Tolillar Project

NI 43-101 Technical Report Update on Preliminary Economic Assessment

Salta, Argentina

Effective Date: August 10, 2023

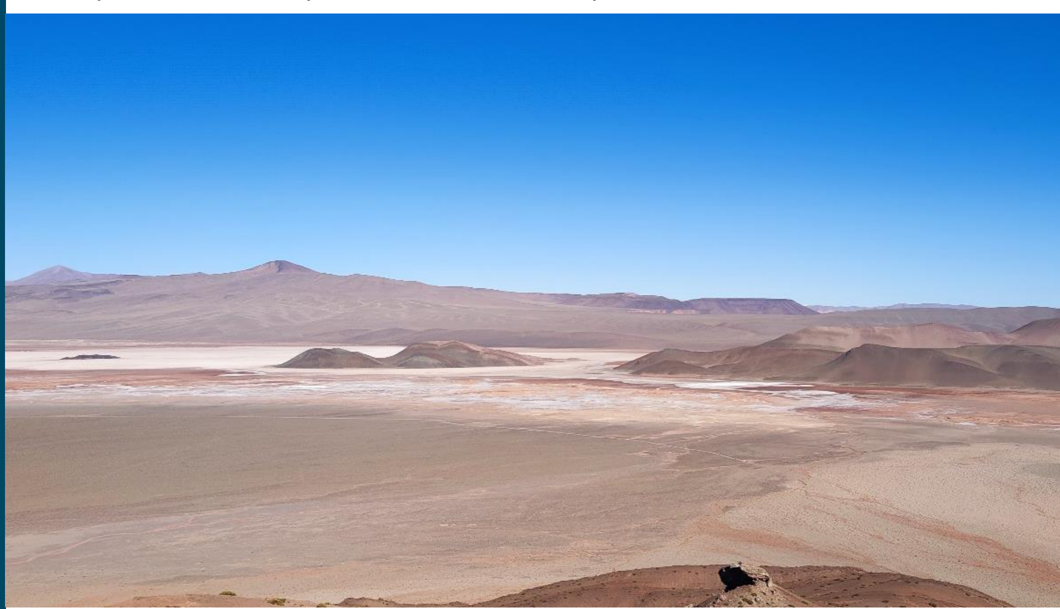
Prepared for: Alpha Lithium Corporation

Suite 801, 535 Thurlow Street Vancouver, BC,
V6E 3L2, Canada

Prepared by: Ausenco Chile Limitada

Avenida Las Condes 11283, Floor 6
Las Condes, Santiago, Chile CP 75550000

List of Qualified Persons:
James Millard, P.Geo., Ausenco Sustainability Inc.;
Patricio Pinto, R.M., Ausenco;
Mark W.G. King, P. Geo., Groundwater Insight, Inc;
Murray Brooker, MAIG, Hydrominex Geoscience Pty Ltd.



CERTIFICATE OF QUALIFIED PERSON
James Millard, P. Geo.

I, James Millard, P. Geo., certify that:

1. I am employed as a Director, Strategic Projects with Ausenco Sustainability Inc., a wholly owned subsidiary of Ausenco Engineering Canada ("Ausenco"), with an office address of Suite 100, 2 Ralston Avenue, Dartmouth, NS, B3B 1H7, Canada.
2. This certificate applies to the technical report titled "*Tolillar Project NI 43-101 Technical Report Update on Preliminary Economic Assessment, Salta Argentina*" (the "Technical Report"), prepared for Alpha Lithium Corporation (the "Company") with an effective date of August 10, 2023 (the "Effective Date").
3. I graduated from Brock University in St. Catharines, Ontario in 1986 with a Bachelor of Science in Geological Sciences, and from Queen's University in Kingston, Ontario in 1995 with a Master of Science in Environmental Engineering.
4. I am a member (P. Geo.) of the Association of Professional Geoscientists of Nova Scotia, Membership No. 021.
5. I have practiced my profession for 25 years. I have worked for mid- and large-size mining companies where I have acted in senior technical and management roles, in senior environmental consulting roles, and provided advise and/or expertise in a number of key subject areas. These key areas included: feasibility-level study reviews; NI 43-101 report writing and review; due diligence review of environmental, social, and governance areas for proposed mining operations and acquisitions, and directing environmental impact assessments and permitting applications to support construction, operations, and closure of mining projects. In addition to the above, I have been responsible for conducting baseline data assessments, surface and groundwater quantity and quality studies, mine rock geochemistry and water quality predictions, mine reclamation and closure plan development, and community stakeholder and Indigenous peoples' engagement initiatives. Recently, I acted in the following project roles: Qualified Person for the environmental/sustainability aspects for "Puquios Project, Feasibility Study Report, La Higuera, Coquimbo Region, Chile", "Volcan Project, NI 43-101 Technical Report on Preliminary Economic Assessment, Tierra Amarilla, Atacama Region, Chile" and, "Colomac Gold Project, NI 43-101 Technical Report and Preliminary Economic Assessment, Northwest Territories, Canada"; and principal author for the environmental/sustainability sections for the "Kwanika-Stardust Project, NI 43-101 Technical Report and, Preliminary Economic Assessment, British Columbia, Canada".
6. I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.
7. I have not visited the Tolillar Project.
8. I am responsible for: 1.18, 1.22, 1.22.1.8, 1.22.2.6, 1.22.3.5, 1.23, 1.23.5, 20, 25.1, 25.9, 25.12.1.6, 25.12.2.6, 25.13, 26.1, 26.6 and 27 of the Technical Report.
9. I am independent of the Company as independence is defined in Section 1.5 of NI 43-101.
10. On July 04, 2023 Alpha Lithium submitted a NI 43-101 Technical Report on Preliminary Economic Assessment in which I acted as Qualified Person.
11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 14, 2023
"Signed and sealed"
James Millard, P. Geo.

