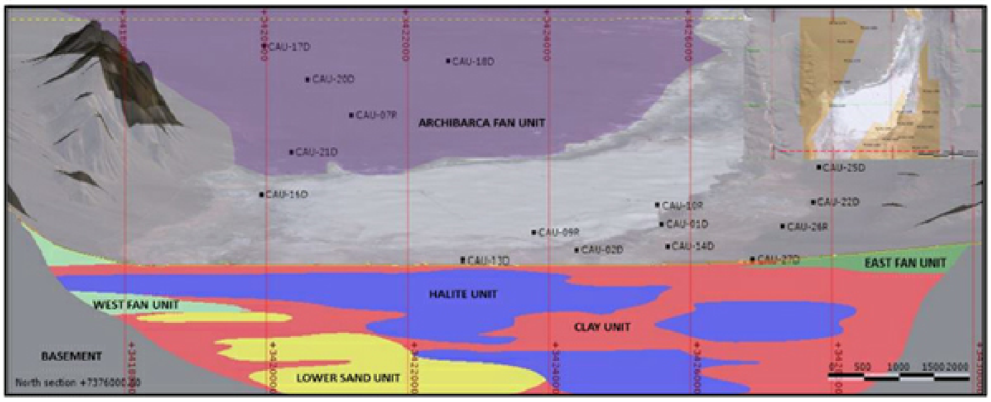


Figure 6-4 - W-E section looking north through the Cauchari JV geological model.

Table 6-3 provides a breakdown of the lithological composition of the units in the geological model for the Cauchari Project. A summary description of each of the geological units is provided hereafter.

Table 6-2 - Allkem internal classification used for core logging.

CODE		DESCRIPTION
NR	No Recovery	Non-recovered material.
GRA	Gravel	Gravel, coarse sediment with clasts over 4 mm.
SND	Sand	Fine, medium to coarse sand with scarce to no matrix.
SNDMX	Sand with Matrix	Sand layers with silt or clayey silt matrix.
SNDHL	Sand with Halite	Halite levels with sand interstitial or layers interbedded.
CLY	Clay	Clay, silty clays in general.
CLYHL	Clay with Halite	Clay with presence of crystalline halite in variable proportions.
SILT	Silt	Silt or clayey silt in general.
SILTHL	Silt with Halite	Silt and clayey silt with presence of crystalline interstitial halite.
HAL	Halite	Massive or granular crystalline halite with sparse proportions of clastic material.

Table 6-3 - Lithology of the units in the Cauchari geological model.

UNIT/LITHO	HAL	CLY	CLYHL	NR	SND	SNDHL	GRA	SNDMX	SILT	SILTHL	ASH	TOTAL
CLAY	1.11%	68.77%	3.73%	3.09%	1.21%	0.12%	0.01%	6.22%	10.70%	5.01%	0.03%	36.32%
HALITE	77.81%	3.99%	9.70%	1.63%	0.95%	2.95%		0.69%	0.78%	1.51%		35.09%
ARCHIBARCA FAN		3.02%		5.28%	31.76%		34.09%	24.45%	1.00%		0.39%	10.76%
EAST FAN		2.61%		4.50%	59.16%		13.99%	19.74%				1.77%

UNIT/LITHO	HAL	CLY	CLYHL	NR	SND	SNDHL	GRA	SNDMX	SILT	SILTHL	ASH	TOTAL
WEST FAN	0.03%	4.08%		19.87%	36.01%		10.98%	28.95%	0.07%			11.17%
LOWER SAND	0.58%	11.62%		15.47%	35.60%		1.54%	35.20%				4.89%
TOTAL	**27.74%**	**27.78%**	**4.76%**	**5.32%**	**11.00%**	**1.08%**	**5.22%**	**10.44%**	**4.28%**	**2.35%**	**0.05%**	

6.2.1 Archibarca Fan Unit

The Archibarca alluvial fan constitutes the NW boundary to the salt deposits within the Salar de Cauchari and covers a surface area of around 23.8 km² within the Allkem properties, extending north into properties owned by Allkem in Salar de Olaroz. This unit is the surface divide between the Salar de Olaroz basin to the North and the Salar de Cauchari basin to the South.

The boreholes (CAU07R, CAU17D, CAU18D, CAU20D and CAU21D) drilled on the Archibarca fan intercepted coarse materials (sandy gravels and gravelly sand with coarse sand levels), overlapping and inter-fingering at greater than 200 m depth with saline / lacustrine deposits (Clay and Halite Unit) as shown in Figure 6-5. This suggests that the Archibarca fan unit overlies salar sediments above this depth.

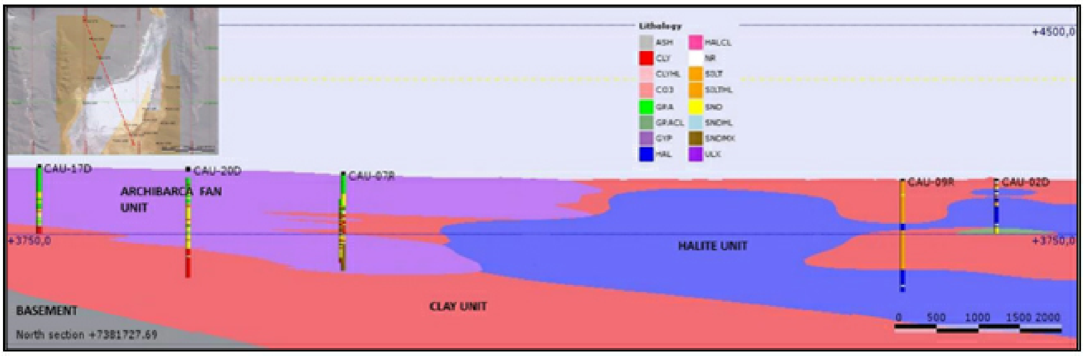


Figure 6-5 - W-E section looking north, showing the progressive inter-fingering of the Archibarca fan with the Clay and Halite units.

The unit is characterized by a thick sequence of coarse sediments consisting of medium to coarse gravels which in turn are formed by clasts of gray quartzite and greenish-white clasts of quartz, basalts and graywackes transported downslope from the west. The clasts range from sub-angular to rounded with the presence of medium to coarse sand in variable proportions and with the presence of clay in some sandy and/or gravelly levels as shown in Figure 6-6. The alluvial fan gravel is commonly interbedded with thick layers of medium to coarse sand inter-fingered with levels of clay.

Figure 6-6 - Sandy gravels with some clay from the Archibarca fan (CAU07R).

6.2.2 West Fan Unit

The piedmont developed at the base of the mountain range that constitutes the western boundary of Salar de Cauchari is dominated by a series of small alluvial fans that inter-finger with the saline / lacustrine sediments (Clay Unit) of the salar as shown in Figure 6-7.

Boreholes CAU16D and CAU15D were drilled along the western boundary of the salar in the northern part of the West Fan. These boreholes intersected inter-fingering clayey levels (Clay unit) with thick intervals of sand and sandy silt and with a few levels of sandy gravel.

Boreholes CAU23D, CAU24D, CAU28D and CAU29D were drilled in the southern part of the West Fan and intersect thick levels of sand, silty sand, and gravel sequences at depth (200 m approx.) interbedded with clay and halite levels (CAU24D). The sequence of coarse materials (sands and gravels) becomes thicker towards the south (CAU29D) where wide alluvial fans develop extending to the maximum depth of drilling (404 m in CAU29).

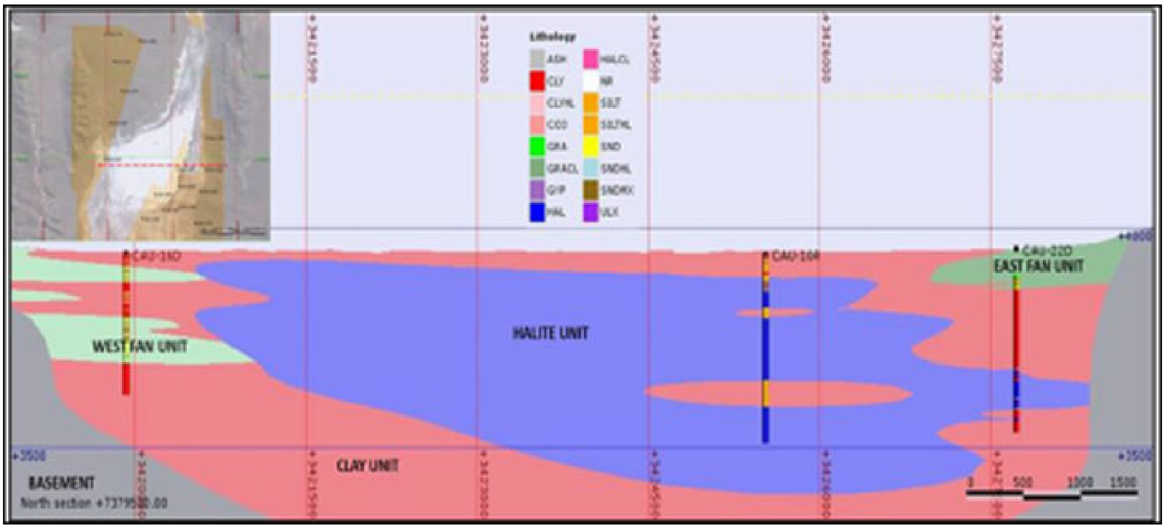


Figure 6-7 - W-E section looking north between boreholes CAU16D and CAU10R.

The West Fan is dominated by fine to medium gray green to dark green sands with abundant presence of gypsum crystals (Selenite), quartz and dark lithic material. The sands are interbedded with levels of medium to coarse gravel with sub-rounded clasts in a sandy matrix formed by the greenish quartzites and volcanic lithic material, with fragments from 1 cm to 8 cm in size as shown in Figure 6-8.

Figure 6-8 - Gravel from CAU16D (264.5-268m) with sub-rounded green quartzites.

6.2.3 East Fan Unit

The eastern boundary of the Cauchari basin is dominated by a series of fluvial/alluvial fans with a variable extension. Boreholes CAU01D, CAU02D, CAU05D, CAU10D, CAU14D, CAU22D, CAU26D/A and CAU27D intercept 3 m to 20 m thick layers of alternating friable dark sands to massive, cemented grits that are interpreted as distal facies of the fans seen along the eastern margin of the salar.

The East Fan unit is much more restricted in thickness and areal extent than the sequences observed along the western margin (West Fan Unit) with shallow/thinner sequences that overlie lacustrine / saline deposits.

Figure 6-7 and Figure 6-9 show overlapping sequences of the East Fan unit over the saline/ lacustrine units along the eastern margin of the basin.

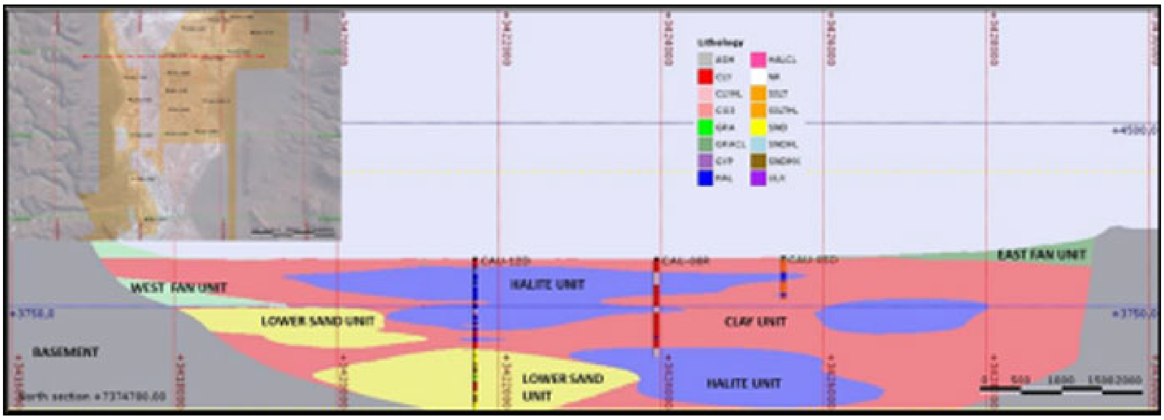


Figure 6-9 - Section showing the interpreted geometry of the East Fan unit.

6.2.4 Lower Sand Unit

Boreholes CAU11R, CAU12D A, CAU13D A and CAU19D intersected a sand dominant unit at approx. 400 m depth. The bottom of this sand dominant unit was not defined in these boreholes (drilled up to 610 m depth) as shown in Figure 6-10. CAU15D on the western margin of the salar shows sand levels with similar features to those observed in the sands before-mentioned boreholes.

When incorporating additional borehole information from Lithium Americas Corp (LAC) it is possible to interpret the broad regional distribution of this unit which suggests that this unit may probably linked to the Archibarca Fan Unit. The supply of clastic sediments is wide enough to generate the volume of these basal sands that could be correlated to the deepest and transgressive section of the Archibarca Fan and possibly to a lesser extent to the West fans. In addition to this, a slope can be observed, at least at the top of this sandy sequence, which is deepening towards the south-central sector of the basin (CAU12D A, CAU13D A and CAU19D). This sandy unit could represent basal sedimentation of the basin on which the upper saline / lacustrine system, represented by the Clay and Halite Units, was developed.

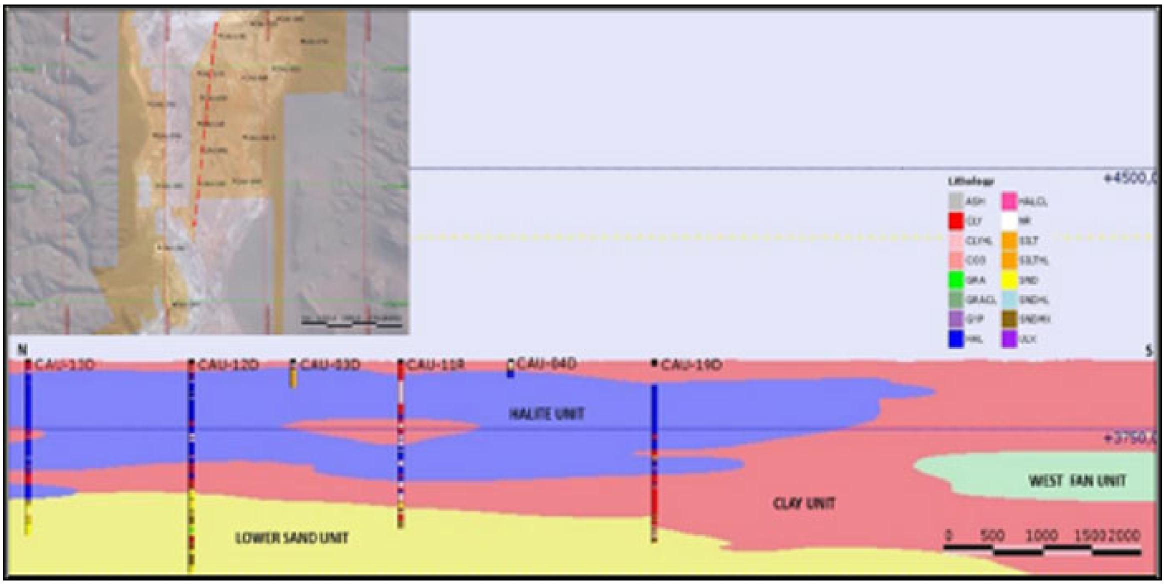


Figure 6-10 - Section with the interpreted geometry of the Lower Sand unit.

The Lower Sand unit is characterized by medium, greenish gray to dark gray sand with abundant presence of friable gypsum (selenite) and lesser dark lithic and quartz crystals with some biotite (Figure 6-11). Some irregular layers with cemented carbonates or halite are also observed and that are interbedded with occasional thin reddish-brown sandy, silty, and clayey layers.

Figure 6-11 - Example of the Lower Sand unit (CAU12D: 389 m).

6.2.5 Clay Unit

The clay unit is widely distributed throughout Salar de Cauchari and was intersected in all boreholes in the SE Sector of the Project. The Clay unit is an irregular N-S elongated body and in some boreholes (CAU08R and CAU09R) can extend to below 300 m depth. It is mainly inter-fingered with the Halite unit. The Clay unit together with the Halite unit constitutes the saline / lacustrine sediments in the center of the salar as shown in Figure 6-12. The Clay unit appears to thicken towards the east of the salar.

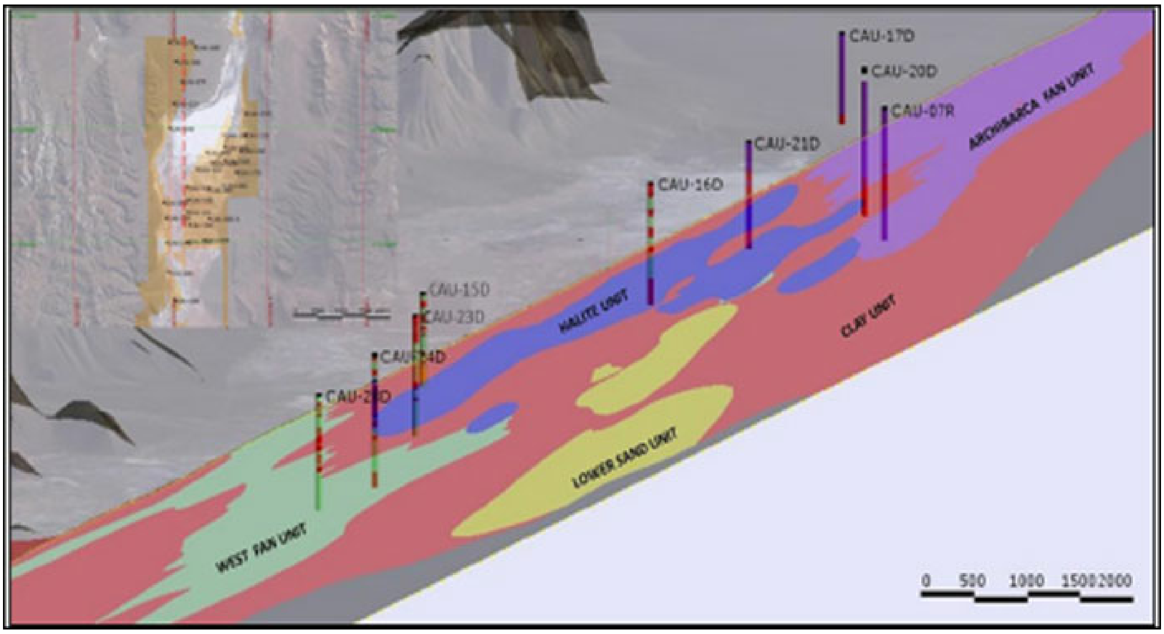


Figure 6-12 - N-S section (looking NW) showing the distributions of the Clay and Halite units.

The Clay unit is mainly composed of reddish or reddish brown to brown clays (Figure 6-13), silty clays and/or limey clays, with a variable content of halite crystals and ulexite nodules. To a lesser degree, some black clayey levels with a presence of organic matter and green clays were recognized. It is commonly inter-fingered with some thin levels of fine to very fine sand. Numerous crystals of twinned gypsum (selenite) are locally present forming inter- grown polycrystalline aggregates.

Figure 6-13 - Example of the Clay unit (CAU12D: 177.5-179m).

6.2.6 Halite Unit

The boreholes in the SE Sector of the Project intersected numerous, thick, and extensive levels of halite with a variable content of clastic sediments (sands and clays). These levels are interpreted as an irregular body of crystalline halite that inter-fingers with the clays (Clay unit) described above. The Halite unit thins and becomes shallower towards the western margin of the salar.

The surface of the salar shows a very thin halite cover (a few centimeters thick) and immediately passes to the clay core (Clay unit). The first significant halite occurs between 20 m and 35 m deep, as shown in Figure 6-14. It has an estimated thickness of 300 m in CAU13D and over 500 m in CAU14D.

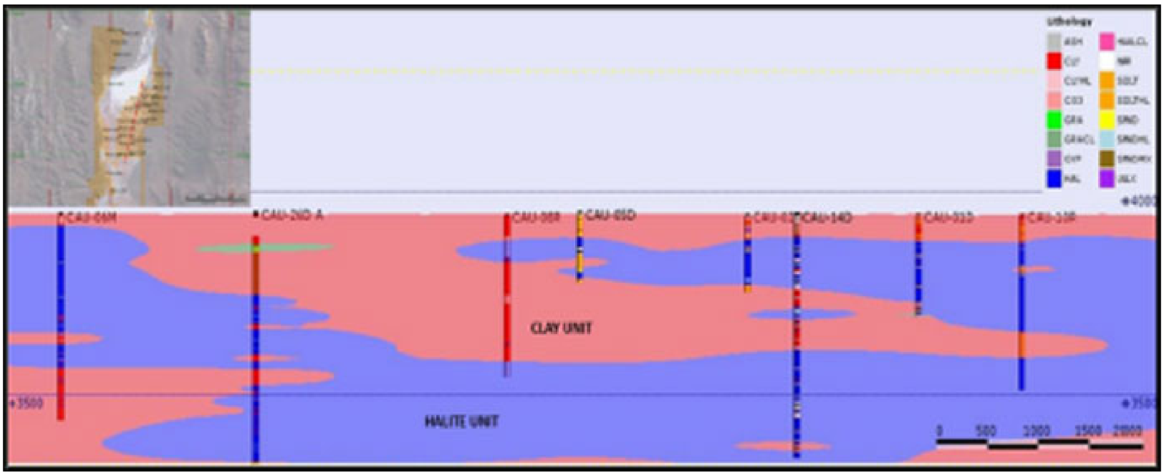


Figure 6-14 - NE-SW section looking west, showing the distribution of Halite and Clay units.

The Halite unit is characterized by massive crystalline halite or, to a lesser extent, friable aggregates of crystals that can exceed one centimeter in size (Figure 6-15), mainly with gray to reddish brown colors, according to the associated clastic sediments (fine sands with selenite and clays and silt-clays respectively). It is commonly inter-fingered with fine to very fine sand levels, of variable thickness, with abundant gypsum crystals (selenite) and clay layers with abundant presence of halite crystals. The halite is accompanied by crystals of mirabilite (sodium sulphate) and scarce ulexite (hydrated sodium calcium borate hydroxide). Some intervals of the halite (Figure 6-15) show enhanced permeability over the typical more compact halite material.

Figure 6-15 - Example of the Halite unit.

6.3 Mineralization

The brines from Cauchari are solutions saturated in sodium chloride with an average concentration of total dissolved solids (TDS) of 290 g/l. The average density is 1.19 g/cm^3. The other components present in the Cauchari brine are K, Li, Mg, Ca, Cl, SO_4 and B.

Table 6-4 shows a breakdown of the principal chemical constituents in the Cauchari brine including maximum, average, and minimum values, based on 546 brine samples used in the brine resource estimate herein that were collected from the 2011 - 2018 drilling programs.

Table 6-4 - Maximum, average, and minimum elemental concentrations of the Cauchari brine.

Analyte	Li	K	B	Na	Ca	Mg	SO4	Density
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	g/cm^3
Maximum	956	8,202	2,528	135,362	1,681	2,640	62,530	1.23
Mean	512	4,349	941	105,721	504	1,323	18,930	1.19
Minimum	157	101	62	101	174	314	101	1.07
Std. Dev.	144	1,186	487	16,033	212	412	8,561	0.03

Figure 11-7 and Figure 11-8 show the kriged distribution of lithium and potassium concentrations in the salar. Typically, concentrations of lithium and potassium show a high degree of correlation. The kriged three-dimensional distribution of lithium and potassium concentrations were used in the updated resource model as further described in Chapter 11.

Brine quality is evaluated through the relationship of the elements of commercial interest lithium and potassium. Components of the brine that in some respect constitute impurities, include Mg, Ca and SO_4. The calculated ratios for the averaged brine chemical composition are presented in Table 6-5.

Table 6-5 - Average values (g/l) of key components and ratios for the Cauchari brine.

K	Li	Mg	Ca	SO4	B	Mg/Li	K/Li	(SO4+2B)/(Ca+Mg)*
4.3	0.5	1.3	0.5	18.9	0.9	2.6	8.6	11.4

*(SO4+2B)/ (Ca+Mg) is a molar ratio

As in other natural brines in the region, such as those of the Salar de Atacama and Salar del Hombre Muerto, the Cl-, SO_4=, K+, Mg++, Na+ ion concentrations are used to follow the crystallization of salts during the evaporation process. The known phase diagram (Janecke projection) of the aqueous quinary system (Na+, K+, Mg++, SO_4=, Cl-) at 25°C and saturated in sodium chloride can be used when adjusted for the presence of lithium in the brines. The Janecke projection of $MgLi_2$-SO_4-K_2 in mol % is used to make this adjustment. The Cauchari brine composition is represented in the Janecke Projection diagram in Figure 6-16 along with the brine compositions from other salars. The Cauchari brine composition is compared with those of Silver Peak, Salar de Atacama, Salar del Hombre Muerto, Salar de Rincon and Salar de Uyuni in Table 6-6.

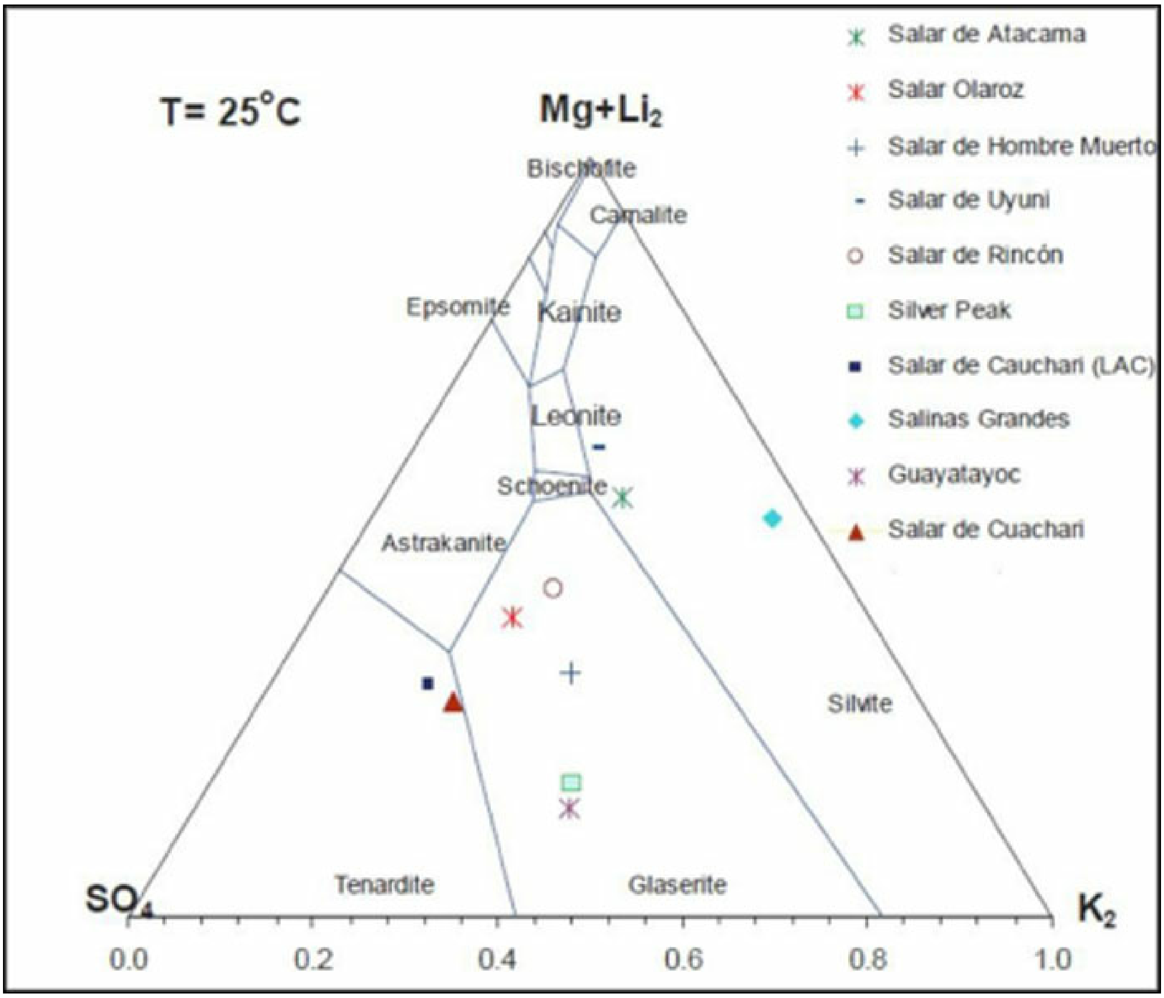


Figure 6-16 - Comparison of brines from various salars in Janecke Projection.

Table 6-6 - Comparison of brine composition of various Salars (weight %).

	Salar de Cauchari (Argentina)	Salar de Olaroz (Argentina)	Silver Peak (USA)	Salar de Atacama (Chile)	Hombre Muerto (Argentina)	Salar de Maricunga (Chile)	Salar del Rincon (Argentina)	Salar de Uyuni (Bolivia)
K	0.37	0.5	0.53	1.85	0.617	0.686	0.656	0.72
Li	0.043	0.057	0.023	0.15	0.062	0.094	0.033	0.035
Mg	0.11	0.14	0.03	0.96	0.085	0.61	0.303	0.65
Ca	0.04	0.04	0.02	0.031	0.053	1.124	0.059	0.046
SO4	1.59	1.53	0.71	1.65	0.853	0.06	1.015	0.85
Density (g/cm3)	1.19	1.21	N/A	1.223	1.205	1.2	1.22	1.211
Mg/Li	2.56	2.46	1.43	6.4	1.37	6.55	9.29	18.6
K/Li	8.6	8.77	23.04	12.33	9.95	7.35	20.12	20.57
SO4/Li	37	26.8	30.87	11	13.76	0.64	31.13	24.28
SO4/Mg	14.45	10.93	23.67	1.72	10.04	0.097	3.35	1.308
Ca/Li	0.93	0.7	0.87	0.21	0.86	9.5	1.79	1.314

Source: Published data from various

6.4 Deposit Types

Salars occur in closed (endorheic) basins without external drainage, in dry desert regions where evaporation rates exceed stream and groundwater recharge rates, preventing lakes from reaching the size necessary to form outlet streams or rivers. Evaporative concentration of surface water over time in these basins leads to residual concentration of dissolved salts (Bradley et al., 2013) to develop saline brines enriched in one or more of the following constituents: sodium, potassium, chloride, sulfate, carbonate species, and, in some basins, metals such as boron and lithium. Salar de Cauchari is a brine deposit with enriched concentrations of lithium and potassium.

Houston et al., 2011 identified, as shown in, Figure 6-17 two general categories of salars:

1. mature, halite dominant (those containing extensive thicknesses - often hundreds of meters of halite, such as the Salar de Atacama, and the FMC Hombre Muerto operation).
2. Immature salars, which are dominated by clastic sediments with limited thicknesses of halite.

Mature salt dominated salars can have high permeability and intermediate values of specific yield near surface, with both parameters decreasing rapidly with depth. In these salars the brine resource can be within 50 m below surface.

Immature salars conversely have porosity and permeability controlled by individual layers within the salar sequence. The porosity and permeability may continue to depths of hundreds of meters in clastic salars but can be highly variable due to differences between sand and gravel units and finer grained silts and clays. The presence of different stratigraphic units in clastic salars can result in a variable distribution of the contained brine.

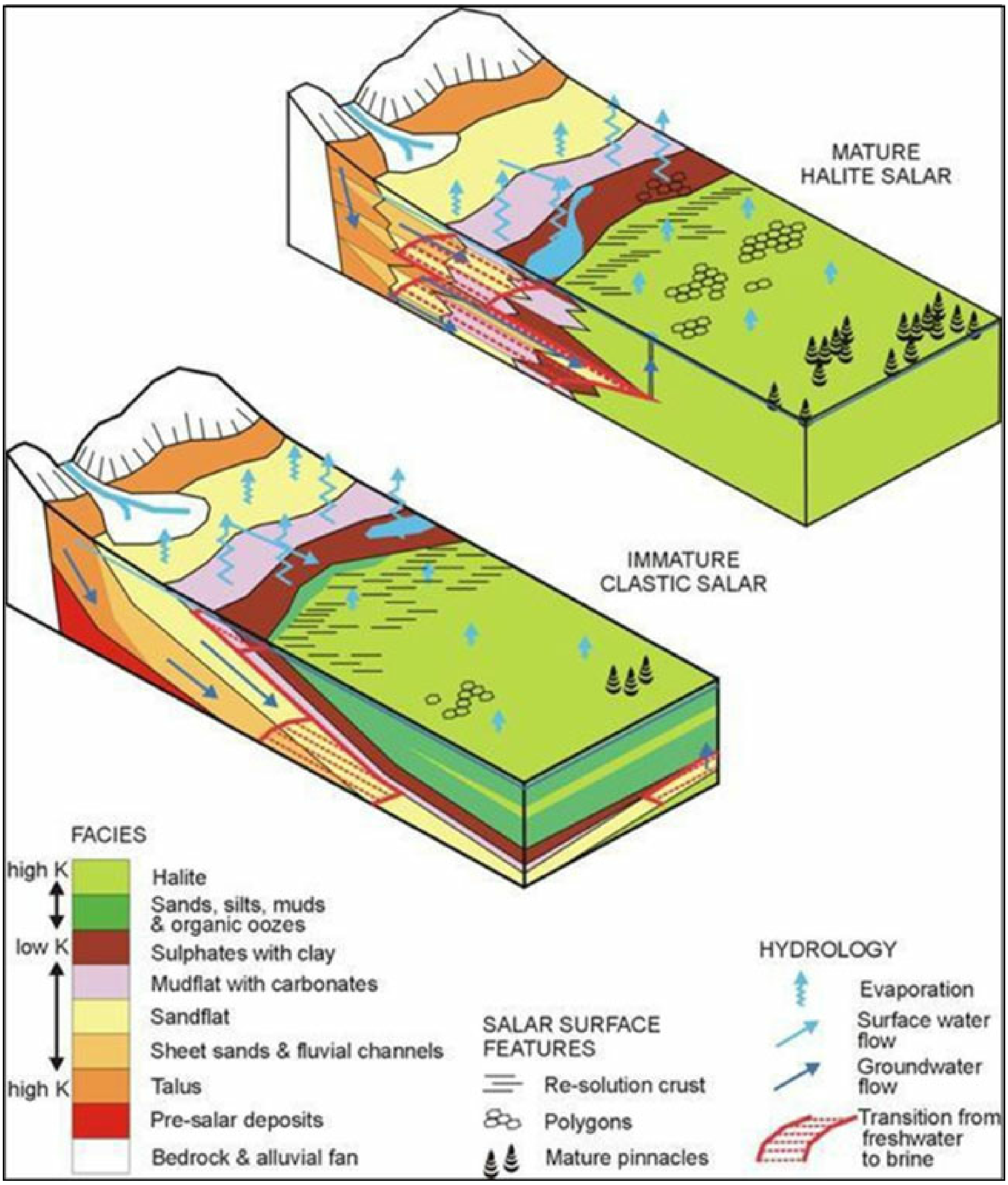


Figure 6-17 - Model showing the difference between mature and immature salars.

6.5 Hydrogeology

Salars generally consist of an inner nucleus of halite surrounded by marginal deposits of mixed carbonate and sulphate evaporites with fine grained clastic sediments. Coarser grained sediments generally occur on the margins of the basin, with successive inner shells of finer grained clastic units. Towards the center of the salar, sediments can show a progressive change from carbonate to sulphate and finally chloride evaporites (principally halite).

Drilling results in Cauchari to date have helped identify the following hydrogeological units:

- Alluvial fans surrounding the salar. These are coarse grained and overall, highly permeable units that drain towards the salar. Groundwater flow is unconfined to semi-confined; specific yield (drainable porosity) is high. The water quality in the fans above the brine interface is fresh to brackish. The long-term CAU07 pumping test in the NW Sector (Archibarca Fan) has yielded positive results that are further discussed in Section 7.4.3.
- A clay unit. This clay unit covers a large area over the central part of the salar and is interpreted to extend below the alluvial fans. This clay unit has a low permeability and could locally form a hydraulic barrier. The clay contains brine in the central part of the salar. Fresh water may sit on top of this clay unit along the edges of the salar.
- A semi-confined to confined halite unit can be identified in the central portion of the salar where it underlies the clay unit. Locally, the halite unit is interbedded with fine grained sediment of the clay unit. Data collected to date suggests that the bulk halite unit is not very permeable, but interbedded coarser grained clastic layers can display locally high permeabilities as seen in the CAU11 pumping test. It is host to medium- to high lithium concentration brine. The results of the long-term CAU11 pumping test are further discussed in Section 7.4.3 below.
- A deep sand unit. This deep sand unit has been identified in four boreholes (CAU11, 12, 13 and 19) in the SE Sector at depths below 300 m, excluding holes that were drilled on platforms to intersect the sand at deeper levels (CAU12DA and 13DA). The unit appears to be relatively permeable based on pumping test results of CAU11 as discussed in Section 7.4 below. The deep sand hosts high quality lithium brine.

6.6 Drainable Porosity

Porosity is highly dependent on lithology. Total porosity is generally higher in finer grained sediments, whereas the reverse is true for drainable porosity or specific yield since finer grained sediments have a high specific retention (portion of fluid that cannot be extracted). The lithology within the salar is variable with halite and halite mixed units, clay, and gravel- sand-silt-clay sized mixes spanning the full range of sediment types.

Drainable porosity analyses were carried out on undisturbed core samples by laboratories GSA, DBSA and the BGS. Based on the results of these analyses, drainable porosity values were assigned to the specific lithological units defined in the geological model as described in Section 6.2. Table 6-7 summarizes the results of the porosity analysis. The analysis of drainable porosity is further discussed in Section 8.

Table 6-7 - Results of drainable porosity analyses.

Geological Unit	No. Samples	Average	Declustered Average	Standard Deviations	Coefficient of Variation
Halite	144	0.05	0.05	0.06	1.1
East Fan	9	0.04	0.03	0.02	0.6
West Fan	30	0.11	0.11	0.06	0.5
Archibarca Fan	28	0.12	0.12	0.06	0.5
Clay	84	0.03	0.03	0.02	0.6
Lower Sand	6	0.16	0.14	0.11	0.7

6.7 Permeability

Permeability (or hydraulic conductivity) is also a parameter that is highly dependent on lithology. Generally finer grained and well-graded sediments have a lower permeability than coarser grained poorly graded sediments. The permeability of halite can be enhanced though fracturing and solutions features. AAL has carried out pumping tests within the salar and LAC has carried out other pumping tests in the adjacent mining properties. The analysis of the AAL pumping tests is further discussed in Section 7.4 below. Table 6-8 provides a general overview of the permeability values for the various hydrogeological units.

Table 6-8 - Summary of estimated permeability values.

Unit	Description	K (m/d)
Clay	Local silt and sand	0.001 - 1
Halite	Confined / massive	0.01 - 1
Archibarca Fan	Confined	0.1 - 75
Lower sand	Confined	0.1- 2

6.8 Groundwater Levels and Flow Patterns

Groundwater level information is available from regular monitoring activities (manual water level measurements) carried out by SAS and from third party information (mostly Minera Exar data) available in the public domain. Figure 6-18 shows the location and sources of the water level information available in the Project area. Figure 6-19 and Figure 6-20 show hydrographs for the AAL wells located in the NW Sector and the SE Sector of the Project area, respectively. Table 6-9 provides a summary of all selected water level information used (AAL data and third-party data) to prepare the interpreted groundwater elevation map shown in Figure 6-21.

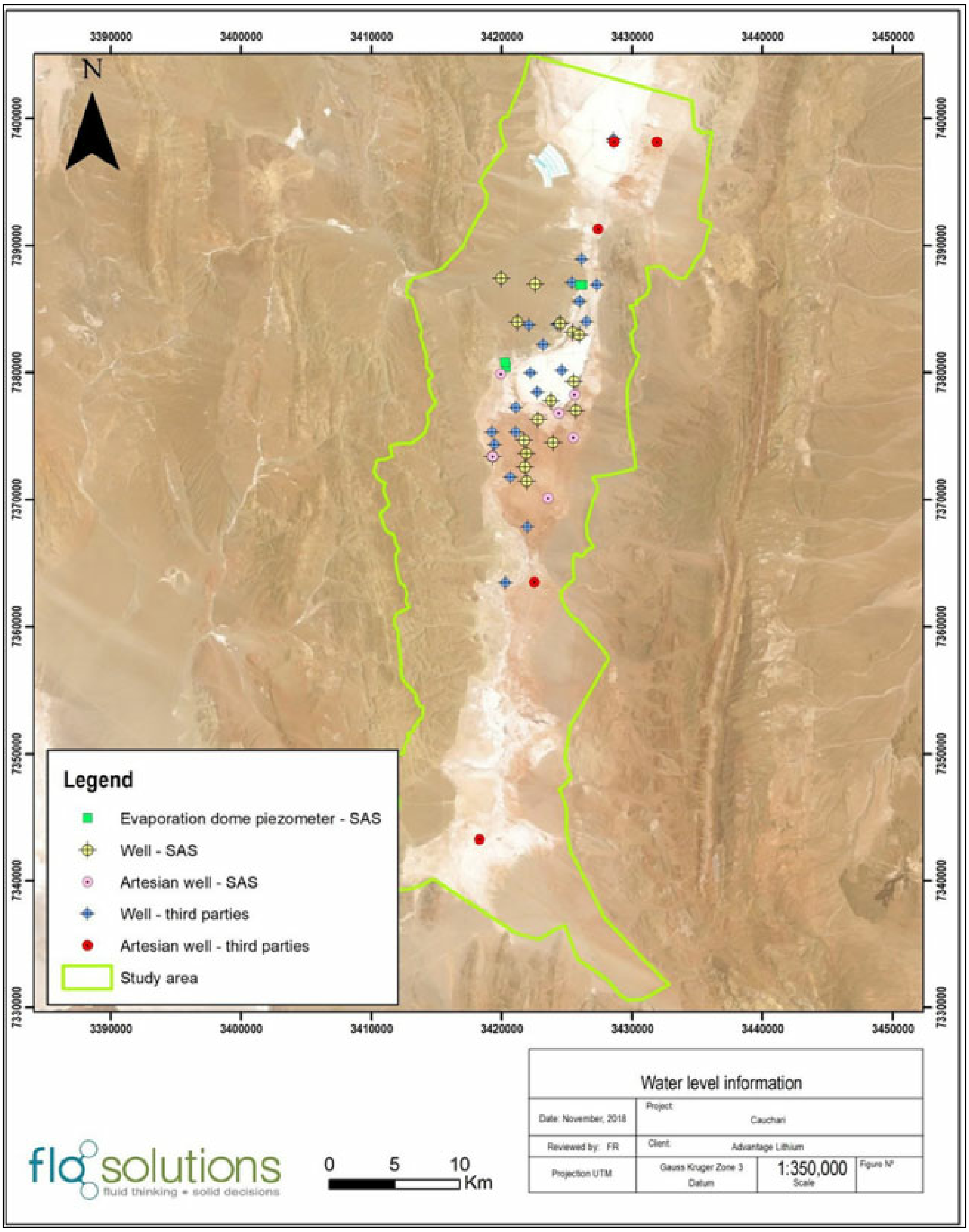


Figure 6-18 - Location map of water level information - 2019.

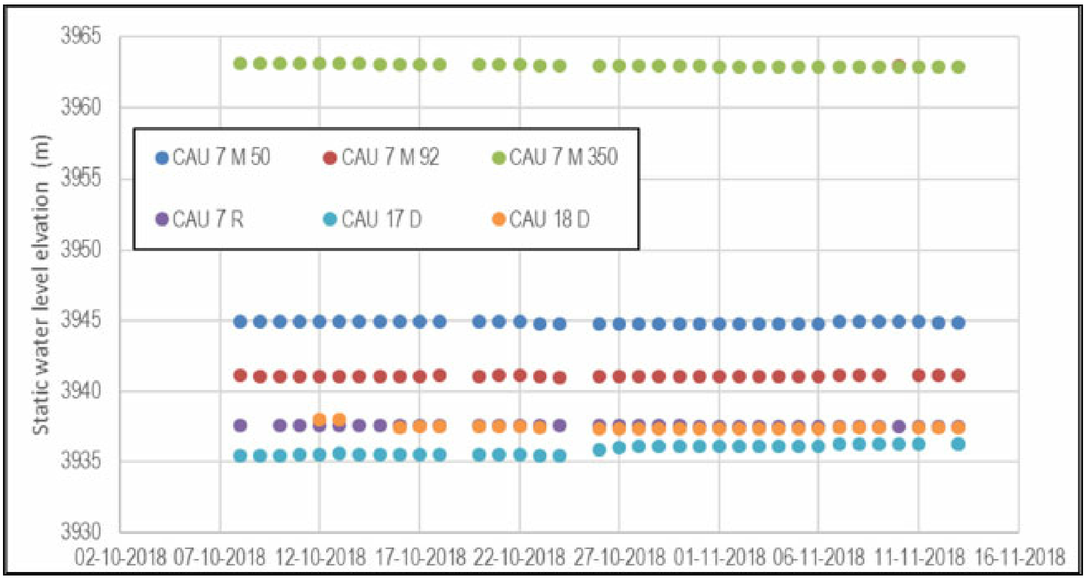


Figure 6-19 - NW Sector hydrographs.

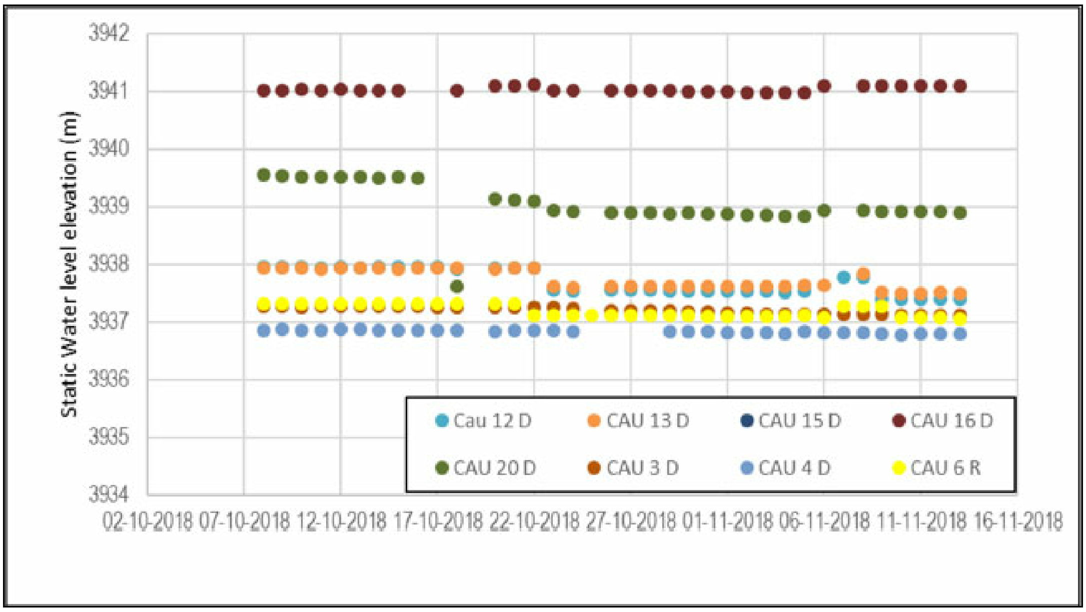


Figure 6-20 - Sector hydrographs.

Table 6-9 - Selected representative groundwater elevation information.

Well	Source	UTM E	UTM N	Elevation (masl)	Ave SWL (m)	Groundwater Elevation (masl)
CAU03	AAL	3,421,873	7,373,648	3,941.96	3.85	3,938.11
CAU04	AAL	3,421,903	7,371,452	3,941.53	5.67	3,935.86
CAU07 50	AAL	3,421,200	7,383,987	3,964.12	19.66	3,944.46
CAU11 MC	AAL	3,421,964	7,367,859	3,942.34	0.62	3,941.72
CAU12	AAL	3,424,289	7,383,777	3,946.04	3.42	3,942.62
CAU13	AAL	3,426,157	7,388,919	3,941.35	2.96	3,938.39
CAU15	AAL	3,427,293	7,386,921	3,941.50	6.79	3,934.71
CAU18	AAL	3,421,087	7,375,315	3,940.48	27.09	3,913.39
PP02	AAL	3,420,682	7,371,761	3,941.65	1.09	3,940.56
PP03	AAL	3,419,252	7,375,340	3,940.45	1.31	3,939.14
DDH1	EXAR	3,428,588	7,398,395	3,937.99	5.55	3,932.44
DDH2	EXAR	3,425,982	7,385,598	3,942.01	0.55	3,941.46
DDH3	EXAR	3,420,270	7,363,470	3,945.19	6.85	3,938.34
DDH4	EXAR	3,421,092	7,377,243	3,940.10	1.8	3,938.30
DDH5	EXAR	3,421,964	7,367,859	3,942.34	0.3	3,942.04
DDH6	EXAR	3,424,289	7,383,777	3,946.04	2.75	3,943.29
DDH8	EXAR	3,426,498	7,383,998	3,940.71	0.4	3,940.31
DDH9	EXAR	3,427,293	7,386,921	3,941.50	0.75	3,940.75
DDH13	EXAR	3,421,087	7,375,315	3,940.48	3.25	3,937.23
DDH14	EXAR	3,420,682	7,371,761	3,941.65	7.35	3,934.30
DDH15	EXAR	3,419,252	7,375,340	3,940.45	0.75	3,939.70
DDH16	EXAR	3,433,071	7,408,816	3,938.55	8.75	3,929.80
DDH18	EXAR	3,425,407	7,387,082	3,946.63	2.85	3,943.78
PE1	EXAR	3,428,570	7,398,146	3,937.99	0.8	3,937.19
PE2	EXAR	3,428,616	7,398,146	3,938.01	0.4	3,937.61
PE4	EXAR	3,422,220	7,379,986	3,939.95	4.7	3,935.25
PE5	EXAR	3,428,568	7,398,344	3,937.97	3.5	3,934.47
PE7	EXAR	3,425,982	7,385,606	3,942.05	8.7	3,933.35
PE8	EXAR	3,422,504	7,363,500	3,944.46	0.05	3,944.41
PE9	EXAR	3,419,453	7,374,363	3,940.91	4.6	3,936.31
PE11	EXAR	3,427,395	7,391,300	3,939.18	0.45	3,938.73
PE13	EXAR	3,422,096	7,383,755	3,955.74	13.05	3,942.69
PE14	EXAR	3,423,178	7,382,200	3,944.22	0.25	3,943.97
PE19	EXAR	3,424,620	7,380,198	3,939.98	1.65	3,938.33
PE22	EXAR	3,422,756	7,378,461	3,940	3.4	3,936.60

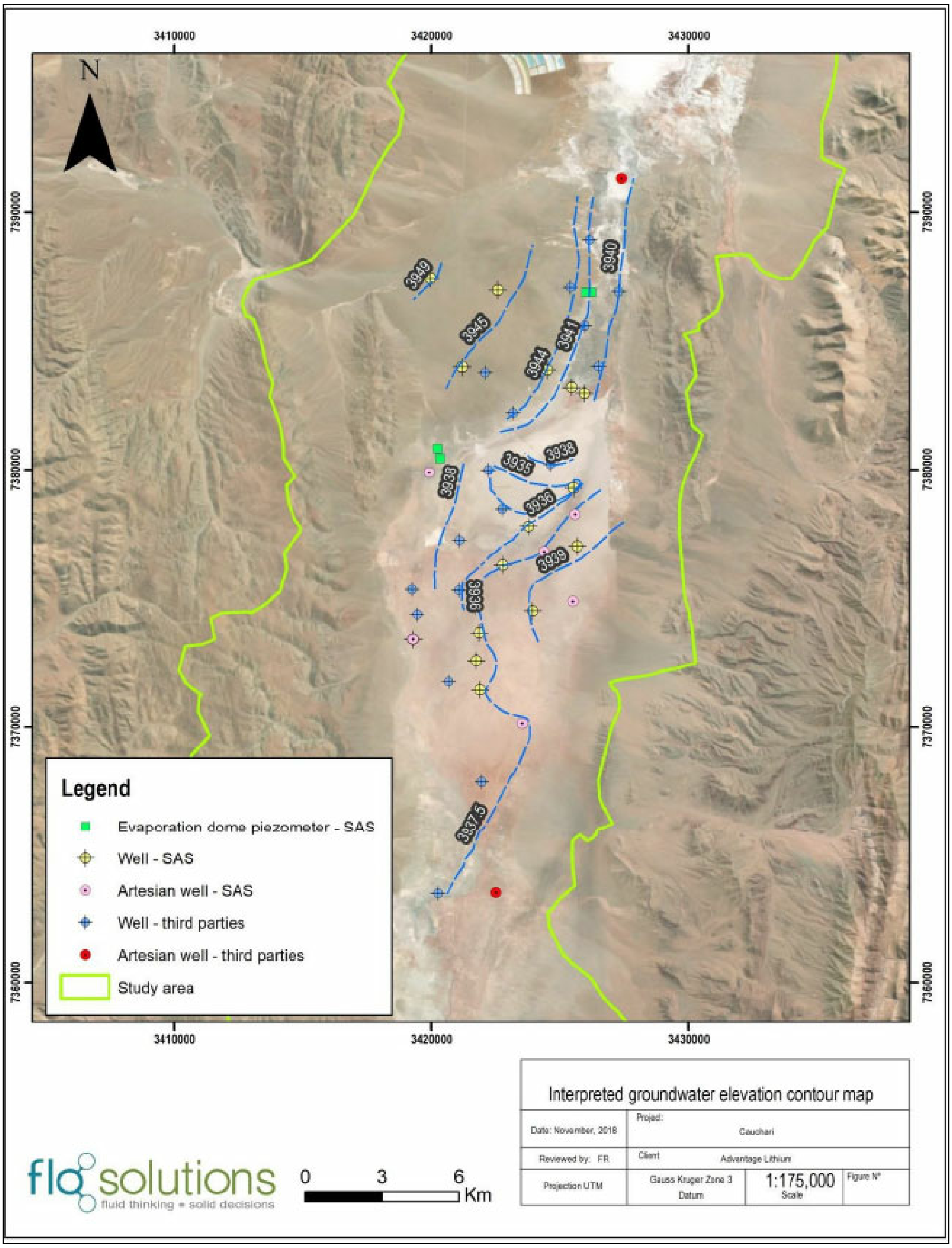


Figure 6-21 - Interpreted groundwater elevation contour map - 2019.

6.9 Water Balance

It is assumed that in most enclosed basins, in absence of any major groundwater abstraction, the long-term water balance is in equilibrium with groundwater recharge equal to the groundwater discharge. Groundwater recharge in high desert basins is generally difficult to quantify due to scarcity of precipitation measurements (liquid and solid) and the uncertainties in the soil infiltration and potential sublimation rates, and runoff coefficients. Groundwater recharge was estimated from groundwater inflow into the salar from surrounding sub-basins for which infiltration was calculated through a HEC-HMS model by the DHI Group.

Groundwater discharge in enclosed basins takes place through evaporation as a function of soil type (grainsize/permeability), depth to the phreatic level, water (brine) density and climatic factors. Soil evaporation rates for the Project area were determined as a function of these parameters using evaporation domes and data collection from shallow auger holes in December 2018.

The results of the water balance estimate for the Project area are summarized in Table 6-10. The recharge was estimated at 730 l/s and could be underestimated due to the uncertainties explained above. The discharge for the Project area was estimated at 810 l/s.

Table 6-10 - Summary water balance for the Cauchari JV Project area.

Inflow (L/s)	
Recharge as gw inflow from sub-basins:	730
Total Inflow	**730**

Outflow (L/s)	
Soil evaporation:	810
Total Outflow	**810**

6.10 Surface Water

Rio Tocomar entering Cauchari from the south and Rio Archibarca from the west are the only two permanent (year-round) surface water features in the Project area. Other surface water flows are intermittent and occur generally during summer months as a result of intense rainfall events.

Rio Tocomar and Rio Archibarca have been monitored on a relatively regular basis by Minera Exar since 2010 and more recently also by Orocobre since 2015. Orocobre has made these monitoring data available, and they are discussed below. Flow measurements for other intermittent surface water features are sporadic and records are not complete.

6.10.1 Río Archibarca

A permanent flow gauge for the collection of monthly manual volumetric flow measurements was installed on Rio Archibarca just above the western extent of the alluvial cone at an elevation of 4,000 m. Figure 6-22 shows a photo of the Rio Archibarca channel. Figure 6-23 shows the average monthly flows measured (2015-2018) in the Rio Archibarca. Peak flows occur during the winter months when evaporation (transpiration) rates are at a minimum.

Figure 6-22 - Río Archibarca channel, November 2018.

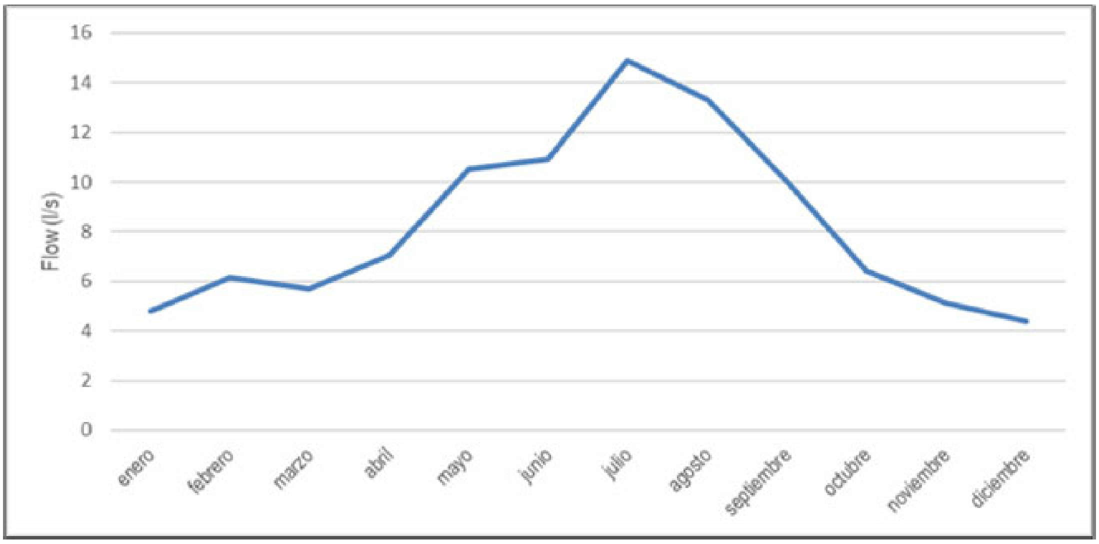


Figure 6- 23 - Monthly average flows (l/s) in Rio Archibarca (2015-2018).