CERTIFICATE OF QUALIFIED PERSON
Patricio Pinto Gallardo, C.P.

I, Patricio Pinto Gallardo, C.P., certify that:

1. I am employed as a process manager with Ausenco Chile Ltda. (“Ausenco”), with an office address of Avenida Las Condes 11283, Floor 6, Las Condes, Santiago, Chile CP 75550000.
2. This certificate applies to the technical report titled “*Tolillar Project NI 43-101 Technical Report Update on Preliminary Economic Assessment, Salta Argentina*” (the “Technical Report”), prepared for Alpha Lithium Corporation (the “Company”) with an effective date of August 10, 2023 (the “Effective Date”).
3. I graduated from the University of Santiago de Chile in 1987 with a bachelor’s in civil chemical engineering, and from Adolfo Ibañez University with a postgraduate diploma in business administration in 2004.
4. I am a Competent Person with the Qualifying Commission for Competencies in Mining Resources and Reserves (Registration No. 0440).
5. I have practiced my profession for 35 years in which I have held virtually every position in the mining industry, such as Process Engineer, Head of Research and Development, and Project Manager, focusing on mineral recovery projects from salt flats. I have been directly involved in research of new processes and detailed plant design. I have participated in all stages of engineering: conceptual engineering, basic engineering, and detailed engineering, as well as in the construction, pre-commissioning, commissioning, and start-up stages. As a Consultant, I have done Due Diligences for the purchase or agreement between companies. As a Process Audit Engineer, I have participated in the review of lithium carbonate plants in Chile and Argentina. In addition to the above, in several lithium carbonate production projects from brines, I have been responsible for the definition of the salt matrix and preparation of the fundamental process design data together with the development of an optimal pipeline configuration, the well field configuration and the design of the brine reservoirs, the definition of the extraction capacity of each well, construction geometry, definition of pond depths and other works and estimate exploitation costs. Recently, I acted as Qualified Person for the process metallurgical, recovery methods, infrastructure, and economic analysis aspects for “Pozuelos-Pastos Grandes Project (Li_2CO_3), Preliminary Economic Assessment update, in the Salta province, northwest Argentina in 2022” and for “Sal de Vida Project (Li_2CO_3), NI 43-101 Technical Report, in Catamarca Province, Argentina in 2022. Examples of other experiences I have domestic and internationally include White Project in Maricunga Salar, Lithium Carbonate Plant Audit in Olaroz Salar, Clayton Valley Lithium PFS, Rhyolite Ridge Project, Capricornio Project in Atacama Salar, Aguas Blancas Project, Pascua-Lama Project, and La Negra Project in Atacama Salar.
6. I have read the definition of “Qualified Person” set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects (“NI 43-101”) and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for those sections of the Technical Report that I am responsible for preparing.
7. I visited the Tolillar Project on March 30, 2023.
8. I am responsible for 1.1 to 1.4, 1.11.2, 1.12, 1.15 to 1.17, 1.19 to 1.21, 1.22, 1.22.1.1, 1.22.1.4, 1.22.1.6, 1.22.1.7, 1.22.1.9, 1.22.1.10, 1.22.2.2, 1.22.2.4, 1.22.2.5, 1.22.2.7, 1.22.3.2, 1.22.3.4, 1.23, 1.23.3, 1.23.4, 2 to 5, 12.2, 13, 17 to 19, 21 to 24, 25.1, 25.2, 25.5, 25.7, 25.8, 25.10, 25.11, 25.12.1.2, 25.12.1.4, 25.12.1.5, 25.12.1.7, 25.12.2.2, 25.12.2.4, 25.12.2.5, 25.13, 26.1, 26.4, 26.5 and 27 of the Technical Report.
9. I am independent of the Company as independence is defined in Section 1.5 of NI 43-101.
10. On July 04, 2023 Alpha Lithium submitted a NI 43-101 Technical Report on Preliminary Economic Assessment in which I acted as Qualified Person.
11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 14, 2023
“Signed and sealed”
Patricio Pinto Gallardo, C.P.

CERTIFICATE OF QUALIFIED PERSON
Mark W.G. King, Ph.D., P.Geo., F.G.C.