6.10.1 Río Tocomar

Manual monthly flow measurements are made on the Rio Tocomar near the extreme southeast corner of the Cauchari basis at an elevation of 4,200 m. Figure 6-24 shows a photo of the Rio Tocomar channel. Figure 6-25 shows the monthly average flows in the Rio Tocomar based on the data collected between 2015 and 2018. Peak flows again occur during the winter months when evaporation (transpiration)ration rates are at a minimum.

Figure 6-24 - Río Tocomar, November 2018.

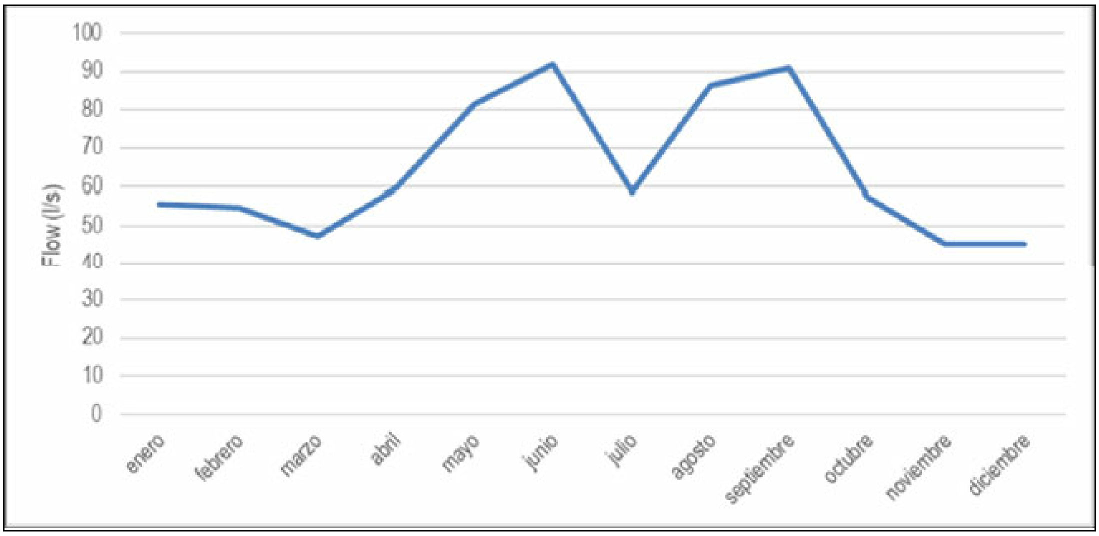


Figure 6- 25 - Average monthly flow (l/s) in Rio Tocomar.

7. EXPLORATION

This section summarizes exploration conducted in support of the Project.

7.1 Surface Sampling

In 2009, Geochemical sampling was conducted on 134 brine samples from 105 pits. Results showed that the northern part the salar had the most elevated lithium concentrations.

7.2 Logging Historical Drillhole Cuttings

Refer to section 7.4 for details of core logging.

7.3 Geophysical Exploration

7.3.1 Audio Magnetotelluric Survey - 2009 (AMT)

In 2009 geophysical surveys undertaken by Orocobre in Cauchari consisted of three coincident AMT and gravity lines aimed at mapping the basin geometry and depth.

7.3.1.1 AMT Data Acquisition

Audio-frequency MT (AMT) measures temporary variations in the electromagnetic field caused by electrical storms (high frequencies >1 Hz), and the interaction between the solar wind and the terrestrial magnetic field (low frequencies <1 Hz), which allows variations in the electrical subsurface to depths of 2 km or more.

The electrical properties of the subsurface depend on Archie's Law: Rt = a Rw / Pm where Rt is the measured total resistivity, Rw is the resistivity of the fluid in the rock pores and P is the rock porosity, a and m are constants. Hence, it is possible to infer the subsurface variations in fluid resistivity and porosity, although it is important to note that once again the problem of a non-unique solution always exists.

Data at 250 m spaced stations was acquired using Phoenix Geophysics equipment within a range of 10,000-1 Hz, using up to 7 GPS synchronized receptors. The equipment includes a V8 receptor with 3 electrical channels and 3 magnetic channels which also serves as a radio controller of auxiliary RXU-3E acquisition units. Three magnetic coils of different size and hence frequency was used at each station, and non-polarizable electrodes that improve signal to noise ratios. The natural geomagnetic signal during the acquisition period remained low (the Planetary An Index was <= 5 for 95% of the acquisition time) requiring 18- 20 hours of recording at each station.

All stations were surveyed using differential GPS to allow for subsequent topographic corrections. AMT requires a Remote Station, far from the surveyed area, in a low-level noise location to act as a baseline for the acquired data.

7.3.1.2 AMT Data processing and modelling

Processing of the AMT data requires the following stages:

- Filtering and impedance inversion of each station.
- 1D inversion for each station.
- Development of a resistivity pseudo-section.
- 2D profile inversion (including topographic 3D net).

The WinGlink software package was used for filtering, inversion, and development of the pseudo-section and eventually the 2D model output.

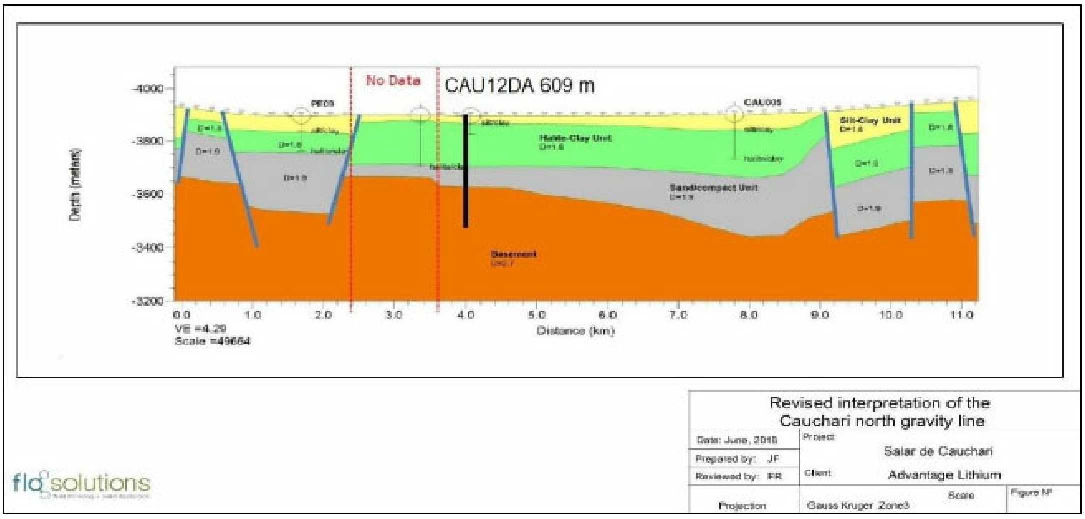


Figure 7-1 - Interpretation of the Cauchari north gravity line (looking north).

7.3.1.3 AMT Model output and interpretation

The 2D AMT model results for the northern section at Cauchari are presented below in Figure 7-2. The drill hole CAU12DA is located within 1 km of the geophysical profile. In the Cauchari north AMT line the darkest blue on the AMT line is interpreted to represent brine, which extends across the salar between bounding reverse faults which thrust older sediments and unsaturated units over the salar sediments on the margins of the salar basin. This interpretation is supported by TEM (King, 2010b) and electrical soundings (Vazques, 2011) conducted by LAC in the adjacent tenements.

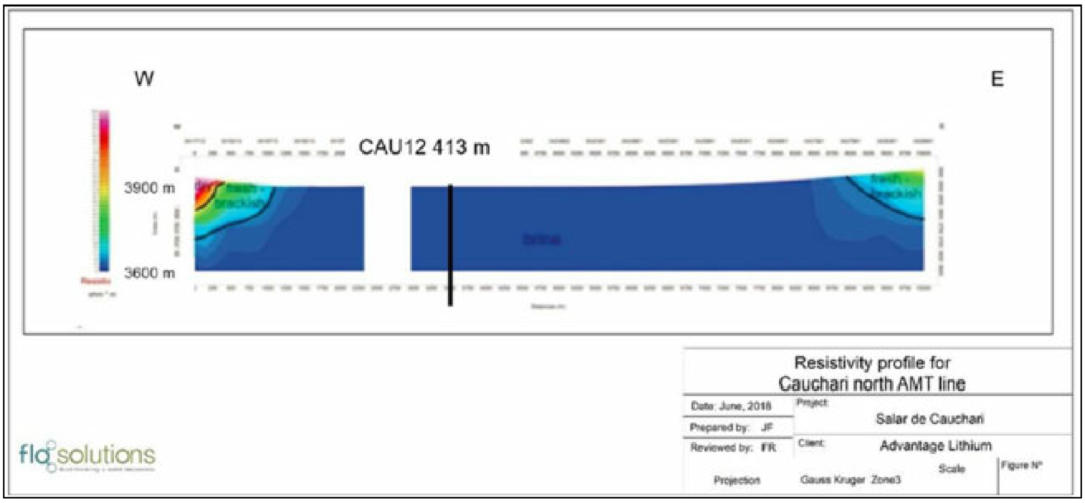


Figure 7-2 - Resistivity profile for Cauchari north AMT line.

7.3.2 Gravity Surveys

7.3.2.1 Gravity Survey - 2009

Gravity techniques measure the local value of acceleration which, after correction, can be used to detect variations in the gravitational field on the earth's surface which may then be attributed to the density distribution in the subsurface. As different rock types have different densities, it is possible to infer the likely subsurface structure and lithology, although various combinations of thickness and density can produce the same measured density; resulting in multiple possible models for layers in the salar (referred to as non-unique solutions to the gravity data).

7.3.2.2 Gravity Data Acquisition

Gravity data was acquired at 200 m spaced stations which were surveyed with high precision GPS equipment. A Scintrex CG-5 gravimeter (the most up-to-date equipment available) was used, and measurements were taken over an average 15-minute period in order to minimize noise. A base station was established with readings taken at the beginning and end of each day's activities in order to establish and subsequently correct for the effects of instrument drift and barometric pressure changes. The daily base stations were referred to the absolute gravity point PF-90N, close to Salta, where a relative gravity of 2,149.14 mGal was obtained. Since this point is distant from Cauchari, intermediate stations were used to transfer the absolute gravity to Pastos Chicos where a relative gravity base station was established with a value of 1,425.31 mGal.

A differential GPS was used to survey the x, y, and z coordinates of the gravity stations (Trimble 5700). This methodology allows centimeter accuracies with observation times comparable to or less than the corresponding gravity observation. The gravity station position data was recorded using a mobile GPS (Rover). Another GPS (Fixed) at the fixed base station recorded data simultaneously to correct the Rover GPS. The Fixed and Rover GPS units were located within a radius of 10 to 20 km of each other. Both data sets were post-processed to obtain a vertical accuracy of 1 cm.

7.3.2.3 Gravity Data processing

In order to arrive at the complete Bouguer anomaly which can be used to interpret the subsurface the following corrections to the acquired data must be made:

- Tidal correction.
- Drift, instrumental height, and ellipsoid corrections.
- Free air, latitude, Bouguer and topographic corrections.

The tidal correction compensates for variations in gravity caused by the sun and moon. Using TIDES software, the acceleration due to gravity for these effects can be determined corresponding to the location and time of measurements. The data acquired in the survey were translated to UTC time to facilitate data handling. The exported data were converted from μGal to mGal and used to correct the acquired data.

Instrument drift was calculated from the difference in gravity measured at the base station. This difference was then linearly distributed with respect to time of each reading and used to correct the acquired data.

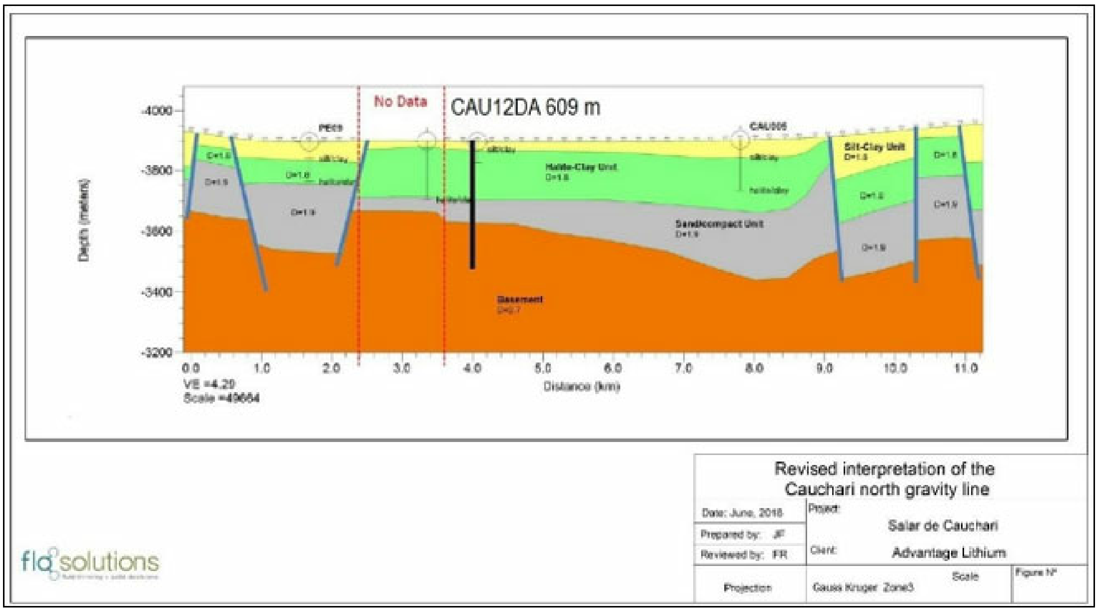


Figure 7-3 - Interpretation of the Cauchari north gravity line (looking north).

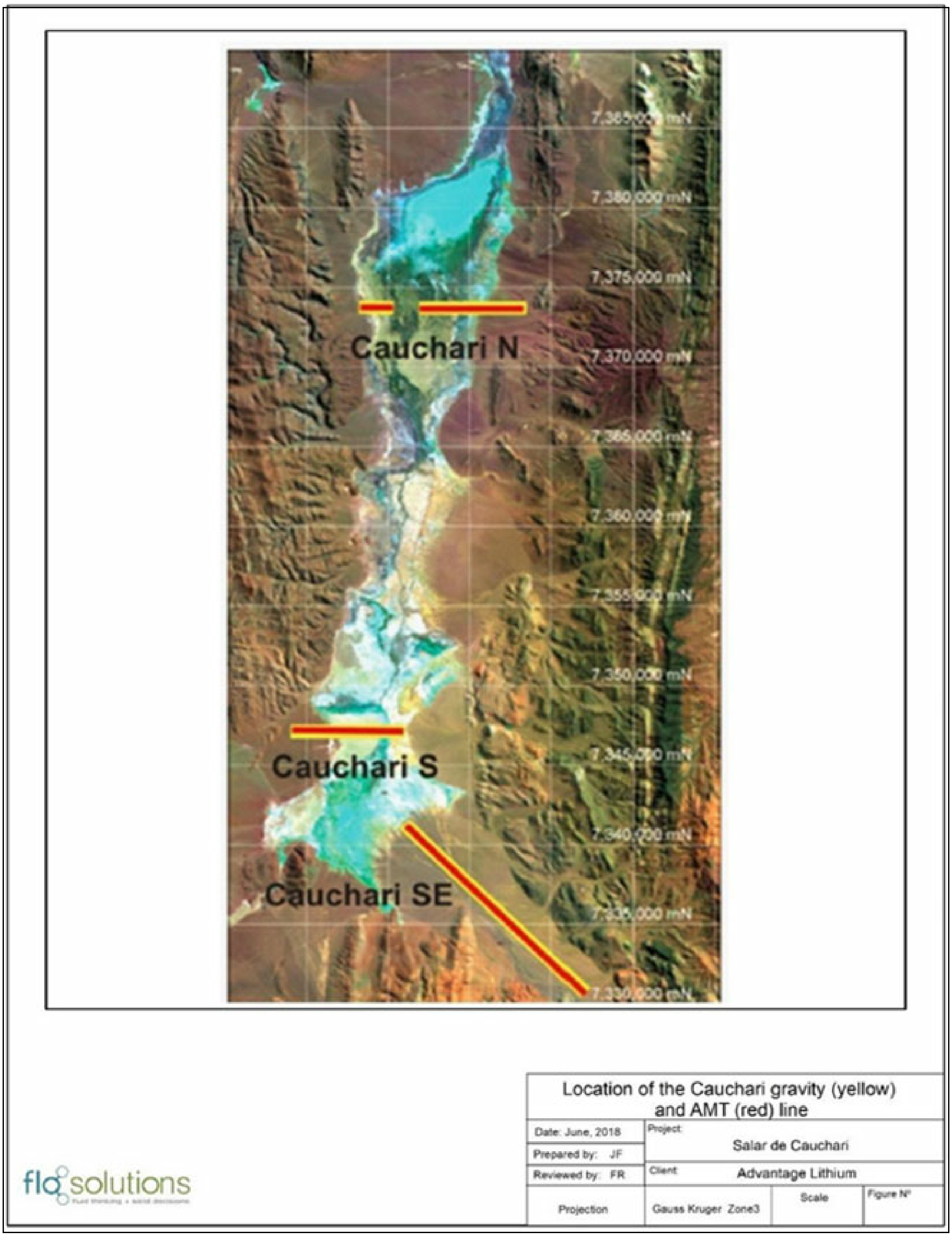


Figure 7-4 - Location of the Cauchari gravity (yellow) and AMT (red) lines.

Each reading was corrected for the height of the instrument using the following formula:

$$r_h = r_t + 0.308596\ h_i \qquad \text{(Formula 1)}$$

where rh is the corrected instrument height, rt is the tidal correction, and hi is the observed instrument height. The formula employed to correct variations in gravity associated with the ellipsoidal shape of the earth corresponds to the 1980 model:

$$gl = 978{,}032.7\ [\ 1 + 0.0053024\ \sin2(l) - 0.0000058\ \sin2(2l)] \qquad \text{(Formula 2)}$$

where gl is the theoretical gravity in milligals and l is latitude.

The free air anomaly is calculated as:

$$gfree\ air = -\ 0.3086\ (\Delta h) \qquad \text{(Formula 3)}$$

where gfree air is the correction factor and ∆h refers to the difference in altitude of the station with respect to the base.

Figure 7-5 - Gravimeter base station.

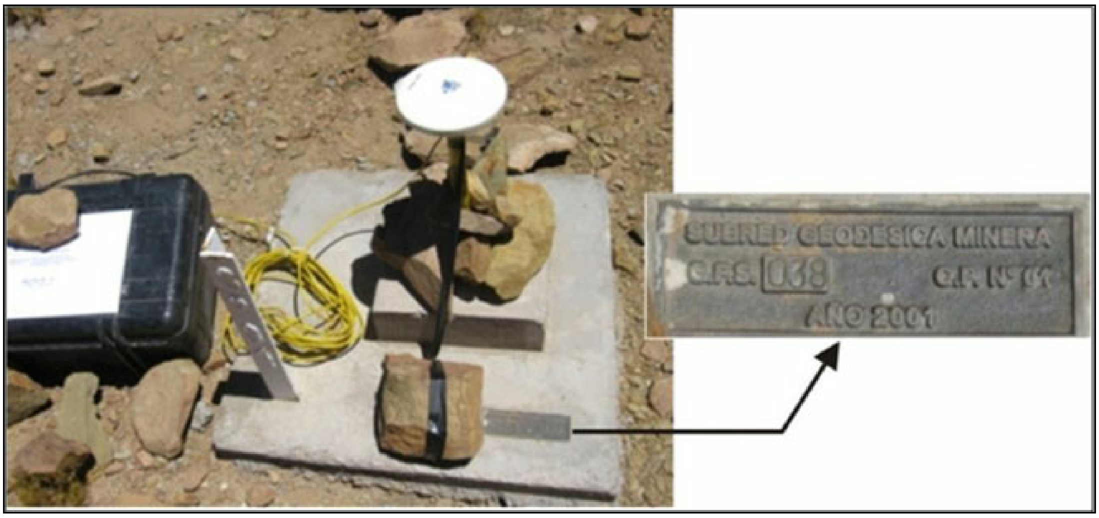


Figure 7-6 - GPS base station.

To eliminate the effect of the rock masses between the reference level and observation station, the Bouguer correction was employed.

$$gCB = 0.04191(\Delta h)\ \rho \quad \text{(Formula 4)}$$

where gCB is the correction factor, the value Δh refers to the difference in altitude between the observation point and the base station, and ρ is the mean rock mass density in the area calculated using the graphical Nettleton method to be 2.07 gm cm^3.

The topographic correction is used to compensate the effects of the relief in the gravity measurements. It considers the topography at different levels of accuracy and importance, according to its distance from the gravimetric station to correct. Centered areas are considered at the station with radii of 100 m, 2.5 km, and 150 km respectively. The result of applying all corrections is the Bouguer anomaly.

7.3.2.4 Gravity data modelling

The Bouguer anomaly can be modeled to represent the subsurface geology. However, any model is non-unique, and it is essential to consider the known geology and rock density. After the gravity survey, drilling was carried out 2011 and density measurements were made on 18 core samples. This information (Table 7-1) was used to remodel the gravity profile across the central part of the salar. The interpretation is provided in Figure 7-1.

Table 7-1 - Bulk rock density values used in the gravity interpretation.

Salar Unit	Density used in modelling (g/cc)	Density measured from Cauchari samples (g/cc)
Salar deposits	1.6	
Clastic sediments	1.8	1.8
Compact halite		1.7
Porous halite		1.4
Basement 2	2.6	
Basement 1	2.7	

The gravity interpretation extends the asymmetric nature of the Salar de Cauchari towards the south (Figure 7-1), although the maximum basin depth was interpreted to be greater than 450 m along the eastern boundary in the southern gravity line. Recent drilling by the company, with Rotary hole CAU11 completed to 480 m and other holes such as CAU14 to 600 m, suggests that the gravity modelling substantially underestimates the thickness of the salar sediments and the depth to underlying basement. Drilling by neighboring property owner Lithium Americas Corp (LAC) supports this interpretation, with the deepest historical hole drilled by LAC to 650 m (Burga et. al, 2017).

7.3.2.5 Gravity Survey - 2016

In late 2016 additional gravity data was collected on a quasi-grid basis across the NW Sector and SE Sectors of the Cauchari Salar. The work was carried out by staff from the Seismology and Geophysics institute at the University of San Juan using Scintrex CG-3 and CG-5 gravimeters and digital GPS equipment to precisely locate each gravity station. A series of regional gravity points were measured in the surrounding area and a residual bouguer map was generated from the available information. Lines were on a nominal 1 km spacing north-south, with gravity stations measured every 200 m along the lines. The process of gravity data is consistent with the activities described above in the section discussing processing of the earlier acquired geophysical data.

The gravity survey confirmed the geometry of the Cauchari basin is similar to that presented in Figure 7-1, with the deepest part of the basin on the eastern side.

7.3.3 Time Domain Electromagnetic (TEM) Survey - 2018

In 2018 a TEM survey was undertaken in the NW Sector to assist mapping of the brine body. The TEM survey was conducted with a Geonics Protem 20 channel transmitter, with 195 stations read across five lines, using 200 x 200 m loops transmitting at 25 and 2.5 Hz with 100 V output. The receiver was configured to automatically make 3 readings, each with an integration period of 30 seconds. To evaluate the coherency of the data a comparison of the graphical display of the Z component resistivity with time was made on the three recorded measurements. If noise was detected a repeat set of 3 measurements was made.

Further quality control was made when data was downloaded from the Protem device. The data was then presented as profiles, which clearly identified the unsaturated zone, fresh to brackish water, the transition to brine and the brine body itself, as well as basement features on the margins of the survey area, near outcropping rocks. This information has been incorporated into the geological and resource model for the Project, as diamond drilling has provided useful information to validate the TEM profiles.

7.3.4 Drilling

Three drilling campaigns have been carried out for the Project since 2011. The first program in 2011 by SAS (Phase I) covered the SE Sector of the Project area; the second and third campaigns (Phases II and III) by AAL covered both the NW and SE Sectors of the Project area. The objectives of the drilling and testing can be broken down into three general categories:

1. Exploration drilling on a general grid basis to allow the estimation of "in-situ" brine resources. The drilling methods were selected to allow for 1) the collection of continuous cores to prepare "undisturbed" samples from specified depth intervals for laboratory porosity analyses and 2) the collection of depth-representative brine samples at specified intervals. The 2011 campaign included five (5) diamond core holes CAU01 through CAU05 and one rotary hole (CAU06). The Phase II and III programs included 20 diamond core holes (CAU12 through CAU29). Figure 7-7 shows the location of the exploration boreholes.
2. Test well installations. The Phase II campaign included five rotary holes (CAU07 through CAU11) which were drilled and completed as test production wells to carry out pumping tests and additional selective brine sampling. Monitoring wells were installed adjacent to these test production wells for use during the pumping tests as part of the Phase III program.
3. Pumping tests. Initial short-term (48 hour) pumping tests were carried out on CAU07 through CAU11 during 2017. Two long-term (30-day) pumping tests were carried out on CAU07 and CAU11 as part of the Phase III program. Three nested monitoring wells were completed immediately adjacent to each CAU07 and CAU11 to observe water levels in distinct hydrogeological units throughout the 30-day tests.

7.3.5 Exploration Drilling

Five HQ and NQ core holes (CAU01 through CAU05) were drilled for a total of 721 m by Falcon Drilling using a Longyear 38 trailer mounted rig in 2011. CAU06R was drilled as a rotary hole to 150 m depth. 20 HQ core holes were drilled for a total of 9,376.5 m by Falcon-AGV and Major Drilling in 2017/18. Core recovery averaged 76% and 70% in the 2011 and 2017/18 programs, respectively. Table 7-2 shows the details of the drilling depths that varied from 46.5 m in CAU04D to 619 m in CAU12D. All holes were drilled vertically.

Diamond drilling was carried out in 1.5 m core runs with lexan (plastic) tubes in the core barrel in place of a split triple tube. Core recovery was measured for each run. The retrieved core was subsampled by cutting off the bottom 15 cm of alternating 1.5 m length plastic core tubes (nominal 3 m intervals) for porosity analysis. Thereafter, cores were split, and the lithology was described by the on-site geological team.

Brine samples were collected using a bailer and following protocols developed by Orocobre for resource drilling at the Olaroz Project. Brine samples were taken at 3 m intervals during the 2011 program and at 6 m to 12 m intervals (due to deeper holes) during the 2017/18 program. Up to 3 well volumes of brine were bailed from the hole prior to sampling. The bailed brine volume was adjusted based on the height of the brine column at each sampling depth.

Core drilling was carried out using brackish water from the margins of the salar as drilling fluid. This fluid has a Li concentration of less than 20 mg/l. Fluorescein, an organic tracer dye was added to the drilling fluid to distinguish between drilling fluid and natural formation brine. Detection of this bright red dye in samples provided evidence of contamination from drilling fluid and these samples were discarded.

Brine sample recovery from halite and clay units was low due to the low permeability and brine samples were not obtained in a number of intervals in various holes. Double packer brine sampling equipment was used to obtain check samples from selected depth intervals. On completion of the drilling and sampling, each diamond hole was completed as a monitoring well by the installation of 3-inch diameter schedule slotted PVC.

Table 7-2 - Cauchari summary borehole information (2011-2018).

Hole ID	UTM mE*	UTM mN*	Elev. (masl)	TD (m)	Type	Year	Drilling Co.	Rec. (%)	SWL (m)	Screened Interval	Casing Dia (in)
CAU01D	3,425,589	7,378,259	3940.42	249	DDH	2011	Falcon	76	0	0 - 249 m	2
CAU02D	3,424,385	7,376,814	3940.41	189	DDH	2011	Falcon	69	2.15	0 - 189 m	2
CAU03D	3,421,874	7,373,649	3941.06	71.5	DDH	2011	Falcon	80	4.16	0 -71.5 m	2
CAU04D	3,421,903	7,371,452	3941.53	46.5	DDH	2011	Falcon	77	5.5	0 - 46.5 m	2
CAU05D	3,425,500	7,374,882	3945.57	168	DDH	2011	Falcon	82	0	0 - 168 m	2
CAU06R	3,423,531	7,370,126	3941.95	150	Rotary	2011	Valle	NA	3.97	-	-
CAU07R	3,421,200	7,383,987	3964.13	348	Rotary	2017	Andina	NA	-	134 - 326 m	6
CAU08R	3,423,938	7,374,503	3940.95	400	Rotary	2017	Andina	NA	2.82	60 - 396 m	8 & 6
CAU09R	3,423,778	7,377,785	3939.96	400	Rotary	2017	Andina	NA	5.04	65 - 394 m	8 & 6
CAU10R	3,425,532	7,379,306	3940.19	429	Rotary	2017	Andina	NA	6.84	60 - 418 m	8 & 6
CAU11R	3,421,752	7,372,571	3941.22	480	Rotary	2017	Andina	NA	12.2		8 & 6
CAU12D	3,421,708	7,374,690	3940.56	413	DDH	2017	Falcon	64	1.73	3 - 201 m	3
CAU12D A	3,421,679	7,374,669	3940.56	609	DDH	2018	Falcon	-	-	-	-
CAU13D	3,422,774	7,376,298	3940.16	449	DDH	2018	Falcon	73	1.78	0 - 252 m	3
CAU13D A	3,422,747	7,376,293	3940.16	497	DDH	2018	Falcon	-	-	-	-
CAU14D	3,425,670	7,377,021	3942.09	600	DDH	2018	Falcon	78	-	0 - 454.5 m	3 & 2
CAU15D	3,419,292	7,373,396	3941.34	243.5	DDH	2017	Falcon	39	0	6 - 204 m	3
CAU16D	3,419,924	7,379,892	3940.83	321.5	DDH	2017	Falcon	63	0.77	3 - 249 m	3
CAU17D	3,419,965	7,387,430	3990.59	237.5	DDH	2018	Falcon	48	42.07	3.5 - 238 m	3

Hole ID	UTM mE*	UTM mN*	Elev. (masl)	TD (m)	Type	Year	Drilling Co.	Rec. (%)	SWL (m)	Screened Interval	Casing Dia (in)
CAU18D	3,422,571	7,386,977	3964.07	359	DDH	2018	Falcon	86	18.57	0 - 353 m	3
CAU19D	3,421,745	7,369,998	3941	519.5	DDH	2018	Major	66.7	-		3
CAU20D	3,420,585	7,385,750	3982	390	DDH	2018	Major		42.87		3
CAU21D	3,420,351	7,382,047	3956	283	DDH	2018	Major		16.58		3
CAU22D	3,427,728	7,379,299	3953	418	DDH	2018	Falcon	88.95	5.51		3
CAU23D	3,419,549	7,372,041	3948	319	DDH	2018	Falcon		0.56		3
CAU24D	3,419,658	7,369,902	3944	352.5	DDH	2018	Major	55.5	1.21		3
CAU25D	3,427,810	7,381,196	3955	427	DDH	2018	Falcon	80.55	9.66		3
CAU26D	3,423,997	7,371,974	3946	619	DDH	2018	Major	64.67	-		3
CAU27D	3,426,874	7,376,061	3959	473	DDH	2018	Falcon	72.94	17.06		3
CAU28D	3,419,760	7,367,270	3959	303.5	DDH	2018	Major	46.46	-		-
CAU29D	3,420,475	7,364,855	3959	404	DDH	2018	Major	35.8	-		3

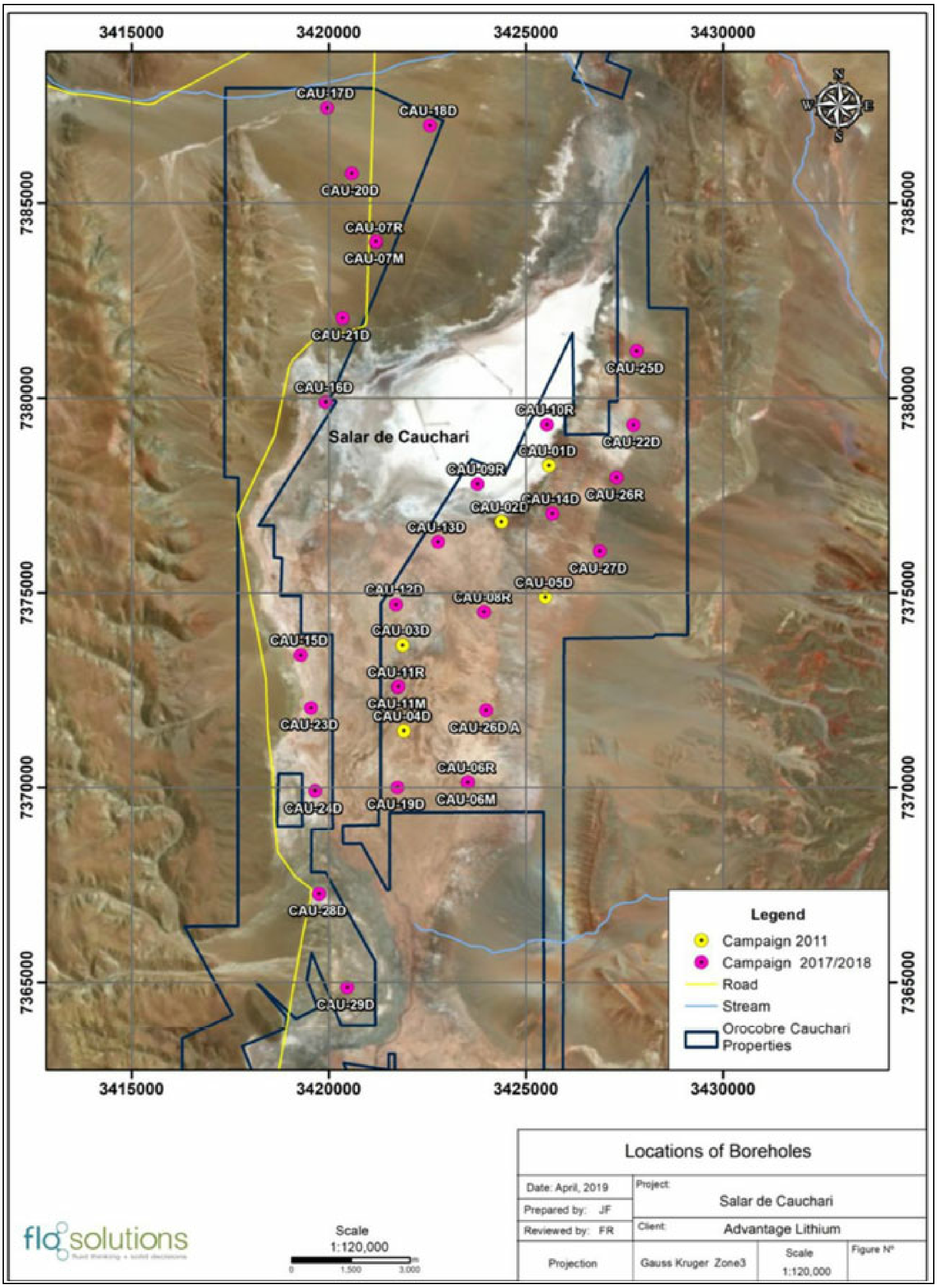


Figure 7-7 - Location map of boreholes - 2018

7.3.6 Production Well Drilling

Five test production wells (CAU07 through CAU11) were drilled and completed by Andina Perforaciones using a Speedstar SS-3 table drive rotary rig in 2017. The rotary holes were drilled at a first pass in 7 7/8 -inch diameter and subsequently reamed to 15-inch diameter in the upper part of the hole and to 12- inch diameter in the lower part of the hole. Drilling depths varied between 343 m (CAU07) and 480 m (CAU11). A total of 2,052 m was drilled with the rotary method during which cutting samples were collected at 2 m intervals for geological logging using a hand lens and binocular microscope. Cuttings were stored in chip trays. The holes were completed with 8-inch (upper section) and 6-inch diameter (lower section) blank and screened stainless steel production casing. The completion details of the test wells are provided in Table 7-2. The annulus space was completed with a gravel pack and a cement surface seal. The wells were developed by pumping over a minimum 72-hour period with a submersible pump.

7.3.7 Pumping Tests

7.3.7.1 48-Hr Pumping Tests

Preliminary pumping tests were carried out on the five test production wells CAU07 through CAU11 during the Phase II program in 2017. These pumping tests were carried out over a period of 48 hours after the well development was completed. In each well the pump was installed within the upper 8-inch section of the wells. The pumping test in CAU07 (completed in the coarser grained units of the NW Sector) was carried out at a rate of 17 l/s. The test in CAU11 (completed in the deep sand unit of the SE Sector was carried out at a constant rate of 19 l/s. The tests in CAU08, CAU09, and CAU10 (all completed in the finer grained and halite units in the SE Sector) were carried out at a constant rate of 4 l/s.

7.3.7.2 30-Day Pumping Tests

Two long-term (30-day) pumping tests were carried out on CAU07 in the NW Sector and CAU11 in the SE Sector as part of the Phase III program. Three nested monitoring wells were completed immediately adjacent to CAU07 in three distinct hydrogeological units as follows: the upper Archibarca fan material (freshwater aquifer); the intermediate low permeability clay and a third in the lower brine aquifer of the NW Sector. The 30-day CAU7 test started on December 11, 2018, and stopped on January 10, 2019. The average flow during the test was 22 l/s and the observed drawdown in the pumping well stabilized at 40.2m. Brine produced during the pumping test was discharged through a 0.80 km length pipeline into a LAC evaporation pond. Water level recovery was observed over a 15-day period after completion of the pumping cycle. Table 7-3 shows the results of the CAU7 pumping test interpretation.

Three nested monitoring wells were also completed immediately adjacent to CAU11 as follows: in the upper clay / halite unit, the intermediate depth halite unit and in the Lower Sand unit. The 30-day CAU11 test started on October 25, 2018, and stopped on November 23, 2018. The average flow during the test was 18 L/s and the observed drawdown in the pumping well stabilized at 26 m. Brine produced during the pumping test was discharged away from the wellhead through a 1.0 km length pipeline into a suitable depression in the salar. Water level recovery was observed over a 30-day period after completion of the pumping cycle. Table 7-3 shows the results of the pumping test interpretation.

Table 7-3 - CAU07 and CAU11 pumping test interpretation results.

Obs. Well	Unit	Max drawdown (m)	Method	T (m2/d)	S(-)	K (m/d)	Ss (m^{-1})
CAU07 M350	Archibarca Fan	3.67	Theis	477.2	0.018	3.4	1.28E-04
CAU11 MA	Lower sand	1.79	Theis	96 - 253	1.18	2.4 - 6.3	0.03
CAU11 MB	Halite-clay	26.91	Theis	62 - 100	2.07 x 10-4	10-Jun	2.07 x 10-5
CAU11MC	Clay, Fan, Halite	1.3	Theis	112 - 373	0.22	0,7 - 2,5	1.4 x 10-3

7.4 Recommendations

7.4.1 NW wellfield area

- It is recommended that two additional test production wells are installed in the lower Archibarca unit to verify the lateral continuity of the low permeability units (and/or anisotropy) between the upper freshwater aquifer and the underlying brine unit. Each well site will require the completion of two adjacent monitoring wells with isolated screened intervals in the upper and lower units. Complete 7-day pumping trials in each new test production well.
- A minimum of 10 additional mini piezometers are installed at the toe of the Archibarca Fan and new evaporation measurements are undertaken to refine the water balance.
- Low flow sampling is carried out in CAU7M350, CAU17D, CAU18D, CAU20D, and 21D at five selected depth intervals to verify previous chemistry analysis.

7.4.2 SE wellfield area

- It is recommended that a minimum of 3 diamond core exploration holes are drilled to convert Inferred Resource into Indicated Resources to a depth of 600 m in the SE Sector (Lower Sand and Halite/Clay units).
- A spinner log test should be carried out in CAU11R during a short new pumping test to verify the CAU11R pumping test results and interpretation.
- A new test production well and two adjacent monitoring wells should be drilled targeting the Lower Sand unit and a 20-day pumping test is completed.

7.4.3 Regional hydrogeology

- It is recommended that five multi-level piezometers are installed in and around the salar to improve the understanding of the distribution of piezometric heads. Groundwater samples should be taken from each multi-piezometer.

8. Sample Preparation, Analyses And Security

This section describes the preparation and analyses of samples taken from the Salar de Cauchari.

8.1 Drilling, Core Sample Collection, Handling and Transportation

Diamond drilling took place in HQ or NQ sizes with lexan tubes inside the core barrel to facilitate recovery and preparation of sub-samples for laboratory physical parameter analyses. When cores were recovered to surface the lexan tube was pumped from the core barrel using water and a plug separating tube and water. Upon release from the core barrel tight fitting caps were applied to both ends of the lexan tube. The lexan tube was then cleaned, dried, and labeled.

8.2 QA / QC Procedures

8.2.1 Drainable Porosity Sample Preparation, Handling and Security

The 2011 samples were prepared for drainable porosity testing and brine extraction by the BGS and consisted of a 20 cm sub-section of core cut from the bottom section of each lexan liner. The samples prepared for total porosity testing by the Company's laboratory in Salta consisted of a 10 cm sub-section of the core. Both sample types were sealed with endcaps and taped. All samples were labelled with the borehole number and depth interval. Each day the porosity samples were transferred to the workshop in the onsite camp where the samples were labelled with a unique sample number. Prior to shipping each sample was wrapped in bubble plastic to prevent disturbance during shipping. A register of samples was compiled at the camp site to control transportation of samples to the Company's Salta office. Porosity samples prepared from the HQ core collected during the 2017/18 Program followed the same procedures as outlined above.

The following test work has been carried out on the undisturbed core samples:

- 123 samples were analyzed by the BGS laboratory for total porosity and specific yield from the 5 core holes CAU1 through CAU5 drilled in 2011. 13 samples were rejected on arrival in the BGS due to damage that occurred during the shipping and handling.
- 164 samples were analyzed in 2011 by the Company's Salta laboratory for total porosity.
- 292 samples were analyzed by GSA in 2017/18 for drainable porosity and other physical parameters.
- 30 samples (subsamples from the 2017/18 GSA samples) were analyzed as QA/QC analyses by Corelabs in Houston TX in 2018, with a further 26 samples analyzed by DBSA.

8.3 Sample Shipment and Security

Brine samples were taken using bailer, packer, and drive point methods. In addition, a second sampling was carried out once drilling was finished using Low Flow Sampling (LFS) equipment inside the 3-inch diameter PVC slotted casing installed in each of the DD boreholes. Prior to bottling, the sample was transferred to a bucket, which had been rinsed with the same brine as the sample. When necessary fine sediment was allowed to settle in the bucket before the brine sample was transferred from the bucket to two 1-liter plastic bottles. The bottles were rinsed with the brine and then filled to the top of the bottle removing any airspace and capped. Bottles were labeled with the borehole number and sample depth with permanent marker pens, and labels were covered with transparent tape, to prevent labels being smudged or removed. Samples with fluorescein contamination were noted at this point and except in specific circumstances these were not sent for laboratory analysis, due to the interpreted sample contamination.

A volume of the same brine as the bottled sample was used to measure the physical parameters: density (with a pycnometer), temperature, pH, Eh and in some samples dissolved oxygen. Details of field parameters were recorded on paper tags, which were stuck to the bottle with transparent tape when completed with sample information.

Samples were transferred from the drill site to the field camp where they were stored in an office out of direct sunlight. Samples with suspended material were filtered to produce a final 150 ml sample for the laboratory. Before being sent to the laboratory the 150 ml bottles of fluid were sealed with tape and labeled with a unique sample ticket number from a printed book of sample tickets. The hole number, depth, date of collection, and physical parameters of each sample number were recorded on the respective pages of the sample ticket book and in a spreadsheet control of samples. Photographs were taken of the original 1-liter sample bottles and the 150 ml bottles of filtered brine to document the relationship of sample numbers, drill holes and depths.

Brine chemistry analyses summary was carried out as follows:

- 268 brine samples including (QA/QC samples: duplicates, standards, and blanks) were analyzed by Alex Steward Assayers (ASA) in Mendoza Argentina as the primary independent laboratory for the 2011 campaign.
- 15 brine samples were analyzed by the University of Antofagasta as the external secondary laboratory for QA/QC analyses during the 2011 campaign.
- 1,565 brine samples including (QA/QC samples: duplicates, standards, and blanks) were analyzed by NorLab in Jujuy, Argentina as the primary laboratory for the 2017/18 campaign.
- 42 brine samples were analyzed by Alex Steward Assayers (ASA) in Mendoza Argentina as the secondary laboratory for QA/QC analyses during the 2017/18 campaign.

- 35 brine samples were analyzed by the University of Antofagasta as the independent secondary laboratory for QA/QC analyses during the 2017/18 campaign.

8.4 Core Handling Procedures - Brine Analysis and Quality Control Results

8.4.1 Analytical Methods

Alex Stewart Argentina in Jujuy, Argentina (NorLab) was selected as the primary laboratory to conduct the assaying of the brine samples collected as part of the 2017/18 drilling program. This laboratory is ISO 9001 accredited and operates according to Alex Stewart Group standards consistent with ISO 17025 methods at other laboratories.

Alex Stewart Argentina in Mendoza, Argentina (ASAMen) was used for the analysis of external check samples during the 2017/18 drilling campaign and as primary laboratory during the 2011 drilling campaign. The laboratory of the University of Antofagasta in northern Chile was also used for external check samples during the 2017/18 and 2011 campaigns. This laboratory is not ISO certified, but it is specialized in the chemical analysis of brines and inorganic salts, with extensive experience in this field since the 1980s, when the main development studies of the Salar de Atacama were begun. Other clients include SQM, FMC, LAC and Orocobre.

Table 8-1 lists the basic suite of analyses requested from the laboratories. The labs used the same analytical methods based on the Standard Methods for the Examination of Water and Wastewater, published by American Public Health Association (APHA) and the American Water Works Association (AWWA), 21st edition, 2005, Washington DC.

Table 8-1 - List of analyses requested from the University of Antofagasta and Alex Stewart Argentina SA Laboratories.

Analysis	Alex Stewart Argentina	University Of Antofagasta	Methods
Total Dissolved Solids	SM 2540-C	SM 2540-C	Total Dissolved Solids Dried at 180ºC
pH	SM 4500-H+B	SM 4500-H+B	Electrometric Method
Density	IMA-28	CAQ - 001DS	Pycnometer
Alkalinity	SM 2320-B	SM 2320-B	Acid-Base Titration
Boron (B)	ICP - OES	CAQ - 005 BS	Acid-Base Titration
Chlorides (Cl)	SM 4500-Cl-B	SM 4500-Cl-B	Argentometric Method
Sulfates (SO4)	SM 45002-C (Ignition of Residue)	SM 45002-D (Drying of Residue)	Gravimetric Method
Sodium (Na)	ICP-OES 10	SM 3111 B	Direct Aspiration-AA or ICP Finish

Analysis	Alex Stewart Argentina	University Of Antofagasta	Methods
Potassium (K)	ICP-OES 10	SM 3111 B	Direct Aspiration-AA or ICP Finish
Lithium (Li)	ICP-OES 10	SM 3111 B	Direct Aspiration-AA or ICP Finish
Magnesium (Mg)	ICP-OES 10	SM 3111 B	Direct Aspiration-AA or ICP Finish
Calcium (Ca)	ICP-OES 10	SM 3111 D	Direct Aspiration-AA or ICP Finish

8.4.2 Analytical Quality Control - 2011 Program

A full QA/QC program for s accuracy, precision and potential contamination of the entire brine sampling and analytical process was implemented. Accuracy, the closeness of measurements to the "true" or accepted value, was monitored by the insertion of standards, or reference samples, and by check analysis at an independent secondary laboratory.

Precision of the sampling and analytical program, which is the ability to consistently reproduce a measurement in similar conditions, was monitored by submitting blind field duplicates to the primary laboratory. Contamination, the transference of material from one sample to another, was measured by inserting blank samples into the sample stream at site.

Blanks were barren samples on which the presence of the main elements undergoing analysis has been confirmed to be below the detection limit. The results of the analyses of the standards are summarized in Table 8-2. The analyses showed little systematic drift in the results relative to the standard values over the period analyzed. Results are generally within 10% of stated standard values, with a small number of exceptions for each element. However, boron values were consistently below the standard value for standards 4G, 5G and SG2.

Table 8-2 - Standards analysis results from ASA Mendoza (2011).

	B mg/L	Ca mg/L	K mg/L	Li mg/L	Mg mg/L	Na mg/L	Chlorides mg/L	Sulfates mg/L
Field standard CJ 1314								
# Samples	11	11	11	11	11	11	11	11
Average	392	2,189	17,235	1,547	4,159	93,338	184,782	4,335
Std Dev	23	157	1,017	68	318	6,147	3,987	382
RSD%	6.00%	7.20%	5.90%	4.40%	7.60%	6.60%	2.20%	8.80%
Max	430	2,316	18,904	1,658	4,474	103,728	193,035	4,989
Min	364	1,875	16,042	1,467	3,571	83,569	177,210	3,787
RPD %	16.70%	20.10%	16.60%	12.30%	21.70%	21.60%	8.60%	27.70%
STD SG1	**20**	**1,000**	**9,000**	**1,000**	**1,735**	**80,000**	**143,556**	
# Samples	7	7	7	7	7	7	7	7
Average	21	1,176	8,494	942	1,695	87,485	131,680	22,270

	B mg/L	Ca mg/L	K mg/L	Li mg/L	Mg mg/L	Na mg/L	Chlorides mg/L	Sulfates mg/L
Field standard CJ 1314								
Std Dev	4	31	210	35	17	4,985	833	809
RSD%	18.70%	2.70%	2.50%	3.80%	1.00%	5.70%	0.60%	3.60%
Max	30	1,224	8,908	1,018	1,714	92,383	132,246	23,799
Min	18	1,143	8,304	912	1,672	78,016	130,483	21,387
RPD %	54.20%	6.90%	7.10%	11.20%	2.50%	16.40%	1.30%	10.80%
STD SG2	**80**	**200**	**6,000**	**600**	**1,301**	**90,000**	**149,289**	
# Samples	7	7	7	7	7	7	7	7
Average	69	363	6,121	584	1,133	121,435	142,596	61,823
Std Dev	4	11	313	30	78	1,588	988	1,362
RSD%	5.40%	2.90%	5.10%	5.20%	6.90%	1.30%	0.70%	2.20%
Max	73	374	6,307	645	1,301	123,709	144,036	63,526
Min	62	347	5,418	561	1,071	118,365	141,329	59,838
RPD %	16.40%	7.40%	14.50%	14.30%	20.30%	4.40%	1.90%	6.00%
STD-4G	**400**	**200**	**4,000**	**400**	**1,820**	**80,000**	**129,446**	**7,500**
# Samples	12	12	12	12	12	12	12	12
Average	3505	252	3,944	402	18,428	80,545	126,666	8,688
Std Dev	14.9	10	184	18.5	134.1	3,767	1,662	381
RSD%	4.30%	4.00%	4.70%	4.60%	7.30%	4.70%	1.30%	4.40%
Max	3707	266	4,172	438	2,020	87,280	129,196	9,203
Min	321	236	3,618	385	1,644	75,146	124,094	8092
RPD %	14.00%	11.60%	14.00%	13.30%	20.40%	15.10%	4.00%	12.80%
STD-5G	**800**	**100**	**7,500**	**800**	**2,707**	**85,000**	**142,200**	**11,000**
# Samples	6	6	6	6	6	6	6	6
Average	707	197	7,318	802	2,632	83,219	137,497	12,469
Std Dev	20	4	144	19	81	4,572	3,119	640
RSD%	2.80%	2.20%	2.00%	2.30%	3.10%	5.50%	2.30%	5.10%
Max	734	202	7,451	820	2,716	87,768	141,417	13,295
Min	677	191	7,121	772	2,544	76,549	134,435	11,607
RPD %	7.90%	5.80%	4.50%	6.00%	6.80%	13.40%	5.10%	13.80%

Table 8-3 shows a summary of the duplicate samples analysis. The duplicates show there is a high level of analytical repeatability and precision in the bailed samples analyzed by ASAMen, with duplicates generally well within +/- 10.

Table 8-3 - Duplicate analysis results (2011).

	B		K		Li		Mg	
	Original	Duplicate	Original	Duplicate	Original	Duplicate	Original	Duplicate
# Samples	19	19	19	19	19	19	19	19
Average mg/L	646	650	4,283	4,317	458	463	1,143	1,158
Std Dev	314	309	2,292	2,306	288	285	795	795

	B		K		Li		Mg	
	Original	Duplicate	Original	Duplicate	Original	Duplicate	Original	Duplicate
Graph r^2	0.992		0.996		0.994		0.997	
RPD%	0.60%		0.80%		1.00%		1.30%	
	SO4		Cl		TDS		Density	
	Original	Duplicate	Original	Original	Original	Duplicate	Original	Duplicate
# Samples	19	19	19	19	19	19	19	19
Average mg/L	21,499	21,372	165,287	165,283	303,932	303,917	1.2	1.2
Std Dev	7,284	7,309	16,503	16,712	32,315	32,140	0	0
Graph r2	0.934		0.98		0.985		0.977	
RPD%	0.60%		0.00%		0.00%		0.00%	

Ionic balances shown in Figure 8-1 demonstrate that the analyses are of good quality.

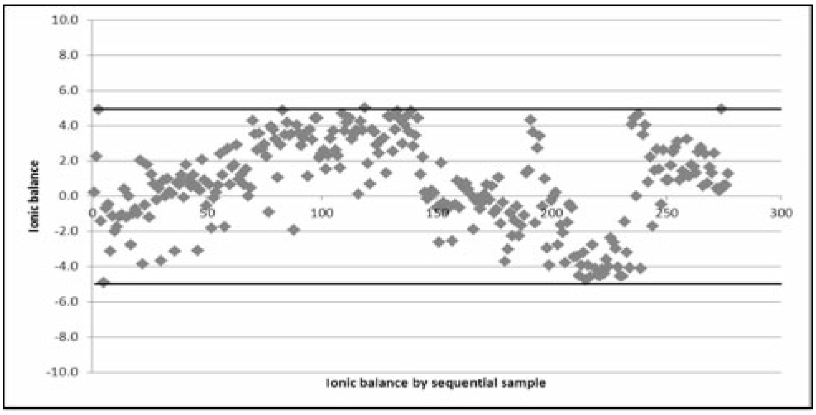


Figure 8-1 - Results of ionic balance analyses (2011).

A suite of inter-laboratory check samples was analyzed at the University of Antofagasta. These samples showed generally low RPD values between the ASAMen and University of Antofagasta laboratory, suggesting ASAMen analyses have an acceptable level of accuracy as well as precision. Overall, the ASAMen results are considered acceptable accuracy and precision.

8.4.3 Analytical Quality Control - 2017/18 Program

A total of 841 primary brine samples were analyzed from the 2017/18 drilling campaign. An additional 338 brine samples from pumping tests and baseline monitoring were analyzed. These primary analyses were supported by a total 386 QA/QC (24.7%) analyses consisting of:

- 152 standard samples (10%) with 8 different standards.
- 130 duplicates (8%) by external laboratory (ASA Mendoza).
- 104 blank samples (7%).

The results of the standards analyses are summarized in Table 8-4. This table lists the statistics, number of samples exceeding the acceptable failure criteria of the mean +/- 2 standard deviations, and the relative standard deviation (RSD) for each standard. Standard analyses at NorLab indicate very acceptable accuracy.

Table 8-4 - Results of standards analysis by NorLab (2017/18).

	Li mg/L	Ca mg/L	Mg mg/L	B mg/L	Na mg/L	K mg/L	Cl^- mg/L	SO4 mg/L
STD SG1								
# Samples	4	4	4	4	4	4	4	4
Average	521	213	1,316	568	76,497	4,000	122,461	4,970
Std Dev	12	13	146	6	213	57	267	64
RSD%	2.39%	6.21%	11.09%	1.01%	0.28%	1.42%	0.22%	1.29%
Max	539	228	1,530	577	76,715	4,078	122,808	5,049
Min	510	201	1,201	565	76,213	3,949	122,166	4,893
RPD %	5.39%	13.01%	25.01%	2.14%	0.66%	3.23%	0.52%	3.14%
STD SG2								
# Samples	6	6	6	6	6	6	3	3
Average	601	363	1,375	79	115,875	5,795	140,429	65,132
StdDev	10	30	15	2	875	54	1274	548
RSD%	1.71%	8.21%	1.12%	1.90%	0.76%	0.94%	0.91%	0.84%
Max	610	396	1,389	80	117,191	5,903	141,794	65,730
Min	588	334	1,347	76	114,837	5,759	139,271	64,656
RPD %	3.68%	17.22%	3.05%	5.05%	2.03%	2.49%	1.80%	1.65%
STD SG4								
# Samples	25	25	25	25	25	25	23	23
Average	575	499	1,866	561	71,278	5,587	117,085	7,625
StdDev	10	8	53	17	533	173	575	134
RSD%	1.72%	1.69%	2.85%	2.95%	0.75%	3.10%	0.49%	1.76%
Max	593	509	1,924	596	72,200	5,770	117,801	7,730

	Li mg/L	Ca mg/L	Mg mg/L	B mg/L	Na mg/L	K mg/L	Cl^- mg/L	SO4 mg/L
Min	546	474	1,760	520	69,996	5,024	115,060	7,079
RPD %	8.05%	7.06%	8.83%	13.61%	3.09%	13.36%	2.34%	8.53%
STD SG5								
# Samples	3	3	3	3	3	3	3	3
Average	755	233	2741	763	84,638	7,090	135,282	11,817
StdDev	3	7	27	11	176	41	329	287
RSD%	0.37%	3.11%	0.97%	1.38%	0.21%	0.58%	0.24%	2.43%
Max	758	242	2,771	775	84,841	7,114	135,653	12,065
Min	752	229	2,720	755	84,534	7,042	135,023	11,503
RPD %	0.70%	5.68%	1.84%	2.56%	0.36%	1.02%	0.47%	4.75%
STD SG7								
# Samples	16	16	16	16	16	16	15	15
Average	294	249	924	282	36,598	2,827	60,187	3,609
StdDev	4	5	11	9	640	170	837	145
RSD%	1.30%	1.84%	1.24%	3.13%	1.75%	6.03%	1.39%	4.02%
Max	301	260	946	301	37,346	3,034	61,881	3,927
Min	285	244	906	263	35,484	2,456	59,175	3,317
RPD %	5.48%	6.70%	4.28%	13.21%	5.09%	20.44%	4.50%	16.89%
STD 200								
# Samples	30	30	30	30	30	30	24	24
Average	214	82	506	246	32,131	1,648	50,646	2,062
StdDev	6	2	12	4	509	42	971	52
RSD%	2.75%	2.56%	2.36%	1.75%	1.58%	2.56%	1.92%	2.53%
Max	226	84	527	255	32,975	1,737	52,768	2,153
Min	199	78	483	237	31,181	1,591	48,311	1,962
RPD %	12.52%	7.68%	8.63%	7.52%	5.58%	8.87%	8.80%	9.23%
STD 400								
# Samples	29	29	29	29	29	29	24	24
Average	375	39	864	413	32,518	2,964	52,330	3,415
StdDev	9	2	26	6	440	57	947	94
RSD%	2.45%	4.68%	2.95%	1.37%	1.35%	1.92%	1.81%	2.76%
Max	391	44	902	422	33,380	3,100	53,673	3,581
Min	350	35	805	397	31,349	2,875	50,609	3,284
RPD %	10.88%	21.59%	11.29%	6.11%	6.24%	7.59%	5.86%	8.69%
STD 500								
# Samples	29	29	29	29	29	29	20	20
Average	519	483	1,413	826	84,261	4,543	134,535	8,521
StdDev	11	9	43	14	1,451	129	1,005	258
RSD%	2.15%	1.78%	3.05%	1.70%	1.72%	2.85%	0.75%	3.02%
Max	538	497	1,569	846	86,919	4,812	136,191	9,343

	Li mg/L	Ca mg/L	Mg mg/L	B mg/L	Na mg/L	K mg/L	Cl^- mg/L	SO4 mg/L
Min	500	462	1,338	786	81,592	4,177	132,233	8,163
RPD %	7.21%	7.35%	16.34%	7.27%	6.32%	13.99%	2.94%	13.84%

Checks analyses were conducted at ASAMen on 5% of the primary brine samples consisting of 42 external duplicate samples. In addition, some blanks and standard control samples were inserted to monitor accuracy and potential laboratory bias. No bias was found in relation to the blanks and standard control samples. Table 8-5 summarizes the results of the duplicate analyses and lists the statistics, number of samples exceeding the acceptable failure criteria of a 5% bias between duplicates. An important bias for the ASAMen laboratory was found for medium to high potassium concentrations.

Table 8-5 - Results of duplicate analyses by ASAMen (2017/18).

	B		K		Li		Mg	
	Original	Duplicate	Original	Duplicate	Original	Duplicate	Original	Duplicate
# Samples	42	42	42	42	42	42	42	42
Average mg/L	688	686	3,898	3,901	433	434	1,070	1,072
Std Dev	373	370	2,283	2,276	249	250	562	563
Graph r2	0.9977		0.9991		0.9996		0.9992	
RPD%	0.29%		0.07%		0.33%		0.18%	
	Na		SO4		Cl		TDS	
	Original	Duplicate	Original	Original	Original	Duplicate	Original	Duplicate
# Samples	42	42	32	32	32	32	26	26
Average mg/L	88,245	88,402	19,355	19,211	136,025	135,889	242,194	241,118
Std Dev	45,205	45,363	11,252	11,080	58,920	58,900	120,174	120,184
Graph r2	0.9989		0.9911		0.9992		0.9964	
RPD%	0.18%		0.75%		0.10%		0.44%	

In addition to evaluation of standards, field duplicates and blanks, the ionic balances (the difference between the sum of the cations and the anions) were reviewed to evaluate the quality of the laboratory analyses. Balances are generally considered to be acceptable if the difference is <5% and were generally <1%. No samples were rejected as having > 5% balances. The results of standard duplicate and blank samples analyses are considered to be adequate and appropriate for use in the resource estimation described herein.

8.4.4 Precision (Duplicates)

During the 2017/18 drilling campaigns a total of 127 duplicate samples were inserted (Table 8-6). The elements for this analysis were Li, Ca, Mg, B, Na and K. A tolerance limit of 5% error was established.

Table 8-6 - Results of duplicate analyses by NorLab (2017/18).

Sample Type	Element	No. Of Samples	No. Errors	Error Rate (%)	"Mix Up"
Duplicates	Li	122	0	0.00%	5
	Ca	121	3	2.48%	6
	Mg	121	5	4.13%	6
	B	122	1	0.82%	5
	Na	122	4	3.28%	5
	K	119	3	2.52%	8

8.4.5 Accuracy (Standards)

The Project has two groups of standards. The first group was inserted in lot 1 to 39, and the second group was inserted from lot 40 to 71. As a result of inconsistency in the composition of the first standard group in the last few batches in which they were used, a second group of standards was prepared and used throughout the remainder of the drilling and sampling program. The deterioration of the first standard group was detected in batch 34, 35 and then reanalyzed and confirmed in batch 36, so the standard samples of these batches (34, 35 and 36) were discarded for this analysis.

The first group of standards consisted of six different standards of which only two were submitted to three inter-laboratories tests (RRA): standards STD-4G and STD-7G. Only these two standards were used for the analysis.

The second group of standards was prepared from a locally available brine source provided by the Sales de Jujuy laboratory with approximate Li concentrations of 900 mg/l and 500 mg/l. In order to have representative standards and enough quantities for the continuity of the drilling program, a series of dilutions were carried out under controlled conditions to yield three final standards with approximate lithium concentrations of 500 mg/l, 400 mg/l and 200 mg/l and named (STD-500, STD-400, and STD-200). These standards were subjected to a round robin analysis (RRA) of pre-selected laboratories (NorLab, ASA Mendoza, SGS in Argentina and Universidad Católica del Norte and Universidad de Antofagasta in Chile).

Control and accuracy charts were prepared for each standard. The values reported for the standards were plotted in a time sequence, the lines corresponding to:

- B (Best Value).

- 1.05 * BV (Best Value) + CI (Confidence Interval).
- 0.95 * BV (Best Value) - CI (Confidence Interval).
- AV (Average) ± 2 *SD (standard deviation).

The Best Value (BV) and the Confidence Interval (CI) at 95 percent were calculated for the results of the different laboratories; the average (AV) and the standard deviation (SD) were calculated with the results of the analysis of the inserted standards. As a rule, the standards that fall within the limits defined by the mean ± two standard deviations are accepted, values that fall beyond these limits are qualified as outliers. The analytical bias Sa is calculated by the following formula.

$$Sa\ (\%) = (AV/BV) - 1$$

Where AV represents the average of the values obtained after excluding the erratic values and BV represents the best value of the standard for the element in question. The bias is considered acceptable if its absolute value is less than 5%, questionable if it is between 5% and 10%, and unacceptable when it exceeds 10%.

The general bias of each element is calculated with the following formula:

$$Sg\ (\%) = SRL - 1$$

Where SRL is the slope of the linear regression of the plotted line of the Average versus the Best Value of each standard and element. A summary of the characteristics and performance of the standards of the first group are presented in Table 8-7 and of the second group in Table 8-8. For all the elements considered of the standards analyzed, good accuracy is observed (Bias <5%).

Table 8-7 - Performance of STD-4G and STD-7G Standards. NorLab (2017/18).

Element	N	R2	m	b	General Bias	Atypical Values
Li	42	1	1.006091	-2.3608	0.61%	2
Ca	42	1	1.008086	-2.7492	0.81%	2
Mg	42	1	1.007522	-6.9485	0.75%	1
B	42	1	1.009221	-18.4657	0.92%	6
Na	42	1	1.003473	-127.1128	0.35%	1
K	42	1	0.989959	-159.7059	-1.00%	4

Table 8-8 - Performance of STD-500, STD-400, and STD-200 Standards. NorLab (2017/18).

Element	N	R2	m	b	General Bias	Atypical Values
Li	88	0.99965	1.006091	10.2693	-3.13%	5
Ca	88	1	1.002345	-0.3551	0.23%	4
Mg	88	0.99875	0.994037	20.2245	-0.60%	3
B	88	1	0.996055	6.3056	-0.39%	6
Na	88	0.99998	0.978342	-72.0559	-2.17%	1
K	88	0.99836	0.964586	-9.3029	-3.54%	6

8.4.6 Contamination (Blanks)

A total of 106 blanks were inserted to analyze for potential sample contamination. Some batches showed values of Ca and Na that exceeded the quantification limit. Nevertheless, the correlation between these samples and their respective consecutives allows to establish that there is no clear analytical contamination but a variation in the source of distilled water used in the preparation of the blanks.

8.5 Specific Gravity Measurements, Drainable Porosity Analysis and Quality Control Results

8.5.1 British Geological Survey - 2011

The British Geological Survey (BGS) was used during the 2011 campaign to analyze drainable porosity. Specific yield (or drainable porosity) is defined as the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table. Bear (1979) relates specific yield to total porosity as follows: n = Sy + Sr, where Sr is specific retention.

The BGS determines drainable porosity using a centrifugation technique where samples are saturated with simulated formation brine and weighed. They are then placed in a low speed refrigerated centrifuge with swing out rotor cups and centrifuged at 1,200 rpm for two hours and afterwards weighted a second time. A centrifuge speed is selected to produce suction on the samples equivalent to 3.430 mm H_2O. This suction is chosen as it had previously been used by Lovelock (1972) and Lawrence (1977) and taken to be characteristic of gravitational drainage.

8.5.2 Geosystems Analyses - 2017/18

Geosystems Analyses (GSA) was selected as the main laboratory for the Phase II and III drainable porosity (Sy) and other physical parameter analyses. GSA utilized the Rapid Brine Release method (Yao et al., 2018) to measure drainable porosity and the total porosity. The Rapid Brine Release (RBR) method is based on the moisture retention characteristics (MRC) method for direct measurement of total porosity (Pt, MOSA Part 4 Ch. 2, 2.3.2.1), specific retention (Sr, MOSA Part 4 Ch3, 3.3.3.5), and specific yield (Sy, Cassel and Nielson, 1986). A simplified Tempe cell design (Modified ASTM D6836-16) was used to test the core samples. Brine release was measured at 120 mbar and 330 mbar of pressure for reference (Nwankwor et al., 1984, Cassel and Nielsen, 1986).

In addition to drainable porosity, bulk density, particle size analyses and specific gravity were determined on selected core samples. Table 8-9 provides an overview of the test work carried out by GSA. Figure 8-2 shows the results of the test work by lithology type.

Table 8-9 - Physical and hydraulic test work on core samples - 2017/18.

Test Type	Sample Type and Number	Test Method	Testing Laboratory	Standard1,2
Physical	292 core samples	Bulk Density	GSA Laboratory, (Tucson, AZ)	ASTM D2937-17e2[1]
	64 core samples	Particle Size Distribution with #200 brine wash	GSA Laboratory, (Tucson, AZ)	ASTM D6913-17 / ASTM C136-14[1]
	160 core samples	Specific Gravity of Soils	GSA Laboratory, (Tucson, AZ)	ASTM D854-14[1]
Hydraulic	26 core samples	Relative Brine Release Capacity (RBRC)	Daniel B. Stephens & Associates, Inc. (Albuquerque, NM)	Stormont et. al., 2011
	30 core samples	Centrifuge Moisture Equivalent of Soils	Core Laboratories (Houston, TX)	Modified ASTM D425-17[1]
	292 core samples	Estimated Total Porosity	GSA Laboratory (Tucson, AZ)	MOSA Part 4 Ch. 2, 2.3.2.1[2]
		Estimated Field Water Capacity		MOSA Part 4 Ch. 3, 3.3.3.2[2]
		Rapid Brine Release (RBR)		Modified ASTM D6836- 161 MOSA Part 4 Ch. 3, 3.3.3.5[2]

8.5.3 Drainable Porosity Quality Control - 2018 Program

For quality control, a subset of paired samples representative of the range in lithology types were selected by AAL and GSA for testing using the Relative Brine Release Capacity (RBRC, Stormont et. al., 2011) method by DBSA, or the Centrifuge Moisture Equivalent of Soils (Centrifuge, ASTM D 6836-16) method by Core Laboratories (Houston, TX). Table 8-10 shows a summary of the comparison by laboratory for each method derived for paired core samples using the RBR, RBRC, and Centrifuge methods.

Correlations between GSA and external laboratory measured values are provided in Figure 8-2. There is a lower correlation between the specific yield data (R2 = 0.44). Correlation was slightly higher (R2 = 0.45) between Sy (RBRC and Centrifuge) and drainable porosity at 120 mbar (RBR, Figure 8-3). Most of the samples tested for Sy fall below the 1:1 line, indicating that GSA measured Sy values were often higher than external laboratory measured Sy values, particularly those from Core Laboratories. Differences are likely attributable to testing equilibration time and testing method, with GSA testing the samples for a longer period than the DBSA laboratory using the RBRC method.

Table 8-10 - Summary of the drainable porosity statistics by laboratory methods.

Lithological Group	RBR Drainable Porosity @330 mbar (GSA)			RBR Drainable Porosity @120 mbar (GSA)			Centrifuge Sy (Core Laboratories)			RBRC Sy (DBS&A)		
	Quantity	Mean	Std Dev	Quantity	Mean	Std Dev	Quantity	Mean	Std Dev	Quantity	Mean	Std Dev
Clay dominated	34	0.03	0.02	32	0.02	0.02	4	0.02	0.02	0	—	—
Halite dominated	63	0.04	0.03	58	0.03	0.03	0	—	—	21	0.05	0.02
Sand / Clay dominated	48	0.07	0.04	46	0.04	0.03	15	0.05	0.04	0	—	—
Sand dominated	38	0.19	0.06	44	0.13	0.06	13	0.12	0.05	3	0.08	0.05

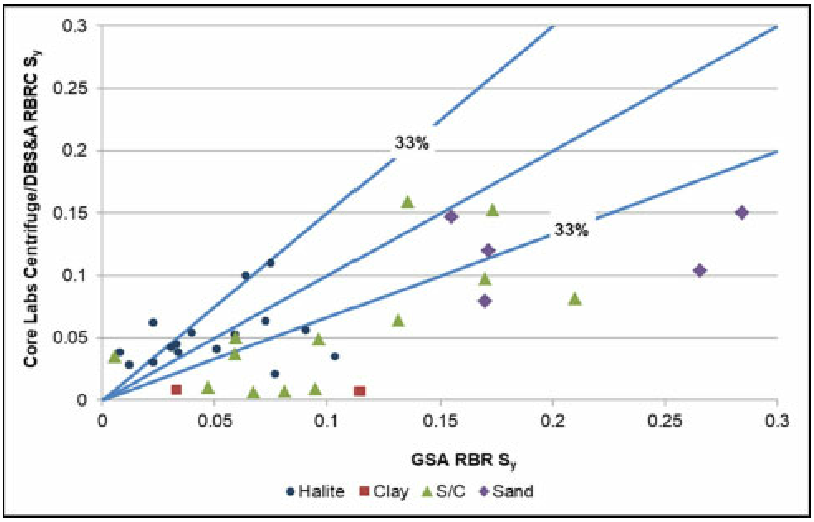


Figure 8-2 - Comparison between GSA RBR and Core Labs Centrifuge by lithology.

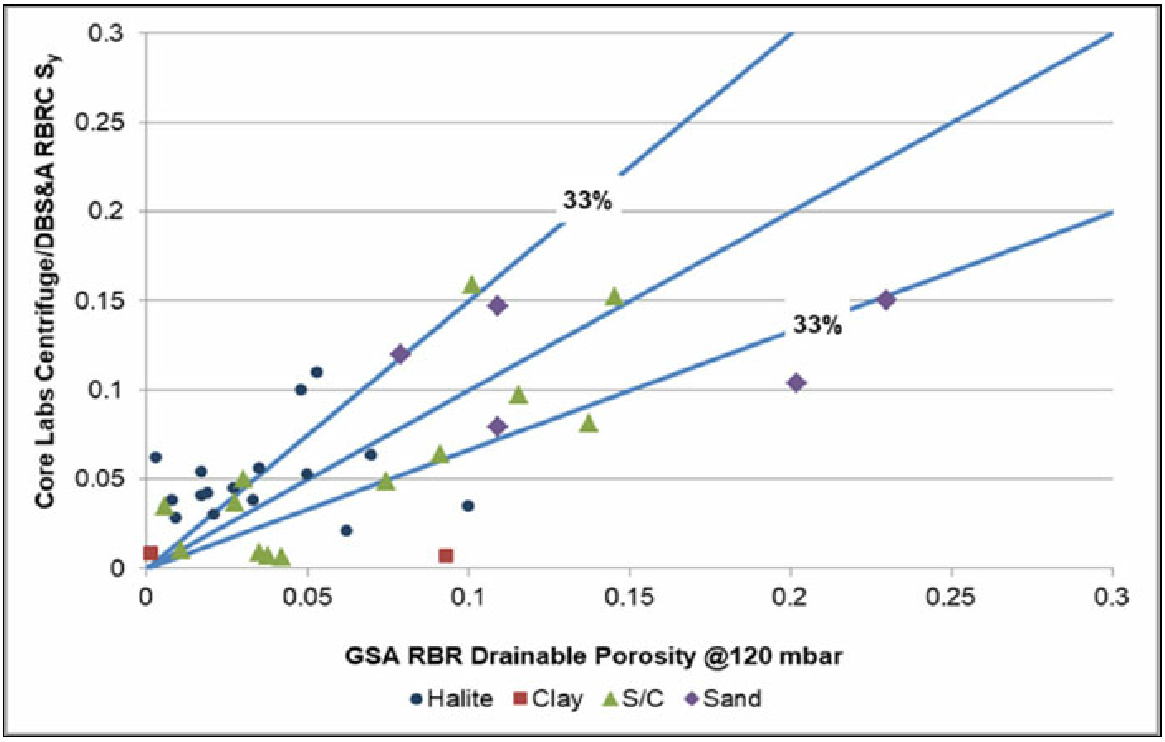


Figure 8-3 - Comparison between GSA RBR @120 mbar and Core Labs centrifuge by lithology.

8.6 Comments and QP opinion

Mr. F. Reidel AIPG (the QP), considers that brine and core samples have been collected in an acceptable manner, and the analysis of QA/QC samples indicate that the results of the lithium concentration and drainable porosity analyses are accurate and reliable for the use in the resource estimate described hereafter in Chapter 11.

9. DATA VERIFICATION

Mr. F. Reidel AIPG (the QP), reviewed the protocols for drilling, sampling, and testing procedures at the initial planning stage as well as during the execution of the 2017/18 drilling and testing programs in Salar de Cauchari. Mr. F. Reidel AIPG spent a significant amount of time in the field during the 2017/18 field campaign overlooking the implementation and execution of drilling, testing, and sampling protocols.

Mr. F. Reidel AIPG was responsible for the oversight and analysis of the QA/QC programs related to brine sampling and laboratory brine chemistry analysis as well as the laboratory porosity analysis. A significant amount of QA/QC protocols were implemented for the brine chemistry and drainable porosity analysis programs that allowed continuous verification of the accuracy and reliability of the results obtained. As described in Chapter 8 no significant issues were found with the results of the brine and porosity laboratory analysis.

It is the opinion of Mr. F. Reidel AIPG that the information developed and used for the brine resource and reserve estimates herein is adequate, accurate and reliable.

10. MINERAL PROCESSING AND METALLURGICAL TESTING

This section describes the processing of extracted brine into saleable products. Related test work, assumptions and expected recoveries are further described.

10.1 Initial Characterization and Scoping Studies

The brines from Salar de Cauchari are solutions nearly saturated in sodium chloride with an average concentration of total dissolved solids (TDS) of 290 g/l. The average density is 1.19 g/cm^3. Components present in the Cauchari brine are K+, Li+, Mg++, Ca++, Na+, Cl-, SO4 2-, and borates. Table 10-1 presents a summary of the Cauchari 2019 exploration sample brine chemistry.

Table 10-1 - Brine chemistry summaries for Cauchari and for Olaroz

Analyte	Li	K	B	Na	Ca	Mg	SO_4	Density	Mg/Li	SO4/Li	B/Li
Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	g/cm^3			
CAUCHARI 2019 EXPLORATION SAMPLE BRINE CHEMISTRY SUMMARY											
Mean	512	4,349	941	105,721	504	1,323	18,930	1.19	2.6	37	1.8
Std.Dev.	144	1,186	487	16,033	212	412	8,561	0.03	2.9	59.5	3.4
Maximum	956	8,202	2,528	135,362	1,681	2,640	62,530	1.23	2.8	65.4	2.6
Minimum	157	101	62	101	174	314	101	1.07	2	0.6	0.4
OLAROZ 2011 EXPLORATION BRINE CHEMISTRY SUMMARY (54-197 M SAMPLES)											
Mean	721	5,930	1,022	116,294	459	1,887	16,518	1.22	2.6	22.9	1.4
Std.Dev.	150	1,031	256	7,433	49	608	2,560	0.02	4.1	17	1.7
Maximum	1,000	8,028	1,403	126,529	626	3,325	25,291	1.25	3.3	25.3	1.4
Minimum	409	3,676	563	94,791	394	832	12,808	1.17	2	31.3	1.4

Table 10-1 also presents a summary of the Olaroz 2011 exploration brine chemistry. When the chemical characteristics of the Cauchari brine were established, it became clear that they were very similar to the Olaroz brine. The Olaroz salar is 20 km north of the Cauchari salar and the climatic conditions around the two salars are similar. The variance for the Mg/Li and for the Li/ SO_4 ratios for both brines are low enough to state that Cauchari brine could be processed using similar processing technology to that applied in the Olaroz production facility, which has been successfully applied to produce lithium carbonate in the Orocobre facilities.

Using the Cauchari and Olaroz brine compositions, Janecke phase diagrams were produced to show the evaporation paths for the two brines, under winter and summer conditions. It can be said that the precipitation is dependent on seasonal temperature and as such, there is Glauber salt (Na_2SO_4•$10H_2O$) precipitating during cold months (winter season) and glaserite salts (Na_2SO_4•$3K_2SO_4$) precipitating along with gypsum salts during hot months (summer season). Saturation in sylvite (KCl) will occur at about 0.4% (5,300 mg/l) of lithium. Figure 10-1 presents the winter diagram and Figure 10-2 presents the summer diagram.

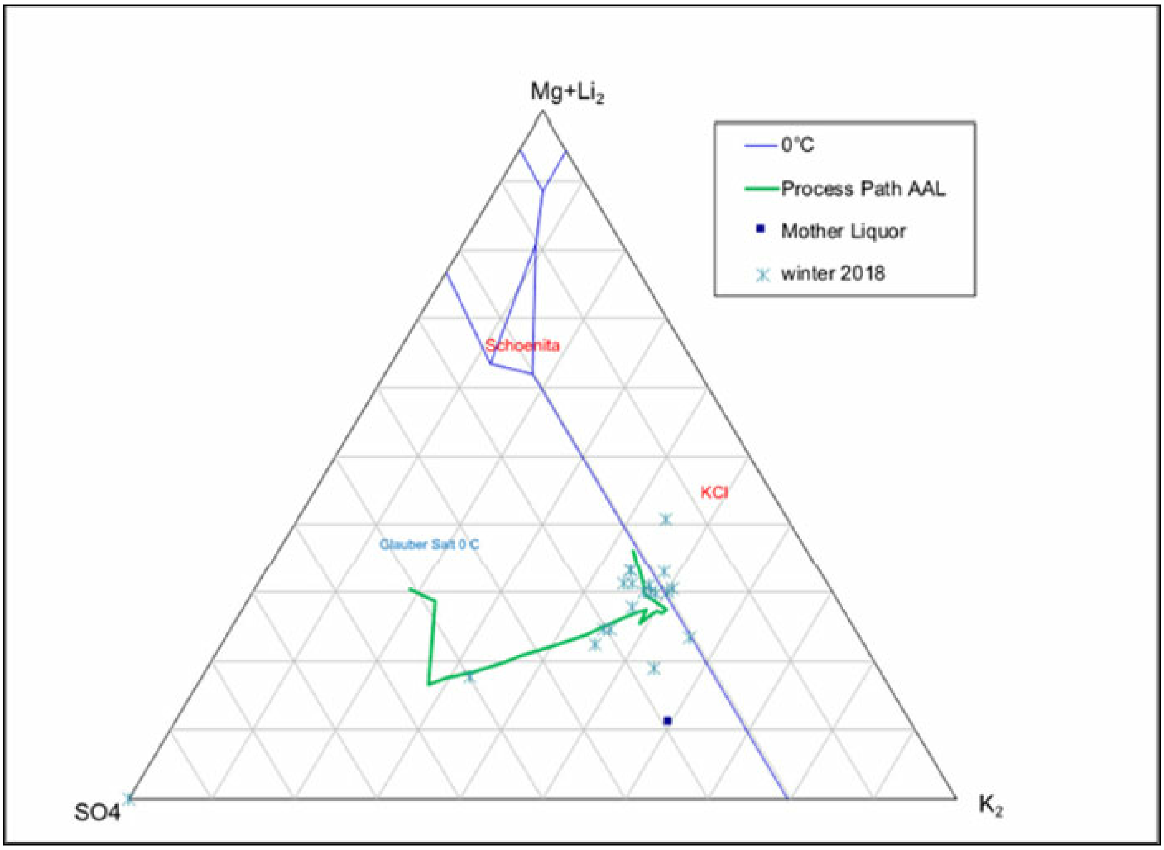


Figure 10-1 - Process path projected in Janecke phase diagram at 0 °C. Process path AAL represents Cauchari and winter 2018 represents Olaroz.

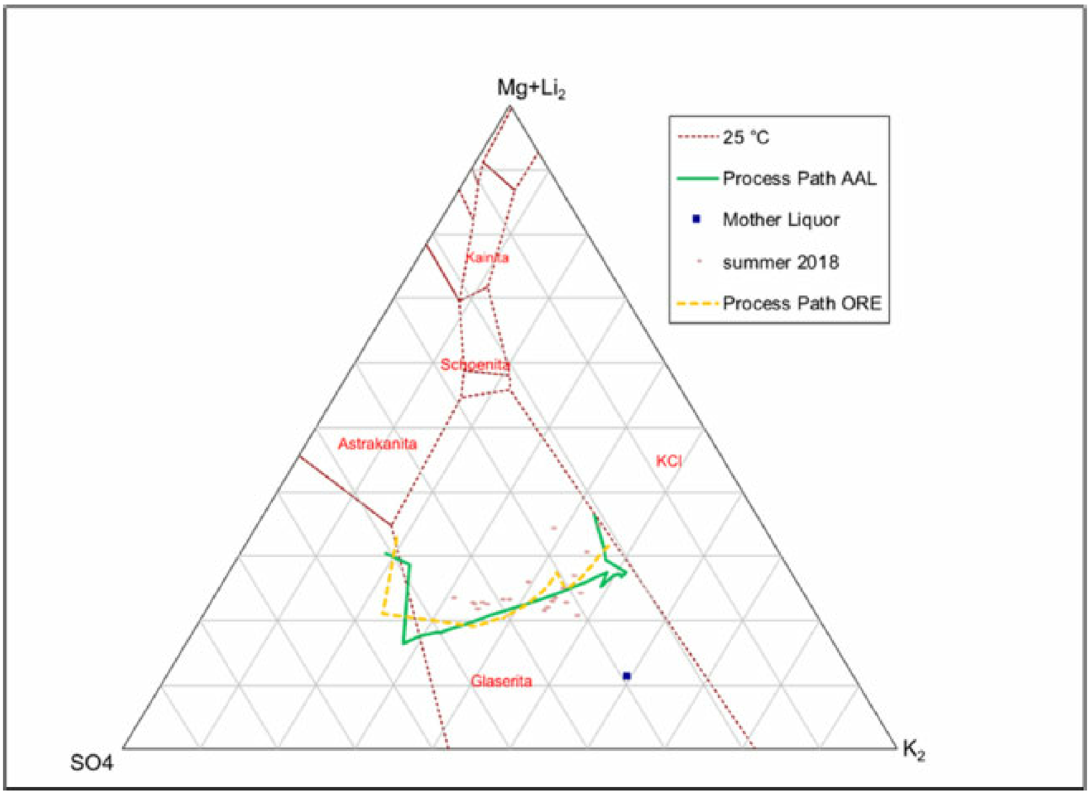


Figure 10-2 - Process path projected in Janecke phase diagram at 25 °C. Process path AAL represents Cauchari and summer 2018 together with process path ORE represents Olaroz.

Initial assessment of the Olaroz brine chemistry in 2008 indicated that it had a low magnesium to lithium ratio, moderate levels of sulphate and was suitable for application of the 'Silver Peak' method used at the world's first lithium brine treatment operation in Nevada, USA since the mid 1960's. However, the 'Silver Peak' process, although generally applicable to the Olaroz brine chemistry, required modification to suit the differences in brine chemistry and the different climatic conditions at the Olaroz Project. The process route also required some enhancement to produce a lithium product to meet the more demanding battery grade specifications.

The process development program sequentially defined the performance of each stage in the process, resulting in a flow sheet capable of producing battery grade lithium carbonate. Test work has been undertaken at SDJ's facilities at the Olaroz Project site and at commercial and university laboratories. The process development program resulted in a process route incorporating a number of proprietary innovations. Early work focused on evaporation rate testing to understand the phase chemistry of the brine during a twelve-month weather cycle, this followed by lime addition test work to remove magnesium. Subsequently, the focus of the Olaroz Project test work moved to the removal of boron by multi-stage solvent extraction processing, and then on to the final stage of lithium carbonate purification.

Lithium is present at concentrations that are economic but are low in comparison to the other salts in the brine. Before final purification the other salts must be selectively rejected, and this is done primarily by evaporation, causing the salt concentrations to increase beyond their solubility limits, and by simple and well-established methods of chemical treatment. Based on test work and phase chemistry, over 70% of the lithium was modelled to be recovered in this process to a high specification product, with the majority of the lithium losses incurred by inclusion of brine in the pores of the solid salts formed during the evaporation process.

There is nothing to suggest that if the Cauchari brine followed the same test work path, the results would not be similar to those of Olaroz. The most significant aspect is that the Olaroz test work has been translated into a successful operation. Applying Olaroz operating experience, particularly process lessons learned from the operation, is more valuable than any test work. This is because more process data is generated than is possible with test work and there are people available with operating experience who can assist with the Cauchari process design.

10.2 Metallurgical test-work program

10.2.1 Overview

The Olaroz brine underwent laboratory and pilot scale test work during the period 2008 to 2011 to establish the process design basis for the original Orocobre operation which started up in 2015.

For all the Olaroz experimental work, well FD-16B was used which was drilled during the 2008 drilling program. Analysis of the brine chemistry of the 2010 drilling data and 2011 resource estimate showed FD-16B brine to be representative of the Olaroz resource.

The Olaroz Salar brine is located at the border of the Janecke glaserite ($Na_2SO_4.3K_2SO_4$) field and the ternadite (Na_2SO_4) fields. Low ambient temperatures at the Olaroz Salar will cause the crystallization of sulphate as glauber-salt ($Na_2SO_4.10H_2O$) in the evaporation ponds (refer to figures 10-1 and 10-2). The Cauchari brine chemistry shows similar properties, as well as there being low ambient temperatures at the Cauchari Salar.

The low Mg/Li ratio of the Olaroz brine makes magnesium removal with slaked lime a feasible process step. The Cauchari brine has the same Mg/Li ratio, which means slaked lime addition for magnesium removal can also be applied. The Olaroz brine has a high sulphate content (high SO_4/Mg); hence sodium and potassium sulphate salts are likely to crystallize. As it has a SO_4/Mg ratio higher than 4, there is also enough sulphate available in the brine to recipitate the calcium liberated during the formation of magnesium hydroxide as gypsum. The Cauchari brine also has a high sulphate content and a SO_4/Mg ratio higher than 4.

The only disadvantage of the high sulphate level is that it tends to lock up potassium as glaserite and at higher concentrations of lithium, causing lithium losses as lithium schoenite.

10.2.2 Solar evaporation testing

The evaporation of water from the solar evaporation ponds is a critical factor in the processing of the brines. The evaporation information was coherent in that the pilot scale pond testing on saturated Olaroz brine provided an annual rate of 1733 mm. This is conservative in the context of the test results of 3,900 mm per year on water and 2600 mm per year on unsaturated brine.

The actual Olaroz ponds area was designed based on 1,300 mm of annual evaporation [3.6 mm/day]. This is a reasonable base line in the context of brine activity factors that range from 75 - 80% depending on saturation levels, and industrial scaling factors of 75% applied to small pond data to predict large pond evaporation rates. This also allows a generous margin to compensate for any unusually high rainfall event.

The most relevant and reliable information was provided by the data gathered from the large number of open evaporation test ponds operating in sequence on the Olaroz salar. The weather variables needed to be defined to assist with assessing the potential for variance in the pilot plant data.

Evaporation is driven by solar radiation, ambient temperatures, wind impact and humidity, and must consider variable rainfall. The average annual temperature at the Olaroz Project site is approximately 7° C, with extremes of 30º C and -15º C. The coldest months with temperatures below zero correspond to May through August. Solar radiation is the most important factor in evaporation. The rainfall in the operating years 2015 - 2021 was often significantly higher than the early design basis reflects. This contributed to reduced Li concentration in plant feed and so impacted Olaroz production projections.

The Cauchari salar is 20 km south of the Olaroz salar and the two salars are at the same altitude, which means the climatic conditions are similar. Therefore, the experience gained in evaporation pond design and operation at the Olaroz operation can be applied to the Cauchari project.

10.3 Metallurgical results

10.3.1 Crystallized Salts

In all the ponds it is mainly sodium chloride (NaCl > 94%) that is crystallized. Other salts that crystallize are glauber salt ($Na_2SO_4.10H_20$: 2-6%) and calcium sulphate ($CaSO_4.2H_20$: 1%). In the most concentrated ponds halite and silvite (KCl) crystallize, with minor concentrations of glaserite ($Na_2SO_4.3K_2SO_4$) and borate salts. Under these alkaline conditions the boron is precipitated as sodium and calcium borate [$Na_2B_4O_7$ and CaB_4O_7], and to assist in the final lithium purification process this precipitation may be encouraged by addition of calcium chloride. The optimal lithium concentration for the recovery plant was defined by the loss of lithium at concentrations greater than ~0.7% by precipitation of lithium as schoenite [$Li_2SO_4.K_2SO_4$].

Given the similarity between the brine chemistry of the Olaroz salar and that of the Cauchari salar, the nature of the crystallised salts at the Olaroz evaporation ponds will be similar for the Cauchari project.

10.3.2 Liming test work

Initially Allkem was using hydrated lime ($Ca(OH)_2$) from a provider located near Jujuy for its Olaroz experiments. This was replaced by active or burnt lime (CaO) from the same provider, with the advantage of reducing product and transportation costs. At pilot scale the lime reacted very well and completely fulfilled the process requirements. Magnesium reacts instantaneously with the lime. Subsequently the liberated calcium starts to react with the available sulphate and some boron reacts early with calcium from the liberated lime.

Given that both the Olaroz and Cauchari brines have high sulphate concentrations and SO_4/Mg ratios higher than 4, the application of liming for magnesium removal would be equally applicable to the Cauchari brine.

10.3.3 Lithium carbonate process

The Olaroz pilot plant was operated successfully from the 3rd Quarter of 2010, producing technical grade lithium carbonate. At the beginning of 2011 the pilot plant testing process included an additional purification step to achieve battery grade lithium carbonate.

The lithium carbonate process used by Allkem in their Olaroz plant is well proven and has been operating for several years. This process can be applied directly to the Cauchari project, given the similarity between the Cauchari and Olaroz brines.

10.3.4 Analytical quality control

Standardized quality control procedures were adopted and verified for the analysis of the various samples emerging from the Olaroz test work program.

These analyses are complicated since the solutions have a high concentration of ions generating interference in the measurements with the analytical equipment. Only a limited number of laboratories have the experience to analyze brines and those laboratories were selected to do Allkem´s quality control.

The samples from the Olaroz Salar were analyzed by Alex Stewart Assayers [ASA] of Mendoza, Argentina, who have extensive experience analyzing lithium bearing brines. The Alex Stewart laboratory is accredited to ISO 9001 and operates according to the Alex Stewart Group (AS) standards consistent with ISO 17025 methods at other laboratories.

Duplicate process samples were sent to:

- University of Antofagasta (UA), Chile.
- ALS-Environment (ALS) laboratory located in Antofagasta, Chile, which is ISO 17025 and ISO 9001:2000 accredited.

Both the University and the ALS laboratory have a long history in brine analysis. However, the university is not certified.

Physical parameters, such as pH, conductivity, density, and total dissolved solids are determined directly upon brine subsamples. Determination of lithium, potassium, calcium, sodium, and magnesium is achieved by fixed dilution of filtered samples and direct aspiration into atomic absorption or inductively coupled plasma analysis systems.

In summary:

- ASA analyses show acceptable accuracy and precision with an acceptable anion-cation balance.
- Check samples analyzed at ALS Environment displayed acceptable accuracy and precision, with a high degree of correlation with ASA analyses, but the inorganic analytes (Li, K and Mg) are biased higher than corresponding analyses at ASA.
- Check samples analyzed at the University of Antofagasta displayed acceptable accuracy and precision, with a high degree of correlation with ASA analyses, but the inorganic analytes (Li, K and Mg) are also biased higher than corresponding analyses at ASA.
- The lower bias observed in the ALS and UA data is most likely due to calibration differences between the ICP and AA instruments used to analyze the samples.

The quality control systems are well designed and under continuous improvement. Data analysis of the QA results produced by the laboratories is considered to have sufficient accuracy for the purposes of process design. The improved performance of the principal laboratory, ASA, as shown by the improvement in ionic balance over time and the reproducibility of the analytical results is noteworthy and shows the benefit of a close working constructive relationship.

10.4 Metallurgical performance predictions - QP commentary

To date no actual metallurgical test work has been conducted on the Cauchari brine. The reason for this is because for the Cauchari project PEA in 2018, it was decided that the Cauchari process design could be based on the Olaroz process design, especially given that the Orocobre lithium carbonate operation was already producing lithium carbonate at the time. This decision can be supported for a number of reasons, and these will be discussed below.

The chemistry of the Cauchari brine is well understood due to extensive sampling and analysis that was carried out to support the Cauchari mineral resource estimate. The Olaroz brine chemistry is also well understood and when a comparison is made between Cauchari and Olaroz, their brine chemistries are similar (refer to Table 10-1). The significance of this is best presented using Janecke phase diagrams (refer to Figure 10-1 and Figure 10-2). These show the similarity in the crystallization of salts under evaporation conditions during winter and summer. It is the opinion of the QP that the brine chemistry data and neighbouring Olaroz metallurgical data referenced herein is adequate for the purposes of process design and recovery estimation.

The design of evaporation ponds is primarily based on brine chemistry and climatic conditions. The Cauchari salar is 20 km south of the Olaroz salar and the two salars are at the same altitude, which means their climatic conditions are similar. Therefore, the design of the Cauchari evaporation ponds can be confidently based on the Olaroz evaporation ponds. This is further supported because the Olaroz evaporation ponds have been in operation for 8 years, allowing the accumulation of extensive design and operating data.

The Olaroz lithium carbonate plant was commissioned in 2015. Initially there were a number of problems which were overcome during an extended ramp-up period. A great deal of information relating to production performance and subsequent efficiency improvements has been gained since 2015.

The knowledge and experience gained by Allkem from the first Olaroz plant has resulted in the design, construction, and commissioning of a second Olaroz plant, with an optimized process design and a greater capacity. This second plant is currently in ramp-up.

Allkem's intention is to base the process design of the Cauchari process plant on its experience derived from the design of both the second Olaroz process plant and its Sal de Vida project. Given all the test work, operating experience, and process optimization behind the second Olaroz plant and its Sal de Vida project, it is reasonable to base the process design of the Cauchari plant on the aforementioned works. The process design basis is adequate for the purposes of this prefeasibility study. Therefore, it is the opinion of the responsible QP that it is reasonable to base the process design of the Cauchari plant on the second Olaroz plant.

In terms of a forecast final lithium recovery, a figure of 66% can be used since this is based on the current Olaroz operating experience. During the Cauchari feasibility study it would be advisable to construct some pilot evaporation ponds at the Cauchari site to generate a lithium carbonate plant feed brine for testing Allkem's piloting facilities at its Sal De Vida project. This brine could then be tested by the main equipment vendors which were used for the second Olaroz plant. The results of this test work would be used for process design fine tuning where necessary.

11. MINERAL RESOURCE ESTIMATES

This section describes the development and current estimate of the mineral resource.

11.1 Data Used for Brine Resource Estimation.

The essential elements of a brine resource determination for a salar are:

- Definition of the aquifer geometry.
- Determination of the drainable porosity or specific yield (Sy).
- Determination of the concentration of the elements of interest.

Resources may be defined as the product of the first three parameters. Aquifer geometry is a function of both the shape of the aquifer, the internal structure, and the boundary conditions (brine / freshwater interface). Aquifer geometry and boundary conditions can be established by drilling and geophysical methods. Hydrogeological analyses are required to establish catchment characteristics such as surface and groundwater inflows, evaporation rates, water chemistry and other factors potentially affecting the brine reservoir volume and composition in-situ. Drilling is required to obtain samples to estimate the salar lithology, specific yield, and grade variations both laterally and vertically.

11.2 Resource Model Domain and Geometry

The Cauchari resource model domain covers an area of 117.7 km^2 and is limited to the Cauchari JV Project area and further constrained by the following factors:

- The top of the model coincides with the brine level in the salar as measured in a number of monitoring wells and further interpreted by TEM and SEV geophysical profiles.
- The lateral boundaries of the model domain are limited to the area of the Cauchari tenements where they flank the neighboring LAC concessions and by the brine / freshwater interface along the eastern and western limits of the salar as interpreted from boreholes information and TEM and SEV profiles.
- The bottom of the model coincides with a surface created from the bottom of the boreholes. Locally, a deeper resource volume has been defined in the Lower Sand as defined by boreholes CAU11R, CAU12DA, CAU13DA and CAU19D.

The resource model has been divided into three domains to account for the different data availability, geological knowledge, and sample support. The domains are shown in Figure 11-1 and are described as follow:

- Transition Domain: Accounts for five percent of the total resources and is defined as the volume in the upper part of the salar that includes fresher water and transition into brine. The lithium concentrations in the transition zone increase with depth. The number of brine samples in the transition domain is low because the surface casing installations for the exploration boreholes (mostly in the transition domain) was generally carried out using rotary mud drilling that is not suitable for reliable brine sample collection. A regression approach was adapted to estimate the lithium concentrations within this domain due to the good correlation with depth and the lack of samples.
- Main Domain: Accounts for 83% of the total resources and has normal and reliable sample data obtained during the drilling. A kriging approach was selected for this domain due to the number of samples available.
- Secondary Data Domain: Accounts for 12% of the total resources and its lithium content was defined mostly by brine chemistry analysis on samples derived during pumping tests on CAU8, CAU9, CAU10, and CAU11. An inverse distance approach was selected because of the amount of information available.

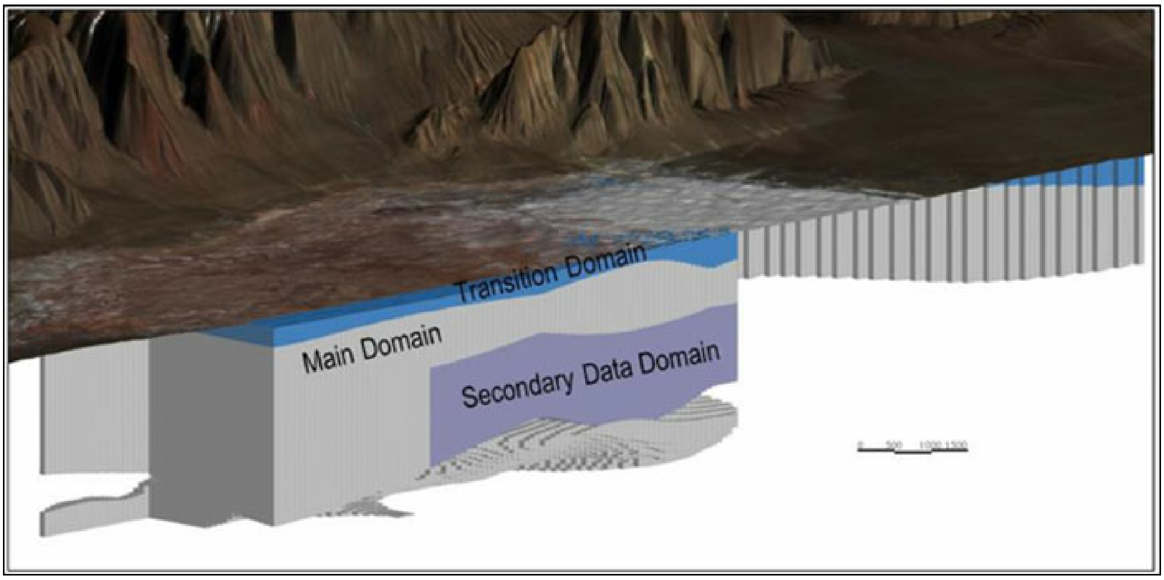


Figure 11-1 - Schematic showing the block model domains.

11.3 Specific Yield

Specific yield is defined as the volume of water released from storage by an unconfined aquifer per unit surface area of aquifer per unit decline of the water table.

The specific yield values used to develop the resources model are based on analyses of 301 undisturbed valid samples from diamond drill core by GSA, Core Laboratories, and DBSA as discussed in Section 8. Figure 11-2 shows the normal distribution of the specific yield grouped by lithology.

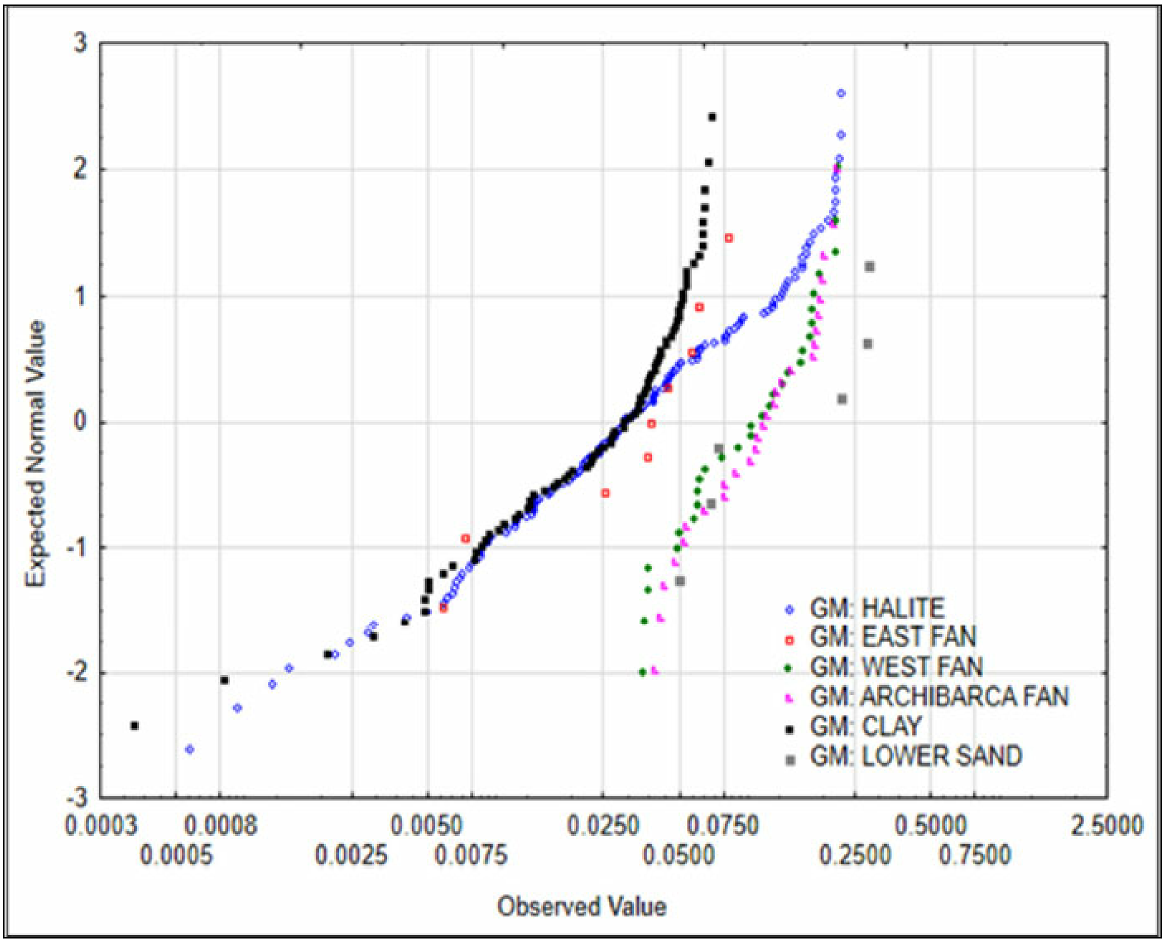


Figure 11-2 - Normal probability plot of Sy grouped by lithology.

A cell de-clustering approach was used to account for spatial sample density. The de-clustered average was assigned to each geological unit. Table 11-1 shows the general statistics and the de-clustered average for each geological unit.

Table 11-1 - Distribution of specific yield (Sy) in the resource model.

Geological Unit	No. Samples	Average	Declustered Average	Standard Deviations	Coefficient of Variation
Halite	144	0.05	0.05	0.06	1.1

Geological Unit	No. Samples	Average	Declustered Average	Standard Deviations	Coefficient of Variation
East Fan	9	0.04	0.03	0.02	0.6
West Fan	30	0.11	0.11	0.06	0.5
Archibarca Fan	28	0.12	0.12	0.06	0.5
Clay	84	0.03	0.03	0.02	0.6
Lower Sand	6	0.16	0.14	0.11	0.7

11.4 Brine Concentration

The distributions of lithium and potassium concentrations in the model domain are based on a total of 546 brine analyses (not including QA/QC analyses and rejected samples) as discussed in Chapter 6. Table 6-4 shows a summary of the brine chemical composition.

11.5 Resource Estimate Methodology, Assumptions and Parameters

11.5.1 Overview

The Stanford Geostatistical Modeling Software (SGeMS) was used for the Cauchari JV brine resource estimation. SGeMS has been used in the past for the estimation of brine resources in other areas of the Central Andes. Geostatistics is a branch of statistics specifically developed to estimate ore grades for mining operations from spatiotemporal datasets. Geostatistics goes far beyond simple interpolation methods such as nearest neighbor or inverse distance as it accounts for the spatial correlation and continuity of geological properties typically observed in the field. Based on this, the following steps were carried out to estimate the lithium and potassium resources.

- The block model geometry was adapted to represent the geological model as described in Section 6.2 with an appropriate block size (x=100 m, y=100 m, z=1 m).
- Generation of histograms, probability plots and box plots were conducted for the Exploratory Data Analysis (EDA) for lithium and potassium.
- Calculation of the experimental variograms with their respective variogram models for lithium and potassium in three orthogonal directions.
- Definition of the random function model and selection of the kriging method.
- Interpolation of lithium and potassium for each block in mg/L using ordinary kriging with the variogram models shown in Figure 11-11 and Figure 11-12.
- Calculation of total resources using the de-clustered porosity average value for each geological unit, based on the boreholes data. Each geological unit will represent a particular porosity value as shown in Table 11-1. The total resources are shown in Table 11-7.

11.5.2 Exploratory Data Analysis

The Exploratory Data Analysis (EDA) of lithium (Li) and potassium (K) concentrations consisted of a univariate statistical description using histograms, probability plots and box plots, and a spatial description based on data posting and trend analysis. This information is used to define the random function models and the type of kriging method.

Exploratory data results show significant differences in both the statistical properties of the concentration of ions and the patterns of spatial continuity across the different lithological units defined in the study area. To illustrate this, Figure 11-3 and Figure 11-4 show the box- plot of Li and K, respectively. The boxplots depict the quartiles (the second quartile is the median) as well as the minimum and maximum values of the data analyzed separately by lithological units. In addition, Table 11-2 and Table 11-3 summarize the main univariate statistics of Li and K for the different lithological units.

Li in the Archibarca unit renders less variability than the Halite and West Fan units, and that the mean value of the West Fan is significantly smaller (more than 100 mg/l) than that of the Archibarca unit. Based on this, data within each lithological unit is treated as a separate population. The spatial patterns of Li and K in the different lithological units are also significantly different, suggesting the existence of different statistical populations. This is shown in the next section.

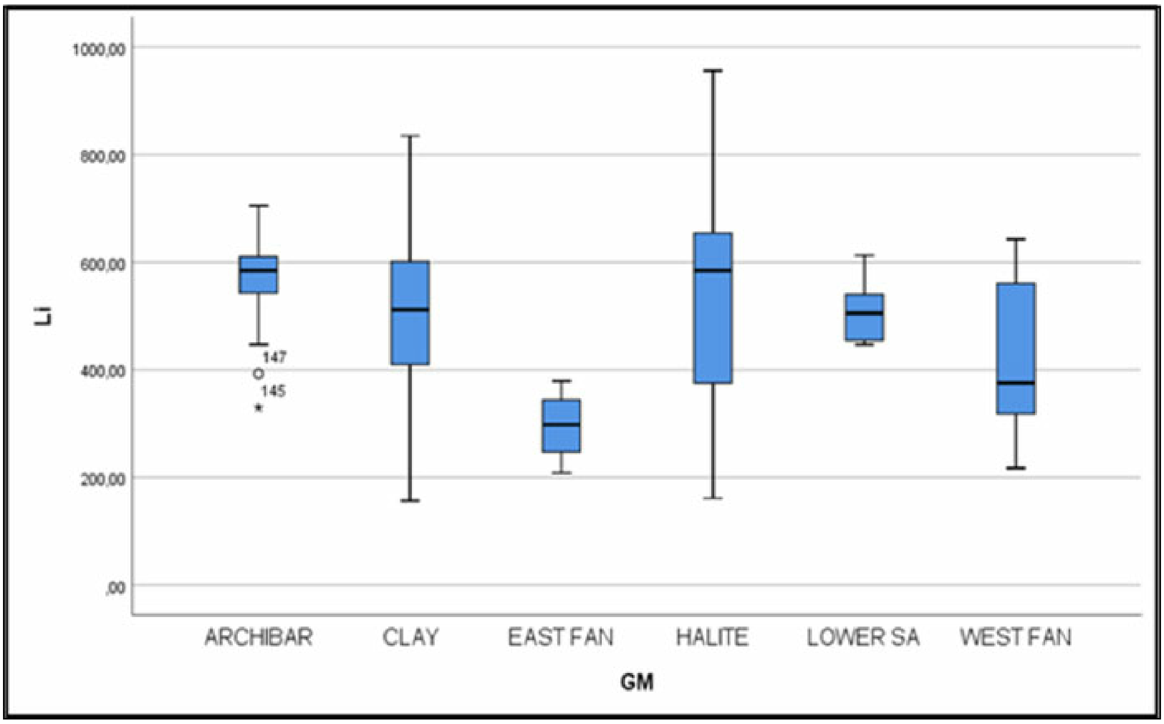


Figure 11-3 . Lithium Boxplot.

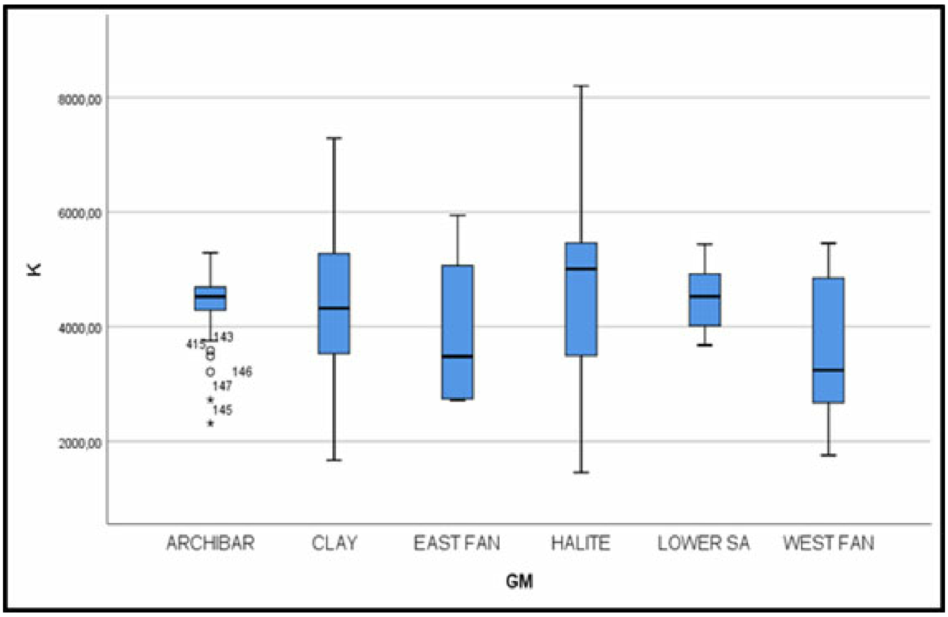


Figure 11-4 - Potassium Boxplot.

Table 11-2 - Univariate statistics of Li concentrations (mg/l) for each lithological unit.

GM	Sample Number	Li Mean	Li Standard Deviation	Li Minimum	Li Maximum
Archibarca Fan	93	578	59	330	705
Clay	185	495	138	157	835
East Fan	4	296	70	209	379
Halite	188	530	165	161	956
Lower Sand	14	506	55	447	613
West Fan	62	417	127	217	643

Table 11-3 - Univariate statistics of K concentrations (mg/l) for each lithological unit.

GM	Sample Number	K Mean	K Standard Deviation	K Minimum	K Maximum
Archibarca Fan	93	4,471	459	2,316	5,290
Clay	185	4,352	1,169	1,668	7,287
East Fan	4	3,904	1,522	2,715	5,942
Halite	188	4,578	1,352	1,457	8,202
Lower Sand	14	4,525	554	3,679	5,439
West Fan	62	3,525	1,089	1,758	5,454

11.5.3 Variography

The spatial variability of Li and K concentrations were characterized by the semi-variogram, γ(h). The semi-variogram is a function that measures the variability between pairs of variables separated by a distance h. Very often, the correlation between two variables separated by a certain distance disappears when |h| becomes too large. At this instant, γ(h) approaches a constant value. The distance beyond which γ(h) can be considered to be a constant value is known as the range, which represents the transition of the variable to the state of negligible correlation. Experimental semi-variograms obtained along multiple directions revealed that the random function model of the selected ions can be characterized with an axisymmetric random function model; and symmetric semi-variogram with respect to the z-direction. This type of correlation function model is typically observed in sedimentary geological formations such as an evaporitic system.

11.5.3.1 Variogram Models of Potassium

The experimental semi-variograms of K or the different units were fitted with a theoretical model consisting of two correlation structures, i.e., the combination of an exponential model with a Gaussian model. This composite structure is necessary in this case to properly represent the small-scale correlation observed along the z-direction compared to a larger correlation observed in the xy plane directions.

Clay-Halite

$$yK(h) = 9 \times 105 + 105\ yExp(ax = ay = 3300,\ az\ 60)$$

$$+\ 8 \times 105\ yGauss(ax = ay = 3300,\ az = 300)$$

Archibarca

$$yK(h) = 80800\ yExp(ax = ay = 4320,\ az = 20)$$

$$+\ 140000\ yGauss(ax = ay = 4320\ az = 350)$$

West Fan

$$yK(h) = 2 \times 105\ yExp(ax = ay = 3300,\ az\ 60)$$

$$+1.8 \times 106\ yGauss(ax = ay = 12000,\ az = 580)$$

The semi-variogram is expressed in units of mg2/L2, and the range in units of meters. Thus, the correlation structure in the xy plane has a range between 3,300 m and 4,320 m, whereas the correlation structure in the z-direction has a range between 300 m and 580 m. This means that overall, the system is stratified with lenses that extend laterally several kilometers but with limited thickness of few hundreds of meters. The variogram models shown below were fitted to experimental semi-variograms. Only the semi-variogram point estimates with sufficient pair samples were considered. The experimental variograms of lithium and potassium are shown in the following figures with their respective variogram models.

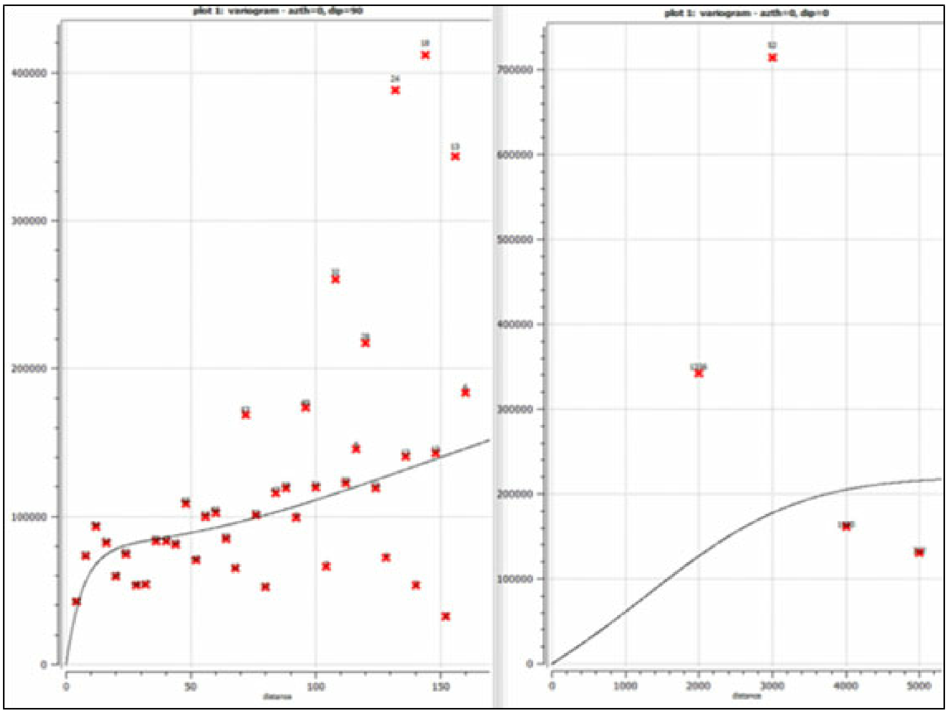


Figure 11-5 - Archibarca variogram model fitted with the corresponding experimental variogram.

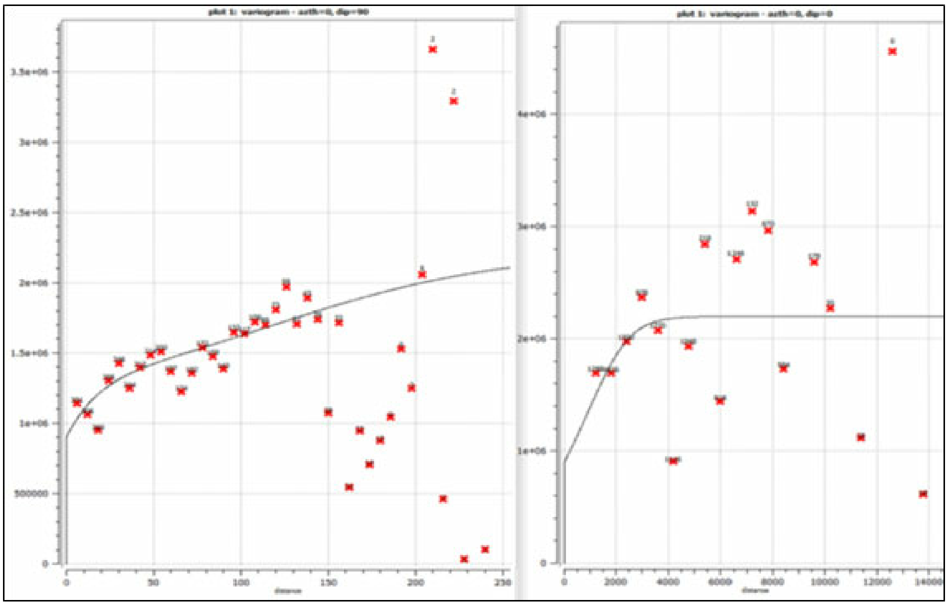


Figure 11-6 - Clay-Halite variogram model fitted with the corresponding experimental variogram.

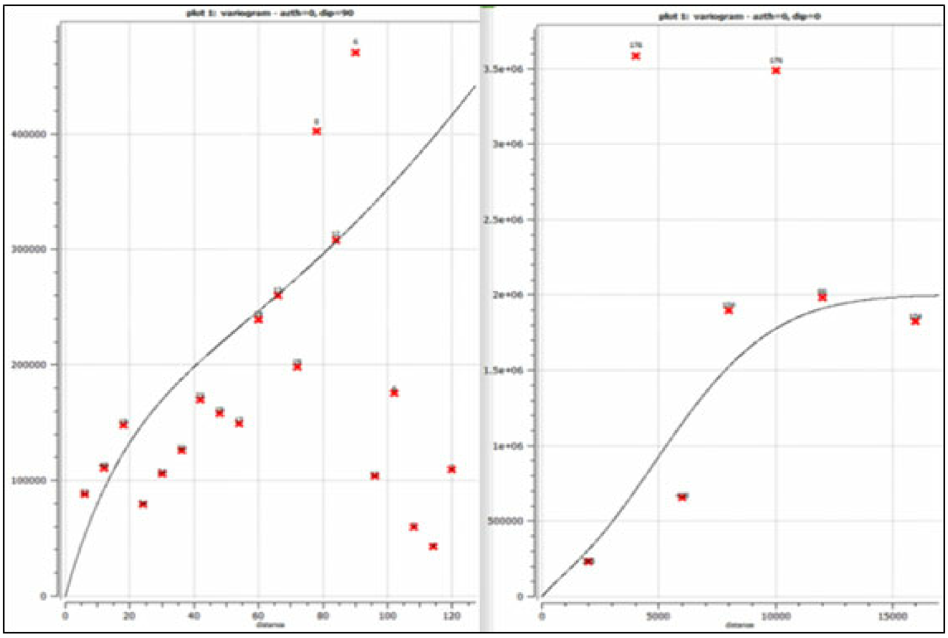


Figure 11-7 - West Fan variogram model fitted with the corresponding experimental variogram.

11.5.3.2 Variogram Models of Lithium

The experimental semi-variograms were fitted with a theoretical model consisting of only one correlation structure and a nugget coefficient. The experimental variograms for Li with their respective variogram models is shown in the following figures.

Clay-Halite

$$yLi(h) = 9000 + 18000 ysph(ax = ay = 3835, az = 150)$$

Archibarca

$$yLi(h) = 2800 yExp(ax = ay = 4320, az = 40)$$

West Fan

$$yLi(h) = 3000 yExp(ax = \mathrm{ay} = 5800, az = 50)$$

The semi-variogram is expressed in units of mg2/L2, and the range in units of meters. In this case, the correlation structure in the xy plane has a range that varies between 3,835 m and 5,800 m, whereas the correlation structure in the z-direction has one structure with a range that oscillates between 40 m and 150 m. Results show that Li is more stratified than K with similar spatial continuity in the xy plane.

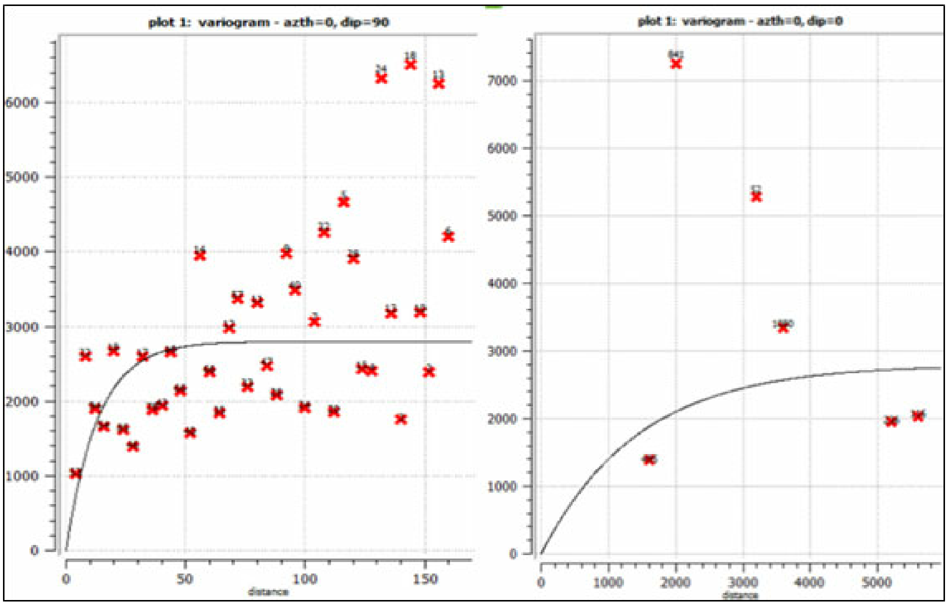


Figure 11-8 - Archibarca variogram model fitted with the corresponding experimental variogram.

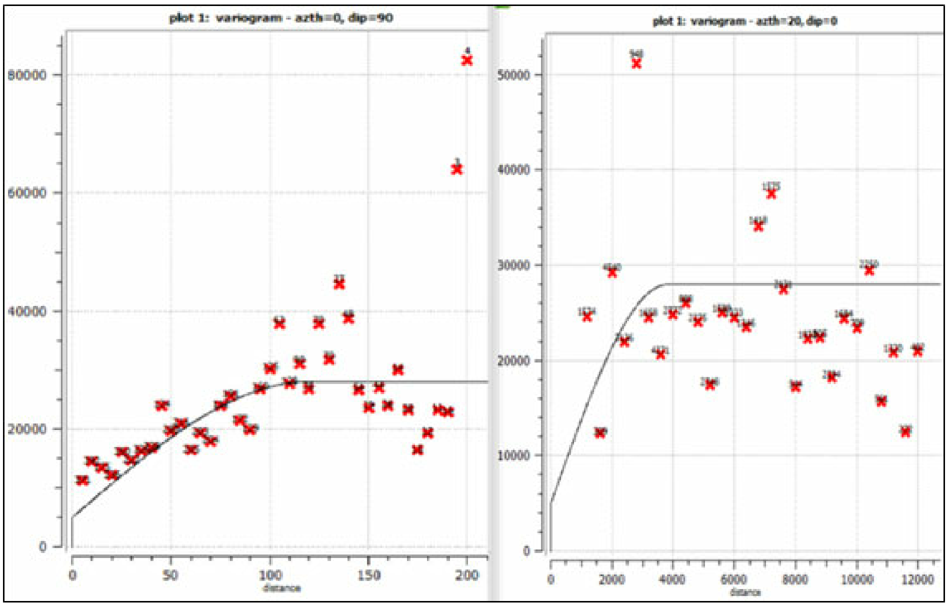


Figure 11-9 - Clay-Halite variogram model fitted with the corresponding experimental variogram.

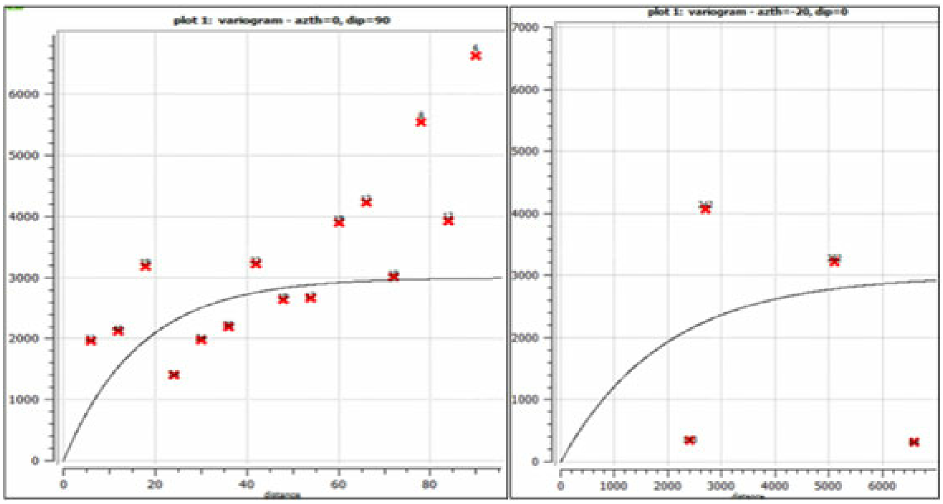


Figure 11-10 - West Fan variogram model fitted with the corresponding experimental variogram.

Table 11-4 - Parameters for the calculation of the experimental variograms.

Variogram Parameters				Tolerance	
Lag (m)	Max. No. Of Lags	Azimuth (°)	Dip (°)	Bandwidth (m)	Angular (°)
200	50	20	0	500	45
10	70	0	90	500	89

11.5.4 Kriging Methods and Random Function Models

The estimation procedure follows the method known as 'kriging within strata' (KWS). The estimation within each unit is performed with the data associated with that unit and the corresponding variogram model. In some units, the semi-variogram is poorly estimated because the number of data pairs is insufficient. This is the case with Lower Sand and East Fan. In those cases, the proportional effect correction suggested by Journel and Huijbregts (1978) is used to estimate the variogram.

The results of the EDA indicate that even though the structure of heterogeneity (random function model) is different for each unit, ordinary kriging is an appropriate technique for the estimation of Li and K concentrations in each unit. The ordinary kriging method is the most commonly used kriging method. It assumes that the mean is an unknown constant dictated by neighborhood data. Essentially, ordinary kriging re-estimates, at each estimation location, the mean value by only using the data within the search neighborhood. Hence, ordinary kriging can represent a random function with varying mean but stationary variogram. As previously, in accordance with this random function model, all experimental variograms were properly fitted with a combination of stationary theoretical variograms characterized by a well-defined sill. Figure 11-11 and Figure 11-12 show the results from the kriging estimation.

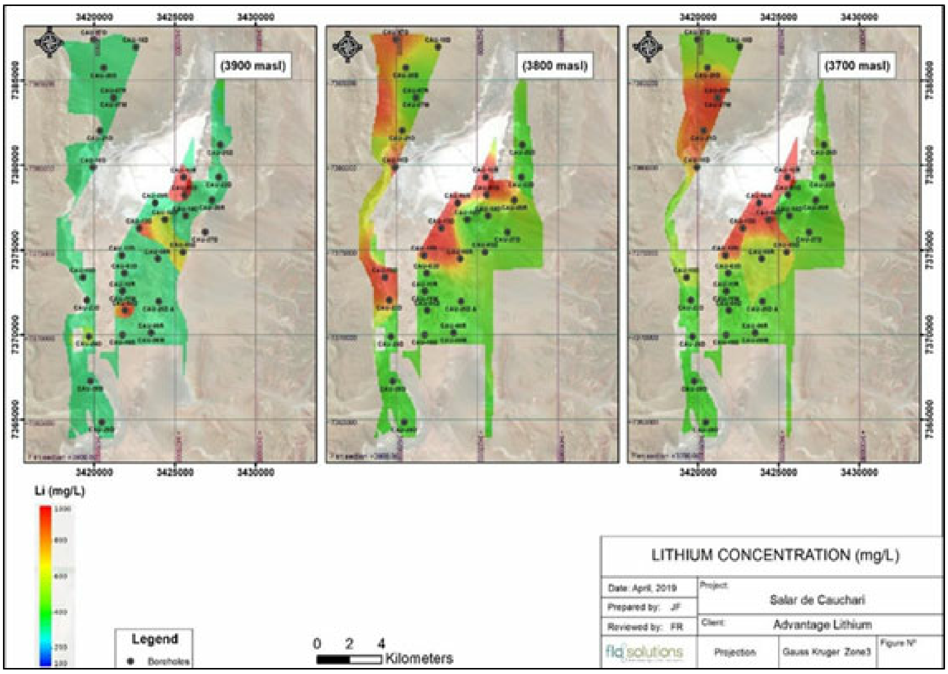


Figure 11-11 - Lithium concentration distribution.

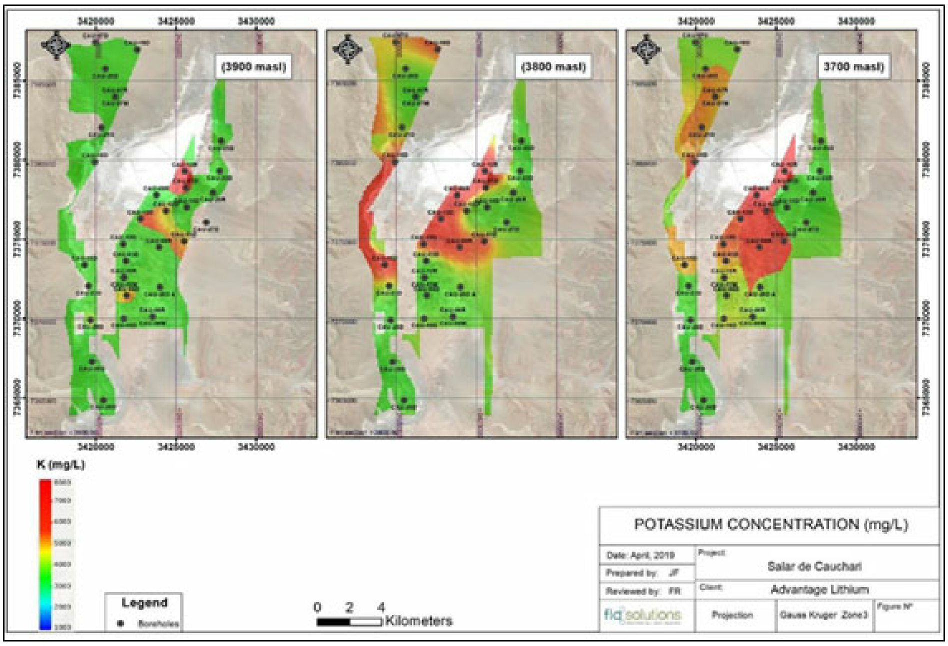


Figure 11-12 - Potassium concentration distribution.

11.6 Mineral Grade Estimation

The grade of lithium and potassium in each model block was calculated applying the following operation:

$$R_i = C_i.Sy_iV_i$$

Where: i is the block index, going from 1 to 4,138,515

R_i : Grade value to be assigned (g)

C_i : Concentration value assigned from the estimation (mg/L)

Sy_i : Porosity value assigned from the estimation (%)

V_i : Block volume (m^3)

The total resource in the reservoir is estimated as the sum of all blocks in the model,

$$R_T = \sum R_i$$

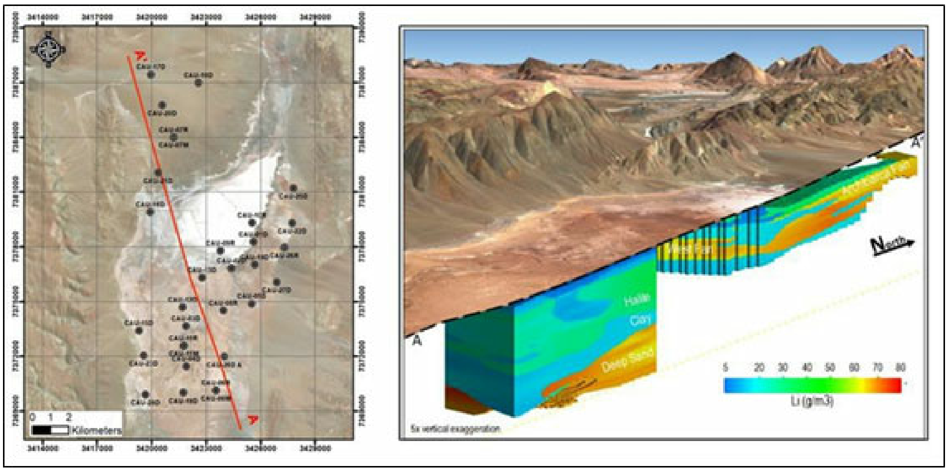


Figure 11-13 - NW-SE section looking West through the resource model showing the lithium grade.

11.6.1.1 Validation

To validate the accuracy of our estimation models, a comprehensive series of checks was conducted. These checks encompassed various techniques, including the comparison of univariate statistics, visual inspections, swath plots, and block comparison analyses.

Univariate statistics were utilized to assess the presence of any global estimation bias. Comparisons between the statistics of the sample averages, Nearest Neighbor (NN), and Ordinary Kriging (OK) were performed. Remarkably, the percentage difference between NN and OK stood at a mere 0.17%, indicating a high degree of similarity between the two methods. Table 11-5 summarizes the univariate statistics comparison.

Table 11-5 - Univariate Statistics of Samples, Nearest Neighbor, and Ordinary Kriging Estimates.

Sample	Samples	Nearest Neighbor	Ordinary Kriging	Difference	Percentage Difference
Average	511.61	475.71	474.85	0.86	0.17%

Sample	Samples	Nearest Neighbor	Ordinary Kriging	Difference	Percentage Difference
S. Deviation	143.66	129.54	104.45	25.09	17.46%
Minimum	156.77	156.77	161.45	-4.68	-2.99%
Maximum	956.33	956.33	719.57	236.76	24.76%
Median	542.74	500.69	484.78	15.92	2.93%

A block comparison analysis was conducted. In this analysis, a block size of 2,000x2,000x50 meters was used, resulting in an acceptable R-squared value of 0.74. This indicates a good level of agreement between the estimated and observed values within the blocks. Figure 11-14 showcases the block comparisons between Ordinary Kriging estimates and the sample data, allowing for visual assessment of the agreement and accuracy of the estimation model.

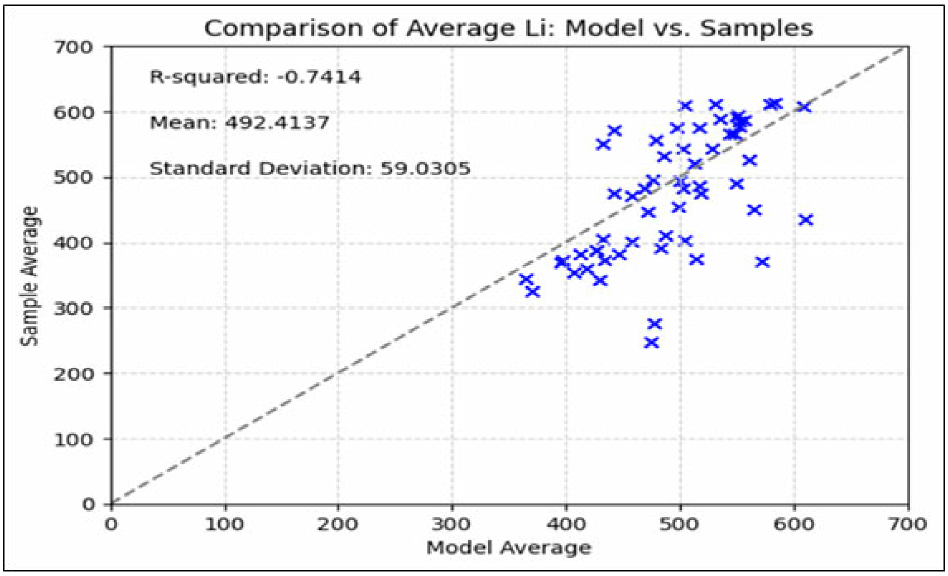


Figure 11-14 - Block Comparison Between Ordinary Kriging and Samples.

Visual inspections were carried out by overlaying the estimated values onto plans and sections containing sample data. This enabled a meticulous examination of the estimated values in relation to the sample locations, helping to identify any discrepancies or spatial bias. Additionally, swath plots were generated in the north, south, and vertical directions to detect potential spatial bias. These plots revealed an acceptable performance overall, with a conservative estimation tendency observed to mitigate regions of very high concentration values. Figure 11-15 presents the swath plots in the north, south, and vertical directions, illustrating the spatial distribution of concentration values.

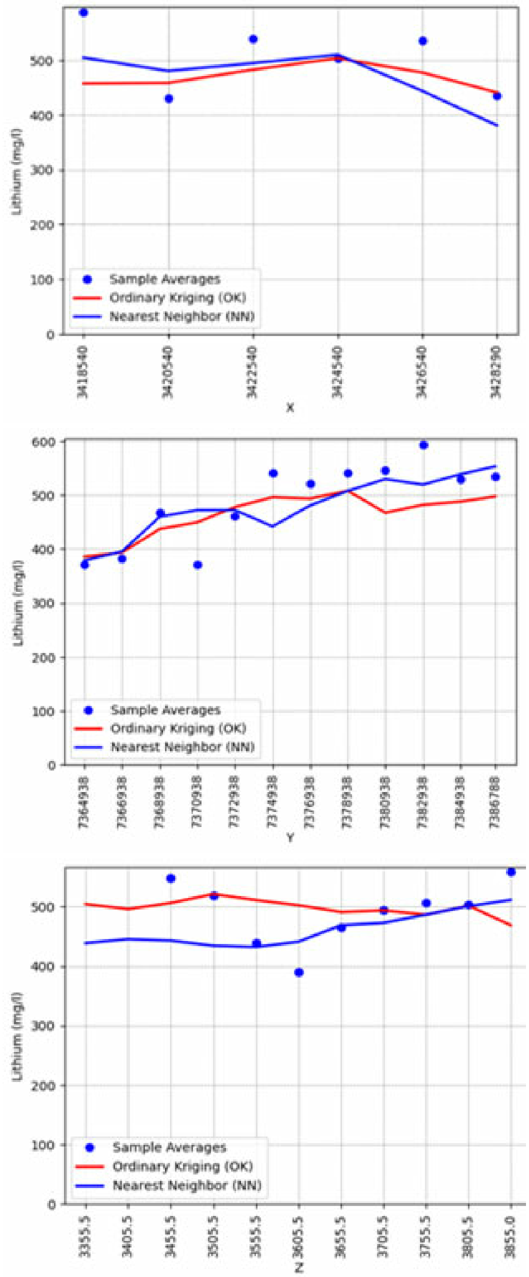


Figure 11-15 - Swath Plots in North, South, and Vertical Directions.

11.7 Mineral Resource Classification

This sub-section contains forward-looking information related to Mineral Resource estimates for Cauchari Project.

11.7.1 Inferred Mineral Resource

An Inferred Mineral Resource is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An Inferred Mineral Resource is based on limited information and sampling gathered through appropriate sampling techniques from locations such as outcrops, trenches, pits, workings, and drill holes. Inferred Mineral Resources must not be included in the economic analysis, production schedules, or estimated mine life in publicly disclosed Pre-Feasibility or Feasibility Studies, or in the Life of Mine plans and cash flow models of developed mines. Inferred Mineral Resources can only be used in economic studies as provided under S-K §229.1302 TRS disclosure.

There may be circumstances, where appropriate sampling, testing, and other measurements are sufficient to demonstrate data integrity, geological and grade/quality continuity of a Measured or Indicated Mineral Resource, however, quality assurance and quality control, or other information may not meet all industry norms for the disclosure of an Indicated or Measured Mineral Resource. Under these circumstances, it may be reasonable for the Qualified Person to report an Inferred Mineral Resource if the Qualified Person has taken steps to verify the information meets the requirements of an Inferred Mineral Resource.

11.7.2 Indicated Mineral Resource

An Indicated Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve.

Mineralization may be classified as an Indicated Mineral Resource by the Qualified Person when the nature, quality, quantity, and distribution of data are such as to allow confident interpretation of the geological framework and to reasonably assume the continuity of mineralization. The Qualified Person must recognize the importance of the Indicated Mineral Resource category to the advancement of the feasibility of the Project. An Indicated Mineral Resource estimate is of sufficient quality to support a Pre-Feasibility Study which can serve as the basis for major development decisions.

11.7.3 Measured Mineral Resource

A Measured Mineral Resource is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Mineral Reserve or to a Probable Mineral Reserve.

Mineralization or other natural material of economic interest may be classified as a Measured Mineral Resource by the Qualified Person when the nature, quality, quantity, and distribution of data are such that the tonnage and grade or quality of the mineralization can be estimated to within close limits and that variation from the estimate would not significantly affect potential economic viability of the deposit. This category requires a high level of confidence in, and understanding of, the geology and controls of the mineral deposit.

11.7.4 Resource Category Definition

The Mineral Resources category for the Project has been assigned according to S-K §229.1300 requirements as described above and reflect level of hydrogeological knowledge, sample availability and quality. The category classification is shown in Figure 11-16 and is described as follows:

- Measured Resources include the majority of Archibarca Fan area and the Clay and Halite units to a variable depth of up to approximately 400 m (based on core and brine sample availability) within the SE Sector of the Project.
- Indicated Resources include the West Fan, the deeper portions of the Clay and Halite Units, the upper part of the East Fan (within the transitions domain) and the Lower Sand to a depth of 500 m.
- Inferred Resources include outlaying deeper pockets of the Archibarca Fan area, the Lower Sand below 500 m depth, the limits of the property in the East and the East Fan below the transition domain.

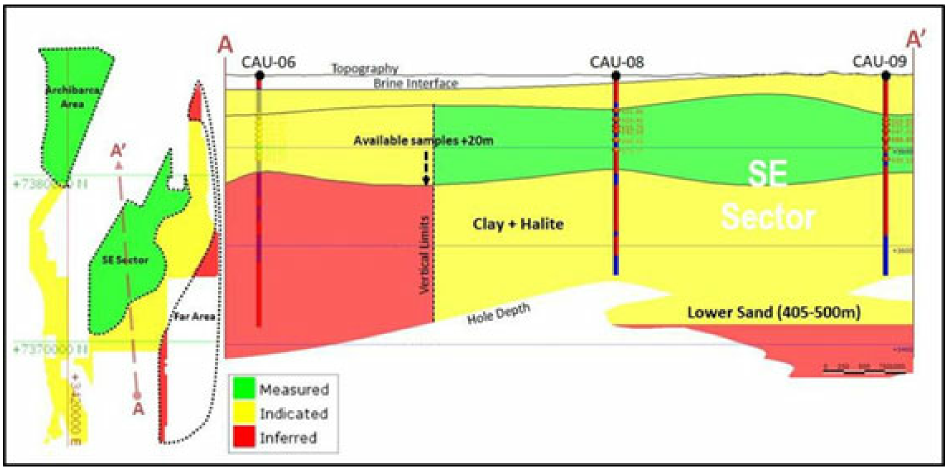


Figure 11-16 - 1115 Resources category classification.

The resource estimate was prepared in accordance with the requirements of S-K §229.1300 and uses best practice methods specific to brine Resources, including a reliance on core drilling and sampling methods that yield depth-specific chemistry and drainable porosity measurements. This resource estimate was previously reported on April 19, 2019, without the application of a cut-off lithium concentration and inclusive of Reserves. On request of Allkem, a 300 mg/l lithium concentration cut-off was applied to the resource base which has results in an 11% decrease in Indicated Resources from those reported in 2019. Figure 11-17 provides the cut-off grade volume curve applied to the Measured, Indicated, and Inferred Resources. Table 11-6 summarizes the lithium Resources with the 300 mg/l lithium concentration cut-off and exclusive of Mineral Reserves.

Mr. F. Reidel AIPG (the QP), is of the opinion and warns that the reporting of Mineral Resources exclusive of Mineral Reserves should not be applied to brine Resources and the numbers reported in Table 11-6 may contain certain errors related to the mixing of Resources and Reserves under pumping conditions.

Mr. F. Reidel AIPG is of the opinion that brine Resources should be reported inclusive of Reserves and therefore the reader is advised to refer the numbers presented in Table *11-7*.

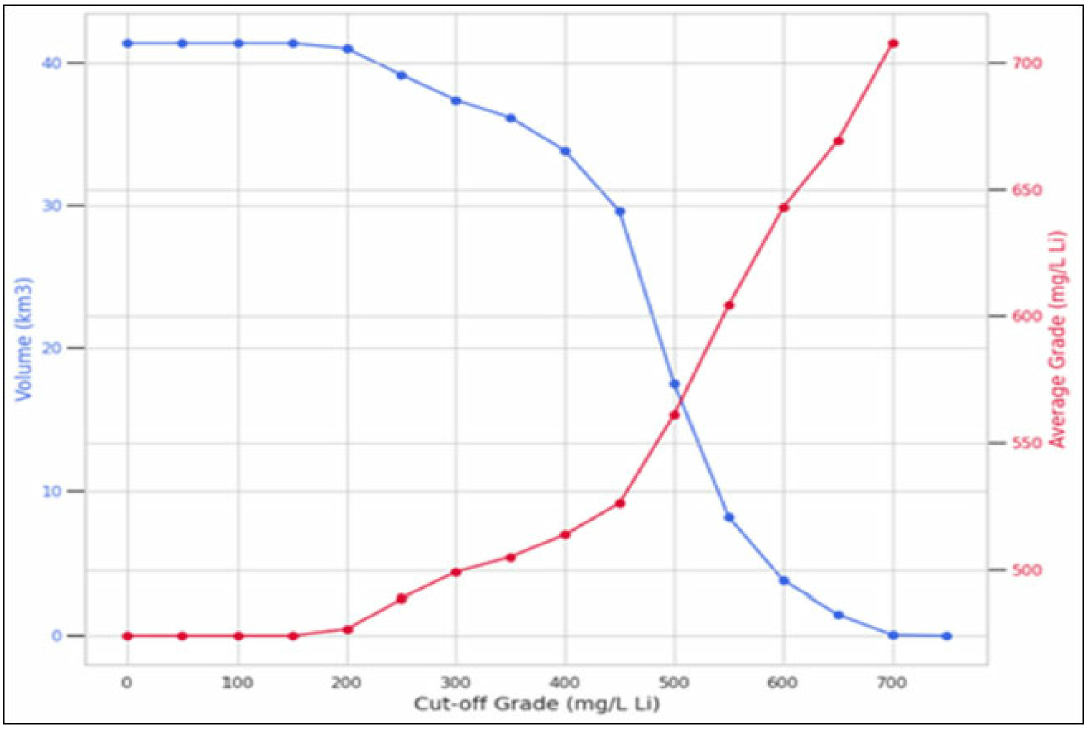


Figure 11-17 - Brine volume cut=off grade for M+I+I Resources.

Table 11-6 - Summary of Measured Indicated and Inferred Brine Resources, Exclusive of Mineral Reserves (June 30, 2023).

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/L)
Measured	**0.302**	**1.6**	**581**
Indicated	**0.321**	**1.7**	**494**
Total Measured and Indicated	**0.623**	**3.3**	**519**
Inferred	**0.285**	**1.5**	**473**

1. S-K 1300 definitions were followed for Mineral Resources.
2. The Qualified Person(s) for these Mineral Resources and Mineral Reserves estimate is Mr. F. Reidel AIPG for Cauchari.
3. A 300 mg/L Li concentration cut-off has been applied to the resource estimate based for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM.
4. Numbers may not add up due to rounding.
5. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
6. The estimate is reported in-situ and exclusive of Mineral Reserves, where the lithium mass is representative of what remains in the reservoir after the LOM. To calculate Resources exclusive of Mineral Reserves, a direct correlation was assumed between Proven Reserves and Measured Resources, as well as Probable Reserves and Indicated Resources. Proven Mineral Reserves (as Li contained in brine pumped to the evaporation ponds) were subtracted from Measured Mineral Resources and Probable Mineral Reserves (as Li contained in brine pumped to the evaporation ponds) were subtracted from Indicated Mineral Resources. The average concentration for Measured and Indicated Resources exclusive of Mineral Reserves was back calculated based on the remaining brine volume and lithium mass.

Table 11-7 - Summary of Measured Indicated and Inferred Brine Resources, Inclusive of Mineral Reserves (June 30, 2023).

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/l)
Measured	0.345	1.85	527
Indicated	0.49	2.60	452
Total Measured and Indicated	0.835	4.45	476
Inferred	0.285	1.50	473

1. S-K 1300 definitions were followed for Mineral Resources.
2. The Qualified Person(s) for these Mineral Resources and mineral reserves estimate is Mr. F. Reidel AIPG for Cauchari.
3. A 300 mg/L Li concentration cut-off has been applied to the resource estimate based for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM.
4. Numbers may not add up due to rounding.
5. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
6. The estimate is reported in-situ and exclusive of Mineral Reserves, where the lithium mass is representative of what remains in the reservoir after the LOM. To calculate Resources exclusive of Mineral Reserves, a direct correlation was assumed between Proven Reserves and Measured Resources, as well as Probable Reserves and Indicated Resources. Proven Mineral Reserves (as Li contained in brine pumped to the evaporation ponds) were subtracted from Measured Mineral Resources and Probable Mineral Reserves (as Li contained in brine pumped to the evaporation ponds) were subtracted from Indicated Mineral Resources. The average concentration for Measured and Indicated Resources exclusive of Mineral Reserves was back calculated based on the remaining brine volume and lithium mass.

The cut-off grade is based on the various inputs and formula below:

$$Cutoff\ Grade = \frac{\dfrac{(Total\ Capital\ Expenditure + Total\ Operating\ Expenditure)}{Total\ Brine\ Extracted}}{(Recovery * Conversion\ from\ Li\ to\ LiCO_3 * Projected\ LCE\ Price * (1 - Export\ Duties) * (1 - Royalties))}$$

Where:

Total Capital Expenditure = US$ 1,255 million

Total Operating Expenditure = US$ 3,020 million

Cost of Capital = US$ 126 million (10 percent of Total Capital)

Total Brine Extracted = $424\ Mm^3$

Conversion from Li to Li2CO3 = 5.323

Projected LCE Price = US$ 20,000 per metric ton of LCE

Export Duties = 4.5%

Royalties = 3.0%

Calculated Recovery = 66%

Resulting in a calculated cut-off grade of 159 mg/l.

The cut-off grade was elevated to 300 mg/l to increase margin and de-risk the uncertainties around price fluctuations. The cut-off grade is used to determine whether the brine pumped will generate a profit after paying for costs across the value chain.

Factors that may affect the Brine Resource estimate include: locations of aquifer boundaries; lateral continuity of key aquifer zones; presence of fresh and brackish water which have the potential to dilute the brine in the wellfield area; the uniformity of aquifer parameters within specific aquifer units; commodity price assumptions; changes to hydrogeological, metallurgical recovery, and extraction assumptions; density assignments; and input factors used to assess reasonable prospects for eventual economic extraction. Currently, Mr. F. Reidel AIPG (the QP), does not know of any environmental, legal, title, taxation, socio-economic, marketing, political, or other factors that would materially affect the current Resource estimate.

11.8 Potential Risks in Developing the Mineral Resource

The potential risks with the development of the Mineral Resources are mainly related to the behavior of the hydrogeological units in the Archibarca Fan under pumping conditions. Greater than forecasted mixing of the pumped brine with freshwater from the upper aquifer in the Archibarca fan could lead to lower Li concentrations in the pumped brine than forecasted. The recommendations outlined in Section 7 include additional drilling and testing to reduce this potential risk.

12. MINERAL RESERVES ESTIMATES

This Section of the Technical Report describes 1) the construction of the three-dimensional groundwater flow and transport model; 2) the steady state- and transient calibration methodology and results; 3) simulation results of the proposed brine production scenario using the calibrated model and an estimate of Mineral Reserves and 4) description of sensitivity analysis completed around the calibration and the limitations of the modeling.

12.1 Introduction

A numerical groundwater flow and transport model using the FEFLOW 7.1 code was developed for the Project in support of this PFS. The numerical model was built, calibrated, and operated by the DHI Group with the guidance of Mr. F. Reidel AIPG. The specific objectives of the model in support of this PFS are to:

- Calibrate the model to a normalized root mean squared error (NRMSE) of 10% or less under pre-mining, steady-state conditions.
- Calibrate the model in transient mode for pumping tests at wells CAU07R and CAU11R.
- Simulate brine abstraction of the wellfields located in the NW- and SE Sectors of the Project area to support an annual LCE production of 25,000 tonnes over a 30-year mine life, assuming 67 percent lithium process recovery efficiency.
- Evaluate preliminary well-field configurations and pumping schedules to minimize the potential dilution of lithium concentrations in the discharge of the production wells.
- Prepare an estimate of Mineral Reserves for the Project.

12.2 Reserve Estimate Methodology, Assumptions, and Parameters

12.2.1 Model Construction

The model domain includes the Salar de Cauchari and the southern part of the Salar de Olaroz (Flosolutions, 2018) and is shown in Figure 12-1. The domain encompasses the unconsolidated sediments of the Cauchari basin extending from the center of the salar, to the upper reaches of the alluvial fans in the catchments east, south, west, and north of the salar. The far northern boundary of the model domain falls within the southern part of Salar de Olaroz. The Leapfrog geological model described in Chapter 6 was imported into the FEFLOW model. Areas of bedrock outcrops surrounding the sedimentary deposits are excluded from the model domain.

The topographic elevation of the model domain ranges from 3,925 masl in Salar de Olaroz to 4,210 masl in the northeast corner of the domain. The base of the model has an elevation of between 3,332 m and 3,409 m for a total simulated sediment thickness in the Salar of 600 m.

12.2.1.1 Meshing and layering

The model has a total of 3,702,105 nodes, 7,144,704 elements, and 32 layers. Elements located where bedrock is present are inactive in the flow and transport simulations. Therefore, the total number of active elements is 6,476,125. All elements are triangular prisms with elemental diameters ranging from approximately 80 m in the center of Salar de Cauchari to approximately 380 m at the outer edges of the model domain. Mesh refinement is also implemented in the vicinity of pumping wells reaching an elemental diameter down to approximately 5 m.

The layer thickness ranges from 1.0 m to 20 m. Layers 1 and 2 have thicknesses ranging from 1 m to 5 m and 3 m to 4 m, respectively. Layer thicknesses for Layers 3 to 32 are uniform, ranging from 15 m thick in Layer 3 to 20 m thick for Layers 4 to 32. The finite element mesh is shown in Figure 12-2.

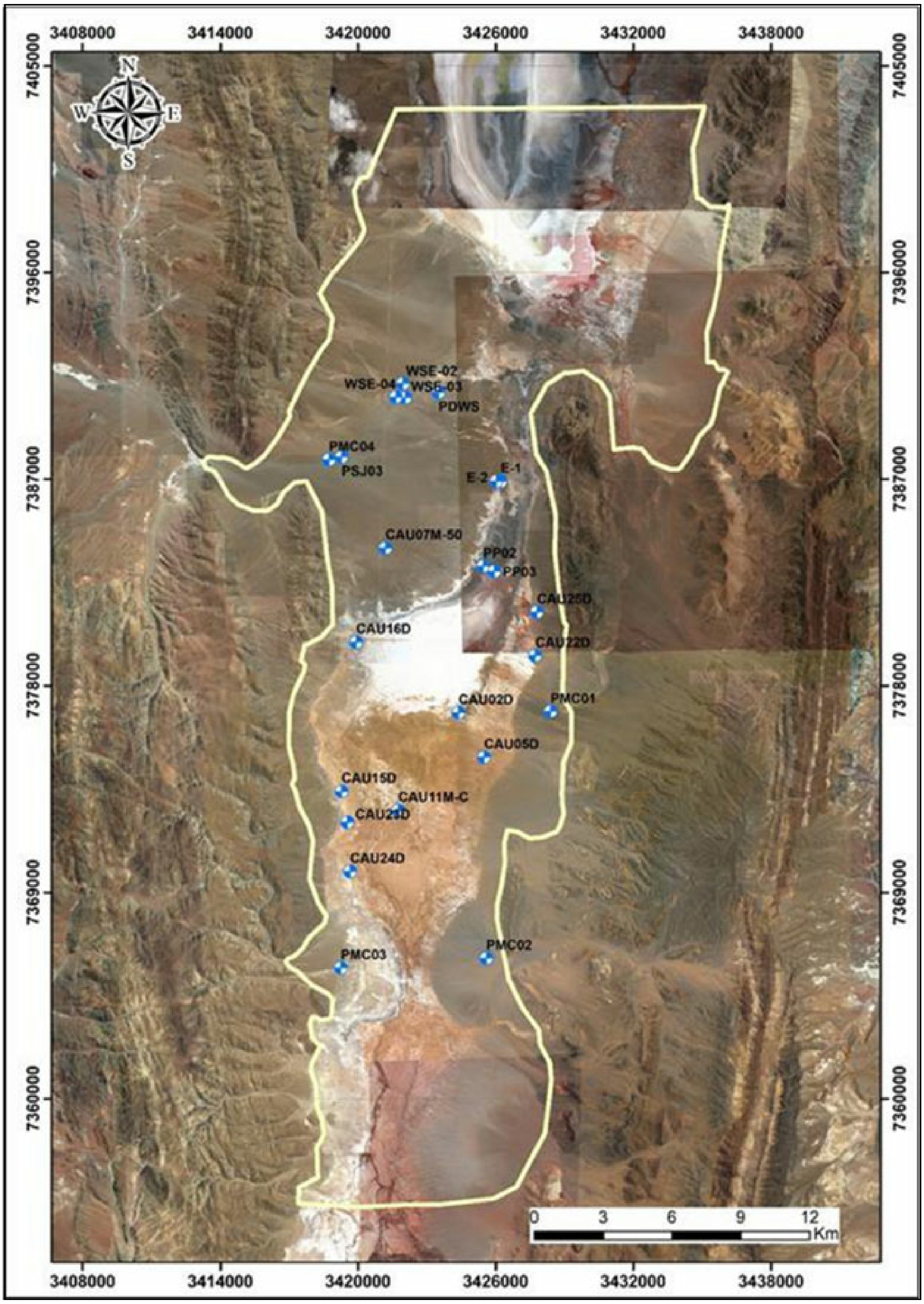


Figure 12-1 - Model domain.

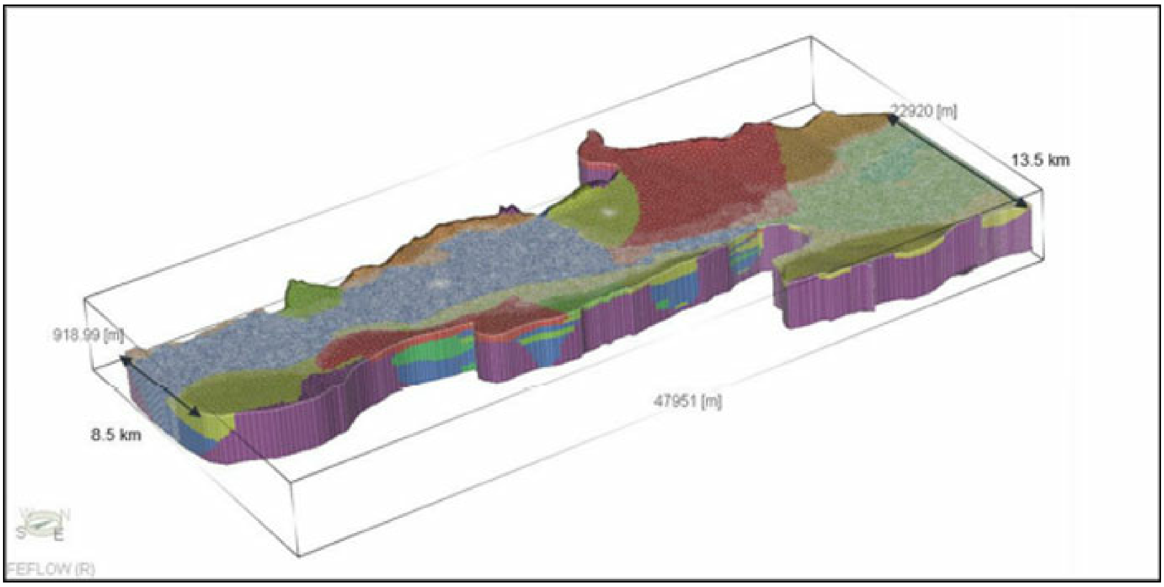


Figure 12-2 - Model element mesh.

12.2.1.2 Flow Boundary Conditions

There are two primary groundwater inflow processes at the Salar de Cauchari: recharge by direct precipitation and indirect recharge from catchments surrounding the Salar de Cauchari hydrogeological system as described previously in Chapter 6 Groundwater discharges at lower elevations from the nucleus of the Salar via evaporation. The modelled water balance components are further quantified hereafter. A schematic of the key boundary condition types is presented in Figure 12-3. The boundary condition zones are discussed in this section.

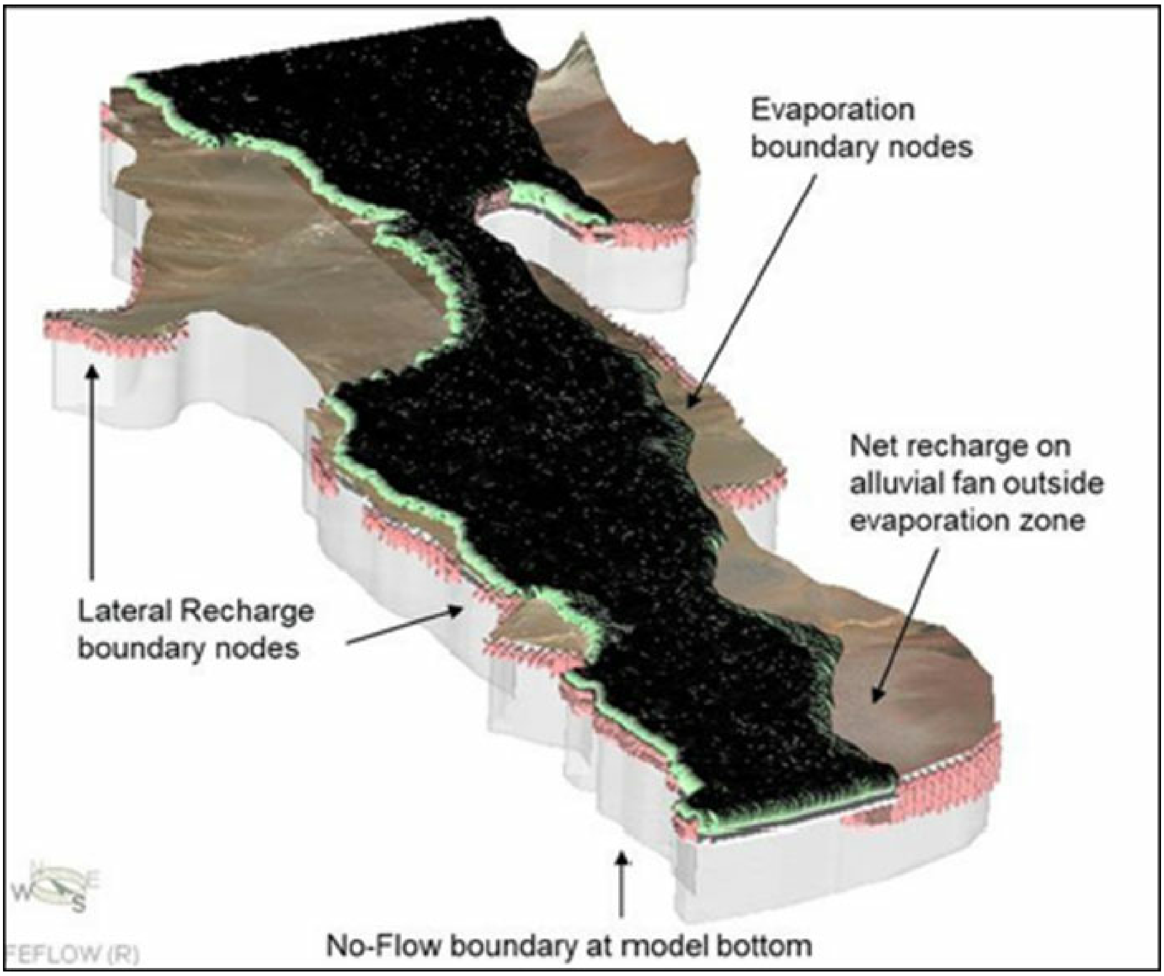


Figure 12-3 - Schematic of key flow boundary processes.

The bottom or floor of the model domain is treated as a no-flow boundary. Evaporation and recharge boundary conditions are applied to Layer 1. The lateral recharge boundary conditions are applied to the outer boundaries in Slices 1 to 19 of the model. Where a lateral recharge boundary is not defined, the lateral horizontal boundary of the model is treated as a no-flow boundary.

12.2.1.3 Direct Recharge

In the FEFLOW model, recharge is applied only to the alluvial fan materials, at a rate of 25.6 mm/y, or 20% of the mean annual precipitation of 136 mm/year estimated at the Salar (DHI, 2018). This area is shown in Figure 12-3 and corresponds to the top of the elements on which there are no applied nodal boundary conditions. No recharge was applied to the nucleus of the salar, which are assumed to be areas of net groundwater discharge. Additionally, this approach is considered conservative as any predictive wellfield drawdown and capture area will be overestimated under the absence of direct recharge.

12.2.1.4 Catchment Inflows

In addition to direct recharge, Salar de Cauchari receives indirect or lateral recharge at higher elevations within the catchments that surround the salar. Figure 12-4 shows the catchments that generate lateral groundwater flow into the Cauchari Basin and the annual average flow rates for each catchment from the water balance (DHI, 2018). The catchment inflows were treated as flux or second type boundary conditions. The boundary nodes were generally applied below the water table in Slices 1 to 19 of the model, provided that the outer boundary element was not a bedrock element. For each sub-catchment, the flux boundary nodes were assigned a total inflow equal to the flux values shown in Figure 12-4.

The most significant lateral groundwater inflow is the 143 l/s estimated for the Archibarca fan.

Second type boundary conditions nodes were applied to the north and south lateral boundaries, with flux values defined during the steady state calibration. The inflows associated with these boundaries resulted in a steady state water balance for the pre-mining condition. Under steady state groundwater flow conditions, the total groundwater inflow via direct and indirect recharge must equal the total groundwater loss via evaporation. The calibrated flows across the north and south boundaries required to balance evaporative outflow are shown in Figure 12-4.

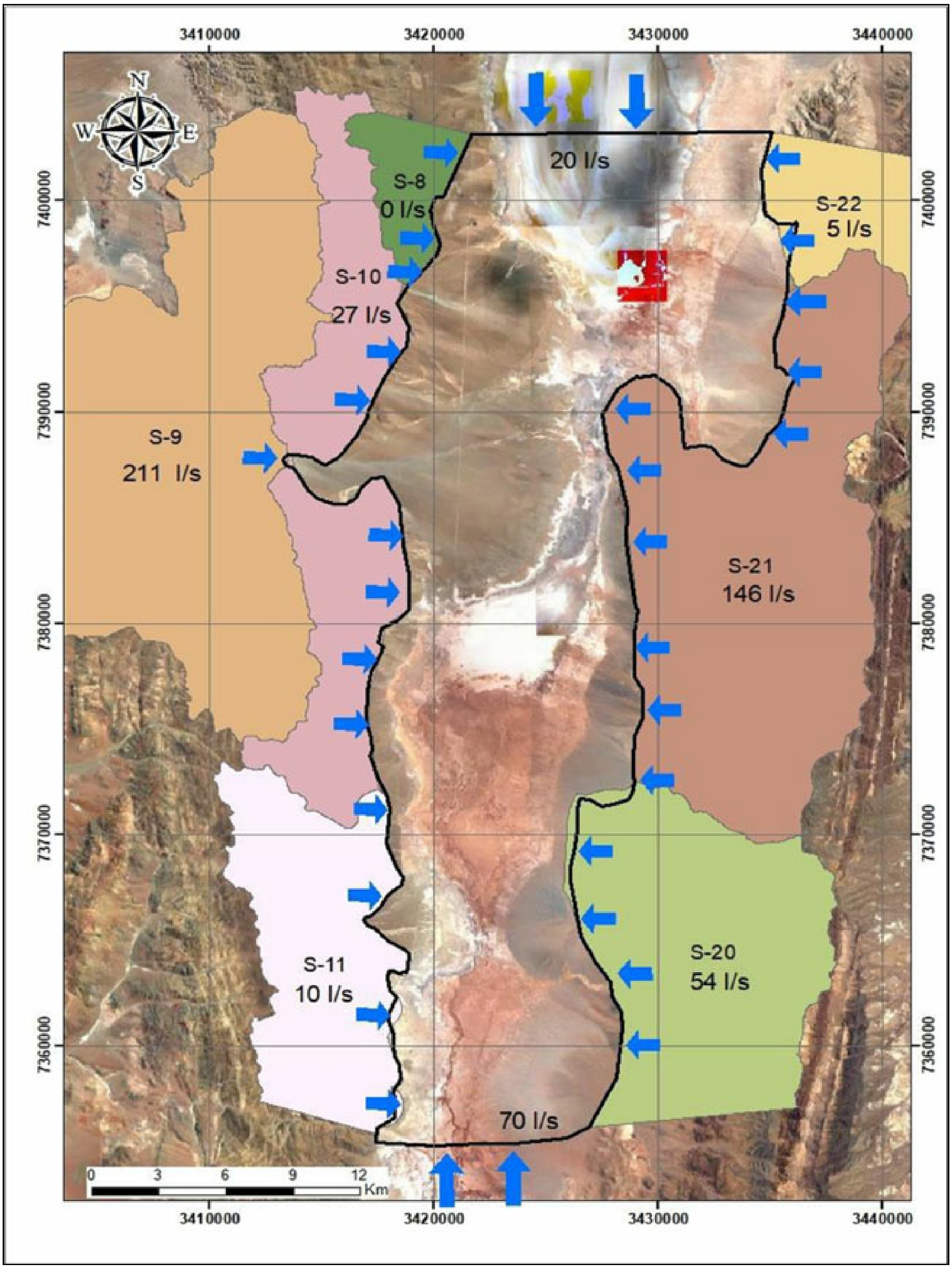


Figure 12-4 - Catchment inflows simulated by the FEFLOW model.

12.2.2 Evaporation

The primary groundwater discharge process in Salar de Cauchari is evaporation from the soil surface. Figure 15-5 illustrates the distribution of the evaporation function in the model. In all cases, the vertical evaporation rate is defined as a linear function of water table depth from ground surface. When the water table is at the topographic elevation, the applied evaporation rate equals the maximum value shown in Figure 12-5. The evaporation rate decreases linearly with depth from ground surface to an extinction depth, defined to range from 1.5 m to 3 m, at which point, the applied evaporation rate is equal zero. Therefore, the evaporation is considered dynamic in the FEFLOW model. Table 12-1 lists the evaporation parameters for five zones within the FEFLOW model.

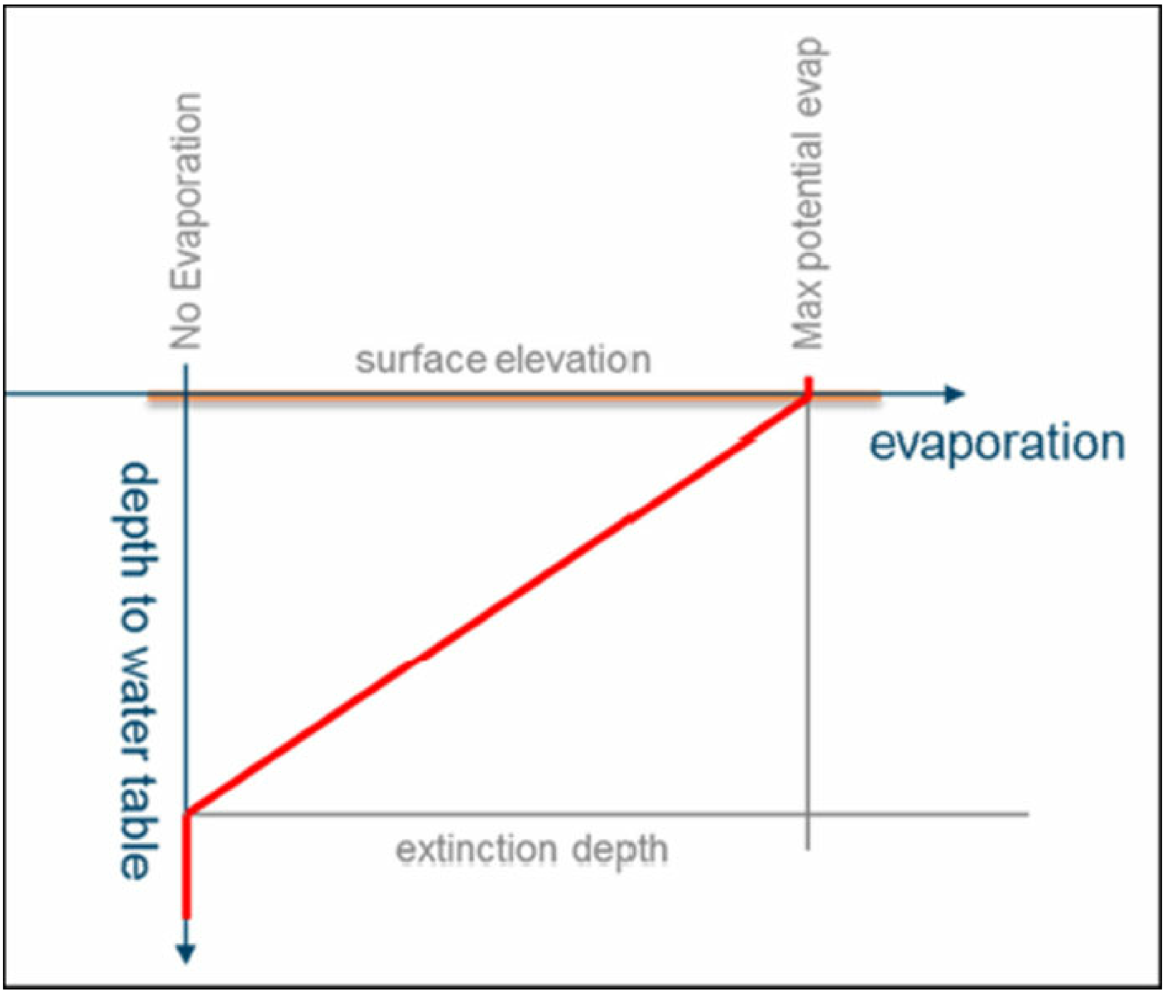


Figure 12-5 - Linearized EVT-Model used in implicit approach.

Table 12-1 - Evaporation parameters.

Water Type	Location	Maximum Evaporation Rate (mm/d)	Extinction Depth (m)
Fresh	Edge of Alluvial Fans	2.5	1.5
Brine	from Clay	0.7	5
Brine	Salar Nucleus	0.3	3
Brine	Carbonates	0.15	5
Brine	Archibarca	1.2	1.5

The magnitude of the maximum evaporation in each of the five zones was calibrated using target evaporation fluxes from the water balance (FloSolutions, 2018). As a general rule, two factors control the maximum evaporation rate. The first is the salinity of the groundwater. Brine from the Salar nucleus was assigned a lower maximum evaporation rate, consistent with the well-established reduction in evaporation of brine compared to fresh water. A second criterion is the hydraulic conductivity of the soil. More permeable sediments, such as the alluvial fan materials of the Archibarca fan, have higher maximum evaporation rates than lower-permeability materials like the clays, due to a coarse soils' greater ability to transmit groundwater to the evaporative surface.

As a consequence of these factors, five evaporation zones are defined, as shown in Figure 12-6 and listed in Table 12-1. The five zones can be subdivided into functional groups as follows:

- Evaporation of freshwater at the edge of the alluvial fans. This evaporation zone occurs at the edge of the majority of alluvial fan catchments surrounding Salar de Cauchari.
- Evaporation of brine at the edge of the alluvial fans in two areas:
  - Archibarca alluvial fan. The Archibarca fan feeds Rio Archibarca on the northern part of the western edge of the FEFLOW model domain. This catchment contributes a larger volume of lateral recharge than the other alluvial fan basins (see Figure 12-4). The brine present in the deeper Archibarca fan deposits discharges at the salar in two areas shown in Figure 12-6.
  - Brine discharge from carbonate soils associated with catchment S-11 occurs in the southwestern portion of the model.
- Evaporation from brine within the Salar is divided into two zones characterized by the surficial stratigraphic material.
  - Evaporation from halite from the salar's nucleus in the approximate center of the Salar de Cauchari.
  - Evaporation from the clay core surrounding the halite.

Each of these zones is treated as a FEFLOW transfer boundary node, corresponding to a Cauchy or third-type boundary condition. The value of the maximum evaporation transfer rate in each zone was adjusted during the calibration such that the total evaporation from all zones matched the conceptual water budget.

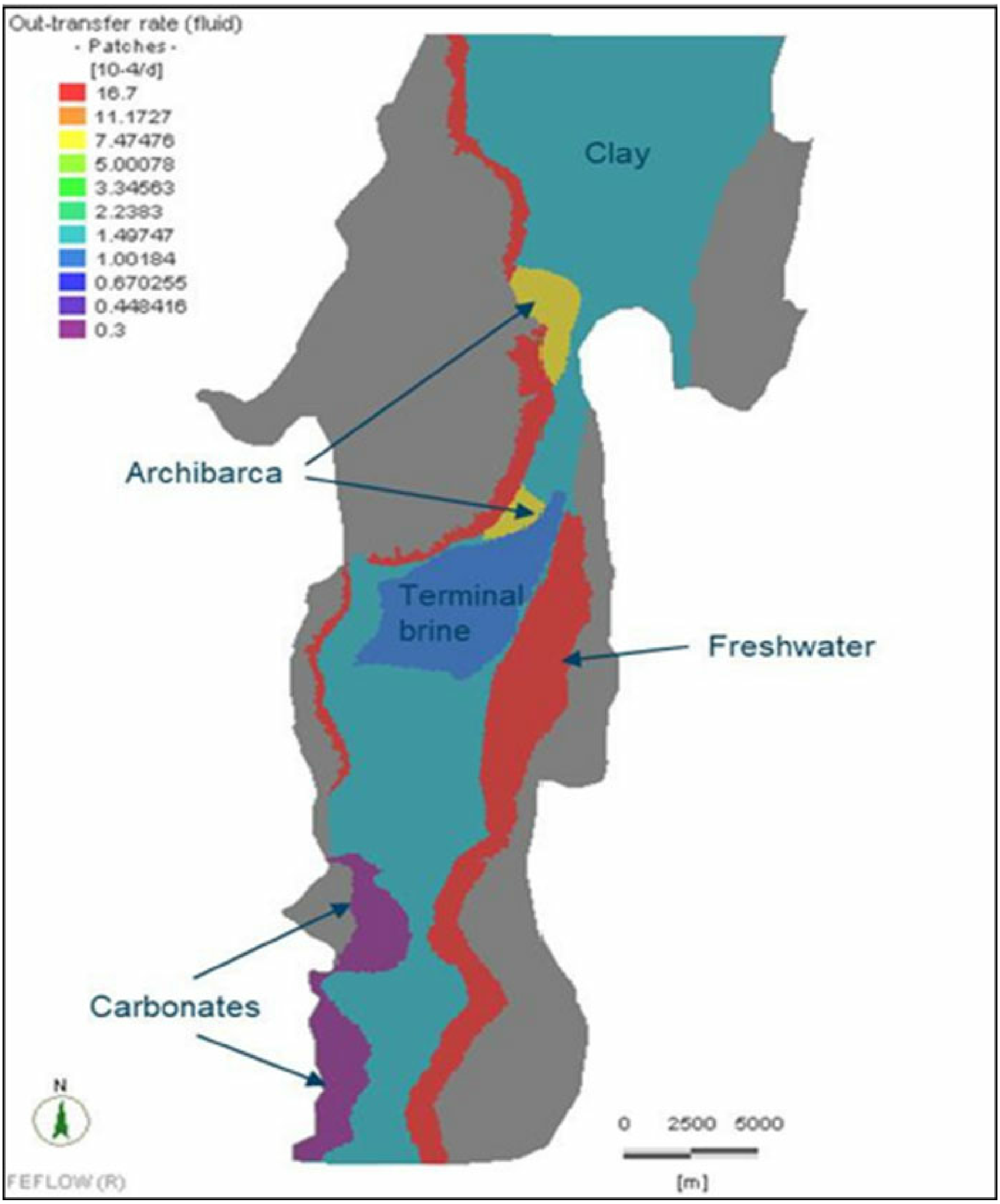


Figure 12-6 - Evaporation zones.

12.2.3 Pumping Wells

Pumping tests were completed in two wells, CAU07R and CAU11R. These pumping tests are described in Section 7.4 and further below in Section 12.3.1. These two existing wells are simulated as multilayer wells in the FEFLOW model.

In addition, 67 lithium brine extraction wells are simulated boundary nodes as Well for the predictive model simulations. The pumping wells in the model are shown in Figure 12-7. The coordinates of the proposed extraction wells are shown in Table 12-2 and Table 12-3. The brine production wellfields are located in the NW Sector of the Project (Archibarca fan area) and the SE Sector. The depth for the Archibarca production wells varies between 160 m and 360 m depth. The Archibarca production wells are screened in Slices 11 and 21 of the FEFLOW model. The depth of the SE wells varies between 120 m and 460 m. The SE production wells are screened in Slices 9 to 26 of the FEFLOW model.

Table 12-2 - Proposed well locations in NW Sector (POSGAR 94 3S).

Well ID	Easting (m)	Northing (m)
P1	3,421,209	7,383,981
P11	3,421,446	7,385,828
P12	3,421,291	7,385,411
P15	3,421,084	7,385,783
P14	3,420,908	7,385,412
P7	3,420,887	7,384,759
P10	3,421,568	7,386,261
P13	3,421,059	7,385,027
P16	3,421,186	7,386,134
P2	3,421,245	7,384,505
P6	3,420,696	7,384,522
P5	3,421,907	7,385,913
P4	3,421,774	7,385,421
P19	3,420,641	7,386,207
P17	3,420,266	7,386,172
P9	3,421,641	7,386,758
P8	3,420,705	7,385,117
P18	3,420,436	7,385,762
P3	3,421,540	7,384,949
P4B	3,420,565	7,385,421
P5B	3,420,771	7,385,840
P3B	3,420,941	7,386,358

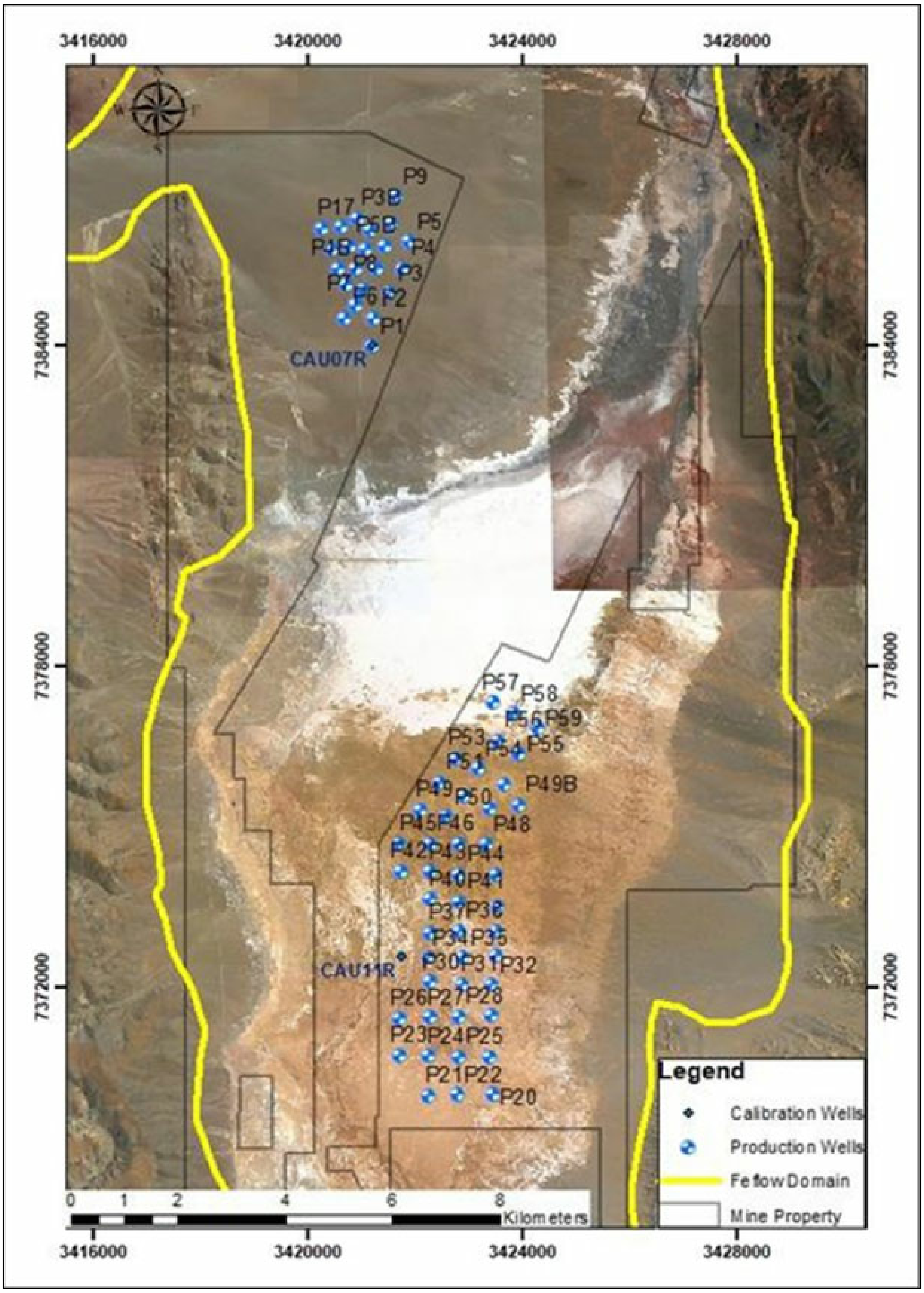


Figure 12-7 - NW and SE wellfield locations.

Table 12-3 - Proposed well locations in SE Sector (POSGAR 94 S3).

Well ID	Easting (m)	Northing (m)
P33	3,423,533	7,373,048
P34	3,422,267	7,372,572
P36	3,423,539	7,373,526
P29	3,423,527	7,372,605
P35	3,422,898	7,372,578
P39	3,423,535	7,374,128
P42	3,421,735	7,374,178
P45	3,421,708	7,374,690
P47	3,422,839	7,374,691
P46	3,422,288	7,374,702
P43	3,422,273	7,374,174
P44	3,422,843	7,374,124
P40	3,422,273	7,373,655
P41	3,422,843	7,373,604
P37	3,422,280	7,373,041
P38	3,422,826	7,373,068
P30	3,422,273	7,372,112
P31	3,422,876	7,372,079
P49	3,422,105	7,375,331
P51	3,422,457	7,375,834
P53	3,422,774	7,376,298
P55	3,423,950	7,376,375
P57	3,423,463	7,377,326

Well ID	Easting (m)	Northing (m)
P59	3,424,292	7,376,856
P58	3,423,843	7,377,120
P56	3,423,549	7,376,628
P54	3,423,192	7,376,096
P52	3,422,922	7,375,604
P50	3,422,596	7,375,191
P26	3,421,723	7,371,445
P23	3,421,723	7,370,747
P20	3,423,455	7,370,023
P21	3,422,247	7,370,000
P24	3,422,263	7,370,731
P27	3,422,279	7,371,461
P28	3,422,819	7,371,477
P32	3,423,438	7,372,064
P25	3,422,819	7,370,715
P22	3,422,787	7,370,016
P48	3,423,327	7,374,676
P53B	3,423,662	7,375,816
P51B	3,423,387	7,375,353
P49	3,423,931	7,375,422
P26B	3,423,427	7,371,495
P23B	3,423,410	7,370,713

12.2.4 Hydrogeological Units and Parameters

12.2.4.1 Main Hydrogeological Units

The geometry of the hydrogeological units was derived from the three-dimensional geological model (Leapfrog) described previously in Section 6.2.

During the calibration, subunits were defined to improve the match between the observed and simulated response. A total of 27 hydrogeological property zones are defined. The main hydrogeological zones that exist at ground surface-i.e., in Layer 1 of the model-are shown in Figure 12-8. A full list of the 27 hydrogeological units is presented in Table 12-4.

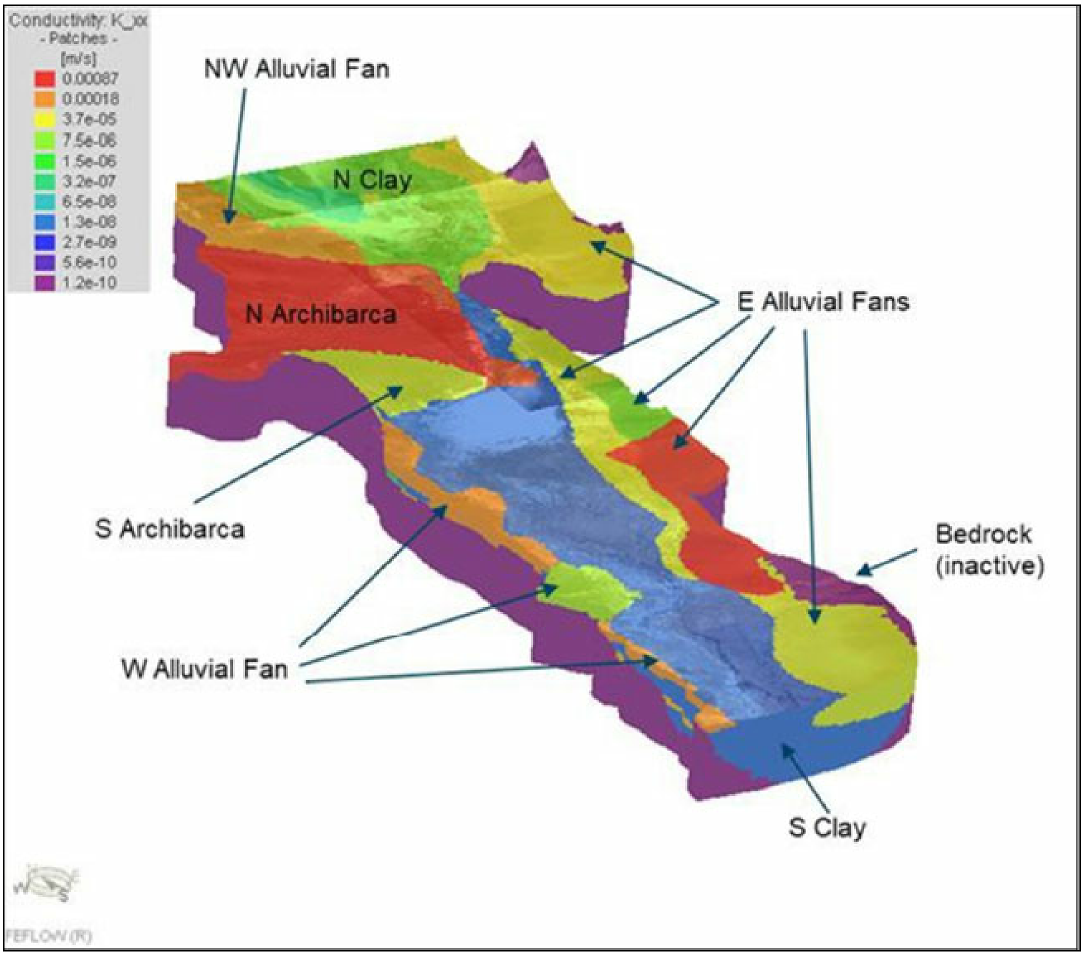


Figure 12-8 - Surficial hydrogeological units.

Table 12-4 - Hydrogeological units.

Hydrogeologic Unit	Description	Model Layers	Conceptual Hydraulic Conductivity horizontal (m/d)	Conceptual Sy
Upper Halite	Low-permeability halite deposits	1 - 32	0.05	0.03
High Sy Halite		7 - 13	0.6	0.11
South Clay		1-32	0.001	0.03

Hydrogeologic Unit	Description	Model Layers	Conceptual Hydraulic Conductivity horizontal (m/d)	Conceptual Sy
North Clay	Fine-grained sediments underlying salar, intercalated with sands and gravels	1 - 32	0.5	0.03
North Sand		17 - 32	2	0.03
High K clay		11 - 14	0.5	0.03
North shallow Archibarca	Unconfined to confined, high-permeability materials associated Archibarca fan	1 - 7	75	0.12
North deep Archibarca		8 - 18	1.95	0.12
South Archibarca		1 - 30	1.95	0.12
Deep Archibarca		19 - 31	1.85	0.12
North Alluvial Fan East	Unconfined, moderate- to high-permeability materials east of Salar de Cauchari	1 - 25	3	0.05
PMC01 Alluvial Fan East		1 - 5	0.5	0.05
PMC02 Alluvial Fan East		1 - 13	75	0.05
South Alluvial Fan East		1 - 19	2	0.05
PMC1&2 Alluvial Fan East		1 - 11	60	0.05
CAU22 Alluvial Fan East		1 - 7	0.5	0.05
CAU05 Alluvial Fan East		1 - 7	60	0.05
CAU25 Alluvial Fan East		1 - 15	2	0.05
Transition Clay		1 - 15	1.8	0.05
PMC03 Alluvial Fan West	Unconfined, moderate- to high-permeability materials west of Salar de Cauchari	1 - 22	0.9	0.12
S1-9 Alluvial Fan West		1 - 10	15	0.12
CAU16 Alluvial Fan West		1 - 15	15	0.12
CAU23 Alluvial Fan West		5 - 11	15	0.12
S10-22 Alluvial Fan West		11 - 23	8	0.12
North Alluvial Fan West		1 - 32	10	0.12
South Alluvial Fan West		17 - 25	1	0.12
Lower Sand	Confined, moderate- to high-permeability basin sediment	12 - 32	0.4	0.14

12.2.4.2 Storage and Unsaturated Parameters

The conceptual specific storage (Ss) for all active zones of the model is $1x10^{-4}$ m^{-1}, except the clay units with a Ss value of $1x10^{-6}$ m^{-1}. The specific storage was calibrated to the pumping test data (see Section 12.3.1), and only minor adjustments to this parameter were required (see Section 12.4).

The FEFLOW model was run using a variably saturated configuration. FEFLOW's modified van Genuchten parameterization was used. The parameters used in the FEFLOW model for unconfined materials are shown in Table 12-5.

Table 12-5 - Unsaturated parameters.

Hydrogeologic Unit	Porosity	Sr *	α (m^{-1})	n	m	δ	Effective Sy**	Conceptual Sy
Halite	0.05	0	1	1.5	0.33	1	0.03	0.03
Clay	0.4	0.2	0.2	1.19	0.15	2	0.03	0.03
North Sand	0.4	0.1	0.2	1.19	0.15	7	0.03	0.03
Archibarca Alluvial Fan	0.25	0.1	1.1	1.5	0.33	1.5	0.12	0.11
East Alluvial Fan	0.2	0.1	0.5	1.35	0.25	2	0.05	0.05
Transition Clay	0.2	0.1	0.5	1.35	0.25	2	0.05	0.05
West Alluvial Fan	0.25	0.1	1.1	1.5	0.33	2.5	0.12	0.11
Lower Sand	0.25	0.1	1.2	1.5	0.33	2	0.12	0.14

Notes: *Sr = θrφ, or the residual saturation

** Effective Sy is the amount water released from storage due to a water table drop of 1 m from a soil column extending from the final water table elevation to a height of 3 m above the initial water table elevation

12.2.5 Lithium Transport Parameters

12.2.5.1 Mass Porosity

In addition to groundwater flow, the FEFLOW model was configured to simulate the mass transport of lithium in support of the reserve calculation. In these simulations, the mass porosity is assumed to equal the specific yield in the FEFLOW model. These values are listed in Table 12-5.

12.2.5.2 Dispersivity

The longitudinal dispersivity was set to a constant value of 30 m, and the horizontal and vertical transverse dispersivity values were set to 3 m.

12.2.6 Initial Lithium Concentration Distribution

The initial distribution of lithium concentrations for the reserve estimate simulations was based on the kriged (SGeMS) lithium concentration used in the resource estimation for the areas within the Allkem properties and as described in chapter 11 above. Third party information (Exar) outside the Allkem properties was used to expand the distribution of initial lithium concentration laterally and vertically throughout the FEFLOW model domain. The initial distribution of lithium concentrations is shown in Figure 12-9. Approximately 1.25 million t of lithium Resources are present in the FEFLOW model domain at the beginning of the simulation.

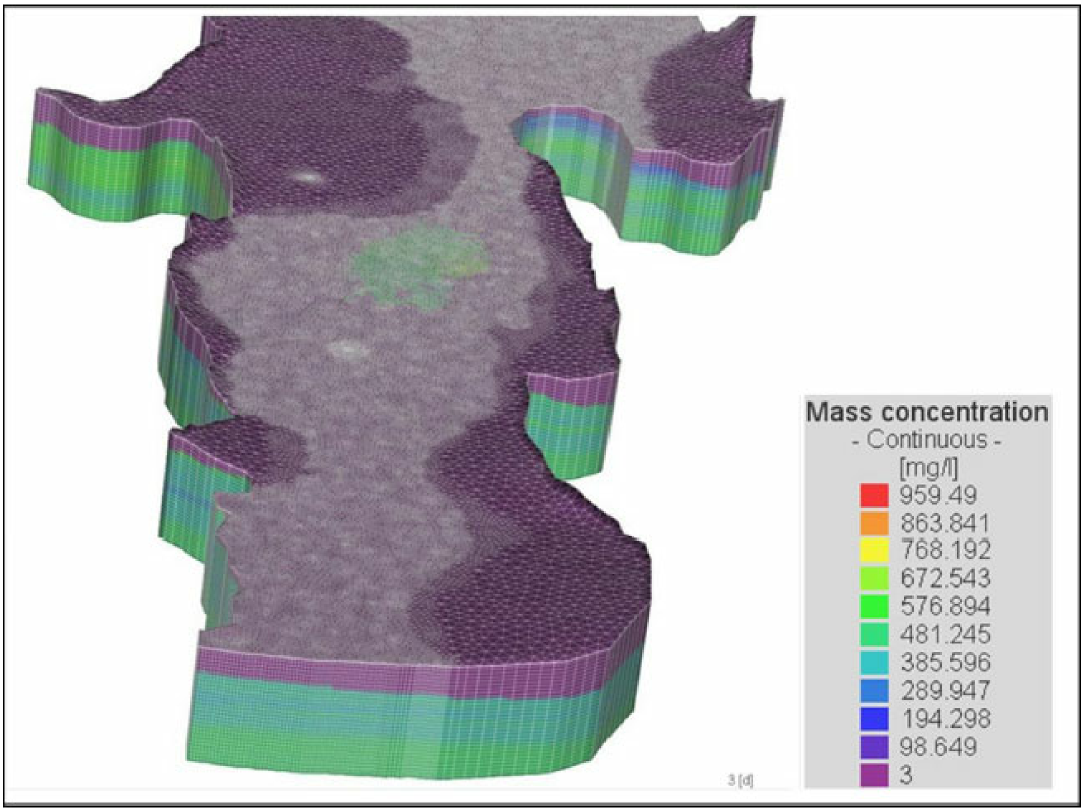


Figure 12-9 - Distribution of initial lithium concentration.

12.2.7 Density Considerations

Fluid density is an important factor in the movement of groundwater in and around a brine salar. Key flow processes related to Salar de Cauchari are illustrated in Figure 12-10. Groundwater is recharged by fresh rainfall primarily at higher elevations, with a secondary component of direct recharge as shown in Figure 12-3. Freshwater flows through the alluvium around the salar and discharges via evaporation or stream baseflow near the freshwater-brine interface and, to a lesser degree, within the salar itself. When dense brine has established itself in the salar, the circulation within the salar, caused by evaporation and density-driven convection within the clay core and halite, is generally a small proportion of the total water balance. In other words, the recharge and discharge of freshwater occurs at a larger rate than the circulation and evaporation of brine. Additionally, the vertical anisotropy identified at some of the alluvial fans (Archibarca fan in particular) precludes vertical groundwater flow, minimizing mixing of freshwater and brine.

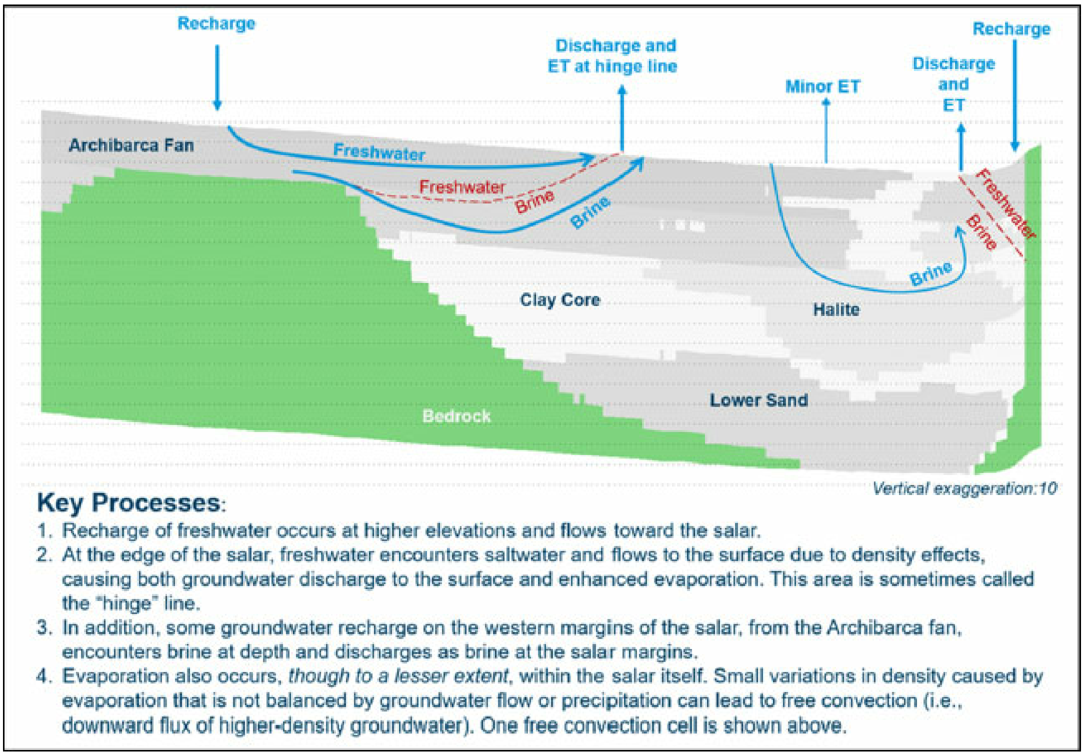


Figure 12-10 - Conceptualization of key density-dependent flow processes relevant to Cauchari JV Project.

The computational burden of simulating variable-density groundwater flow is significant. For the purposes of the predictive model simulation, the three-dimensional groundwater flow and transport model was configured to assume single-density groundwater. Figure 12-11 illustrates the generalized approach to simulating the flow processes in the three- dimensional model. As in the variable-density system shown in Figure 12-10 groundwater recharges at higher elevations and at the margins between the alluvial fans and the clay core of the salar. This freshwater from recharge flows toward the salar and discharges at approximately the location of the freshwater-brine interface due to the change in topographic slope that coincides with the brine-freshwater interface. Due to the lower evaporation rate of brine in the salar compared to freshwater and brine discharge at the margins, additional groundwater discharges via evaporation in the center of the salar, but the magnitude of this flow is lower than that which discharges at the margins of the salar.

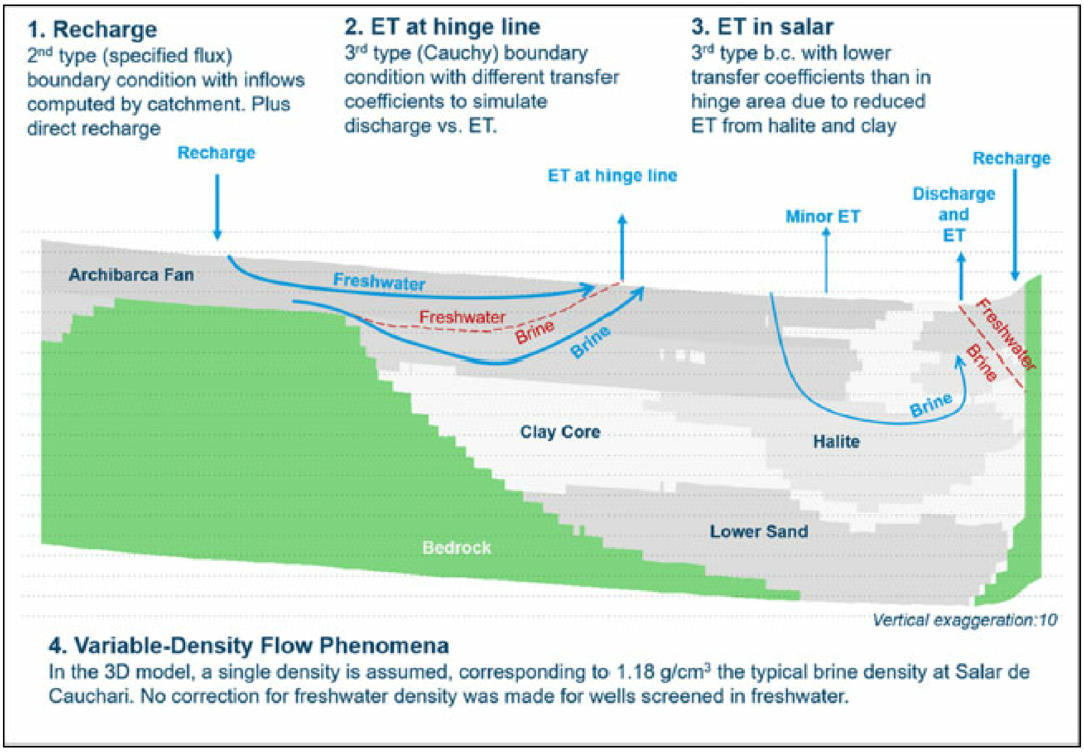


Figure 12-11 - Salar de Cauchari numerical modeling approach.

As a general observation, ignoring density effects will result in greater groundwater mixing and dilution. Therefore, the use of a single-density model for the predictive simulations will provide a conservative estimate of the reserve by allowing more mixing with recharging freshwater.

12.2.8 Solver and Convergence Criteria

The flow solver used in the FEFLOW runs is the Algebraic Multigrid (AMG) Methods for Systems (SAMG) solver with a maximum of 50 AMG cycles and 200 PCG iterations. The transport equation was also solved with the SAMG solver with these settings: a root mean squared (RMS) Euclidian L2 error tolerance of 1×10^{-5}, with a maximum of 10 outer iterations.

12.3 Mine and Plant Production Scenarios

12.3.1 Calibration Methodology

The flow model was calibrated under steady state and transient conditions to:

1) fit the static water levels in Project area wells.

2) match the conceptual water balance.

3) simulate two pumping tests.

A combination of manual and automated calibration was completed under both steady state and transient conditions. This section describes the calibration methodology. Calibration results are presented in Section 12.4.

12.3.1.1 Steady State Calibration

The steady state calibration was designed to identify the best fit values of all hydraulic conductivities as well as the transfer coefficients used to simulate evaporation (Section 12.2.4). Manual and automated calibrations were completed. For the automated calibration, FEFLOW's built-in version of the PEST parameter optimization program, FePest, was applied.

Water level measurements in 23 monitoring wells within the model domain were used as calibration targets. Figure 12-12 shows the location of the monitoring wells used as head calibration targets, and Table 12-6 lists these wells and the target water level for the well.

In addition to head calibration targets, flux targets from the conceptual water balance were introduced to the Fepest run. Table 12-7 lists the calibration targets for fluxes in the FEFLOW domain. The total recharge for the FEFLOW domain is estimated at approximately 730 l/s and groundwater discharge through evaporation from the model domain is approximately 810 l/s. The conceptual water balance closes with a 10 % error which is considered adequate for defining the numerical model calibration targets.

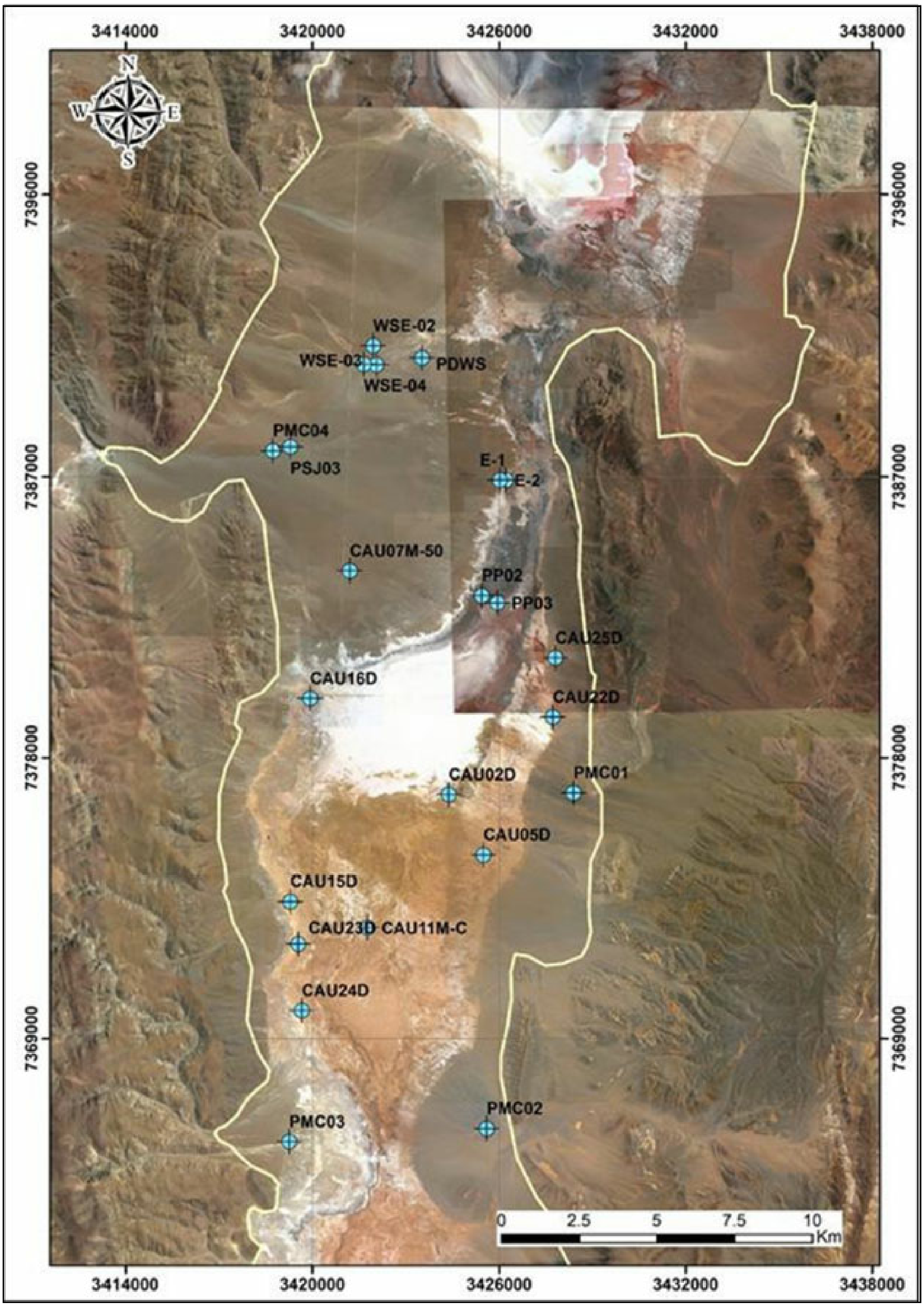


Figure 12-12 - Monitoring wells used in the model calibration.

Table 12-6 - Water level information used for the model calibration.

Well ID	Easting	Northing	Topography (masl)	Screen Midpoint (masl)	Measured Piezometric Head (masl)	Geology
CAU02D	3,424,385	7,376,814	3,940.80	3,821.60	3,940.00	High-Sy Halite
CAU07M-50	3,421,200	7,383,987	3,944.30	3,917.50	3,944.90	Archibarca Fan
CAU11M-C	3,421,769	7,372,564	3,939.30	3,886.80	3,941.30	Halite
CAU22D	3,427,728	7,379,299	3,946.10	3,872.50	3,947.60	East Alluvial Fan
CAU24D	3,419,658	7,369,902	3,941.80	3,694.70	3,943.40	West Alluvial Fan
CAU25D	3,427,810	7,381,196	3,944.60	3,935.00	3,943.40	East Alluvial Fan
PMC01	3,428,394	7,376,871	3,954.50	3,925.00	3,955.00	East Alluvial Fan
PMC02	3,425,602	7,366,116	3,946.60	3,956.40	3,947.40	East Alluvial Fan
PMC03	3,419,256	7,365,692	3,946.60	3,928.10	3,948.80	West Alluvial Fan
PMC04	3,418,734	7,387,835	3,947.70	3,973.10	3,947.60	Archibarca Fan
CAU05D	3,425,500	7,374,882	3,945.70	3,935.60	3,946.90	East Alluvial Fan
CAU15D	3,419,292	7,373,396	3,939.70	3,931.30	3,941.80	West Alluvial Fan
CAU16D	3,419,924	7,379,892	3,941.70	3,890.80	3,941.30	West Alluvial Fan
CAU23D	3,419,549	7,372,041	3,940.80	3,868.00	3,941.10	West Alluvial Fan
PSJ03	3,419,290	7,387,964	3,946.60	3,897.50	3,946.80	Archibarca Fan
WSE-02	3,421,958	7,391,153	3,944.30	3,925.90	3,945.10	Archibarca Fan
WSE-03	3,422,063	7,390,544	3,944.50	3,900.10	3,945.10	Archibarca Fan
WSE-04	3,421,658	7,390,563	3,944.60	3,903.50	3,945.50	Archibarca Fan
PDWS	3,423,521	7,390,768	3,943.70	3,927.30	3,944.50	Archibarca Fan
PP02	3,425,450	7,383,196	3,941.40	3,931.60	3,940.40	Archibarca Fan
PP03	3,425,950	7,382,963	3,940.90	3,930.50	3,939.20	Archibarca Fan
E-1	3,426,222	7,386,893	3,943.00	3,933.50	3,942.70	Archibarca Fan
E-2	3,426,032	7,386,895	3,943.10	3,934.10	3,942.60	Archibarca Fan

Table 12-7 - Water balance components within the FEFLOW domain.

Water Balance Component	Target Flowrate (L/s)
Direct Recharge	190
Lateral Recharge / Inflows	540
Evaporation	810

12.3.1.2 Transient Calibration

Transient water level data from two pumping tests were used to calibrate the model with regard to changing hydraulic heads over time. The pumping well locations are shown on Figure 12-7. The pumping tests were conducted in 2018 and 2019. The pumping period of the tests had a duration of 30 days at CAU07R and 30 days at CAU11R (Table 12-8). The pumping rates ranged from 22 l/s at CAU07R to 18 l/s at CAU11R.

Pumping well CAU07R is screened in the intercalated sand, gravel, and clay units, including the Archibarca fan (see Figure 12-13). CAU11R is screened in the halite, clay, and lower sand units (see Figure 12-14).

The changes in hydraulic head since the beginning of pumping (drawdowns) and not absolute water level values were used as calibration targets. This approach was chosen since the absolute hydraulic head values were constrained during the steady state calibration, and the focus of the transient calibration is the magnitude of the change in hydraulic head that is induced by pumping. The observation wells for each pumping test and their completion intervals and distances to the pumping wells are summarized in Table 12-9.

A node spacing of 1 to 5 m around the pumping wells (see Section 12.2.1) is insufficient to resolve turbulent well losses, and the observed hydraulic head from the pumping wells themselves were not used for the transient calibration.

Table 12-8 - Water balance components within the FEFLOW domain.

Name	Pumping Rate (L/s)	Start	End	Duration (days)
CAU07R	22	11/12/2018	9/1/2019	30
CAU11R	18	25-10-2018	23-11-2018	30

All hydro stratigraphic units that intersected by the pumping and observation wells were included in the transient calibration as adjustable parameters. After each change in the adjustable parameters, the steady state model simulation was re-run, and the steady state hydraulic heads were imported into the transient model as initial heads from which the drawdown was computed.

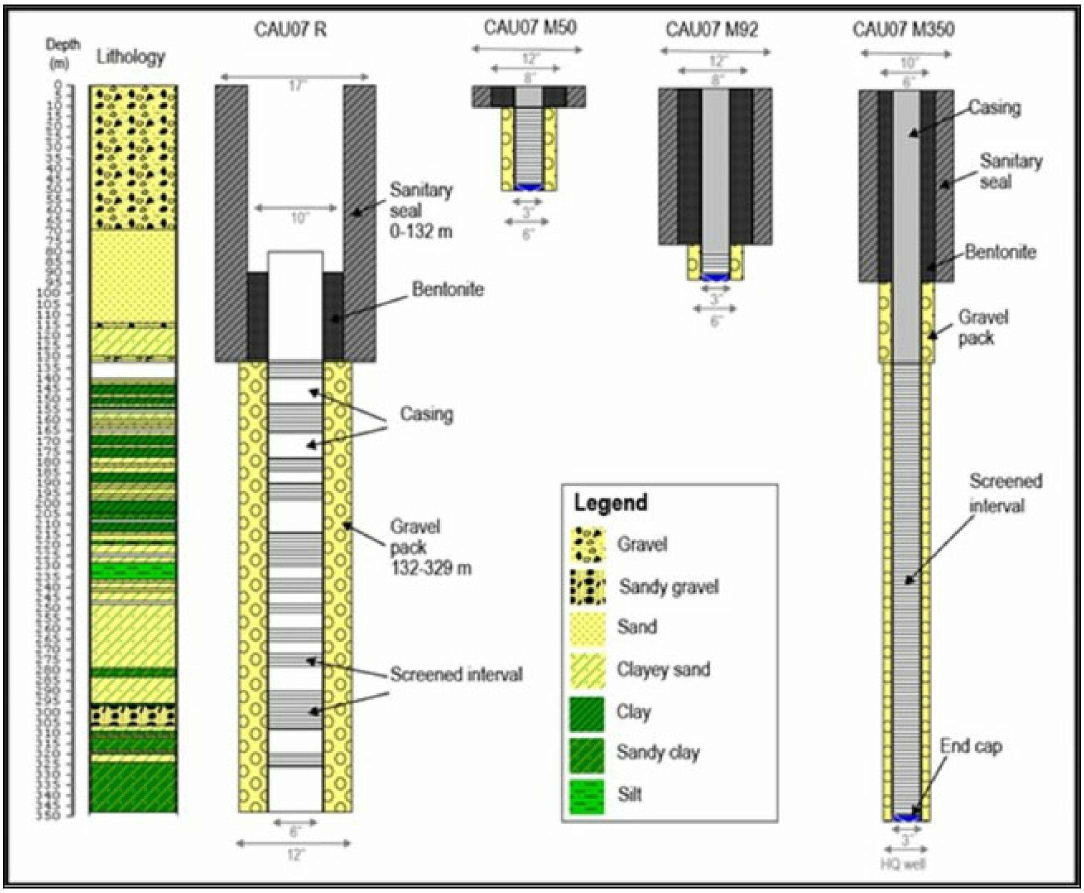


Figure 12-13 - CAU07R Pumping well and observation well stratigraphy.

Table 12-9 - Observation wells for pumping tests.

Pumping Test	Observation Well	Open/Screened Interval (mbtc)	Hydrostratigraphic Unit	Distance to Pumping Well (m)
CAU07R	CAU07-M50	3,917.13 - 3,954.13	Archibarca Fan	15.63
	CAU07-M92	3,875.13 - 3,884.13	Archibarca Fan	15.45
	CAU07-M350	3,617.13 - 3,834.13	Archibarca Fan - Clay	14.06
CAU11R	CAU11-MA	3,529.22	Lower Sand	15
	CAU11-MB	3,766.22 - 3,796.22	High K Clay - Halite	18
	CAU11-MC	3,882.22 - 3,911.22	Clay - Halite - Alluvial Fan West	24

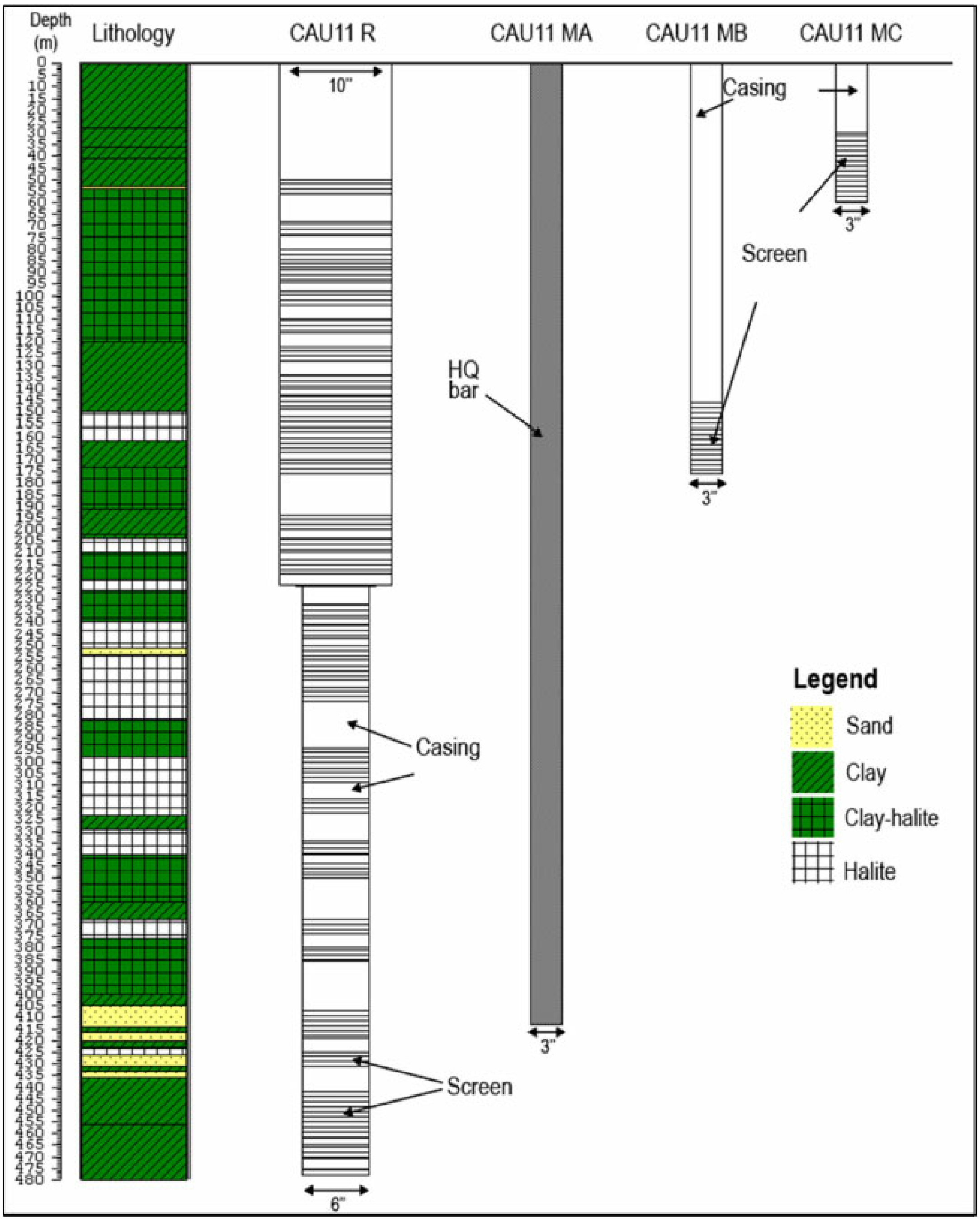


Figure 12-14 - CAU11R pumping well and observation well stratigraphy.

12.4 Calibration Results

12.4.1 Calibrated Parameters

Table 12-10 presents the final calibrated hydraulic conductivity and specific storage values. The calibrated specific storage values for the South Archibarca fan are 1.25x10^{-4} m^{-1} and

1.25x10^{-6} m^{-1} for the clay units. All other hydrogeological units retain the default FEFLOW specific storage value of 1x10^{-4} m^{-1}.

Table 12-10 - Calibrated values of hydraulic conductivity and specific storage.

Hydrogeologic Unit	Calibrated Hydraulic Conductivity (m/d)		Specific Storage (1/m)
	Horizontal	Vertical	
Upper Halite	0.05	0.005	1.00E-04
High Sy Halite	0.6	0.06	1.00E-04
South Clay	0.001	0.0005	1.00E-06
North Clay	0.5	0.005	1.00E-06
North Sand	2	0.2	1.00E-04
High K clay	0.5	0.0005	1.00E-06
North shallow Archibarca	75	0.005	1.00E-04
North deep Archibarca	1.95	0.005	1.00E-04
South Archibarca	1.95	0.005	1.25E-04
Deep Archibarca	1.85	0.095	1.25E-04
North Alluvial Fan East	3	0.3	1.00E-04
PMC01 Alluvial Fan East	0.5	0.003	1.00E-04
PMC02 Alluvial Fan East	75	7.5	1.00E-04
South Alluvial Fan East	2	0.2	1.00E-04
PMC1&2 Alluvial Fan East	60	0.1	1.00E-04
CAU22 Alluvial Fan East	0.5	0.0025	1.00E-04
CAU05 Alluvial Fan East	60	0.1	1.00E-04
CAU25 Alluvial Fan East	2	2	1.00E-04
Transition Clay	1.8	0.9	1.00E-04
PMC03 Alluvial Fan West	0.9	0.009	1.00E-04
S1-9 Alluvial Fan West	15	0.5	1.00E-04
CAU16 Alluvial Fan West	15	1.5	1.00E-04
CAU23 Alluvial Fan West	15	1	1.00E-04
S10-22 Alluvial Fan West	8	0.8	1.00E-04
North Alluvial Fan West	10	1	1.00E-04

Hydrogeologic Unit	Calibrated Hydraulic Conductivity (m/d)		Specific Storage (1/m)
	Horizontal	Vertical	
South Alluvial Fan West	1	0.1	1.00E-04
Lower Sand	0.4	0.1	1.00E-04

12.4.2 Calibration to Heads

The calibration results are shown in Figure 12-15 with a map-view of the calibration residuals. The simulated and observed hydraulic head values are compared in Table 12-11. The residual mean of the calibrated model is -0.2 m, and the absolute residual mean is 1.0 m, for a normalized root mean squared error (NRMSE) of 7.2%.

The maximum negative residual is at PP03, where the head value is over-predicted by 1.9 m. The maximum positive residual is at PSJ03, where the well's water level is under- predicted by 2 m. Overall, the model is considered calibrated with respect to pre-mining steady state heads, due to a NRMSE that is less than 10% and an absolute residual mean that is 1 m or less.

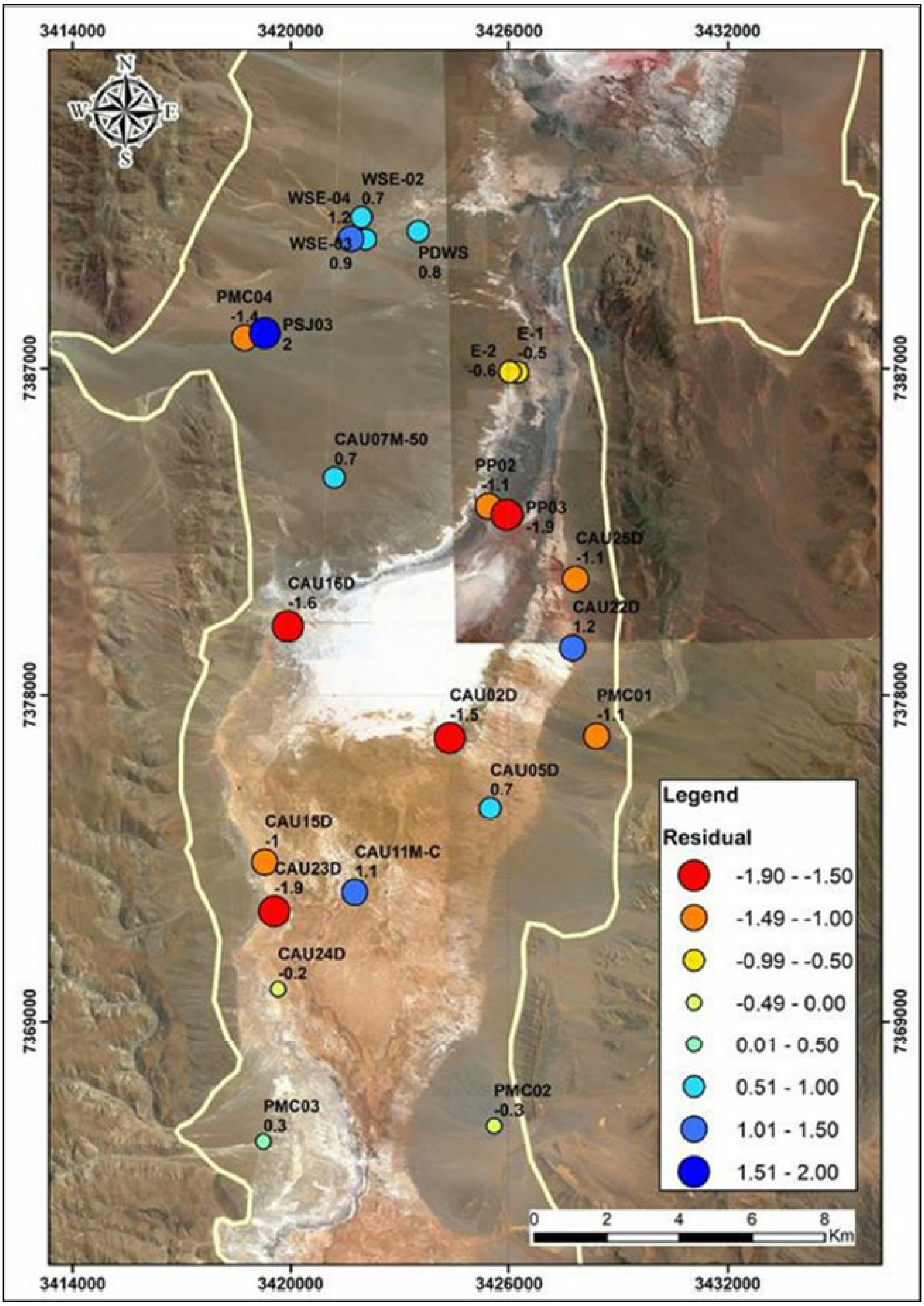


Figure 12-15 - Calibration residual map - (measured-observed values).

Table 12-11 - Observed and simulated water levels.

Well ID	Piezometric Head (masl)		Residual (m)
	Measured	Simulated	
CAU02D	3,940.00	3,941.50	-1.5
CAU07M-50	3,944.90	3,944.20	0.7
CAU11M-C	3,941.30	3,940.20	1.1
CAU22D	3,947.60	3,946.40	1.2
CAU24D	3,943.40	3,943.50	-0.2
CAU25D	3,943.40	3,944.40	-1.1
PMC01	3,955.00	3,956.10	-1.1
PMC02	3,947.40	3,947.70	-0.3
PMC03	3,948.80	3,948.50	0.3
PMC04	3,947.60	3,948.90	-1.4
CAU05D	3,946.90	3,946.20	0.7
CAU15D	3,941.80	3,942.80	-1
CAU16D	3,941.30	3,942.90	-1.6
CAU23D	3,941.10	3,943.00	-1.9
PSJ03	3,946.80	3,944.80	2
WSE-02	3,945.10	3,944.40	0.7
WSE-03	3,945.10	3,944.20	0.9
WSE-04	3,945.50	3,944.30	1.2
PDWS	3,944.50	3,943.70	0.8
PP02	3,940.40	3,941.50	-1.1
PP03	3,939.20	3,941.10	-1.9
E-1	3,942.70	3,943.20	-0.5
E-2	3,942.60	3,943.20	-0.6

12.4.3 Calibration to Flows

The fluxes from the calibrated steady state model are shown in Table 12-12. The total inflow simulated by the model is 731 l/s, which is equal to the 730 l/s of the conceptual model. The simulated direct recharge of precipitation, 190 l/s, is within 2% of the conceptual value of 194 l/s. The lateral recharge from catchments located east and west of Salar de Cauchari is 455 l/s in the FEFLOW and 443 l/s in the conceptual model.

Table 12-12 shows that the total simulated evaporative losses from the FEFLOW model equal 734 l/s, compared to the conceptual value of 810 l/s. The model predicts that 61% of the evaporation occurs along the margins of the salar: 39% of the total evaporation occurs from freshwater portions of the margin, and 22% of the total evaporation occurs from the saltwater portions of the salar margin. Only 2% of the total evaporation is simulated to occur from within the salar itself, in the halite or clay zones. This is consistent with the assumptions made in the simplification of the variable density system into a single density model (see Section12.7.2). The FEFLOW water balance closes with an error less than 1% which is considered adequate for the predictive model simulations further described in Section 12.5 below.

Table 12-12 - Simulated water balance.

Water Balance Component		Simulated Flux (L/s)
Inflow	Direct Recharge	191
	Lateral Recharge / Inflows	541
Outflow	Evaporation	732
	Edge of Alluvial Fans - Fresh Water	283
	Clay	277
	Salar nucleus	11
	Carbonates	3
	Archibarca Brine	158

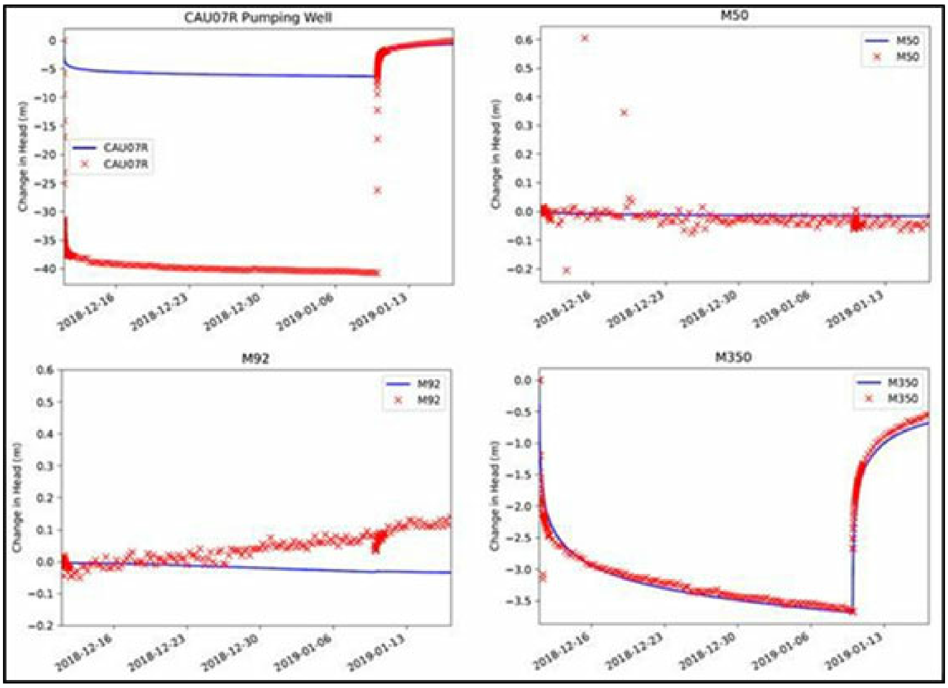
12.4.4 Transient Calibration

12.4.4.1 Pumping Test CAU07R (Simulated)

The observed and simulated drawdowns at CAU07R and its three observation wells in the Archibarca wellfield area are shown on Figure 12-6. The maximum simulated drawdowns in the three observation wells at the end of the pumping period match closely the observed drawdowns as shown in Table 12-3 and the CAU07R pumping test is well- matched by the model.

Table 12-13 - Maximum simulated and observed drawdown values, CAU07 pumping test.

Pumping Test	Observation Well	Maximum Simulated Drawdown (m)	Maximum Observed Drawdown (m)
CAU07R	CAU07-M50	0.01	~0
	CAU07-M92	0.034	0.05
	CAU07-M350	3.68	3.67



12.4.4.2 Pumping Test CAU11R (Simulated)

The simulated drawdowns at CAU11R and its three observation points are compared to observed drawdowns on Figure 12-17. The simulated drawdown at CAU11-MB (completed in the clay and halite units is approximately equal to the observed drawdown (Table 12-14). The overall shape of the drawdown is also generally matched, except for the 5-day period near the end of the test. CAU11-MA completed in the lower sand, and CAU11-MC, completed in the shallow halite display observed drawdowns below 2.0 m. The model predicts higher drawdowns at both locations.

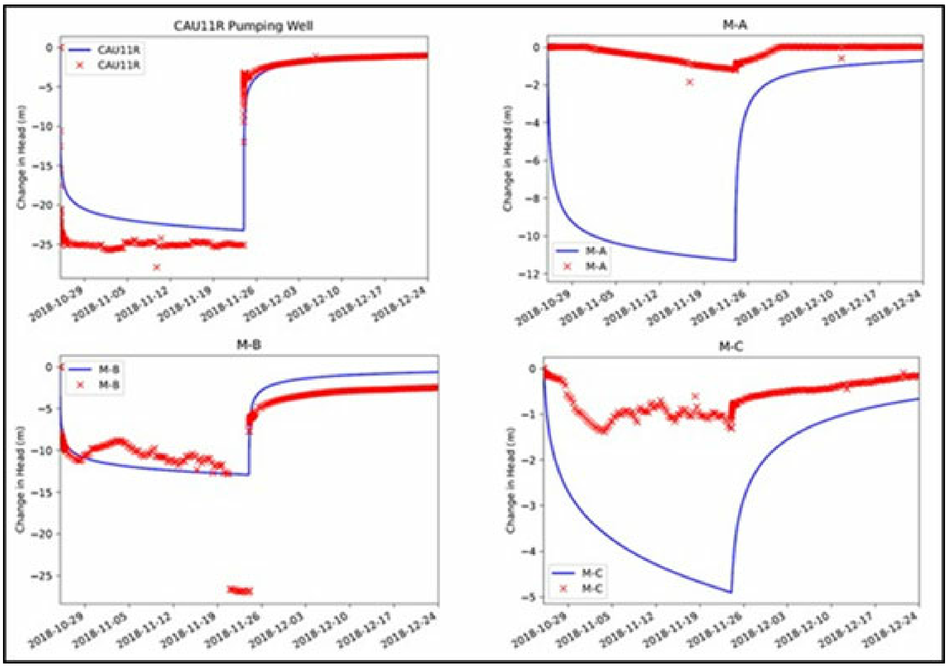


Figure 12-17 - Simulated and observed change in head (m), CAU11R pumping test.

Table 12-14 - Maximum simulated and observed drawdown values, CAU07 pumping test.

Pumping Test	Observation Well	Maximum Simulated Drawdown (m)	Maximum Observed Drawdown (m)
CAU11R	CAU11-MA	11.8	1.85
	CAU11-MB	12.9	12.7
	CAU11-MC	5	1.4

It is possible that poor development (clogging) of the CAU11-MA observation well resulted in the reduced drawdown measurements during the pumping test.

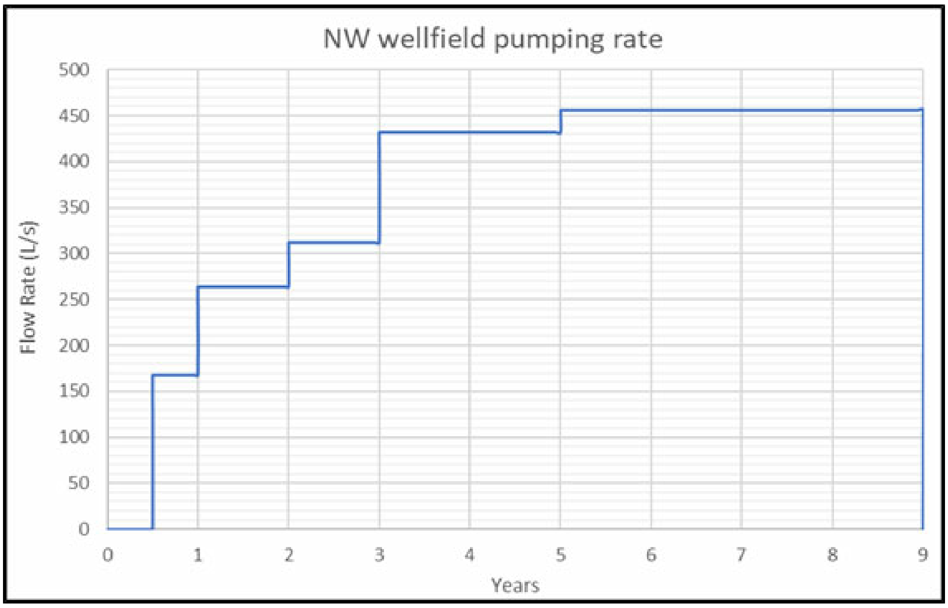
12.5 Brine Production Simulations

12.5.1 Wellfield Production Rates

The calibrated model was used to predict lithium extraction rates from the Salar de Cauchari during the proposed 30-year mine life with a target lithium carbonate equivalent (LCE) extraction rate of 25 kilotonnes per year (ktpy) assuming a process lithium recovery efficiency of 67%. The locations of the brine production wells are shown in Figure 12-7 and Table 12-2 and Table 12-3. As described in Section 12.3.1 the brine production wells are simulated boundary condition nodes as well.

Twenty-two (22) wells are proposed for the NW Sector wellfield in the Archibarca fan area during the first nine years of mine life. The NW production wells target the brine in the lower part of the Archibarca unit. Each well is simulated to pump at a rate of 24 l/s as supported by the CAU07 pumping test results. The NW wellfield pumping schedule is illustrated in Figure 12-18. During the initial three-year ramp-up period, the combined pumping rate increases from 168 l/s in Year 1 to 312 l/s during Year 3.

Forty-five (45) wells are proposed for the SE Sector wellfield with a pumping schedule as shown in Figure 12-18. As for the NW wellfield, production wells are replaced on a regular basis during the LOM. The SE wellfield targets brine in the halite, clay, and Lower Sand units from Year 9 to Year 30 of operations. The proposed total pumping rate from the southeast wells is a constant 480 l/s.



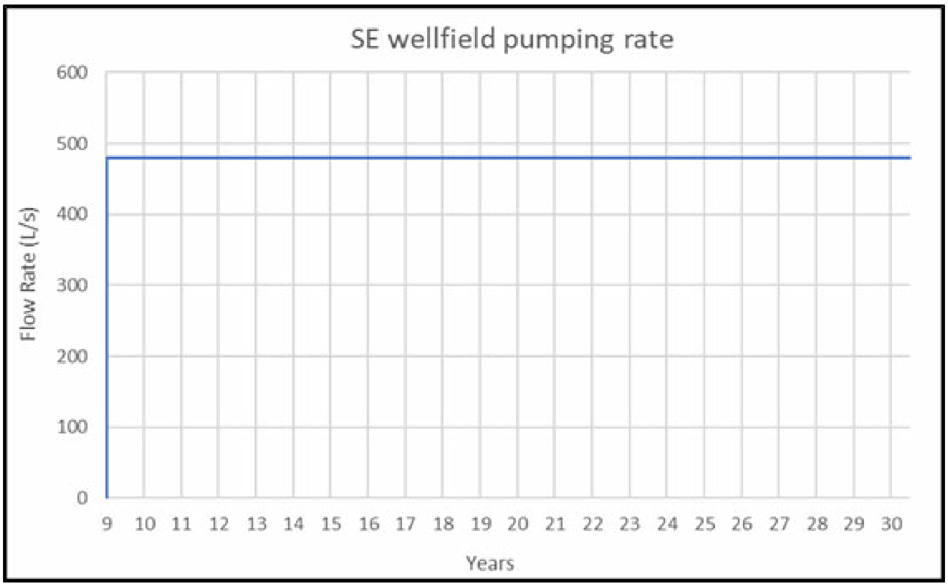


Figure 12-18 - Simulated NW and SE wellfields pumping rates.

12.5.2 LCE Production

Figure 12-19 shows the simulated annual LCE contained in brine pumped from the NW and SE wellfield areas as input to the evaporation ponds. Figure 12-20 shows the modelled LOM evolution of Li concentrations. The initial Li concentration in the pumped brine from the NW wellfield is 580 mg/l in Year 1 and gradually declines to 520 mg/l by Year 8. The initial Li concentration of the brine pumped from the SE wellfield gradually declines from 490 mg/l in Year 9 to 465 mg/l in Year 30. The resulting Li concentrations applied in the PFS cost analyses as further described in Section 19 are: 580 mg/l for Years 1-5, 545 mg/l for Years 6-9, and 490 mg/l for Years 9 - 30. It is expected that through further optimization of the well-field configurations and pumping schedules the overall LOM Li concentrations can be improved.

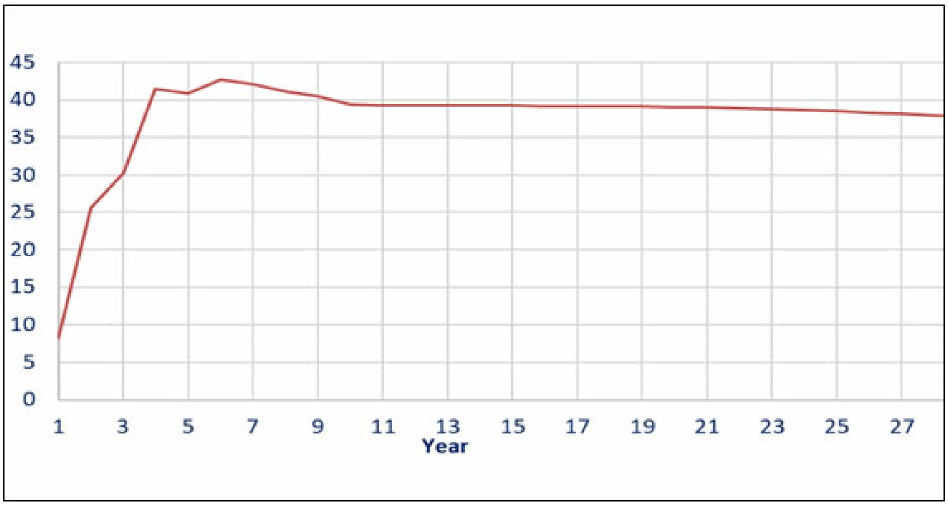


Figure 12-19 - NW and SE wellfield annual LCE production.

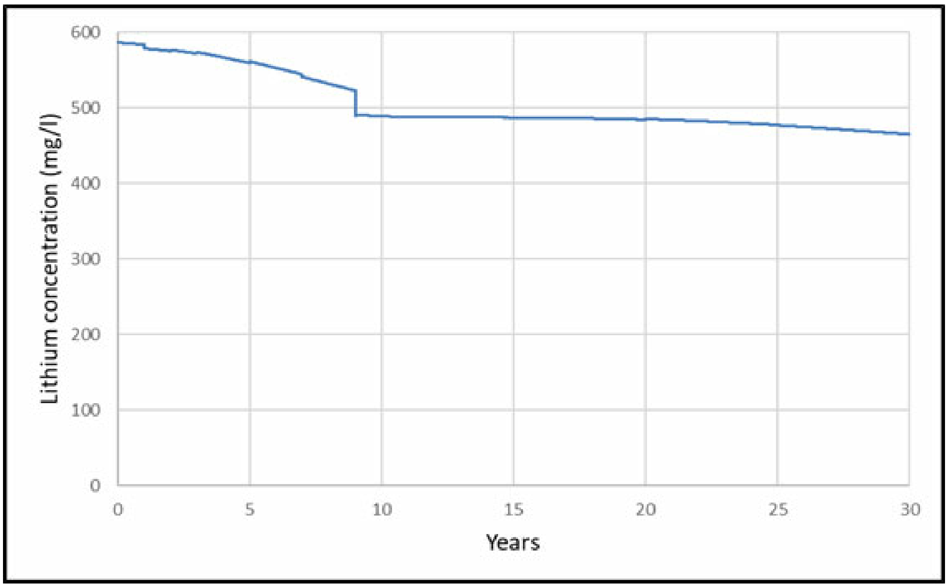


Figure 12-20 - Li concentration of the brine pumped from the NW and SE wellfields.

12.6 Mineral Reserve Estimate

The lithium reserve estimate was carried out based on a FEFLOW multi-species simulation. Each resource type is a specie in the model. Four species were defined for characterizing the Measured, Indicated and Inferred Resources and any brine coming from outside the Cauchari properties. first seven years of production (with production in the NW extending for 9 years). Lithium Reserves derived after Year 7 from the Measured and Indicated Resources in the NW and SE wellfield areas were categorized as Probable Reserves. Results of a separate model simulation to evaluate the potential effect of the neighboring LAC brine production (according to LAC Updated Feasibility Study of January 2020) showed that there is no material impact on the Cauchari Reserve Estimate. An operating agreement between Allkem and LAC regulates and mitigates any effects of intercompany wellfield interference in Salares de Olaroz and Cauchari.

Table 12-15 - Cauchari Project Lithium Reserve Estimate (June 30, 2023).

Category	Year	Brine Vol (Mm3)	Average Lithium Grade (mg/L)	Lithium (kt)	Li2CO3 Equivalent (kt)
Proven	1-7	76	571	43	231
Probable	8-30	347	485	169	897
Total	**1-30**	**423**	**501**	**212**	**1,128**

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Mineral Resources and Mineral Reserves estimate is Mr. F. Reidel AIPG for Cauchari.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li2CO3) with a conversion factor of 5.323.
5. The cut-off grade used to report Cauchari Mineral Resources and Mineral Reserves is 300 mg/l.
6. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
7. The effective date of this Reserve Estimate is June 30, 2023.
8. The Lithium Reserve Estimate represents the lithium contained in the brine produced by the wellfields as input to the evaporation ponds. Brine production initiates in Year 1 from wells located in the NW Sector. In Year 9, brine production switches across to the SE Sector of the Project.
9. Approximately 25% of M+I Resources are converted to Total Reserves.
10. Potential environmental effects of pumping have not been comprehensively analyzed at the PFS stage. Additional evaluation of potential environmental effects will be done as part of the next stage of evaluation.
11. Additional hydrogeological test work will be required in the next stage of evaluation to adequately verify the quantification of hydraulic parameters in the Archibarca fan area and in the Lower Sand unit as indicated by the sensitivity analysis carried out on the model results. Mineral Reserves are derived from and included within the M&I Resources in resource table (Table 11-6).
12. Indicated Resources of 894,000t LCE contained in the West Fan Unit are not included in this PFS production profile. There is a reasonable prospect that through additional hydrogeological test work Inferred Resources in the Lower Sand Units will be converted to M+I Resources.

The cut-off grade is based on the various inputs and formula below:

$$Cutoff\ Grade = \frac{\frac{(Total\ Capital\ Expenditure\ +\ Total\ Operating\ Expenditure)}{Total\ Brine\ Extracted}}{(Recovery * Conversion\ from\ Li\ to\ LiCO_3 * Projected\ LCE\ Price * (1 - Export\ Duties) * (1 - Royalties))}$$

Where:

Total Capital Expenditure = US$ 1,255 million

Total Operating Expenditure = US$ 3,020 million

Cost of Capital = US$ 126 million (10 percent of Total Capital)

Total Brine Extracted = 424 Mm^3

Conversion from Li to Li2CO3 = 5.323

Projected LCE Price = US$ 20,000 per metric ton of LCE

Export Duties = 4.5%

Royalties = 3.0%

Calculated Recovery = 66%

Resulting in a calculated cut-off grade of 159 mg/l.

The cut-off grade was elevated to 300 mg/l to increase margin and de-risk the uncertainties around price fluctuations. The cut-off grade is used to determine whether the brine pumped will generate a profit after paying for costs across the value chain.

12.7 Assumptions and Reserve Estimate Risks

12.7.1 Sensitivity Analyses

Eighteen sensitivity runs were completed on the FEFLOW model parameters selection. The sensitivity analyses indicate that model parameter selection result in a relative stable model, suitable for the simulations carried out as part of this PFS. The selection of values for the anisotropy ratio of the horizontal and vertical hydraulic conductivities in the Archibarca unit are important to the evolution of lithium concentrations and the reserves derived from the NW wellfield area; further work is recommended to verify the quantification of these parameters.

12.7.2 Limitations

The predictions of the numerical model developed for this study are based on the creation of a digital representation (3D numerical model) of built and natural systems. The construction of the model requires assumptions and simplifications, which create inherent limitations in the accuracy of the results. Any decision made based on the modeling work should consider these assumptions and limitations. The calibration of the numerical model, although it reduces the parametric uncertainty of the numerical model, does not represent a unique solution to reproduce the values observed in the field or in the conceptual model. This means that more than one system of parameters or boundary conditions system can reproduce the observed field data. The groundwater numerical model provides a reasonable representation of the system and the compatibility with the conceptual model and the intervals of the probable or exact solutions.

13. MINING METHODS

This section describes the brine extraction methods and related infrastructure.

13.1 Mine Method - Brine Extraction

Lithium bearing brine hosted in pore spaces within sediments in the salar will be extracted by pumping using a series of production wells to pump brine to evaporation ponds for its concentration; extraction of brine does not require open pit or underground mining.

Based on the results of the pumping tests carried out for the Project (as described in Section 7 above), the brine abstraction from Salar de Cauchari will take place by installing and operating two conventional production wellfields. The brine production will take place initially from a wellfield in the NW Sector immediately adjacent to the evaporation ponds on the Archibarca Fan from Year 1 through to Year 9. After Year 9 it is planned that the brine production will shift to a second wellfield constructed in the SE Sector.

The annual numerical values and totals for the Life of Mine (LOM) production, including the quantities pumped from the wellfields with associated solution grades, the overall recovery, and final salable product are detailed in the Table 13-1.

Table 13-1 - Annual numerical values and totals of Life of Mine (LOM) production

Fiscal Year	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Wells	Million l	-	-	-	2,676	8,326	10,245	13,624	13,781	14,380	14,380	14,380	14,819	15,137	15,137	15,137	15,137	15,137	15,137
Lithium Grade	mg Li/l	-	-	-	579	579	554	572	559	559	551	539	514	490	488	488	487	487	487
Overall Recovery	%	-%	-%	-%	-%	60%	82%	60%	61%	58%	59%	61%	62%	63%	64%	64%	64%	64%	64%
Production	tpa Li2CO3	-	-	-	-	15,460	24,612	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Fiscal Year	**Units**	**2042**	**2043**	**2044**	**2045**	**2046**	**2047**	**2048**	**2049**	**2050**	**2051**	**2052**	**2053**	**2054**	**2055**	**2056**	**2057**	**2058**	**LOM**
Wells	Million l	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	-	-	424,494
Lithium Grade	mg Li/l	487	487	486	486	485	485	484	483	481	480	477	475	473	471	469	-	-	500
Overall Recovery	%	64%	64%	64%	64%	64%	64%	64%	64%	65%	65%	65%	65%	66%	66%	66%	-%	-%	66%
Production	tpa Li2CO3	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	-	740,072

Note: Overall Recovery is calculated on an annual basis of lithium produced relative to the lithium contained in the brine produced by the wellfields as input to the evaporation ponds. This calculated Overall Recovery is affected by the pond inventory and production ramp-up causing temporary fluctuations in calculated annual recovery, an Overall Recovery of 66% is assumed during steady state operation.

13.1.1 NW Wellfield

The combined production from the NW wellfield will ramp up from 170 l/s in Year 1 to approximately 460 l/s in Year 8. It is expected that pumping rates of individual wells in the NW wellfield will vary between 20 l/s and 30 l/s so that up to 22 wells may be required to meet the overall brine production requirements. The NW production wells are located on the main access roads between the evaporation ponds and will be drilled and completed to a depth of approximately 360 m in the lower brine aquifer of the Archibarca fan. The upper part of the production wells through the Archibarca fresher to brackish water aquifer will be entirely cemented and sealed to an approximate depth of 140 m to avoid any freshwater inflow into the wells. Below 140 m depth the wells will be completed with 12-inch diameter production casing. The wells will be equipped with submersible pumping equipment (50 HP pumps). It is planned that the NW production wells will discharge immediately into evaporation ponds No 1 and No 2 without intermediate boosting or storage requirements. Figure 12-7 show the general layout of the NW production wellfield.

13.1.2 SE Wellfield

It is planned that brine production will shift to the SE wellfield in Year 9. The combined production rate from the SE wellfield will be in the order of 480 l/s from Year 9 though to Year 30. It is expected that pumping rates of individual wells in the SE wellfield will vary between 10 l/s and 20 l/s so that up to 44 wells may be required to meet the overall production requirements. Production wells will be drilled and completed to a depth of approximately 460 m with 12-inch diameter stainless steel production screens. The wells will be equipped with submersible pumping equipment (50 HP pumps). It is planned that the SE production wells will discharge through feeder pipelines into an intermediate storage pond at the northern limit of the SE wellfield. Brine will be pumped through a main trunk pipeline from the intermediate storage pond to the evaporation ponds at the plant site in the NW Sector of the Project. Figure 12-7 show the general layout of the SE production wellfield.

13.2 Wells Materials, Pads, and Infrastructure

Infrastructure in the well field is planned to include well pads, access roads and power generation. Each brine well will have its own generator and diesel storage tank, and each tank will have a residence time of 72 hr. A diesel truck will feed the diesel tanks to keep the diesel generators running. All wells will be connected by road to the booster station. Drilling pads will be elevated to as much as 1.5 m above the salar surface to mitigate flooding risks. Drill pad dimensions will have a platform area sufficient to house the required diesel generators and control instrumentation. Figure 13-1 shows a picture of a typical production well SVWP21-02 located at the Allkem Sal de Vida Project.

Figure 13-1 - Production Well SVWP21-02.

13.3 Conclusions

The described mining method is deemed appropriate to support economic brine extraction and is similar in configuration to other lithium brine extraction configurations witnessed on operating properties owned by Allkem.

14. PROCESSING AND RECOVERY METHODS

14.1 Test Work and Recovery Methods

Specific brine evaporation and metallurgical recovery test work at the Cauchari site has not progressed as of the Effective Date. The Cauchari brine has been sampled and tested with results indicating similar characteristics to the Allkem Olaroz site brine. This is expected to be due to the proximity (20 km) and interconnectedness of the Olaroz and Cauchari Salars.

Refer to Chapter 10 for further details. The variance on Mg/Li and Li/ SO_4 ratios for both Cauchari and Olaroz brines are low enough to state that Cauchari brine could be processed using similar processing technology to that applied in the Olaroz production facility. The Olaroz process design has been successfully proven to produce lithium carbonate since 2015.

As such, the mass and energy balance and associated process design for the Project is based on the Allkem Olaroz processing technology with the incorporation of some modifications to address operational issues, capitalizing operational experience and lessons learned from Allkem Olaroz operations.

14.2 Process Design

The Cauchari Project will include the design and installation of production wells, evaporation ponds and a processing plant to obtain 25,000 tpy of battery grade lithium carbonate (Li_2CO_3). A general block diagram of the process is shown in Figure 14-1.

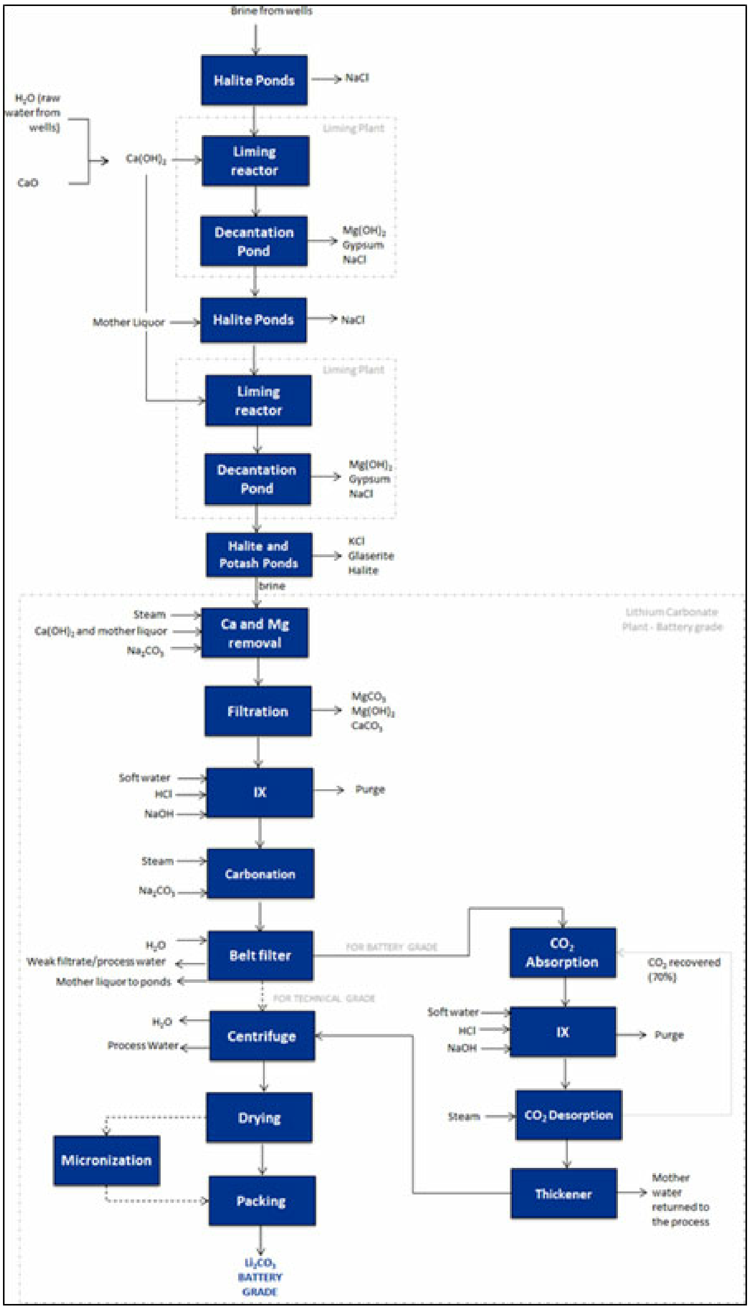


Figure 14-1 - General Block Diagram for the Process.

As a general overview of the process, the brine that feeds the lithium carbonate (Li_2CO_3) Plant is obtained from two brine production wellfields as described in Chapter 13. The NW wellfield will be operated for the first 9 years of the Project; brine production will switch to the SE wellfield during Year 9 and onwards.

The brine is pumped to the evaporation ponds, designed to crystallize mainly Halite and some Glauber salt, Glaserite, silvite and borate salts. At certain points slaked lime is added to the brine, which removes a large part of Magnesium (Mg) as magnesium hydroxide. The Calcium (Ca) is precipitated as gypsum, thus also removing dissolved sulphate (SO_4). After the evaporation ponds, the brine is fed to the Li_2CO_3 plant, where, through a series of purification processes, solid lithium carbonate is obtained, to be shipped according to the final customer requirements. A general process flow diagram is shown in Figure 14-2.

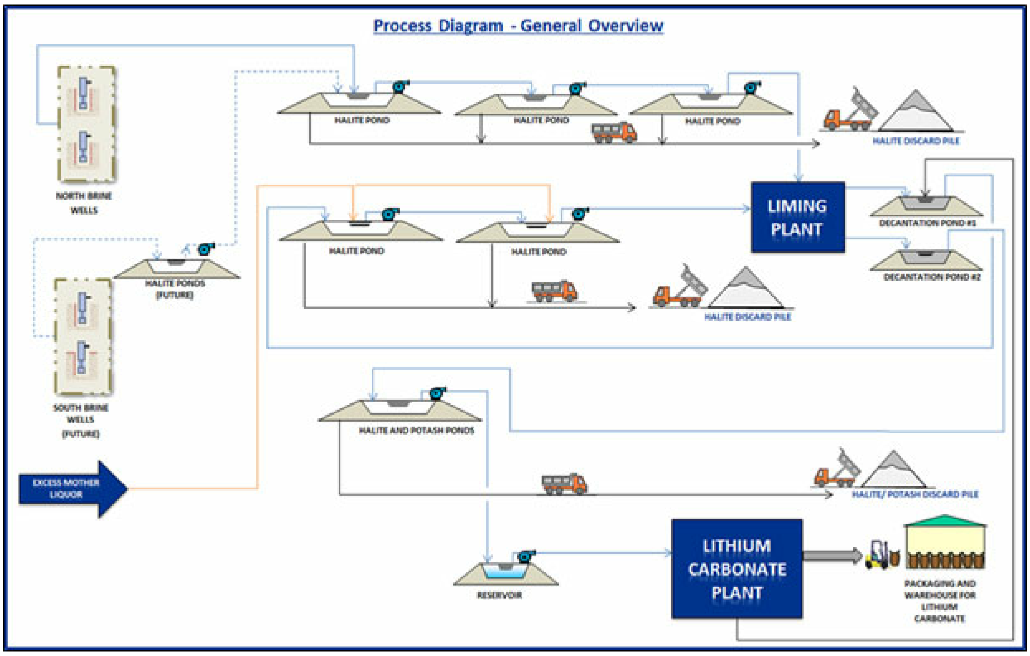


Figure 14-2 - General Process Diagram.

The brine is concentrated until it reaches a Li concentration of 7,000 mg/l. An overall evaporation ponds and lithium carbonate plant recovery of 66% for lithium is modelled based on industrial operational results. A more detailed description of the process for both the evaporation ponds and the lithium carbonate plant are presented below.

14.3 Process Flowsheet and Description

14.3.1 Brine Concentration in the Solar Evaporation Ponds

The evaporation ponds will be fed with brine from the NE wellfield between Years 1 and 9 and from the SE wellfield from Years 9 through 30. The configuration of the wellfield is shown in Figure 12-7 and described in Sections 12.2.1.2 and Chapter 13. The brine produced by the SE wellfield has a lower lithium concentration than brine from NW wellfield but with very similar chemistry. Therefore, the area of the evaporation ponds will expand to maintain the same productions levels. These additional evaporation ponds will be located in the SE Sector Project tenements. The brine produced from the SE wellfield will feed the southern evaporation ponds to be then sent to the northern evaporation ponds.

The area required for the evaporation ponds is calculated based on the evaporation rate and rainfall impact defined for the site conditions. The solar evaporation ponds are designed with a large area and low depth, absorbing solar energy, thus creating a natural evaporation rate of the water contained in the brine. The brine is saturated in salts and during its concentration these salts are crystalizing in the ponds. These crystallized salts are kept inside the pond until they reach a defined height, after which they are harvested and transported to specific stockpiles located outside of the ponds area but inside the properties for the Project.

The construction of the evaporation ponds will incorporate the topography survey of the area in order to minimize material handling. If needed, there will be a surplus area for construction purposes. Both the floor and dykes inside of the ponds are then covered with geomembranes, which are plastic impermeable membranes, to avoid leakage of the brine from inside the ponds.

Once the ponds are filled with brine, the brine transfer between ponds will be executed with pumps, which will allow precise control of the flow between ponds. It is planned to install a liming plant to accomplish impurities elimination, which naturally occur in the brine, such as magnesium and sulphates. This is done via slaked lime addition, which is split into two different stages, that is, at two different lithium concentrations. The brine from the wells is fed to the first group of ponds for pre-concentration, after which it is treated in the first reactors of the liming plant, where the brine is mixed with slaked lime in order to remove the magnesium from the brine. The slurry is then transferred by gravity to the first decantation ponds, where the precipitated solids are separated from the lithium brine. The brine is then fed to a second group of evaporation ponds, after which it is pumped to additional liming reactors, installed as a backup to remove the remaining Mg from the brine through the addition of more slaked lime. Just like the first liming reactors, the reacted slurry is then transferred by gravity to the second decantation pond, to generate separation of the solids. The concentrated brine is then fed to the last group of evaporation ponds. When the lithium concentration is suitable for lithium processing, the brine is stored in reservoir ponds before feeding to the lithium carbonate plant.

Due to changes in lithium concentration expansions of the solar evaporation area are considered after Year 5 and Year 9. Brine production from the NW and SE wellfields will also increase accordingly. The variance in evaporation pond area, brine extraction, harvested salts and solids from liming plant are shown in Table 14-1.

Table 14-1 - Operational parameters variances with lithium concentration.

Compound/type	Units	Initial values	Expansion year 5	Expansion year 9
Solar evaporation pond area	m2	10,568,269	11,288,075	12,167,065
Extracted brine2	million ton/y	14.5	15.7	17.6
Harvested salts (with 12% humidity)	ton/y	2,952,533	3,151,591	4,034,552
Solids in decantation ponds	ton/y	294,913	319,662	192,382

14.3.2 Lithium Carbonate Plant

The lithium carbonate plant is a chemical facility that receives the concentrated brine from the evaporation ponds and, through a series of chemical processes, generates lithium carbonate battery grade in a solid form. All impurities that are still left in the brine after the evaporation ponds are removed in the lithium carbonate plant, through specific stages described below.

The first stage of the lithium carbonate plant is the calcium and magnesium removal stage. A solution of soda ash and slaked lime are added to the concentrated brine from the evaporation ponds in an agitated reactor. Mg and Ca will precipitate as magnesium hydroxide ($Mg(OH)_2$) and calcium carbonate ($CaCO_3$). The slurry is then filtered, and the Mg and Ca free brine is sent to the next stage. The solids obtained from the filtering stage are re-pulped and sent directly to the first sludge pond.

The lithium rich brine is fed to an ion exchange stage, to remove remaining calcium, magnesium, and any other di/tri valent metals in the brine. The impurity free brine is then sent to carbonation reactors. Here the addition of a soda ash solution and high temperatures result in lithium carbonate precipitating (technical grade), which is filtered on a belt filter, repulped and centrifuged. This can be directly dried and sold as technical grade. In order to obtain battery grade, the pulp is transported to another purification stage. The mother liquor generated from the belt filter is recycled to the ponds in order to recover the remaining lithium.

The purification stage consists of the generation of lithium bicarbonate through the reaction in agitated reactors of the solid lithium carbonate and gaseous CO_2 at low temperature. The lithium bicarbonate is much more soluble in water than lithium carbonate, allowing the separation from any residual soluble and insoluble impurities. With the use of an IX stage utilizing a specific selective resin, any boron and/or di/tri valent metals left in the solution are removed, and a highly pure bicarbonate solution is fed to a desorption stage. With the increase of temperature (up to 80°C) the CO_2 is desorbed, and solid lithium carbonate is re- precipitated. The slurry is centrifuged, dried, reduced in size (milled) and packaged in maxibags, to be finally transported to the clients.

14.3.3 Reagents for the Process

14.3.3.1 Prepared slaked lime

The main reagent used in the process is lime. The lime is slaked with water. This process is executed in a liming plant, which is conventional equipment applied in the industry, and it will be installed near the evaporation ponds.

For the lithium carbonate plant, hydrated lime ($Ca(OH)_2$) will be considered for the process. This hydrated lime will be received directly from the vendors and dissolved in agitated tanks to obtain the required solution for the process.

14.3.3.2 Preparation of the Soda Ash solution

The second main reagent used in the process is soda ash (Na_2CO_3), which is used both in the Ca/Mg removal stage and the carbonation stage. Both processes consider a total consumption of soda ash which will be prepared in a specific soda ash plant. In this plant the soda ash is dissolved from a solid state to the solution required for the precipitation, which has a concentration of 28% w/w.

Process water is used for the preparation of the soda ash solution, water that is recycled from the belt filter. Both the process water and solid soda ash are fed to a preparation tank in the soda ash plant, and temperature is controlled for an efficient dissolution. After a defined agitation time, the solution is filtered and pumped to a storage tank, from which it is fed to the process according to the defined consumption.

14.4 Summary of Mass and Water Balances

14.4.1 Water Purification

Although the lithium carbonate plant incorporates the re-utilization of water within the process in various stages, the injection of fresh water is necessary at specific steps, including for the final product washing. Fresh water for the process will be supplied by alluvial water wells located to the southeast of the Project area and will be treated in a water treatment plant to remove all impurities before being pumped into the lithium carbonate plant. The water treatment plant will consider a reverse osmosis process.

Refer to Chapter 15 for further information related to freshwater infrastructure.

14.4.2 Equipment Cleaning

Due to the brine characteristics, specifically all the salts and impurities in the brine, there is generation of salt deposits and scaling inside the equipment of the lithium carbonate plant. These must be periodically cleaned, using a sulfuric acid solution (H_2SO_4) with a concentration of 18%. The frequency of cleaning will be defined by the operations area. The solution obtained after the equipment cleaning is sent directly to the first sludge pond.

Table 14-2 - Annual generation of discards from lithium carbonate plant.

Compound/type	Annual production (tpy)
Magnesium hydroxide ($Mg(OH)_2$) and calcium carbonate ($CaCO_3$) from Li_2CO_3 plant.	310,178

14.4.3 Solid Waste Management

A small fraction of waste solids is generated in the lithium carbonate plant, that are mainly impurities removed from the brine. The main solids are a mixture of magnesium hydroxide and calcium carbonate. These solids will be discarded upon the salt stockpiles as further discussed in Chapter 15.

14.5 Operations staff

The total forecast number of operational personnel including on-duty and off-duty will be approximately 270 to 300 people for both wellfield and processing facilities.

14.6 Conclusions

It is the opinion of Mr. M. Dworzanowski, FSAIMM and FIMMM (the QP), that the described process design is reasonable and implementable. The process is standard and has been previously proven to produce similar products. The process design is based on conducted test work and reflects the related test work parameters. The process-related equipment is suitably sized and organized to produce the mentioned products in the quantities specified. The reagent and commodity consumption rates are deemed appropriate for the size of plant.

14.7 Recommendations

For an optimization of the lithium recovery operations, there are several technologies to be evaluated as alternatives to guarantee the company's future production in the long term. In particular, the carbonation plant effluents, and in particular the so-called "mother liquor". This is recirculated in the process, discharging it back into the evaporation pond circuit. This mother liquor stream still contains a certain concentration of lithium, which is not lost when recirculated, but at the same time the impurities that this stream may have, are also incorporated into the evaporation pond circuit. To improve this recovery process, it is recommended to evaluate alternatives that allow recovering as much lithium as possible from this mother liquor stream but leaving the other elements or impurities to avoid its recirculation.

15. INFRASTRUCTURE

This section describes infrastructure related process, support services and commodities related to the Cauchari Project.

15.1 Access

15.1.1 Access Roads

The main road access to the Project is from the city of San Salvador de Jujuy, RN 9, which heads north-northwest for approximately 60 km, and then meets RN 52 near the town of Purmamarca. Following Route 52 for 50 km will lead to the eastern side of the Salinas Grandes Salar. The road crosses this salar before ascending further and continuing south along the eastern margin of the Olaroz Salar. It then crosses west at the juncture of the Olaroz and Cauchari Salars. The total distance between the city of Jujuy and the Project area is approximately 230 km, and driving it takes approximately 4 hours. This highway continues on to the Chilean border at the Jama pass and connects to the major mining center of Calama and the ports of Antofagasta and Mejillones, in northern Chile. Driving distance to these ports is approximately 500 km and 570 km, respectively. This road is fully paved, from Jujuy to these Chilean ports. Planned Project facilities are within 1 km of Route 52.

The Project may also be accessed from the provincial capital of Salta by driving 27 km WSW from Salta to Campo Quijano, then continuing north for approximately 120 km along Route 51, through Quebrada del Toro, to the town of San Antonio de los Cobres, at an altitude of 3,750 masl. This route is paved, with the exception of the lower section through Quebrada del Toro and the upper section leading to San Antonio. From San Antonio de los Cobres, Route 51 leads west to the south of the Cauchari Salar, with route RP-70 providing access along the western side of the salar to reach the international road (Route 52). The distance from San Antonio to the Project is approximately 125 km entirely on well-maintained gravel roads.

15.1.2 National Route 70 Detour

The current Cauchari evaporation pond layout interferes with the current route of gravel road No.70. The detouring of this road will be required to effect the construction of the evaporation ponds (Figure 15-1). A feasibility study, detour application, and road construction must be allowed for in both project permitting schedule and capital expenditure.

The road detour engineering and trade-offs will be studied in the next project phase following commencement of the application process.

Delays in provincial or municipal approvals may impact the commencement of the project construction.

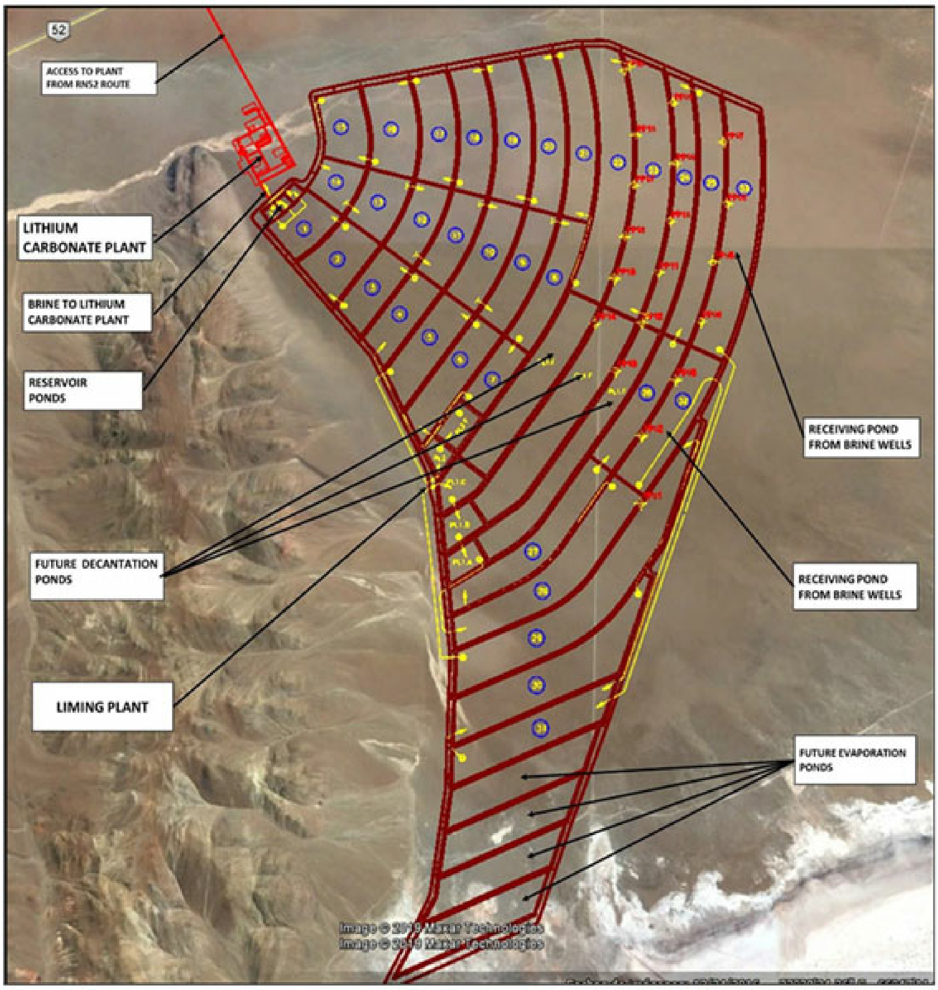


Figure 15-1 - Cauchari evaporation ponds and Route 70 interference with conceptual rerouting.

15.1.3 Flights

Both Jujuy and Salta have regular flights to and from Buenos Aires.

15.1.4 Local population centers

There are a number of local villages within 50 kilometers of the Project site. These include the villages of Olacapato, Catua, Sey and Pastos Chico. The regional administrative center of Susques (population around 2,000 people) is one hour's drive northeast of the Project site. Figure 15-2 shows a map of the access roads around the Cauchari area.

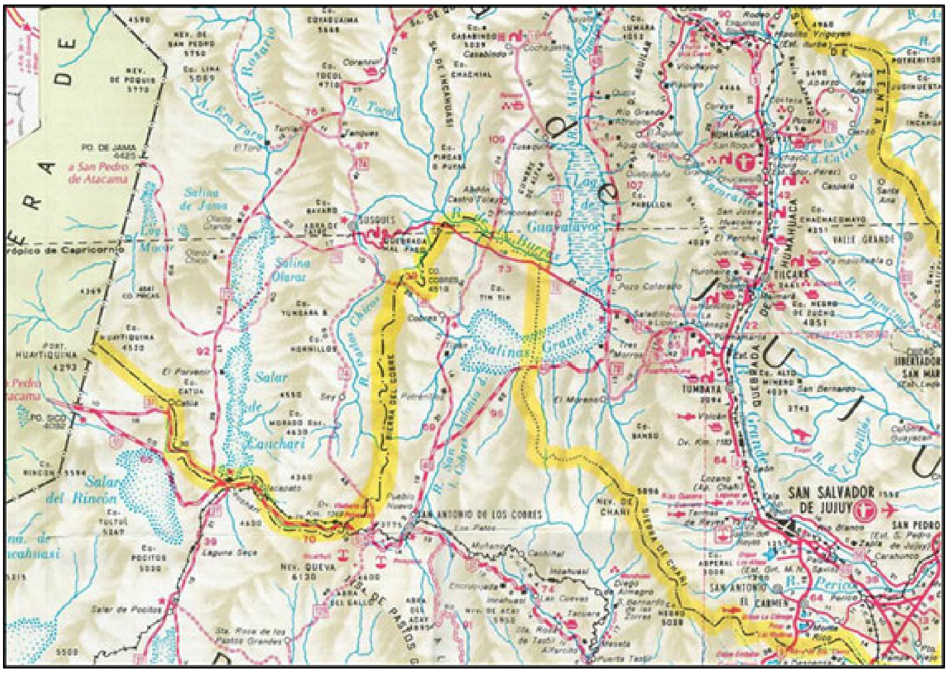


Figure 15-2 - Map of access roads to the Cauchari Area.

15.2 On site infrastructure

Physical areas included on the Project are shown in Figure 15-3 and Figure 15-4:

- NW and SE evaporation ponds and Liming Plant.
- NW brine wellfield (Archibarca location).
- SW brine wellfield.
- Alluvial production wells are located southeast of the Project area.
- Liming plant ponds (decantation ponds).
- Industrial facilities area.

- Harvested salt stockpile areas.

The brine production wellfields will be located on two sectors of the Salar de Cauchari, one in the Archibarca area, near and among the initial evaporation ponds and another located south-east of this location. Initially, and up to year four (4) of the operation, the evaporation ponds will cover an area of approximately 10.5 million m^2. The brine lithium concentration decreases from 580 mg/l to 545 mg/l by Year 5 of the operation, and an increase to 11.3 million m^2 in pond area is required. By Year 10, the average brine lithium concentration decreases to 491 mg/l and requires the final increase of the evaporation ponds area to 12.2 million m^2.

Temporary and permanent facilities are contemplated in the Project for the industrial area. The industrial facilities area for the Project will be located in the NW Sector of the Project on the Archibarca fan, and will include:

- Lithium carbonate plant
- Auxiliary services:
  - Reagent storage
  - Plant supply storage (gas, CO_2, compressed air, fuel)
  - Water Treatment Plant
  - Access control area
  - Electrical rooms (Electrical generators)
  - Boiler room
- Warehouses
- Truck workshop
- Administrative building and laboratory
- Workers’ camp
- Temporary contactors’ installations

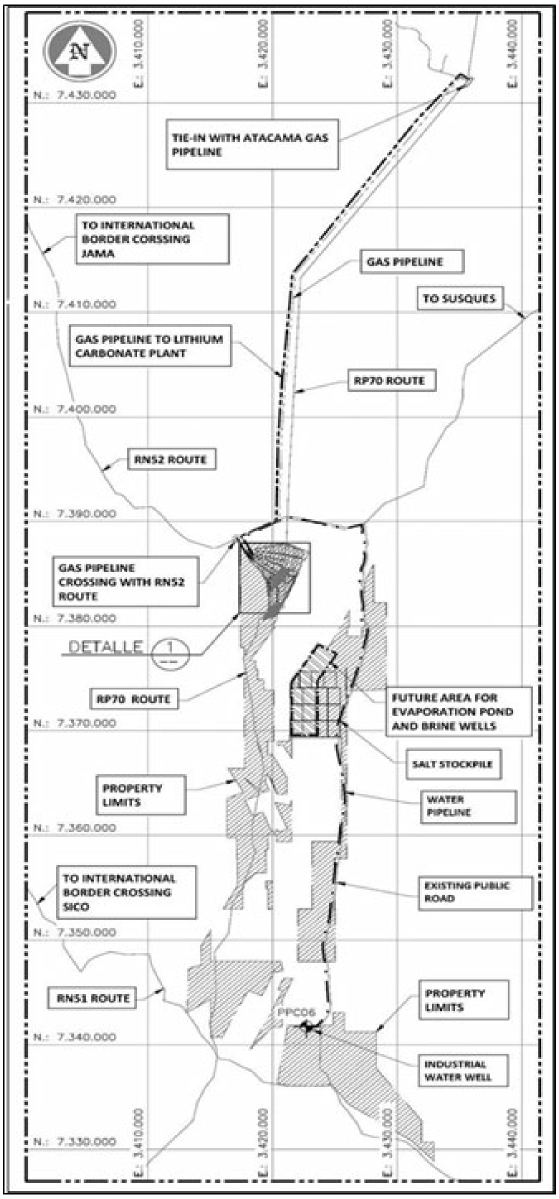


Figure 15-3 - Main physical areas and roads of the Project.

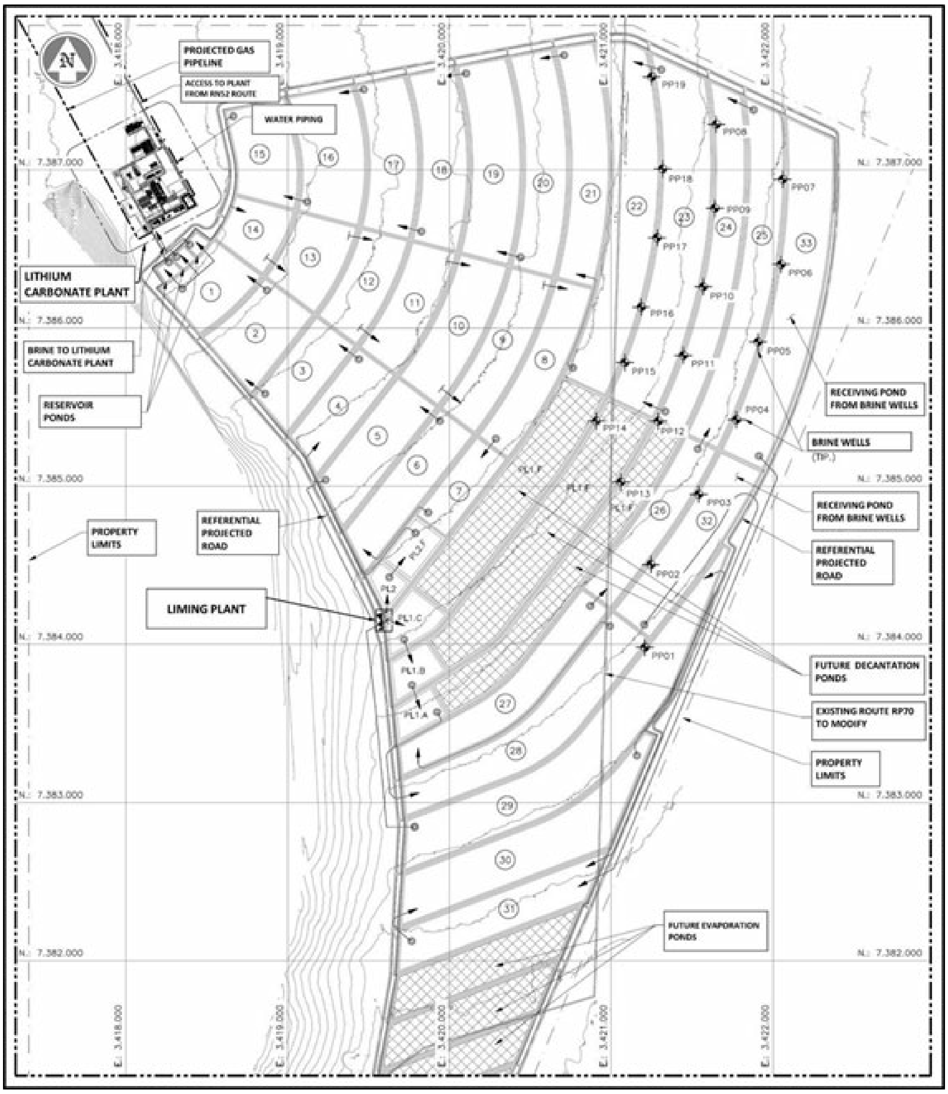


Figure 15-4 - Detail of main installations for the Project.

15.2.1 Temporary construction infrastructure

15.2.1.1 Pioneer Camp

A first team of workers will execute activities to prepare the site for the construction of the Contractor's Installations. This pioneer camp must include all the temporal services required (energy, water, sanitary facilities, etc.) that are required for these activities. These installations will be disassembled and removed once the constructor's installations are complete.

15.2.1.2 Construction facilities

The facilities described below will be considered during the construction stage of the Project. The contractor's installations will be located within the area defined for the Project, and include the following:

- Offices
- Warehouses
- Workshops
- Storerooms
- Worker's camp
- Dining rooms
- Dressing rooms
- Sanitary facilities
- Concrete plant
- Non-hazardous and domestic industrial waste management areas
- Hazardous waste area
- Other facilities

All the temporary installations will be removed after the construction phase has ended unless other uses are defined for some of them.

15.2.2 Brine Extraction Wellfields

The Project considers two (2) production wellfields as shown in Figure 12-7:

- The NW wellfield in the Archibarca area, within the area of the evaporation ponds. All brine wells will be specifically located on top of the berms that divide the evaporation ponds, as shown on Figure 15-4.
- SE wellfield located in the SE Sector of the Project, within the area of the SE evaporation ponds.

While the brine extracted from NW wellfield will be sent directly to the evaporation ponds, brine from the SE wellfield will be collected in a first group of evaporation ponds, and then pumped to the evaporation ponds in Archibarca through a 32.5 km pipeline. This pipeline will be built only once it is required, which is expected to happen in Year 9, and will operate until the end of Project life.

According to the mining plan defined for the Project, and as described in Section 18.2 of this document, the number of wells used during the life of the Project will vary as shown in Table 15-1.

Table 15-1 - Number of brine wells according to different concentration.

Area name	Production starting year	Maximum number of wells	Estimated flow (L/s)
NW wellfield	1	17	22
NW wellfield additional wells	5	2 additional (a total of 19 wells)	20
SW wellfield	9	45	10

15.2.3 Brine pumping

Brine wells will be equipped with variable speed drive submersible pumps. Flow from each well will be monitored after discharging at the well head.

Additional wellfield equipment required includes:

- Temporary portable diesel generators for well pump operation in early stages
- Electrical lines for power distribution
- Portable brine transfer pumps at the site of the southeastern transfer pond and other locations along the brine pipeline

15.2.4 Evaporation Ponds

15.2.4.1 Principal Evaporation ponds

The principal evaporation ponds for the Project will be located off the salar in the Archibarca area as shown in Figure 15-5. Brine will be concentrated in these ponds through solar evaporation. Construction of these ponds involves mainly surface leveling, building up pond borders with material from the area, and waterproofing the base and sides of the ponds with a geomembrane.

Following variances in the lithium concentration in brine, expansions of evaporation ponds are planned for Year 5 and Year 9. The first pond expansion will be located near the principal evaporation ponds whilst the second expansion will be located in the SE Sector of the Project. These ponds will be fed with brine from the SE wellfield to be then sent to the principal evaporation ponds.

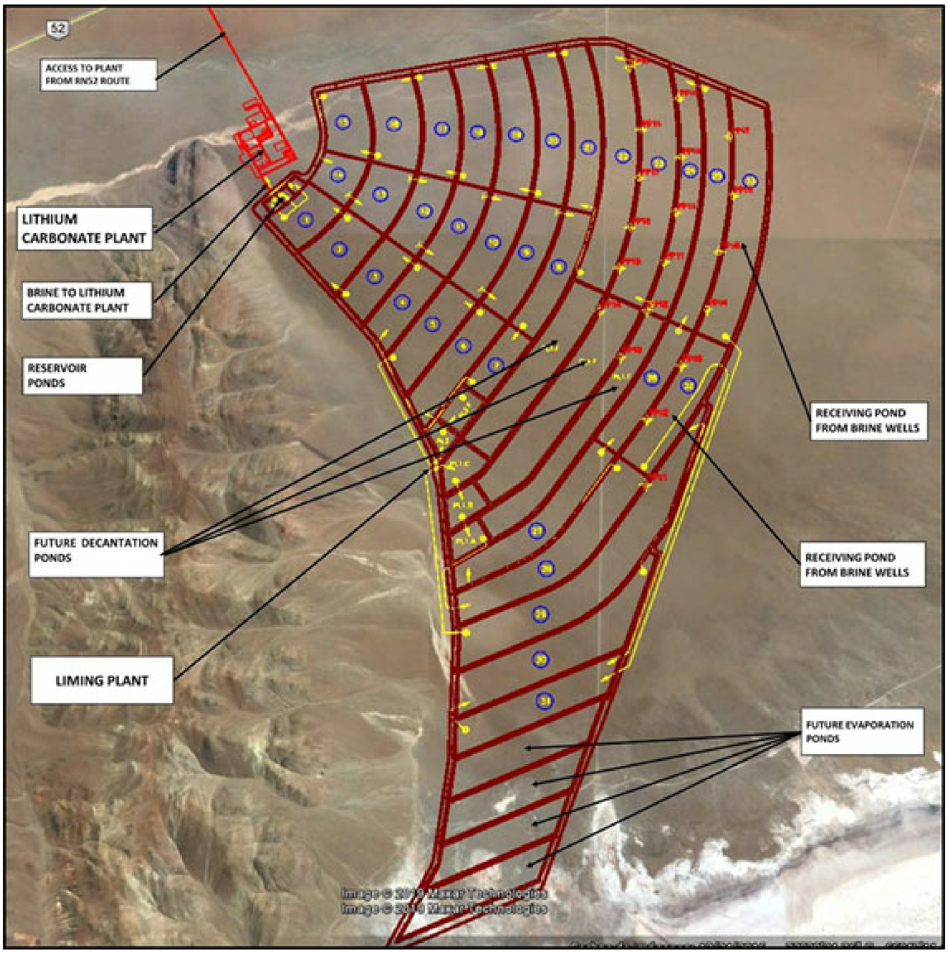


Figure 15-5 - Evaporation ponds.

15.2.4.2 Decantation Ponds

Two decantation ponds will be considered in the Project, according to the process design, to remove all solids from the liquid stream that precipitate in the liming plant. These ponds are located west of the evaporation ponds, near the liming plant. The decantation ponds have similar construction characteristics to the evaporation ponds including geomembrane liners to prevent leakage from the ponds.

15.2.4.3 Reservoirs

The reservoirs are located after the final evaporation ponds, and are smaller ponds, where concentrated brine is stored before being pumped to the lithium carbonate plant. Their construction characteristics are similar to those of the evaporation ponds.

15.2.4.4 Pumping Stations

Brine will be transferred from one evaporation pond to the next through pumping stations. These stations will be installed on the berm between the ponds. The power supply for each station will be aerial. Due to the topography of the area, no gravity transfer among the ponds will be carried out.

15.2.4.5 Evaporation Pond internal roads

Berms constructed between ponds will also serve as roads for truck circulation during pond harvesting, access to brine production wells, and transit for monitoring and maintenance activities. Some berms will be wider and constitute the main service roads for salt harvesting activities and will also include platforms and access for the brine production wells in the NW wellfield. The other berms will be sized to the minimum width required to allow safe pedestrian transit.

15.2.4.6 Evaporation Pond area contour channels

Contour channels will be built on the west side of the evaporation ponds to collect and divert any surface water run-off that might occur during the rainy season.

15.2.5 Liming Plant

The process requires that lime be added to the brine to increase precipitation of impurities - mostly as magnesium and calcium solids- originally dissolved in it. Based on the process design described in Section 17, lime will be added in two (2) stages of the evaporation ponds' process, to maximize precipitation of the impurities. This liming plant will include the equipment required for this task and will be installed in a special building, located near the evaporation ponds/decantation ponds. Figure 15-6 shows the planned layout and design of the plant.

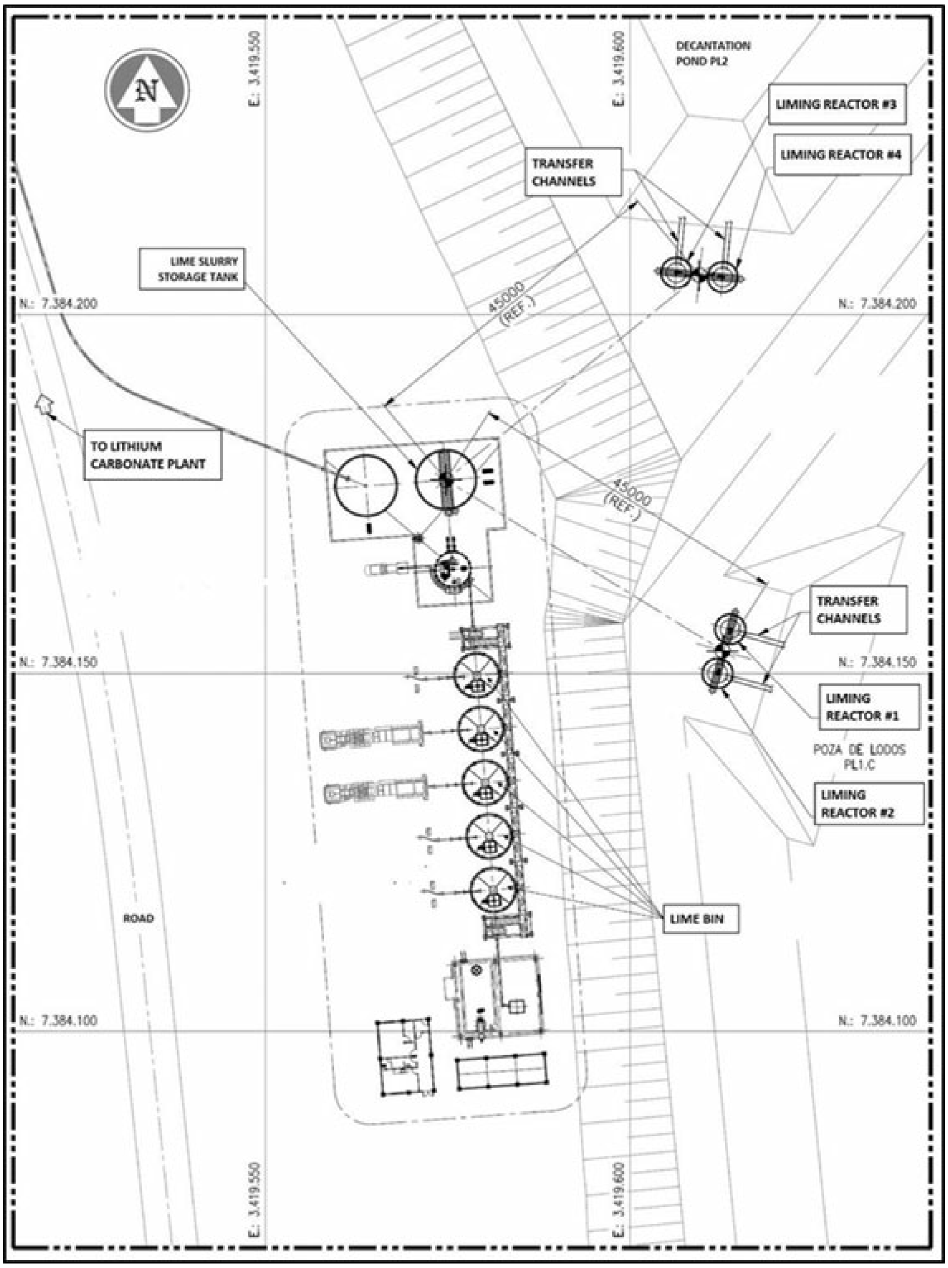


Figure 15-6 - Liming plant.

15.2.6 Carbonation Plant

15.2.6.1 Carbonation Plant

The carbonation process is described in Section 14. The carbonation plant area consists of the following processes housed within processing facility:

- Calcium and magnesium removal
- Lithium carbonate building, including the following stages:
  - Carbonation
  - Filtering
  - Drying
  - Packaging
  - Product storage

15.2.6.2 Services

The Carbonation plant is supported by process services including:

- Reagent preparation building (includes hydrochloric acid reception, caustic soda).
- Fuel plant, storage tanks and filling station.
- Storage, preparation, and distribution of sulfuric acid.
- Compressors room.
- Boiler room.
- Water treatment plant.

15.2.6.3 Electrical rooms

Electrical rooms considered for the Project are based on prefabricated modules, with limits on their dimensions to allow road transportation. Backup generators will also be included, as defined on the plant's critical equipment list.

15.2.6.4 Control Rooms

Control rooms are considered for the different Project areas. They are included in the interior of some of the industrial buildings and will allow accommodation for the operators during working hours.

15.2.7 Buildings and Ancillaries

The Project includes installation of ancillary facilities to support plant operations as follows:

- Access control checkpoint: main entrance to the plant, including admission and control office, luggage control room, induction room, restrooms, and vehicle parking area.
- Administration building: housing the offices required for the plant´s administrative personnel, including a cafeteria for the personnel and a parking area for the building.
- Quality Control Laboratory: facility designed for the quality control process, and able to provide chemical analysis for different brine and solid samples, particle size analysis, moisture analysis, among other services, to ensure proper operation of the process.
- Weighing sector: for the vehicles and trucks that enter and leave the plant and Project site.
- Truck Workshop: designed to provide maintenance services to the Project´s mobile machinery, which will be mostly involved in salt removal and transportation. This facility will include storage areas, mechanical and electrical workshops, waste yards and sludge degreasing treatment.
- Wastewater treatment plant (WWTP): This plant is necessary to treat all wastewater generated in restrooms, bathrooms, and camp kitchens.
- Industrial waste yards and warehouses: yards and warehouses provided for waste separation and storage, according to its specifications (hazardous and non- hazardous), and later on transported to authorized disposal centers, according to regulations for each waste type.
- Fire protection system: a fire protection system is considered for the Project, including industrial water storage tanks feeding the plant´s wet network. This system also includes a pump system (electrical and diesel), able to maintain a constant pressure in the network, guaranteeing water supply, in compliance with NFPA's standards.

The plant will be surrounded by a perimeter closure, which will be constructed with material obtained from the excavation of the area.

15.2.8 Permanent Camp

The Project's workers camp will be built to the west of the lithium carbonate plant, at a reasonable distance from it. The mining camp will include several facilities which will be interconnected with pedestrian and vehicular accesses. All facilities are assumed to be of modular type construction.

The main facilities that will be considered in the mining camp are:

- Bedrooms: dormitories installations will be defined for the construction and the operational phase, with some of the dormitories for the construction phase being temporary. These bedrooms will have a heating system, power supply, ventilation, sanitary installations, networks and fire detection and extinguishing systems. The dormitories will be in a two (2) level modular system, with simple rooms that have an individual bathroom, or double and triple rooms that have a shared bathroom. Landscaping and recreational areas are also considered.

- Dining room: it will include all the facilities to accommodate and serve the number of persons required in the Project during the operational phase. Temporary dining rooms will be considered for the construction stage, which will be removed after the end of this phase. The dining room will have heating and ventilation systems, as well as sanitary installations and fire detection and extinguishing systems according to existing legal requirements in Argentina.
- Recreational areas: There will be recreational areas for the personnel that stay in the camp according to their work shift system. It will include games and recreation, as well as a fitness center.
- Medical clinic: a clinic will be considered inside the mining camp, to provide health care for all the personnel of the plant, during construction and operations. This facility will include a reception room, first aid sector, restrooms, recovery rooms, medical personnel offices, among others. Resuscitation equipment will also be included in this sector. A parking sector for ambulances and a few vehicles is also defined for this area.

15.3 Diesel Fuel Supply

Diesel fuel for the Project, mainly for pond harvesting machinery and trucks, as well as for light vehicles, other trucks, vans, buses, and heavy equipment required by the Project during construction and operations will be obtained from the main diesel fuel tanks. These will be fed by tanker truck by the fuel supplier. These tanks will be refilled on a regular basis, depending on fuel consumption throughout the Project, and will consider all safety measures required for its storage.

15.4 Natural Gas Supply

Natural gas used in the Project will be obtained from the Atacama gas pipeline that runs 50 km north-northeast of the Process Plant. This pipeline (Atacama) was built to export gas to Chile, but currently it mostly provides small gas volumes to local customers, with only occasional import-export volume to/from Chile.

The Project considers building a 6'' diameter gas pipeline, designed for 90,000 m^3/d of gas flow. In Figure 15-7 the gas pipeline route is shown in red.

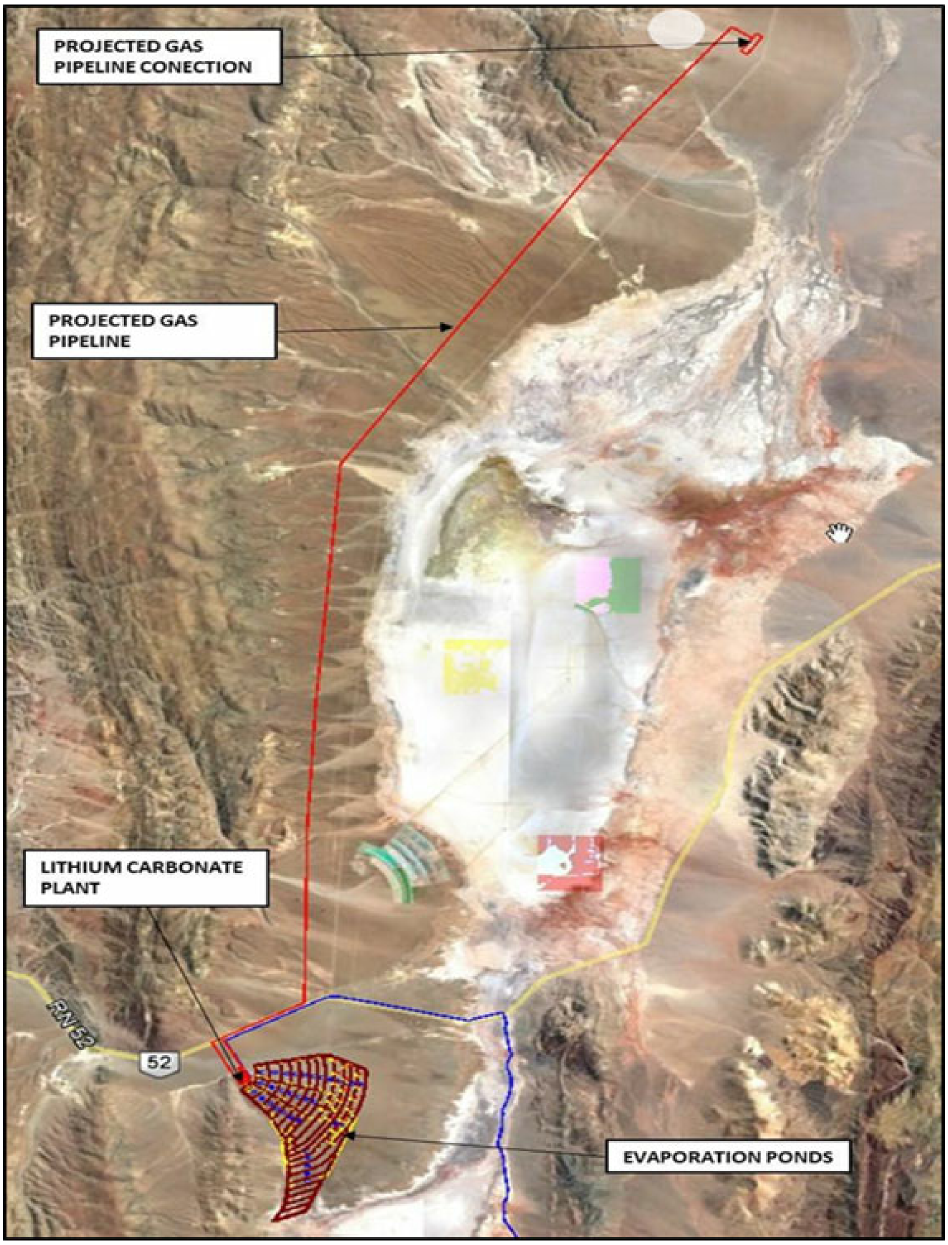


Figure 15-7 - Routing for the Project gas pipeline.

15.5 Electrical Power Supply and Distribution

15.5.1 Wellfield electric distribution

The Project will have its own electrical generation system and will feed power to the individual production wells through low voltage aerial distribution lines constructed along roads providing access to the wells.

15.5.2 Power generation

Electrical power required for the Cauchari Project is 6,6 MW. This estimate includes the power needs for brine extraction wells, evaporation pond brine transfers, liming plant, lithium carbonate plant and worker´s camp.

The power supply alternative considers onsite electrical generators, fed by natural gas through a gas pipeline tapping into the Atacama Gas Pipeline.

The powerhouse will be located at the plant, and it is composed of seven (7) engines and electric generator sets (five in operation, one stand by and one as emergency) all operated with natural gas, and each set with a capacity of 1,500 kW. The Electric Generation Room is considered a main switchgear room.

A stand-by diesel generator station will also be considered, which can power critical safety and operational equipment during power outages.

In general, all the distribution is aerial unless there are major restrictions, in which case underground distribution will be adopted.

15.6 Water Supply

15.6.1 Potable Water

During construction, potable water for the Project will be obtained from the closest authorized sources. It will be transported in tank trucks feeding the plant's potable water tanks. This supply will occur periodically to ensure the provision of potable water for all the personnel. A permanent water treatment plant will be erected during the construction period alleviating the need for trucking of water.

15.6.2 Industrial Water

Industrial water will be obtained from alluvial production wells installed specifically for the Project and located up to 62.1 km to the south-southeast of the plant, as shown in Figure 15-8. This water will be used for:

- Moistening of earthwork material for structural fills during construction of ponds and plant platforms (during the construction phase).
- Irrigation and dust control on work fronts (during the construction phase, after which this task will be carried out with the clean water obtained from the WWTP).
- Water dilution for transfer pumps is used to transfer brine from one pond to another (during the construction phase of the water treatment plant, after which all the rejection water obtained from this water treatment plant will be used for dilution).
- Feeding the lithium carbonate process plant during production.

The process plant requires two (2) types of water: industrial water and pure water. Industrial water will be used directly from the alluvial production wells, and pure water will be obtained from a Reverse Osmosis water treatment plant located near the lithium carbonate plant which treats the industrial water obtained from the alluvial production water wells.

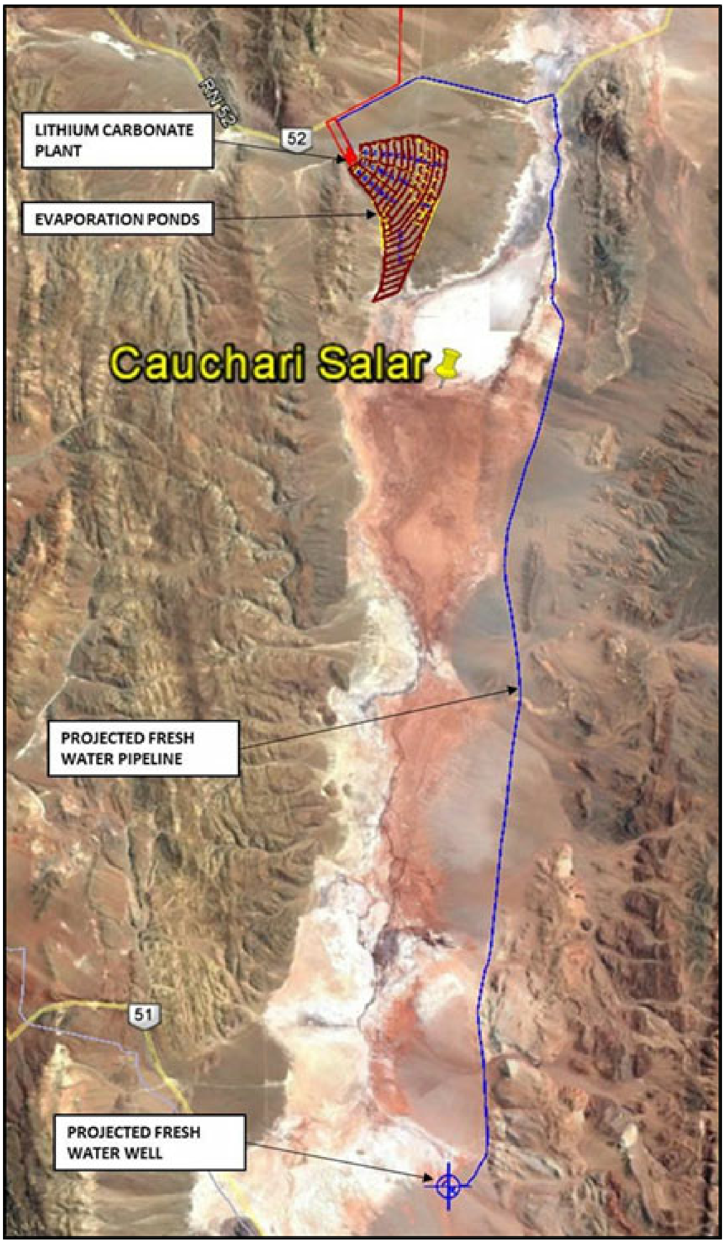


Figure 15-8 - Routing for the Project water pipeline.

15.7 Construction Materials

Project construction materials can be roughly separated into two different areas. The wellfield and ponds, and the industrial area.

The brine wells comprise mainly the well casing, its pump, manifold, and its electrical equipment. Then the brine pipelines are made of plastic materials (e.g., HDPE), and the ponds are run from an earthwork platform whit its embankment, and then lined (LLDPE, HDPE).

Regarding the industrial area, bulk materials are concrete foundations and pavement, steel structures and supports, steel and plastic piping, cables trays and wiring, etc.

Regarding equipment, thickeners, conveyors, cyclones, boilers, compressors, pumps, filters, steel and plastic tanks, agitators, centrifuges, bagging equipment, heat exchangers, etc.

The main characteristic for process piping and equipment is that they need to deal with salt incrustation, acid, hydroxide, etc., so in many cases plastic material and some exotic steels are used. Most of these materials require certain engineering progress to be specified, and at the same time they are not produced in Argentina. Therefore, purchasing these materials is an important issue to consider.

For the industrial plant, the Owner is responsible for the long lead items provision (process main equipment). Bulk materials and other equipment are on main contractor scope.

For the balance of plant (wellfield, ponds, and some other) equipment and material supply is by the Owner.

Logistics and Warehousing are segregated in the same way, it is the responsibility of whoever purchases it.

15.8 Communications

External communication on the Cauchari site is limited. Cellular communications are non-existent. The Project will rely on satellite internet and phone communications for external communication.

The local on-site communication will occur via various communication systems:

- Site Data Network (WWAN wireless).
- Telephony Services.
- Video Surveillance (CCTV).
- Access Control Systems.
- Intruder Detection System.
- Mobile Radio Communication.
- Measuring and control instruments.
- Process Control System (PCS).
- Fire Detection System.

- Radio communication service.
- Satellite phone service.

The main control system room, which will be located inside the process plant building, will house the necessary PC-based OIT. OITs will act as the control system SCADA servers as well as configuration and operator stations. The control room is intended to provide a central area from where the plant and well stations are operated and monitored and from which the regulatory control loops can be monitored and adjusted. All key process and maintenance parameters will be available for trending and alarm on the process control system. Centralization of the complete plant will be at the operation control room and the command of operations will be made remotely from the control system workstations.

15.9 Security and Access Point

Due to the remote site location, a minimum level of security is necessary. The main security function will be to man the gatehouse at the entrance to the plant and camp and monitor and provide guidance and direction to traffic entering and leaving the site.

Monitoring the weighbridge, fuel dispensing and onsite assets will also be carried out by the security staff. The facilities will include a gatehouse with access control, communications, parking, and appropriate area lighting. Certain areas will be equipped with security cameras and a monitoring room will be equipped with screens for surveillance of key areas where security or safety risks are considered high.

15.10 Conclusions

The Project support infrastructure has been reviewed and is deemed adequate by Mr. M. Dworzanowski, FSAIMM and FIMMM (the QP), to support the processing infrastructure and process operations described in this report.

15.11 Recommendations

Based on the experience that Allkem has in the execution of the Olaroz I and II projects, the country context, and the delays in certain types of materials. A detailed Long lead items (LLI) must be made and include, beyond the main equipment, those components that today their manufacture plays an important role due to the scarcity of raw materials for their manufacture.

16. MARKET STUDIES AND CONTRACTS

The information on the lithium market is provided by Wood McKenzie, a prominent global market research group to the chemical and mining industries. Wood Mackenzie, also known as WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries.

Supplementary comments are provided by the Allkem internal marketing team based on experience with Olaroz Project product marketing.

16.1 Overview of the Lithium Industry

Lithium is the lightest and least dense solid element in the periodic table with a standard atomic weight of 6.94. In its metallic form, lithium is a soft silvery-grey metal, with good heat and electric conductivity. Although being the least reactive of the alkali metals, lithium reacts readily with air, burning with a white flame at temperatures above 200°C and at room temperature forming a red-purple coating of lithium nitride. In water, metallic lithium reacts to form lithium hydroxide and hydrogen. As a result of its reactive properties, lithium does not occur naturally in its pure elemental metallic form, instead occurring within minerals and salts.

The crustal abundance of lithium is calculated to be 0.002% (20 ppm), making it the 32nd most abundant crustal element. Typical values of lithium in the main rock types are 1 - 35 ppm in igneous rocks, 8 ppm in carbonate rocks and 70 ppm in shales and clays. The concentration of lithium in seawater is significantly less than the crustal abundance, ranging between 0.14 ppm and 0.25 ppm.

16.1.1 Sources of Lithium

There are five naturally occurring sources of lithium, of which the most developed are lithium pegmatites and continental lithium brines. Other sources of lithium include oilfield brines, geothermal brines, and clays.

16.1.1.1 Lithium Minerals

- Spodumene [$LiAlSi_2O_6$] is the most commonly mined mineral for lithium, with historical and active deposits exploited in China, Australia, Brazil, the USA, and Russia. The high lithium content of spodumene (8% Li_2O) and well-defined extraction process, along with the fact that spodumene typically occurs in larger pegmatite deposits, makes it an important mineral in the lithium industry.

- Lepidolite [$K(Li,Al)_3(Si,Al)_4O_{10}(OH,F)_2$)]is a monoclinic mica group mineral typically associated with granite pegmatites, containing approximately 7% Li_2O. Historically, lepidolite was the most widely extracted mineral for lithium; however, its significant fluorine content made the mineral unattractive in comparison to other lithium bearing silicates. Lepidolite mineral concentrates are produced largely in China and Portugal, either for direct use in the ceramics industry or conversion to lithium compounds.
- Petalite [$LiAl(Si_4O_{10})$] contains comparatively less lithium than both lepidolite and spodumene, with approximately 4.5% Li_2O. Like the two aforementioned lithium minerals, petalite occurs associated with granite pegmatites and is extracted for processing into downstream lithium products or for direct use in the glass and ceramics industry.

16.1.1.2 Lithium Clays

Lithium clays are formed by the breakdown of lithium-enriched igneous rock which may also be enriched further by hydrothermal/metasomatic alteration. The most significant lithium clays are members of the smectite group, in particular the lithium-magnesium-sodium end member hectorite [$Na_{0.3}(Mg,Li)_3Si_4O_{10}(OH)_2$]. Hectorite ores typically contain lithium concentrations of 0.24%-0.53% Li and form numerous deposits in the USA and northern Mexico. As well as having the potential to be processed into downstream lithium compounds, hectorite is also used directly in aggregate coatings, vitreous enamels, aerosols, adhesives, emulsion paints and grouts.

Lithium-enriched brines occur in three main environments: evaporative saline lakes and salars, geothermal brines and oilfield brines. Evaporative saline lakes and salars are formed as lithium-bearing lithologies which are weathered by meteoric waters forming a dilute lithium solution. Dilute lithium solutions percolate or flow into lakes and basin environments which can be enclosed or have an outflow. If lakes and basins form in locations where the evaporation rate is greater than the input of water, lithium and other solutes are concentrated in the solution, as water is removed via evaporation. Concentrated solutions (saline brines) can be retained subterraneous within porous sediments and evaporites or in surface lakes, accumulating over time to form large deposits of saline brines.

The chemistry of saline brines is unique to each deposit, with brines even changing dramatically in composition within the same salar. The overall brine composition is crucial in determining a processing method to extract lithium, as other soluble ions such as Mg, Na, and K must be removed during processing. Brines with a high lithium concentration and low Li:Mg and Li:K ratios are considered the most economical to process. Brines with lower lithium contents can be exploited economically if evaporation costs or impurities are low. Lithium concentrations at the Salar de Atacama in Chile and Salar de Hombre Muerto in Argentina are higher than the majority of other locations, although the Zabuye Salt Lake in China has a more favorable Li:Mg ratio.

16.1.2 Lithium Industry Supply Chain

Figure 16-1 below shows a schematic overview of the flow of material through the lithium industry supply chain in 2021. Raw material sources in blue and brown represent the source of refined production and TG mineral products consumed directly in industrial applications. Refined lithium products are distributed into various compounds displayed in green. Refined products may be processed further into specialty lithium products, such as butyllithium or lithium metal displayed in grey. Demand from major end-use applications is shown in orange with the relevant end-use sectors in yellow.

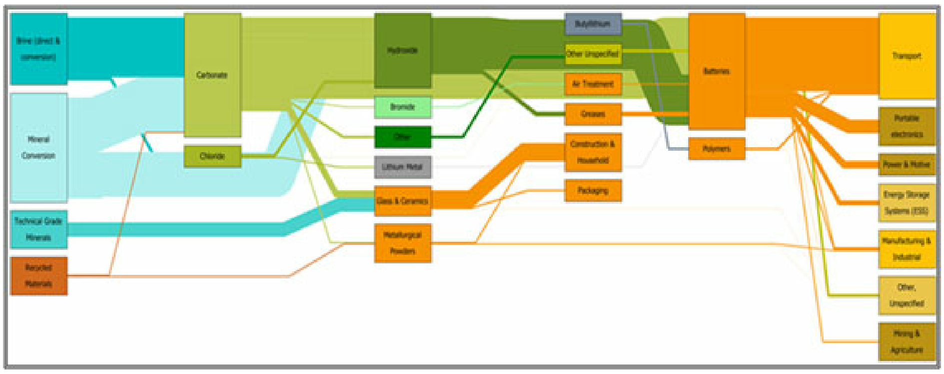


Figure 16-1 - Lithium Industry Flowchart (Wood Mackenzie).

Lithium demand has historically been driven by macro-economic growth, but the increasing use of rechargeable batteries in electrified vehicles over the last several years has been the key driver of global demand. Global demand between 2015 and 2021 has more than doubled, reaching 498.2kt LCE with a CAGR of 16.8% over the period. Adding to this growth, in 2022 global lithium demand is expected to increase by 21.3% to 604.4 kt LCE as demand for rechargeable batteries grows further. Over the next decade, global demand for lithium is expected to grow at a rate of 17.7% CAGR to 2,199 kt in 2032.

16.1.3 Global demand for Lithium

Lithium demand has traditionally been used for applications such as in ceramic glazes and porcelain enamels, glass-ceramics for use in high-temperature applications, lubricating greases and as a catalyst for polymer production. Between 2020 and 2022, demand in these sectors rose steadily by approximately 4% CAGR. Growth in these applications tends to be highly correlated to industrial activity and macro-economic growth. Wood Mackenzie forecast the combined growth of lithium demand from industrial markets is likely to be maintained at approximately 2% per annum from 2023 to 2050.

Rechargeable batteries represent the dominant application of lithium today, representing more than 80% of global lithium demand in 2022. Within the rechargeable battery segment, 58% was attributed to automotive applications which has grown at 69% annually since 2020. This segment is expected to drive lithium demand growth in future. To illustrate, Wood Mackenzie forecast total lithium demand will grow at 11% CAGR between 2023 and 2033: of this lithium demand attributable to the auto-sector is forecast to increase at 13% CAGR; whilst all other applications are forecast to grow at 7% CAGR. Growth is forecast to slow in the following two decades as the market matures (Figure 16-2).

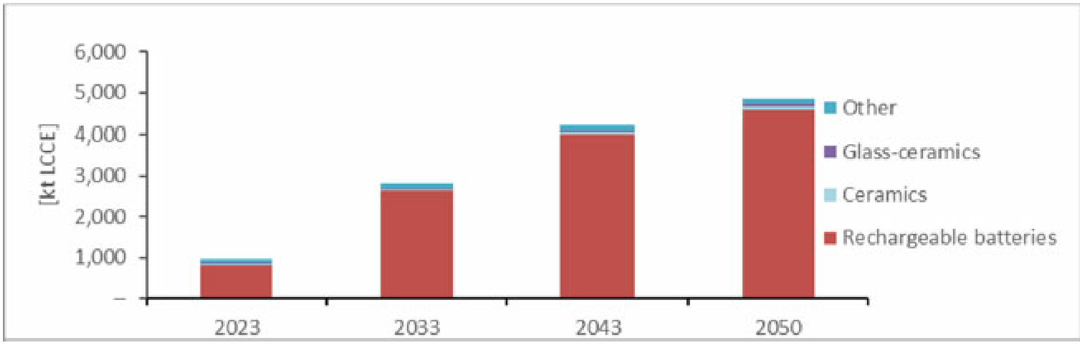


Figure 16-2 - Global Demand for Lithium by End Use, 2030 - 2050 (Wood Mackenzie).

Lithium is produced in a variety of chemical compositions which in turn serve as precursors in the manufacturing of its end use products such as rechargeable batteries, polymers, ceramics, and others. For rechargeable batteries, the cathode, an essential component of each battery cell, is the largest consumer of lithium across the battery supply chain. Demand profiles for lithium carbonate and hydroxide is determined by the evolution in cathode chemistries. The automotive industry mainly uses NCM and NCA cathodes, often grouped together as "high nickel"; and LFP cathodes. High nickel cathodes consume lithium in hydroxide form and generally has a higher lithium intensity; whilst LFP cathodes mainly consume lithium in carbonate form and lithium content is lower. LFP cathodes are predominantly manufactured in China.

Lithium in the form of lithium hydroxide and lithium carbonate collectively accounted for 90% of refined lithium demand in 2022. These two forms are expected to remain important sources of lithium in the foreseeable future reflecting the share of the rechargeable battery market in the overall lithium market (Figure 16-3). The remaining forms of lithium include technical grade mineral concentrate (mainly spodumene, petalite and lepidolite) used in industrial applications accounting for 7% of 2022 demand; and other specialty lithium metal used in industrial and niche applications.

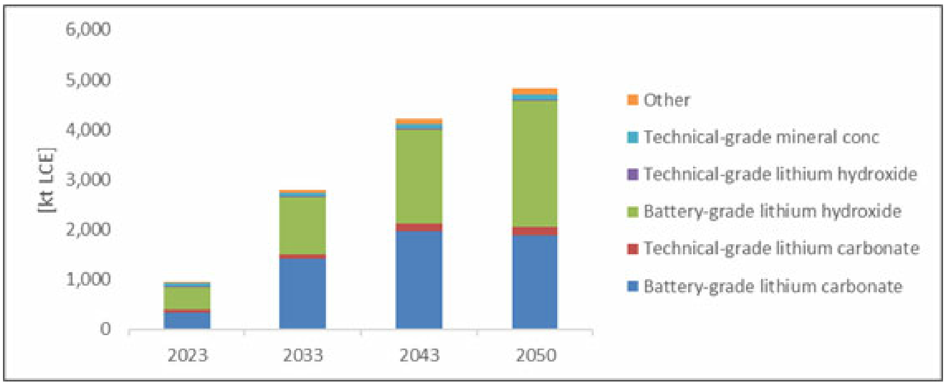


Figure 16-3 - Global Demand for Lithium by Product, 2023 - 2050 (Wood Mackenzie).

Lithium products are classified as 'battery-grade' ("**BG**") for use in rechargeable battery applications and 'technical-grade' ("**TG**") which is primarily used in industrial applications. TG lithium carbonate can also be processed and upgraded to higher purity carbonate or hydroxide products.

Lithium hydroxide is expected to experience exponential growth on the back of high-nickel Li-ion batteries. Demand for BG lithium hydroxide is expected to grow at 10% CAGR 2023-2033 to reach 1,133kt LCE in 2033, up from 450 kt LCE in 2023. Wood Mackenzie predict lithium hydroxide to be the largest product by demand volume in the near term. However, growth of LFP demand beyond China may see BG lithium carbonate reclaim its dominance.

Wood Mackenzie forecast LFP cathodes will increase its share of the cathode market from 28% in 2022 to 43% by 2033. This drives growth in lithium carbonates demand. Wood Mackenzie predicts lithium carbonate demand will grow at 14% CAGR between 2023 and 2033; slowing as the market matures.

16.1.4 Market Balance

The lithium market balance has shown high volatility in recent years. A large supply deficit resulted from historical underinvestment relative to strong demand growth in EVs. The rise in prices over the last few years has incentivized investment in additional supply. However, the ability for supply to meet demand remains uncertain given the persistence of delays and cost increases across both brownfield and greenfield developments.

For battery grade lithium chemicals, Wood Mackenzie predicts the market will remain in deficit in 2024. In 2025, battery grade chemicals are expected to move into a fragile surplus before falling into a sustained deficit in 2033 and beyond. Notably, technical grade lithium chemicals may be reprocessed into battery grade to reduce the deficit. However, the capacity and ability to do so is yet unclear.

16.2 Lithium Prices

Lithium spot prices have experienced considerable volatility in 2022 and 2023. Prices peaked in 2022, with battery grade products breaching US$80,000 / t. However, spot prices fell significantly during Q1 2023 before stabilizing in Q2 2023. A combination of factors can explain the price movements including the plateauing EV sales, slowdown of cathode production in China; and destocking through the supply chain, partially attributed to seasonal maintenance activities and national holidays.

Contract prices have traditionally been agreed on a negotiated basis between customer and supplier. However, in recent years there has been an increasing trend towards linking contract prices to those published by an increasing number of price reporting agencies (“**PRA**”). As such, contracted prices have tended to follow spot pricing trends, albeit with a lag.

16.2.1 Lithium Carbonate

Continued demand growth for LFP cathode batteries will ensure strong demand growth for BG lithium carbonate. This demand is expected to be met predominantly by supply from brine projects. Given the strong pricing environment, a large number of projects have been incentivized to come online steadily over the coming years. Wood Mackenzie forecast prices to decline as additional supply comes online. However, Wood Mackenzie forecasts a sustained deficit in battery-grade lithium chemicals to commence from 2031. Over the longer term, Wood Mackenzie expect prices to settle between US$26,000/t and US$31,000/ t (real US$ 2023 terms) (Figure 16-4).

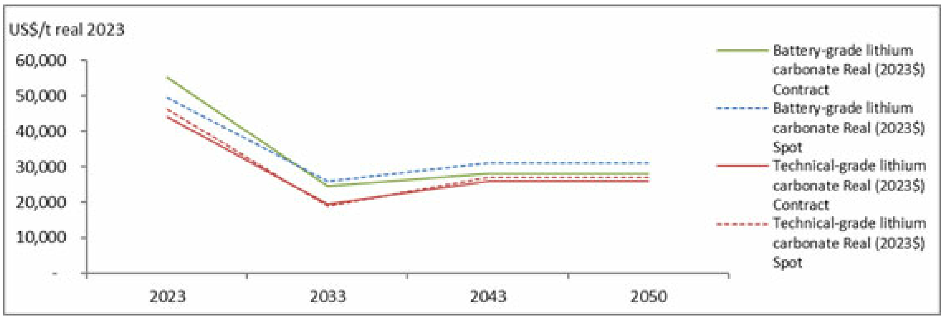


Figure 16-4 - Lithium Carbonate Price Outlook, 2023 - 2050 (Wood Mackenzie).

Notably, the market for BG carbonates is currently deeper and the spot market more liquid than hydroxide due to the size and experience of its main market of China. In addition, BG carbonates are used in a wider variety of batteries beyond the EV end use. TG lithium carbonate demand for industrial applications is forecast to grow in line with economic growth. However, TG lithium carbonate lends itself well to being reprocessed into BG lithium chemicals (either BG carbonate or BG hydroxide). The ability to re-process the product into BG lithium chemicals will ensure that prices will be linked to prices of BG lithium chemicals.

16.2.2 Lithium Hydroxide

The market for BG lithium hydroxide is currently small and relatively illiquid compared to the carbonate market. Growth in high nickel cathode chemistries supports a strong demand outlook. Most BG hydroxide is sold under long term contract currently, which is expected to continue. However, contract prices are expected to be linked to spot prices and therefore are likely to follow spot price trends albeit with a lag. Over the longer term, Wood Mackenzie expect hydroxide prices to settle at between US$25,000 and US$35,000/t (real US$ 2023 terms) (Figure 16-5).

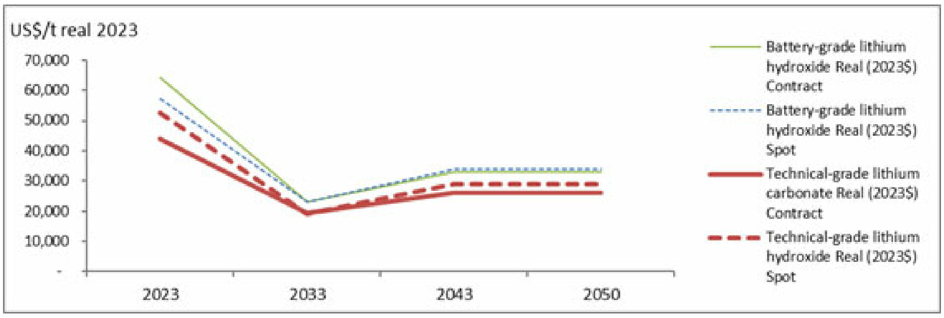


Figure 16-5 - Lithium Hydroxide Price Outlook, 2023 - 2050 (Wood Mackenzie).

16.2.3 Chemical Grade Spodumene

In 2022, demand from converters showed strong growth resulting in improved prices. After years of underinvestment, new capacity has been incentivized and both brownfield and greenfield projects are underway. Notably, these incremental volumes are observed to be at a higher cost and greater difficulty, raising the pricing hurdles required to maintain supply and extending timelines for delivery.

Wood Mackenzie forecasts a short period of supply volatility in the years to 2030, moving from surplus to deficit, to surplus before entering into a sustained deficit beyond 2031. Reflecting this dynamic, prices are expected to be in line with market imbalances. Wood Mackenzie forecast a long-term price between US$2,000/t and US$3,000/t (real US$2023 terms) (Figure 16-6).

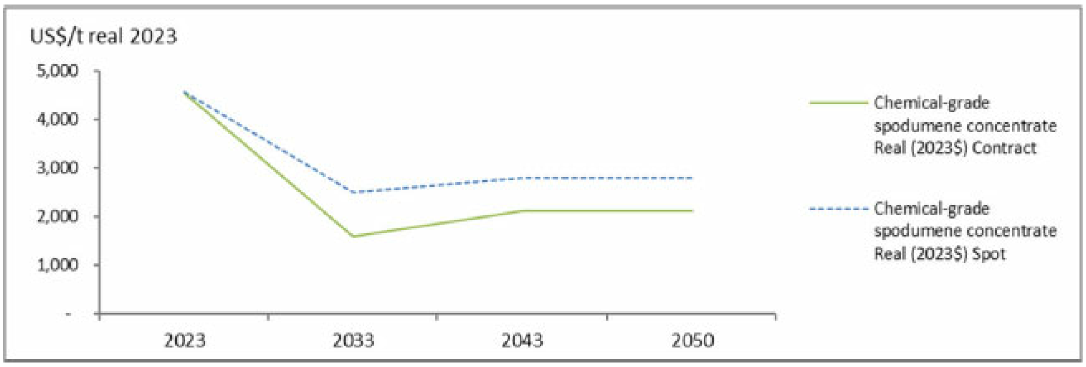


Figure 16-6 - Chemical-Grade Spodumene Price Outlook, 2023 - 2050 (Wood Mackenzie).

16.3 Offtake Agreements

As of the date of this Technical Report, Allkem has no existing formalized commercial agreements in place for the sale of lithium carbonate from the Sal de Vida Project. Allkem remains in discussions with potential customers. In line with the Project execution schedule, these discussions are expected to advance to negotiations throughout the course of the Project.

16.4 Risk and Opportunities

16.4.1 Price volatility

Recent pricing history demonstrates the potential for prices to rise and fall significantly in a short space of time. Prices may be influenced by various factors, including global demand and supply dynamics; strategic plans of both competitors and customers; and regulatory developments.

Volatility of prices reduces the ability to accurately predict revenues and therefore cashflows. At present, Allkem's agreements include index-based or floating pricing terms. In a rising market, this results in positive cashflows and revenues; in a falling market the financial position of the company may be adversely impacted. Uncertainty associated with an unpredictable cashflow may increase funding costs both in debt and equity markets and may therefore impact the company's ability to invest in future production. Conversely, a persistently stronger pricing environment may also permit self-funding strategies to be put into place.

16.4.2 Macroeconomic conditions.

Allkem produces lithium products which are supplied to a range of applications including lithium-ion batteries, the majority being used within the automotive sector and energy storage systems; industrial applications such as lubricating greases, glass, and ceramics; and pharmaceutical applications. Demand for these end uses may be impacted by global macroeconomic conditions, as well as climate change and related regulations, which in turn will impact demand for lithium and lithium prices. Macroeconomic conditions are influenced by numerous factors and tend to be cyclical. Such conditions have been experienced in the past and may be experienced again in future.

16.4.3 Technological developments within battery chemistries.

The primary growth driver for lithium chemicals is the automotive battery application, which accounts for more than 60% of demand today. Technology within automotive cathodes and cathode chemistries are continuously evolving to optimize the balance between range, safety, and cost. New “Next Generation” chemistries are announced with regularity, which carries the risk that a significant technology could move the automotive sector away from lithium-ion batteries. On a similar note, new technologies could also increase the intensity of lithium consumption. For example, solid state and lithium metal batteries could require more lithium compared to current lithium-ion battery technology. Despite the potential for technological innovations, the impact to the lithium market over the short-medium term is expected to be limited given the extended commercialization timelines and long automotive investment cycles which are a natural inhibitor to rapid technological change.

16.4.4 Customer concentration

Allkem is currently exposed to a relatively limited number of customers and limited jurisdictions. As such, a sudden significant reduction in orders from a significant customer could have a material adverse effect on our business and operating results in the short term. In the near term, this risk is likely to persist. As the battery supply chain diversifies on the back of supportive government policies seeking to establish localized supply, in particular in North America and Europe, there will be scope to broaden the customer base, however the size of automakers, the concentration in the automobile industry and the expected market growth will entail high-volume and high-revenue supply agreements. This risk is closely monitored and mitigative actions are in place where practicable.

16.4.5 Competitive environment

Allkem competes in both the mining and refining segments of the lithium industry presently. We face global competition from both integrated and non-integrated producers. Competition is based on several factors such as product capacity and scale, reliability, service, proximity to market, product performance and quality, and price. Allkem faces competition from producers with greater scale; downstream exposures (and therefore guaranteed demand for their upstream products); access to technology; market share; and financial resources to fund organic and/or inorganic growth options. Failure to compete effectively could result in a materially adverse impact on Allkem's financial position, operations, and ability to invest in future growth. In addition, Allkem faces an increasing number of competitors: a large number of new suppliers has been incentivized to come online in recent years in response to favorable policy environment as well as higher lithium prices. The strength of recent lithium price increases has also incentivized greater investment by customers into substitution or thrifting activities, which so far have not resulted in any material threat. Recycling will progressively compete with primary supply, particularly supported by regulatory requirements, as well as the number of end-of-life battery stock that will become available over the next decade as electric vehicles or energy storage systems are retired.

16.5 Conclusion

Wood Mackenzie, also known as WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries. It is the opinion of M. Dworzanowski, FSAIMM and FIMMM (the QP) that the long-term pricing assessment indicated in this section is deemed suitable for economic assessment of the Project at the current level of study.

16.6 Recommendations

Market analysis will continue to evolve during the project development phase. It is recommended that Allkem continue with ongoing market analysis and related economic sensitivity analysis.

Risk factors and opportunities in technological advancements, competition and macroeconomic trends should be reviewed for relevancy prior to major capital investment decisions. Remaining abreast of lithium extraction technology advancements, and potential further test work or pilot plant work may provide opportunities to improve the Project economics.

It is recommended to further develop a diversified customer base and secure offtake agreements to support the next study phase and potential expansion.

17. ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL OR COMMUNITY IMPACTS

This section describes the current status of environmental studies, permitting and social engagements undertaken by the Project.

It is the opinion of the QPs that the current Cauchari plans are adequate for environmental compliance, permitting, and local community relations. The estimated closing and reclamation costs are US$23.1M. In terms of environmental studies, permitting and social factors, Cauchari is in compliance with all federal and provincial regulations.

Cauchari has successfully completed the required environmental studies to support its exploration programs from 2011. In September 2019 it submitted an Environmental Baseline for the Exploitation stage which to date is under evaluation by the provincial mining authority. Environmental monitoring activities are being carried out in compliance with current permit requirements.

According to the mining environmental provincial decree 7751/23 (published in March 2023) the Cauchari project is working with expert teams around the adequacy of the provisions and activities foreseen for the Mine Closure Plan included in the Environmental Impact Report of Exploitation that is under evaluation, and must be adapted later according to new provisions included in Decree 7751/23.

17.1 Environmental Baseline and Impact Studies

As indicated above, the Environmental Impact Assessment is submitted at its baseline, depending on the stage of the project, whether exploration and/or exploitation, and is renewed biannually to keep the permit in force. This is regulated by Provincial Decree N° 5.771/2023 (previous Decree N° 5772/2010).

In the case of Cauchari, it has successfully completed various environmental studies required to support its exploration programs between 2011 and the present. The last Environmental Impact Assessment approval was in 2017 for the exploration stage (Resolution 002-DMYRE/2017, Resolution 084-DMyRE/2018 and Resolution 001-DmyRE/2019). Then, in September 2019 it submitted an Environmental Baseline for the Exploitation stage which to date is under evaluation by the provincial mining authority.

The aforementioned studies have been prepared by interdisciplinary teams of external consultants, specialized, and authorized by the province.

All the Environmental Impact Assessment are submitted to the Provincial Mining Directorate and subject to a participatory evaluation and administrative process with provincial authorities (Indigenous People Secretariat, Water Resources Directorate, Environmental Ministry, Economy, and Production Ministry, among others) and communities of influence, until the final approval resolution is obtained. In the case of SAS, the evaluation process is carried out with the participation and dialogue of the indigenous communities of Manantiales de Pastos Chicos, Olaroz Chico, Huancar, Termas de Tuzgle de Puesto Sey, Catua, Paso de Jama and Susques.

17.2 Project Permitting

While the Environmental Impact Assessment is the most important permit for any mining activity, each stage of the Project has necessarily required other types of permits.

All the permits listed below in Table 17-1 are in the process of renewal before the corresponding provincial authorities, while others are under analysis by the company until the effective exploitation activities begin.

Table 17-1 - Cauchari Permitting status as of Effective Date.

Approvals & Permits	Status	Authority
Industrial Water Feasibility (PPC06)	To renew	Provincial Hydrological Resources Direction
Municipal Authorization (Plant)	To renew	Susques Municipal Commission
Mining Producer Registration	In force	Provincial Mining Direction
Provincial Hazardous Waste Generator Certificate	In force	Environmental Provincial Quality Secretariat
Chemicals Products Certificate (Operator)	To request	National Registry of Chemical Products
Stamp Duty and Gross Income Exemption	To request	Provincial Revenue Direction
Registration of Air Fuel Tanks	To request	National Energy Secretary
Sand and Gravel Quarry Extraction Permit	To request	Provincial Hydrogeological Resources Direction
Modification Provincial Route 70 (Feasibility)	To request	Provincial Road Directorate - Provincial Environmental Quality Secretariat
Other Energy Supply (aqueduct, gas line, power line)	To request	Provincial Environmental Quality Secretariat

17.3 Other Environmental Concerns

The Project is partially located in the Olaroz-Cauchari Fauna and Flora Reserve, that was created in 1981 under provincial law 3820. The reserve is a multi-use area that allows for agricultural and mining activities and scientific investigation programs. Once the EIA Exploitation stage is approved by the provincial authority, the operation stage of the Project must be consistent with the multi-use reserve status.

17.4 Social and Community impacts

The company has been actively involved in community relations since the properties were acquired by Allkem prior to initial drilling on the Project in 2011. Although there is minimal habitation in the area of the salar, Allkem (previously as AAL) has consulted extensively with the local indigenous communities and employs members of these communities in the current exploration activities.

The formal EIA permitting process will address community and socio-economic issues; it is expected the Project will have a positive impact with the creation of new employment opportunities and investment in the region. As part of the EIA, a comprehensive consultation was undertaken with members of the local communities, regarding the Project development and its associated opportunities for the community members.

17.5 Mine Closure and Reclamation Plan

The Project has submitted a mine closure plan within the Exploitation Environmental Impact Assessment which is still under evaluation.

This plan must be approved by the Mining Provincial Directorate. It includes general measures such as decommissioning, physical, and chemical stabilization, land reclamation or rehabilitation, revegetation and post-closure monitoring measures and actions. From a social perspective, it includes social programs aimed at mine workers and the population of the communities interrelated to the mine and must be updated in the next renewal of the Environmental Impact Assessment, all in accordance with the provisions of Decree No. 7751/23.

In addition to these specific plans for the closure, The Project has also presented an Environmental Contingency Plan that establishes the policies, objectives, plans, actions, procedures, and indicators necessary for the development of its operations in an environmentally compatible manner and in compliance with applicable national, provincial, and municipal environmental legal requirements. This Plan is the minimum standard to be met by all personnel associated with the activities carried out at the mine (own personnel, contractors, service providers, auditors, inspectors and/or visitors) and at all sites of the mining operation and is submitted together with the Environmental Impact Assessment and updated with each renewal.

Finally, and since the approval of the Exploration EIA, Allkem carries out participatory and biannually environmental monitoring campaigns, sampling almost 30 representative points of fauna, flora, soil, climate, water, effluents, limnology, air quality, noise, limnology, landscape characteristics and ecosystem characterization, etc. Then, the reports of the results of these points are submitted to the Provincial Directorate of Mining, which evaluates them according to emission and legal conservation parameters and issues the corresponding approval.

According to the mining environmental provincial decree 7751/23 (published in March 2023) SAS is working with expert teams in the adequacy of the provisions and activities foreseen for the Mine Closure Plan included in the Environmental Impact Report of Exploitation that is under evaluation, as indicated above.

The estimated closing and reclamation cost is US$23.1M.

18. CAPITAL AND OPERATING COSTS

This section outlines the capital and operational costs for the Cauchari Project. Every cost forecast is delineated on a yearly basis for the planned life of mine.

18.1 Capital Cost Estimate

Cauchari is interpreted as greenfield project. The capital cost does not consider expenditures that have already been absorbed by Allkem in project development prior to the Effective Date.

All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, financial expenses and all financial assessments are expressed in US dollars.

18.1.1 Basis of Capital Cost Estimate

Cost estimates and economic assessments for the 25,000 tpa processing facility are at an AACE Class 4 +30% / - 20% level with no escalation of costs in the context of long-term product pricing estimate.

The Cauchari Project is still at Pre-Feasibility Study phase considering a ±25% accuracy and 15% contingency.

The capital cost estimate was prepared by Worley Chile S.A. and Worley Argentina S.A. (collectively, Worley) in collaboration with Allkem. The estimate includes capital cost estimation data developed and provided by Worley, Allkem, and current estimates.

The capital cost was broken into direct and indirect costs.

18.1.1.1 Direct costs

This encompasses costs that can be directly attributed to a specific direct facility, including the costs for labor, equipment, and materials. This includes items such as plant equipment, bulk materials, specialty contractor's all-in costs for labor, contractor direct costs, construction, materials, and labor costs for facility construction or installation.

18.1.1.2 Indirect costs

Costs that support the purchase and installation of the direct costs, including temporary buildings and infrastructure; temporary roads, manual labor training and testing; soil and other testing; survey, engineering, procurement, construction, and project management costs (EPCM); costs associated with insurance, travel, accommodation, and overheads, third party consultants, Owner's costs, and contingency.

18.1.1.3 Quantity Estimation

Quantity development was based on a combination of:

- Basic design (engineered conceptual designs).
- Estimates from plot plans, general arrangements or previous experience, and order of magnitude allowances.

Estimate pricing was derived from a combination of:

- Current pricing from Allkem's ongoing Projects and operations at Olaroz Stage 2 and Sal de Vida Stage 1.
- Estimated or built-up rates and allowances.
- Reconfirmed pricing from relevant contractors based on budget quantities and quotations.
- Labor hourly costs based on hourly labor costs built up to include labor wages, statutory payroll additives, insurances, vacation, and overtime provisions.
- The estimate considers execution under an EPC approach.

The construction working hours are based on a 2:1 rotation arrangement, i.e.: 14 (or 20) consecutive working days and 7 (or 10) days off. The regular working hours at 9.5 hours per day but could be extended up to 12 hours of overtime. Whilst an agreement will need to be reached with the relevant trade unions, this roster cycle is allowed under Argentinian law and has been used for similar projects. Labor at the wellfields, ponds, process plant, and pipelines areas will be housed in construction camps, with camp operation, maintenance, and catering included in the indirect cost estimate. A productivity factor of 1.35 was estimated, considering the Project/site-specific conditions.

Sustaining capital is based on current requirements and considers some operational improvements such as continuous pond harvesting.

Engineering, management, and Owner's costs were developed from first principles. The Owner's cost estimate includes:

- Home office costs and site staffing.
- Engineering and other sub-consultants.
- Office consumables, equipment.
- Insurance.

- Exploration.
- Pilot plant activities and associated project travel.

The estimate for the engineering, management and Owner's costs was based on a preliminary staffing schedule for the anticipated Project deliverables and Project schedule. Engineering design of the estimate for the home office is based on calculation of required deliverables and manning levels to complete the Project.

18.1.2 Summary of Capital Cost Estimate

A summary of the estimated direct and indirect capital costs by area is presented in Table 18-1. The capital costs are expressed in an effective exchange rate shown as Allkem's actual expense.

Table 18-1 - Capital Costs by Area.

Description	Capital Intensity (US$ / t Li_2CO^3)	CAPEX Breakdown US$ m
Direct Costs		
Brine Extraction Wells	645	16
Evaporation Ponds	5,854	146
Brine Treatment Plant	711	18
LCP	4,214	105
General Services	4,398	110
Infrastructure	1,591	40
Additional Camps	600	15
Total Direct Cost	**18,013**	**450**
EPCM	1,358	34
Owner Costs	1,160	29
Others	2,404	60
Contingency (15%)	3,440	86
TOTAL CAPEX	**26,376**	**659**

The total sustaining and enhancement capital expenditures for Cauchari Project over the total Life of Mine (LOM) period are shown in the Table 18-2.

Table 18-2 - Sustaining and Enhancement CAPEX.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Sustaining CAPEX	739	547	18
Total	739	547	18

18.2 Operating Costs Basis of Estimate

The operating costs estimate for Cauchari was updated by Worley (Chile) and reviewed by Allkem's management team. The cost estimate excludes indirect costs such as corporate costs, overhead, management fees, marketing and sales, and other centralized corporate services. The operating cost also does not include royalties, and export taxes to the company.

Most of these costs are based on labor and consumables which are in use at Olaroz operation as a going concern.

18.2.1 Basis of Operating Cost Estimate

18.2.1.1 Reagents

Reagent consumption rates are estimated from the process design and benchmarked with Olaroz Stage 2 design. Prices for the main reagent supplies were obtained from costs prevailing for FY 2024 Budget and were based on delivery to site.

18.2.1.2 Maintenance factor

A maintenance factor based on industry norms and established practice at Allkem's Olaroz plant was estimated and applied to each area to calculate the consumables and materials costs.

18.2.1.3 G&A

Annual general and administrative (G&A) costs include the on-site accommodation camp, miscellaneous office costs and expenditure on corporate social responsibility.

18.2.1.4 Taxes, Royalties, and Other Agreements

Current Provincial Mining royalty is limited to 3% of the mine head value of the extracted ore, calculated as the sales price less direct cash costs related to exploitation and excluding fixed asset depreciation. In addition, pursuant to Federal Argentine regulation Decree Nr. 1060/20, a 4.5% export duty on the FOB price is to be paid when exporting lithium products.

18.2.1.5 Employee Benefit Expenses

Cauchari project, like Olaroz Mine will be managed on a drive-in/drive-out basis, with personnel coming from the regional centers, primarily Salta and San Salvador de Jujuy. A substantial camp will be maintained that provides accommodation, recreation, meals, and a manned clinic. The Project will be supported with accounting, logistics, human resources, and supply functions based in an office in Jujuy, already established for Olaroz. Although these services already exist, economies of scale have not been considered for the Cauchari estimate.

The Cauchari operations will use the same work rotation as currently practiced at Olaroz Mine, depending on the operational area.

- This consists of a 14 by 14 days rotation: based on fourteen days on duty and fourteen days off-duty, with 12-hour shifts per workday, applicable for staff at site.
- A 5 by 2-day rotation: based on a Monday-to-Friday schedule, 40 hours per week, and would be applicable only to personnel at the Jujuy city office.

18.2.1.6 Operation Transports

Cauchari is located in the province of Jujuy at 3,900 m altitude, adjacent to the paved international highway (RN52) that links the Jujuy Provincial capital, San Salvador de Jujuy, with ports in the Antofagasta region of Chile that are used to export the lithium carbonate product and to import key chemicals, equipment and other materials used in the production of lithium carbonate. In addition, both Jujuy and Salta have regular flights to and from Buenos Aires.

The logistics cost to ship product out of site is included in the relevant Operating Cost breakdown. Reagents cost includes delivery-at-site prices.

Pricing for Cauchari transportation and port costs were based on the current Olaroz operations due to the 20km proximity of the Projects. The estimate includes freight, handling, depot, and customs clearance to deliver lithium carbonate either Freight on Board (FOB) Angamos Chile or Campana in Argentina.

Approximately 100 to 150 tonnes of lithium carbonate from the Cauchari will be trucked to port each day, equivalent to 4 to 6 trucks per day.

18.2.1.7 Energy

Natural gas is planned to generate the on-site power and process heating. Allkem's Olaroz plant is currently connected to the GAS ATACAMA gas pipeline at the Rosario Compressor Station, located between Susques and Paso de Jama (border with Chile). The Atacama pipeline is of Ø 20" and connects Cornejo (Salta) to Mejillones (Chile) with a length of approximately 950 km, of which 520 km is in Argentine territory. The interconnection to the SDJ gas pipeline is at approximately km 470 (Rosario Compressor Station). Key details of the gas supply are outlined below:

- Transportation Capacity: 240,000 m^3/day.
- Current gas transport: 50,000 m^3/day.
- Gas transport Expansion Project: 150,000 m^3/day.
- Total current + Expansion: 200,000 m^3/day

The Cauchari Project will include a gas pipeline extension to the Project site and related capacity allocations.

The electrical load for Cauchari was developed by Worley and benchmarked to the similar sized Olaroz Stage 2 project. Typical mechanical and electrical efficiency factors for each piece of equipment were applied.

18.2.2 Summary of Operating Cost Estimate

The Table 18-3 provides a summary of the estimated cost by category for a nominal year of operation. No inflation or escalation provisions were included. Subject to the exceptions and exclusions set forth in this Report, the aggregate peak annual Operating Cost for Cauchari are summarized in Table 18-3.

Table 18-3 - Operating Costs Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Variable Cost	2,425	1,794	61
Fixed Cost	1,656	1,226	40
TOTAL OPERATING COST	**4,081**	**3,020**	**101**

* Long Term estimated cost per year

Table 18-4 - Estimated Operating Cost by Category

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Reagents	2,158	1,597	54
Labor	674	499	16
Energy	235	174	6
General & Administration	596	441	14
Consumables & Materials	243	180	6
SITE CASH COSTS	**3,906**	**2,891**	**97**
Transport & Port	175	130	4
FOB CASH OPERATING COSTS	**4,081**	**3,020**	**101**

18.2.2.1 Variable Operating Costs

Consumable chemical reagents are the main operating cost. Reagents represent the largest operating cost category, then labor followed by operations and maintenance. Table 18-5 details the variable costs.

Table 18-5 - Variable Operating Costs Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Soda Ash	1,198	887	30
Lime	453	335	11
Carbon Dioxide	54	40	1
Natural Gas	138	102	3
Other Reagents	497	368	12
REAGENTS & CONSUMABLES COSTS	**2,340**	**1,732**	**58**
Logistics	27	20	1
Packaging	57	42	1
VARIABLE COSTS	**2,425**	**1,794**	**61**

* Long Term estimated cost per year

18.2.2.2 Fixed Operating Costs

From a fixed operating costs perspective, labor, operations, and maintenance are the main contributors to the total Operating Cost, as described in Table 18-6.

Table 18-6 - Fixed Operating Costs Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Labor	674	499	16
Operations	238	176	6
Maintenance	180	133	4
Camp Admin	168	124	4
Support Services	148	109	4
Energy	97	72	2
Others	152	112	4
FIXED COSTS	**1,656**	**1,226**	**40**

* Long Term estimated cost per year

18.2.2.3 Overhead and Sales Taxes

The remaining cost components include predicted Sales Taxes and Overhead. The Sales Taxes encompass the Government Royalty and Export Duties as addressed in previous sections.

18.3 Conclusions

The capital and operating cost for the Cauchari project was independently developed by Worley (Chile) and benchmarked with nearby and Allkem operated Olaroz Stage 2 construction and Olaroz Stage 1 operations, providing improved confidence in the presented costs.

The indicated capital and operational costs accurately reflect the incurred and future expected costs for the Cauchari project and can be utilized for economic analysis.

18.4 Recommendations

Allkem is currently constructing the Sal de Vida Stage 1 processing facility. Continued monitoring of costs and timelines can further enhance planning for Cauchari.

The Cauchari project was evaluated as a stand-alone green fields and current permitting applications reflect this approach. With the successful progression and operation of closely located Olaroz Mine, the project Capex and Opex estimates can be reviewed for synergistic opportunities during construction and operations that could improve overall Project Economics.

19. ECONOMIC ANALYSIS

Certain information and statements contained in this section and in the report are forward-looking in nature. Actual events and results may differ significantly from these forward-looking statements due to various risks, uncertainties, and contingencies, including factors related to business, economics, politics, competition, and society.

Forward-looking statements cover a wide range of aspects, such as project economic and study parameters, estimates of Brine Resource and Brine Reserves (including geological interpretation, grades, extraction and mining recovery rates, hydrological and hydrogeological assumptions), project development cost and timing, dilution and extraction recoveries, processing methods and production rates, metallurgical recovery rate estimates, infrastructure requirements, capital, operating and sustaining cost estimates, estimated mine life, and other project attributes. Additionally, it includes the assessment of net present value (NPV) and internal rate of return (IRR), payback period of capital, commodity prices, environmental assessment process timing, potential changes in project configuration due to stakeholder or government input, government regulations, permitting timelines, estimates of reclamation obligations, requirements for additional capital, and environmental risks.

All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this Report, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Report, the forward-looking statements in this report are subject to the following general assumptions:

- No significant disruptions affecting the project's development and operation timelines.
- The availability of consumables and services at prices consistent with existing operations.
- Labor and materials costs consistent with those for existing operations.
- Permitting and stakeholder arrangements consistent with current expectations.
- Obtaining all required environmental approvals, permits, licenses, and authorizations within expected timelines.
- No significant changes in applicable royalties, foreign exchange rates, or tax rates related to the project.

To conduct the economic evaluation of the project, Allkem's team employed a cash flow model that allows for both before and after-tax analysis. The main inputs for this model include the capital and operating cost estimates presented in the previous chapters, along with an assumed production program based on the plant performance capability and the pricing forecast outlined in Section 16.

Using the cash flow model, it has been calculated the key project's indicators, including a sensitivity analysis on the most critical revenue and cost variables to assess their impact on the project's financial metrics.

19.1 Evaluation Criteria

For the economic analysis, the Discounted Cash Flow (DCF) method was adopted to estimate the project's return based on expected future revenues, costs, and investments. DCF involves discounting all future cash flows to their present value using a discount rate determined by the company. This approach facilitates critical business decisions, such as M&A activities, growth project investments, optimizing investment portfolios, and ensuring efficient capital allocation for the company.

Key points about the Discounted Cash Flow method:

- The discount rate is based on the weighted average cost of capital (WACC), incorporating the rate of return expected by shareholders.
- All capital expenditures that will be incurred as part of project development are considered as sunk costs and excluded them from the present value calculations.

The DCF approach involves estimating net annual free cash flows by forecasting yearly revenues and deducting yearly cash outflows, including operating costs (production and G&A costs), initial and sustaining capital costs, taxes, and royalties. These net cash flows are then discounted back to the valuation date using a real, after-tax discount rate of 10%, reflecting Allkem's estimated cost of capital. The model assumes that all cash flows occur on December 31st, aligning with Allkem's Fiscal Year.

The DCF model is constructed on a real basis without escalation or inflation of any inputs or variables. The primary outputs of the analysis, on a 100% Project basis, include:

- NPV at a discount rate of 10%.
- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.
- Annual earnings before interest, taxes, depreciation, and amortization (EBITDA).
- Annual free cash flow (FCF).

19.2 Financial Model Parameters

19.2.1 Overview

The financial model is based on several key assumptions, including:

- Production schedule in a Fiscal Year basis (July to June), including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule.
- Projections of plant recoveries and lithium grades.
- Operating, capital, and closure costs for a 30-year operating life.

- Operating costs related to wellfields, evaporation ponds, process plant, waste removal, site-wide maintenance and sustaining costs, environmental costs, onsite infrastructure and service costs, and labor costs (including contractors).
- Product sales assumed to be Free on Board (FOB) South America.

19.2.2 Production Rate

The Cauchari Project nominal capacity of annual lithium carbonate is estimated to be 25,000t/year as described in the Chapter 12.

The Table 19-1 summarizes the production quantities, grades, overall recovery, average sale prices, revenues, investments, operating costs, royalties, taxes, depreciation/amortization, and free cash flows on an annual basis with LOM totals, among other things.

Table 19-1 - Annual economic analysis

Fiscal Year	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041
Wells	Million l	-	-	-	2,676	8,326	10,245	13,624	13,781	14,380	14,380	14,380	14,819	15,137	15,137	15,137	15,137	15,137	15,137
Lithium Grade	mg Li/l	-	-	-	579	579	554	572	559	559	551	539	514	490	488	488	487	487	487
Overall Recovery	%	-%	-%	-%	-%	60%	82%	60%	61%	58%	59%	61%	62%	63%	64%	64%	64%	64%	64%
Production	tpa Li2CO3	-	-	-	-	15,460	24,612	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Average Sale Price	US$/t Li2CO3	-	-	-	-	24,340	26,578	24,840	23,340	23,340	24,090	25,090	26,840	27,840	27,840	27,840	27,840	27,840	27,840
Revenues	US$M	-	-	-	-	376	654	621	584	584	602	627	671	696	696	696	696	696	696
Operating Costs	US$M	-	-	-	-	(17)	(82)	(63)	(104)	(96)	(105)	(106)	(106)	(108)	(101)	(101)	(101)	(101)	(101)
Royalties and Export duties	US$M	-	-	-	-	(28)	(47)	(45)	(41)	(41)	(42)	(44)	(47)	(49)	(49)	(49)	(49)	(49)	(49)
G&A	US$M	-	-	-	-	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
EBITDA	**US$M**	**-**	**-**	**-**	**-**	**324**	**518**	**505**	**431**	**439**	**447**	**469**	**510**	**532**	**538**	**538**	**538**	**538**	**538**
Depreciation and Amortization	US$M	-	-	(8)	(16)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)	(17)
Taxes	US$M	-	(57)	(57)	(12)	(39)	(110)	(171)	(145)	(148)	(150)	(158)	(172)	(180)	(182)	(182)	(182)	(182)	(182)
Change in Working Capital	US$M	-	-	-	(33)	(175)	(75)	(71)	10	(12)	1	2	(3)	4	0	0	0	0	(0)
Pre-tax Operating Cash Flow	**US$M**	**-**	**-**	**-**	**(33)**	**149**	**442**	**434**	**441**	**427**	**448**	**471**	**508**	**535**	**538**	**538**	**538**	**538**	**538**
Post-tax Operating Cash Flow	**US$M**	**-**	**(57)**	**(57)**	**(45)**	**110**	**333**	**263**	**296**	**279**	**298**	**313**	**335**	**355**	**356**	**356**	**356**	**356**	**356**
Growth CAPEX	US$M	-	(326)	(326)	(57)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capex	US$M	-	-	-	-	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)
Investment Cash Flow	**US$M**	**-**	**(326)**	**(326)**	**(57)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**
Closing Costs[6]	US$M	(23)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax Free Cash Flow	**US$M**	**-**	**(326)**	**(326)**	**(90)**	**131**	**424**	**416**	**423**	**408**	**430**	**453**	**489**	**517**	**520**	**520**	**520**	**520**	**519**
Post-tax Free Cash Flow	**US$M**	**-**	**(382)**	**(382)**	**(102)**	**92**	**314**	**245**	**278**	**261**	**280**	**295**	**317**	**337**	**338**	**338**	**338**	**338**	**337**

Fiscal Year	Units	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	LOM
Wells	Million l	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	15,137	-	-	424,494
Lithium Grade	mg Li/l	487	487	486	486	485	485	484	483	481	480	477	475	473	471	469	-	-	500
Overall Recovery	%	64%	64%	64%	64%	64%	64%	64%	64%	65%	65%	65%	65%	66%	66%	66%	-%	-%	66%
Production	tpa Li2CO3	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	-	740,072
Average Sale Price	US$/t Li2CO3	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	27,840	-	27,066
Revenues	US$M	696	696	696	696	696	696	696	696	696	696	696	696	696	696	696	696	-	20,031
Operating Costs	US$M	(101)	(101)	(101)	(101)	(101)	(101)	(101)	(101)	(101)	(101)	(102)	(101)	(102)	(101)	(131)	(179)	-	(3,020)
Royalties and Export duties	US$M	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(49)	(48)	(47)	-	(1,412)
G&A	US$M	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	-	(236)
EBITDA	**US$M**	**538**	**538**	**538**	**538**	**538**	**538**	**538**	**538**	**538**	**538**	**537**	**538**	**537**	**538**	**509**	**462**	**-**	**15,363**
Depreciation and Amortization	US$M	(17)	(17)	(17)	(17)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(647)
Taxes	US$M	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(182)	(172)	(156)	-	(5,186)
Change in Working Capital	US$M	0	0	1	0	0	0	1	0	1	1	2	(0)	1	0	60	178	106	-
Pre-tax Operating Cash Flow	**US$M**	**538**	**538**	**538**	**538**	**538**	**538**	**539**	**538**	**538**	**538**	**539**	**538**	**539**	**538**	**569**	**640**	**106**	**15,363**
Post-tax Operating Cash Flow	**US$M**	**356**	**356**	**356**	**356**	**356**	**356**	**357**	**356**	**356**	**356**	**357**	**356**	**357**	**356**	**397**	**484**	**106**	**10,178**
Growth CAPEX	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(708)
Sustaining Capex	US$M	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	(18)	-	(547)
Investment Cash Flow	**US$M**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**(18)**	**-**	**(1,255)**
Closing Costs[1]	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(23)
Pre-tax Free Cash Flow	**US$M**	**520**	**520**	**520**	**520**	**520**	**520**	**520**	**520**	**520**	**520**	**521**	**519**	**520**	**520**	**551**	**622**	**106**	**14,109**
Free Cash Flow	**US$M**	**338**	**338**	**338**	**338**	**338**	**338**	**338**	**338**	**338**	**338**	**339**	**337**	**338**	**338**	**379**	**466**	**106**	**8,923**

Note: The overall recovery is calculated considering the total lithium units produced relative to the total lithium units pumped out of the wells. It may be affected by the pond inventory and production ramp-up, causing temporary fluctuations. At stable production levels, the overall recovery is approximately 64-66%.

[1] Reclamation and closure costs are calculated at Present Value at US$ 23M and not disclosed as cashflows

19.2.3 Process Recoveries

The basis for the process recoveries is included in Chapter 10, and the process design is outlined in Section 14.

19.2.4 Commodity Prices

Wood Mackenzie provided near and long-term price outlooks for all products in Q1 2023. As detailed in the Chapter 16, lithium spot prices have experienced considerable volatility in 2022 and 2023. This issue is addressed with sensitivity analyses.

With a lithium cut-off grade of 300 mg/l utilized, based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$ 20,000 per tonne over the entirety of the LOM, and considering the economic value of the brine against production costs the applied cut-off grade for the resource estimate (300 mg/l) is believed to be conservative in terms of the overall estimated resource. Domains in the block model with grades below the 300 mg/l cut-off grade were not considered in the resource estimate; thus, with these assumptions, a reasonable basis has been established for the prospects of eventual economic extraction.

Furthermore, the assigned 300 mg/L cut-off grade is consistent with other lithium brine projects of the same study level, which use a similar processing method. The resource is relatively homogeneous in grade (as shown in the grade-tonnage curve of Figure 11 17), and the average concentration is well above the cost of production, with brine concentrated in low-cost solar evaporation ponds.

The price estimate for Lithium Carbonate is based on information provided by industry consultants Wood Mackenzie, based on their extensive studies of the lithium market. Actual prices are negotiated by Allkem with customers, generally as contracts related to market prices.

Mr. F. Reidel AIPG (the QP) understands the lithium market will likely have a shortfall of supply in the coming few years, which will support higher than inflation-adjusted historical prices. Based on 2022 and 2023 pricing to date, the Wood Mackenzie analysis is considered a reasonable basis for pricing through to 2025. By this time, a new technical report will likely be completed, outlining details for the feasibility study.

Section 16.2.1 provides details on the basis of estimate for Lithium Carbonate prices used to estimate project revenues showing economic viability under current market conditions.

WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries. Supplementary comments are provided by the Allkem internal marketing team based on experience with Olaroz Project product marketing.

19.2.5 Capital and Operating Costs

The capital and operating cost estimates are detailed in Section 18.

19.2.6 Taxes

Taxes in Argentina are calculated in pesos, as opposed to U.S. Dollars, which Allkem uses to report its results. Pursuant to recent changes in Argentine tax legislation, the corporate tax rate for the top tax bracket was increased from 30% to 35% effective January 1, 2021. For the purpose of this report, the Corporate Rate was 35%.

19.2.7 Closure Costs and Salvage Value

Allkem currently estimates US$23 million rehabilitation cost for the closure cost, based on the current Olaroz estimate.

19.2.8 Financing

The economic analysis assumes 100% equity financing and is reported on a 100% project ownership basis.

19.2.9 Inflation

All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, financial expenses and all financial assessments are expressed in US dollars.

19.2.10 Exchange Rate

All estimates disclosed herein are expressed in US dollars. Allkem uses US dollars as reporting currency in all statements and reports. Allkem's subsidiaries use US dollars as reporting currency and operational currency. Argentine Peso is used as a transactional currency for local payments within the country. Argentine peso has seen high volatility due to hyperinflation and macroeconomic challenges adopting the US dollar as operational currency used to determine prices, costs, estimates, and projections. Foreign exchange currency exposure is an inherent risk Allkem is exposed and has been considered when estimating escalation costs.

19.3 Economic Evaluation Results

The key metrics are summarized in Table 19-2.

Table 19-2 - Base Case Main Economic Results.

Summary Economics		
Production		
LOM	yrs	30
First Production	Date	2027
Full Production	Date	2029
Capacity	tpa	25,000
Investment		
Development Capital Costs	US$m	659
Sustaining Capital Costs	US$m per year	18
Development Capital Intensity	US$/tpa Capacity	26,376
Cash Flow		
LOM Operating Costs	US$/t LCE	4,081
Avg Sale Price (TG)	US$/t LCE	27,066
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	2,523
NPV @ 10% (Post-Tax)	US$m	1,366
NPV @ 8% (Post-Tax)	US$m	1,942
IRR (Pre-Tax)	%	32.6%
IRR (Post-Tax)	%	23.9%
Payback After Tax (production start)	yrs	3.3
Tax Rate	%	35.0%

19.4 Indicative Economics and Sensitivity Analysis

To assess the robustness of the project's financial results, a sensitivity analysis was conducted in a range of +/- 25% on the key variables that impact the Cauchari's after-tax net present value (NPV). The sensitivity analysis explores the potential effects of changes in relevant variables, such as:

- Revenue variables:
    - Lithium carbonate prices
    - Production levels
- Cost variables:
    - Capital expenditure (CAPEX)
    - Operating expenses (OPEX)

The results are graphically summarized in the Figure 19-1 and Table 19-2.

19.4.1 Cauchari Project NPV@10% Sensitivity Analysis

The sensitivity analysis examined the impact of variations in commodity prices, production levels, capital costs, and operating costs on the project's NPV at a discount rate of 10%. The aim is to illustrate how changes in these crucial variables affect the project's financial viability.

The following Table 19-3 and Figure 19-1 provide the insights into the NPV@10% associated with the fluctuations in the key variables.

From the analysis, the commodity price has the most significant impact on the Cauchari's NPV, followed by production levels, OPEX, and CAPEX. Price emerges as the most influential factor and a mere 10% variation in price results in a 19% impact on the NPV. Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, Cauchari remains economically viable.

The sensitivity analysis focused on individual variable changes, and the combined effects of multiple variable variations were not explicitly modeled in this analysis.

Table 19-3 - Sensitivity Analysis NPV.

Driver Variable	Base Case Values		Project NPV@10% (US$ m)				
			Percent of Base Case Value				
			-25%	-10%	Base Case	+10%	+25%
Production	Tonne/yr	25,000	787	1,134	1,366	1,597	1,945
Price	US$/tonne	27,066	712	1,104	1,366	1,627	2,020
CAPEX*	US$m	1,206	1,515	1,425	1,366	1,306	1,216
OPEX	US$/tonne	4,081	1,495	1,418	1,366	1,314	1,236

* Capital + Enhancement + Sustaining

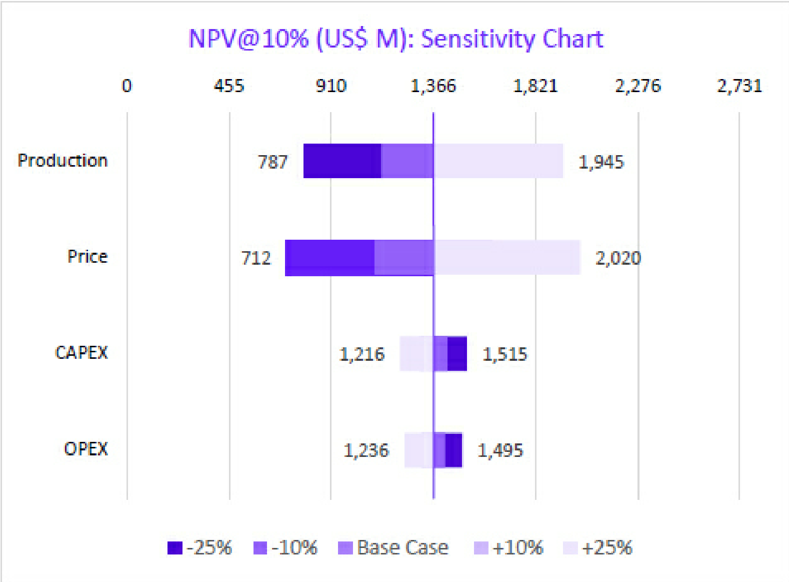


Figure 19-1 - Sensitivity chart.

Based on the assumptions detailed in this report, the economic analysis of Cauchari demonstrates positive financial outcomes. The sensitivity analysis further strengthens its viability, as it indicates resilience to market fluctuations and cost changes. The sensitivity analysis indicates that the greatest project risk is the lithium carbonate price despite the favorable price history of the last two years. Further, unlike production targets, this price risk is not within the control of Allkem.

By conducting this sensitivity analysis, it provides a comprehensive understanding of the project's financial risks and opportunities. This approach allows for informed decision-making and a clear assessment of the Cauchari's potential performance under various economic scenarios.

19.5 Conclusion

Based on the detailed assumptions, the economic analysis of the Cauchari Project demonstrates positive economic outcomes. The sensitivity analysis further indicates economic resilience to market and cost fluctuations.

The financial model incorporates and reflects the main input parameters outlined throughout this report. The financial model reflects the positive potential economic extraction of the resource.

19.6 Recommendation

Risk of changes to government acts, regulations, tax regimes or foreign exchange regulation remains and must be reviewed upon enactment. Related risk and change management must be accurately reflected in the Project contingencies or expected economic performance.

20. ADJACENT PROPERTIES

20.1 Introduction

Information on adjacent properties was obtained from third-party websites operated by the companies and/or official websites. The QPs have not verified the accuracy of this information and make no claims or warranties about the information contained in this section.

The Cauchari Project is located directly adjacent to two other producing lithium operations, the producing Olaroz Lithium Project (Sales de Jujuy, owned by Allkem) and the Cauchari-Olaroz Project owned by Lithium Americas Corp and Ganfeng.

20.2 Sales de Jujuy - Olaroz Lithium Project

The Sales de Jujuy Project to the north in the Olaroz Salar has a reported resource of 6.4 million tonnes of lithium carbonate equivalent and 19.3 million tonnes of potash (KCL) (Houston and Gunn, 2011).

Extract from Minera Exar S.A. Data consulted June 30,2023.

"Lithium Americas Corp. and Ganfeng Lithium Co. Ltd. ("GFL" or "Ganfeng Lithium") own the Cauchari-Olaroz Project through a 49/51 joint venture company ("JV"), Minera Exar S.A. ("Minera Exar"). On August 26, 2020, GFL, LAC and Exar entered into a Share Acquisition Option Execution Agreement with Jujuy Energía y Minería S.E. ("JEMSE") a Province of Jujuy state company, setting the guidelines of JEMSE acquisition of an 8,5% participating interest in Minera Exar, proportionally diluting GFL and LAC participating interest accordingly.

LAC report titled "Updated Feasibility Study and Mineral Reserve Estimation to Support 40,000 tpa Lithium Carbonate Production at the Cauchari-Olaroz Salars, Jujuy Province, Argentina."

LAC, through its Argentine subsidiary, Minera Exar, has acquired mining and exploration permits applications through acquisition of such permits application, direct request of permits from the applicable provincial mining authority and/ or through brines usufruct agreements in the Province of Jujuy, Argentina. A total of 60,712 ha of exploration and mining permits have been requested in the Department of Susques; 28,717 ha have been granted to date and can support the entire project. The claims are contiguous and cover most of the Cauchari Salar and a portion of the Olaroz Salar.

For the execution of this project, Minera Exar owns mineral properties immediately adjacent to the Olaroz Project and described below (Table 20-1).

Table 20-1 - Minera Exar owned mineral properties (Source: Minera Exar).

Mining Rights			
File	Name	Mineral	Area (ha)
1343-M-2009	ALEGRIA 7	Disseminated Lithium and Borate	1,036.77
1149-L-2009	CAUCHARI ESTE	Borate, Lithium and Alkaline Salts	586,906
1251-M-2009	CHICO 3	Borate and Lithium	1.400.00
1252-M-2009	CHICO 4	Borate and disseminated Lithium	62.48
27-R-2000	LA YAVEÑA	Borate, Lithium and Sodium Sulphate	1.119.67
177-Z-2003	MARIA ANGELA	Borate and Lithium	100
381-M-2005	MIGUEL	Borate and Lithium	100.63
37-V-2002	MINERVA	Ulexite and Lithium	229.52
1517-M-2010	PAYO III	Borate and Lithium	2,890.39
1518-M-2010	PAYO IV	Borate and Lithium	2,981.18
1519-M-2010	PAYO V	Disseminated Lithium and Borate	896.61
1520-M-2010	PAYO VI	Disseminated Lithium and Borate	2,800.14
1521-M-2010	PAYO VII	Borate and Lithium	2,999.52
1522-M-2010	PAYO VIII	Borate and Lithium	1,337.11
1072-L-2008	CATEO	1 & 2 category	1,501.38
1440-M-2010	CATEO	2 & 2 category	9,479.12
349-R-2005	CATEO	3 & 2 category	996.37
59-I-1998	ANGELINA	Borate and Lithium	2,253.09
60-I-1998	ARTURO	Borate (Ulexite) and Lithium	5,050.70
183-D-1990	EDUARDO	Boron and Lithium	100.01
120-M-1944	EDUARDO DANIEL	Borate	100.15
101-C-1990	GRUPO MINERO LA INUNDADA	Borate and Lithium	536.37
104-I-1990	GRUPO MINERO OSIRIS	Borate and Lithium	300.29
150-M-1992	HEKATON	Borate and Lithium	200
140-N-1992	IRENE	Borate and Lithium	200
62-L-1998	JORGE	Borate and Lithium	2,352.23
61-I-1998	LUISA	Borate (Ulexite) and Lithium	4,707.40
72-M-1999	SAN ANTONIO	Borate	900
70-R-1998	SULFA 6	Borate, Lithium and Sodium Sulphate	1,682.89
71-R-1998	SULFA 7	Borate and Sodium Sulphate	1,824.44
72-R-1998	SULFA 8	Borate and Sodium Sulphate	1,841.59
67-R-1998	SULFA 9	Borate, Lithium and Sodium Sulphate	1,580.19
48-P-1998	TITO	Borate and Lithium	100
299-M-2004	VERANO I	Borate and Lithium	2,488.25
65-E-2002	VICTORIA I	Borate and Lithium	299.99
2432-M-2018	VALENTINA	Borate and Lithium brines	73
2433-M-2018	ISABELLA	Borate and Lithium brines	2,986.25
2434-M-2018	ISABELLA I	Borate and Lithium brines	2,999.20

Mining Rights			
File	Name	Mineral	Area (ha)
2856-M-2021	CATEO	1 & 2 category	2,812.80
2892-M-2022	CAUCHARI NORTE	Borate and Lithium	1,038.77
2900-M-2022	CAUCHARI SUR	Borate and Lithium brines	612.81
2943-M-2022	CAUCHARI OESTE 3	Borate and Lithium brines	3,205.23
2941-M-2022	CAUCHARI OESTE 1	Borate and Lithium brines	3,140.17
2942-M-2022	CAUCHARI OESTE 2	Borate and Lithium brines	3,133.42
3010-M-2022	CATEO	1 & 2 category	1,382.74

20.3 Possible adjoining disputes

Given that as noted above, Allkem's Cauchari properties adjoin its Olaroz properties, and that the mineral resource to be exploited by the three companies is mobile brine, it is highly likely that wells located near the borders of the properties, will extract brine across these borders. This fact creates the potential for legal conflicts among the companies that share the Mineral Resources contained in the continuous aquifer below the Cauchari and Olaroz Salars.

This problem of adjoining mineral properties, with a mobile resource beneath them, often occurs in oil and gas production, where it is solved via "unitization agreements" among the area concessionaries. Unitization agreements have been used in Argentina, in the oil and gas industry. It is recommended that in the case of the exploitation of the lithium rich Cauchari - Olaroz Salars, the companies involved proactively establish an agreement of this type among themselves.

21. OTHER RELEVANT DATA AND INFORMATION

21.1 Product / Processing Options Trade Off Study

As part previous study phases, Allkem requested Worley (Chile) to carry out a trade-off study to compare the final product/processing options as outlined below:

- Alternative processing options, to include a technical summary of currently available options and potential new processing technologies.
- Recommendations with support for the selected processing methodology.
- Final Product - assuming a nameplate capacity of 25,000 tpy - the following product scenarios evaluated:
    - Scenario 1: on-site lithium carbonate battery grade.
    - Scenario 2: on-site lithium hydroxide.
    - Scenario 3: a mix of the two with lithium hydroxide being produced off-site.

The trade-off study on product type delivery gathered sufficient economic and technical data to estimate capital investment and operational costs for the three product type options. The objective for this study was set to determine the CAPEX and OPEX gaps rather than deriving an accurate estimate that could be used outside this study.

A decision was made in favor of producing lithium carbonate battery grade on site, discarding the production of lithium hydroxide or a mix of the two products.

Accordingly, Worley were requested to complete the study and their cost estimates to AACE class 4 accuracy, based on the production of lithium carbonate battery grade on site, then transported via the Antofagasta port for distribution to customers in Asia.

This is reflected in relevant chapters of this report, including OPEX and CAPEX inputs to the economic model.

21.2 Project Schedule

A project schedule has been developed for the Cauchari project which considers the activities for the Project from the start of the feasibility stage up to the completion of the Plant Commissioning.

The Project major milestones are outlined in Table 21-1.

Table 21-1 - Major Project Milestones.

Milestone	Date
Completion of value engineering and scope definitions following the DFS	Q4 2023
Completion of Feasibility Study - DFS	Q2 2024
Environmental Impact Study Approved	Q2 2025
Start Camp Construction	Q2 2025
Funds Available	Q3 2025
Start Construction	Q4 2025
Start Pond Filling with Brine	Q1 2027
First Brine Ready to be Processed	Q1 2028
First Lithium Carbonate	Q2 2028
Ramp Up Complete	Q4 2028

The evaporation ponds construction duration is estimated at 14 months. The plant construction will be delayed by 12 months to allow sufficient evaporation time for brine within the ponds to meet the process design criteria input requirements. It is estimated that the plant construction schedule will be similar to Allkem’s Olaroz II that is nearing commissioning completion and entering ramp-up phase as of the Effective Date.

22. INTERPRETATION AND CONCLUSIONS

22.1 Geology, Resources and Reserves

Based on the analysis and interpretation of the exploration, resource definition drilling, and hydrogeological test work carried out on the Cauchari Lithium Project between 2011 and 2019, the following concluding statements are prepared:

- The geology consists of permeable alluvial fan material in the NW Sector of the Project and along the eastern and western external property boundaries. This fan material grades into finer grained materials towards the center of the salar. In the center of the salar a clay unit has been identified near surface that overlies a thick halite unit. Deep drilling intersections in the SE Sector of the Project have identified a relatively permeable Lower Sand unit between 400 m and 600 m depth that underlies the central halite.
- The composition of the lithium bearing brines has been characterized to depths of up to 600 m. The brine is amenable to conventional lithium recovery process technology.

It is the opinion of the QPs that the salar geometry, brine chemistry composition and the specific yield of the salar sediments have been adequately defined to support the Measured, Indicated and Inferred Resource estimates.

A numerical groundwater flow and transport model was developed for the Project to simulate the proposed brine production over a 30-year mine life and to prepare a lithium reserve estimate. It is the opinion of the QPs that the FEFLOW model provides a reasonable representation of the hydrogeological setting of the Project area and that the model is adequately calibrated to be used for the preparation of the Mineral Reserve estimate.

22.2 Mining, Processing, and Infrastructure

The described mining method is deemed adequate to support economic brine extraction and is similar in configuration to other lithium brine extraction configurations witnessed on operating properties owned by Allkem.

It is the opinion of the QPs that the described process design is reasonable and implementable. The process is standard and has been previously proven to produce similar products. The process design is based on conducted test work and reflects the related test work parameters. The process-related equipment is suitably sized and organized to produce the mentioned products in the quantities specified. The reagent and commodity consumption rates are deemed appropriate for the size of plant.

The Project support and process infrastructure has been reviewed and is deemed adequate by the QPs to support the process and operations described in this report.

22.3 Market Studies

Wood Mackenzie, also known as WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries. It is the opinion of Mr. M. Dworzanoswki, FSAIMM and FIMMM (QP) that the long-term pricing assessment indicated in this section is deemed suitable for economic assessment of the Project at the current level of study.

22.4 Environmental and Social Issues

The Cauchari tenements are not subject to any known environmental liabilities. There have been historical ulexite / borax mining activities adjacent to the Cauchari JV in the north of the salar. These mining operations are generally limited to within three meters of the surface, and it is assumed that these borax workings will naturally reclaim when mining is halted due to wet season inflows.

22.5 Project Costs and Financial Evaluation

The capital and operating cost for the Cauchari project was independently developed by Worley (Chile) and benchmarked with nearby Olaroz Stage 2 construction and Olaroz Stage 1 operations, providing improved confidence in the presented costs.

The indicated capital and operational costs accurately reflect the incurred and future expected costs for the Cauchari project and can be utilized for economic analysis.

Based on the detailed assumptions, the economic analysis of the Cauchari Project demonstrates positive economic outcomes. The sensitivity analysis further indicates economic resilience to market and cost fluctuations.

The financial model incorporates and reflects the main input parameters outlined throughout this report. The financial model reflects the positive potential economic extraction of the resource.

23. RECOMMENDATIONS

23.1 Resources and Reserves

23.1.1 NW Wellfield Area

It is recommended that two additional test production wells are installed in the lower Archibarca unit to verify the lateral continuity of the low permeability units (and/or anisotropy) between the upper freshwater aquifer and the underlying brine unit. Each well site will require the completion of two adjacent monitoring wells with isolated screened intervals in the upper and lower units. Complete 7-day pumping trials in each new test production well.

A minimum of 10 additional mini piezometers are installed at the toe of the Archibarca Fan and new evaporation measurements are undertaken to refine the water balance.

Low flow sampling is carried out in well CAU7M350, CAU17D, CAU18D, CAU20D, and 21D at five selected depth intervals to verify previous chemistry analysis.

23.1.2 SE Wellfield Area

It is recommended that a minimum of 3 diamond core exploration holes are drilled to convert Inferred Resource into Indicated Resources to a depth of 600 m in the SE Sector (Lower Sand and Halite/Clay units).

The spinner log test is carried out in CAU11R during a new short pumping test to verify the CAU11R pumping test results and interpretation.

A new test production well and two adjacent monitoring wells are drilled targeting the Lower Sand unit and a 20-day pumping test is completed.

23.1.3 Regional Hydrogeology

It is recommended that five multi-level piezometers are installed in and around the salar to improve the understanding of the distribution of piezometric heads. Groundwater samples should be taken from each multi-piezometer.

23.1.4 Analytical Work

Update the geological model and Resource Estimate with all new drilling results in the next project phase.

Update the conceptual hydrogeological model for the FEFLOW model domain in the next project phase.

Incorporate updated hydrogeological model, updated piezometric data, and any new pumping test results into the FEFLOW model and carry out further re-calibration.

Carry out FEFLOW brine production simulations to:

- Optimize wellfield configuration to improve LOM Li concentrations.
- Evaluate environmental considerations to assess any potential restrictions to the production simulations.
- Prepare an updated Mineral Reserve estimate for the Project.

23.2 Mining, Processing, and Infrastructure

For an optimization of the lithium recovery operations, there are several technologies to be evaluated as alternatives to guarantee the company's future production in the long term. In particular, the carbonation plant effluents, and in particular the so-called "mother liquor". This is recirculated in the process, discharging it back into the evaporation pond circuit. This mother liquor stream still contains a certain concentration of lithium, which is not lost when recirculated, but at the same time the impurities that this stream may have, are also incorporated into the evaporation pond circuit. To improve this recovery process, it is recommended to evaluate alternatives that allow recovering as much lithium as possible from this mother liquor stream but leaving the other elements or impurities to avoid its recirculation.

Based on the experience that Allkem has in the execution of the Olaroz I and II projects, the country context, and the delays in certain types of materials. A detailed long lead items (LLI) must be made and include, beyond the main equipment, those components that today their manufacture plays an important role due to the scarcity of raw materials for their manufacture.

A geotechnical investigation of the identified evaporation pond area will confirm its suitability for construction.

The early design, application and rerouting of national road Route 70 will reduce permitting risk for the project and can be completed independently of the project design progression.

Progression of the study to feasibility level is recommended.

23.3 Market Studies

Market analysis will continue to evolve during the project development phase. It is recommended that Allkem continue with ongoing market analysis and related economic sensitivity analysis.

Risk factors and opportunities in technological advancements, competition and macroeconomic trends should be reviewed for relevancy prior to major capital investment decisions. Remaining abreast of lithium extraction technology advancements, and potential further test work or pilot plant work may provide opportunities to improve the Project economics.

It is recommended to further develop a diversified customer base and secure offtake agreements to support the next study phase and potential expansion.

23.4 Project Costs and Financial Evaluation

Allkem is currently constructing the Sal de Vida Stage 1 processing facility. Continued monitoring of costs and timelines can further enhance planning for Cauchari.

The Cauchari project was evaluated as a stand-alone green fields and current permitting applications reflect this approach. With the successful progression and operation of the closely located Olaroz Project, the project Capex and Opex estimates can be reviewed for synergistic opportunities during construction and operations that could improve overall Project Economics.

The risk of changes to government acts, regulations, tax regimes or foreign exchange regulation remains and must be reviewed upon enactment. Related risk and change management must be accurately reflected in the Project contingencies or expected economic performance.

24. REFERENCES

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This report titled “SEC Technical Report Summary, Cauchari Lithium Brine Project’’ with an effective date of June 30, 2023.

25. RELIANCE ON INFORMATION SUPPLIED BY REGISTRANT

The QPs have relied on information provided by Allkem (the registrant), including expert reports, in preparing its findings and conclusions with respect to this report.

The QPs consider it reasonable to rely on Allkem for this information as Allkem has obtained opinions from appropriate experts with regard to such information.

The QPs have relied upon the following categories of information derived from Allkem and legal experts retained by Allkem and have listed the sections of this report where such information was relied upon:

- Ownership of the Project area and any underlying mineral tenure, surface rights, or royalties in Section 3.1.4, 3.1.5 and, 3.1.6.
- Baseline survey data collected related to social and economic impacts in Section 17.1.
- Social and community impacts assessments for the Project in Section 17.4.
- Marketing considerations and commodity price assumptions relevant to the Project are detailed in Section 16.2.1.
- Taxation considerations relevant to the Project were estimated as detailed in Section 18.2.1.4.

26. SIGNATURE PAGE

CERTIFICATE OF AUTHOR

I, Frederik Reidel, Geophysician and Hydrologist, Managing Director of Atacama Water SpA do hereby certify that:

1. I am currently employed as Managing Director of Atacama Water SpA located in Balcarce 175 Office 303 Salta, Argentina.
2. This certificate applies to the Technical Report titled "SEC Technical Report Summary, Cauchari Lithium Brine Project" the ("Technical Report") prepared for Allkem Limited ("the Issuer"), which has an effective date of June 30, 2023, the date of the most recent technical information.
3. Allkem Limited, the registrant, engaged the services of Atacama Water SpA, to prepare the individual Technical Report Summary at the AACE Class IV (PFS) level on their property using data gathered by the Qualified Persons ("QPs") to the disclosure requirements for mining registrants promulgated by the United States Securities and Exchange Commission (SEC), in accordance with the requirements contained in the S-K §229.1300 to S-K §229.1305 regulations. The property is considered material to Allkem Ltd.
4. This report has an effective as-of date of June 30, 2023. The valuable material will be mined through brine extraction mining methods by the proprietor, Allkem Ltd.
5. I am a graduate of New Mexico Institute of Mining and Technology. I am a professional in the discipline of Geology and am a Certified Professional Geologist (# 11454) with the American Institute of Professional Geologist (AIPG) and Competent Person (# 390) with the Chilean Mining Commission (CCCRRM), and co-author of "Complementary Guidelines for Mineral Resource and Reserve Estimation in Brines" for Chilean Code CH 20.235. I have practiced my profession continuously since 1987. I have read the definition of ''qualified person'' set out in S-K §229.1300 and certify that by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a ''qualified person'' for the purposes of S-K §229.1300 reporting.
6. I completed a personal inspection of the Property during August 2019.
7. I am responsible for sections pertaining thereto in Items: Chapter 1 (shared), Chapter 2-9, Chapter 11-13, Chapter 20, Chapter 22-25 (shared).
8. I am independent of the Issuer and related companies applying all of the sections of the S-K §229.1300.
9. I have had prior involvement with the Cauchari project.
10. As of the effective date of the Technical Report Summary and the date of this certificate, to the best of my knowledge, information, and belief, this Technical Report Summary contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signing Date: November 15, 2023.

/s/ Frederik Reidel
Frederik Reidel
Managing Director of Atacama Water SpA
American Institute of Professional Geologist (AIPG) - Certified Professional Geologist (# 11454)
Competent Person (# 390) with the Chilean Mining Commission (CCCRRM)

CERTIFICATE OF AUTHOR

I, Marek Dworzanowski, Metallurgical Engineer, Independent Consultant do hereby certify that:

1. I am currently self-employed as Consultant Metallurgical Engineer.
2. This certificate applies to the Technical Report titled "SEC Technical Report Summary, Cauchari Lithium Brine Project" the ("Technical Report") prepared for Allkem Limited ("the Issuer"), which has an effective date of June 30, 2023, the date of the most recent technical information.
3. Allkem Limited, the registrant, engaged my services, to prepare the individual Technical Report Summary at the AACE Class IV (FS) level on their property using data gathered by the Qualified Persons ("QPs") to the disclosure requirements for mining registrants promulgated by the United States Securities and Exchange Commission (SEC), in accordance with the requirements contained in the S-K §229.1300 to S-K §229.1305 regulations. The property is considered material to Allkem Ltd.
4. This report has an effective as-of date of June 30 2023. The valuable material will be mined through brine extraction mining methods by the proprietor, Allkem Ltd.
5. I am a graduate in Mineral Processing from the University of Leeds. I am a professional in the discipline of Metallurgical Engineering and I am an honorary life Fellow of the Southern African Institute of Mining and Metallurgy (FSAIMM), membership number 19594. I am a Fellow of the Institute of Materials, Minerals and Mining (FIMMM), membership number 485805 and I am a registered as a Chartered Engineer with the Engineering Council of the United Kingdom, registration number 485805. I have practiced my profession continuously since the year 1980. I have read the definition of ''qualified person'' set out in S-K §229.1300 and certify that by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a ''qualified person'' for the purposes of S-K §229.1300 reporting.
6. I completed a personal inspection of the Property from July 18 -21, 2018.
7. I am responsible for sections pertaining thereto in Items: Chapter 1 (shared), Chapter 10, Chapters 14-19, Chapter 22-25 (shared).
8. I am independent of the Issuer and related companies applying all of the sections of the S-K §229.1300.
9. I have had prior involvement with the Cauchari project.
10. As of the effective date of the Technical Report Summary and the date of this certificate, to the best of my knowledge, information, and belief, this Technical Report Summary contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signing Date: November 15, 2023.

/s/ Marek Dworzanowski
Marek Dworzanowski
Metallurgical Engineer
Fellow of the Southern African Institute of Mining and Metallurgy (FSAIMM) membership number 19594
Fellow of the Institute of Materials, Minerals and Mining (FIMMM) membership number 485805
Chartered Engineer with the Engineering Council of the United Kingdom registration number 485805

This report titled "SEC Technical Report Summary, Cauchari Lithium Brine Project" with an effective date of June 30, 2023, was prepared and signed by:

/s/ Marek Dworzanowski
Marek Dworzanowski

/s/ Frederik Reidel
Frederik Reidel