I, Mark W.G. King, PhD., P.G., certify that:

1. I am employed as President and Senior Hydrogeologist with Groundwater Insight Inc., 3 Melvin Road, Halifax, Nova Scotia, B3P 2H5, telephone 902 223 6743, email king@gwinsight.com.
2. This certificate applies to the technical report titled, "*Tolillar Project NI 43-101 Technical Report Update on Preliminary Economic Assessment, Salta Argentina*" (the "Technical Report"), prepared for Alpha Lithium Corporation (the "Company") with an effective date of August 10, 2023 (the "Effective Date").
3. I graduated from Dalhousie University in Halifax, Nova Scotia in 1982 with a B.Sc. in Geology. I obtained a M.A.Sc. in Civil Engineering in 1987 from Technical University of Nova Scotia. In 1997, I received my Ph.D. in Earth Science from the University of Waterloo in Waterloo, Ontario, 1997.
4. I am a Registered Professional Geoscientist of Nova Scotia (membership #84); Serving on the Admissions Board of the Association. I am also a member in good standing of the Association of Groundwater Scientists and Engineers (membership #3002241).
5. I have practiced my profession continuously for 35 years. My experience and areas of specialization relevant to this Technical Report include:
    a. technical involvement in lithium brine projects, in various levels of detail, on more than 30 projects in Chile, Argentina, Nevada, Utah, California, Mongolia, and Germany;
    b. QP for more than 12 lithium brine Resource and Reserve estimates;
    c. numerical modelling of groundwater flow and solutes in groundwater;
    d. field delineation and monitoring of solutes in groundwater;
    e. organic and inorganic groundwater geochemistry; and
    f. experience in groundwater quality and quantity projects.
6. I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.
7. I visited the Alpha Lithium Tolillar Project on March 22-24, and met with the Alpha Lithium expert on March 28, 2023.
8. I am responsible for sections 1.5 to 1.10, 1.11.1, 1.13, 1.22, 1.22.1.2, 1.22.1.3, 1.22.2.1, 1.22.3.1, 1.23, 1.23.1, 6 to 11, 12.1, 14, 25.1, 25.3, 25.4, 25.12.1.1, 25.12.2.1, 25.13, 26.1, 26.2 and 27 of this Technical Report.
9. I am independent of the Company as independence is defined in Section 1.5 of NI 43-101.
10. On August 08, 2023 Alpha Lithium submitted a NI 43-101 Updated Resource Estimate Report in which I acted as Qualified Person.
11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 14, 2023
"Signed and sealed"
Mark W.G. King, Ph.D., P. Geo., F.G.C.

CERTIFICATE OF QUALIFIED PERSON
Murray Brooker, M.Sc. Geol., M.Sc. Hydro.

I, Murray Brooker, M.Sc. Geol., M.Sc. Hydro., certify that:

1. I am an independent consultant with Hydrominex Geoscience Pty Ltd., with an office address of 63 Carlotta St, Greenwich, NSW 2065, Australia.
2. This certificate applies to the technical report titled "*Tolillar Project NI 43-101 Technical Report Update on Preliminary Economic Assessment, Salta Argentina"* (the "Technical Report"), prepared for Alpha Lithium Corporation (the "Company") with an effective date of August 10, 2023 (the "Effective Date").
3. I graduated from Victoria University of Wellington, New Zealand in 1988 with a Bachelor of Science (Honours) degree in Geology. I graduated from James Cook University of North Queensland, Australia, in 1992 with a Master of Science degree in Geology. I also obtained a Master of Science degree in Hydrogeology from the University of Technology, Sydney, Australia, in 2002.
4. I am an Australian Registered Professional Geoscientist (RPGeo) in the fields of mineral exploration and hydrogeology (license no. 10086). I am also a member of the Australian Institute of Geoscientists (MAIG), and a member of the International Association of Hydrogeologists (MIAH).
5. I have practiced my profession continuously for over 30 years with experience in the evaluation of lithium brine projects from exploration through feasibility and production. I have been involved as the QP on the Olaroz project of Allkem since 2010 and was responsible for the planning and optimisation of the Stage 2 wellfield location. This involved assessment of the location of wells, potential flow rates and zones for the installation of filters in the production wells, using downhole geophysics and drilling lithological information. I was also involved in assessment of the planned wellfield layout for the Cauchari project (now owned by Allkem) and the Maricunga project of Lithium Power International (Located in Chile).
6. I have read the definition of "Qualified Person" set out in the National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that by virtue of my education, affiliation to a professional association and past relevant work experience, I fulfill the requirements to be a "Qualified Person" for those sections of the Technical Report that I am responsible for preparing.
7. I have not visited the Tolillar Project. I am familiar with the area surrounding the project and have worked on projects in the immediate vicinity of the salar (15 km to the southeast and 40 km to the north northeast).
8. I am responsible for 1.14, 1.22, 1.22.1.5, 1.22.2.3, 1.22.3.3, 1.23, 1.23.2, 15, 16, 25.1, 25.6, 25.12.1.3, 25.12.2.3, 25.13, 26.1, 26.3 and 27 of the Technical Report.
9. I am independent of the Company as independence is defined in Section 1.5 of NI 43-101.
10. On July 04, 2023 Alpha Lithium submitted a NI 43-101 Technical Report on Preliminary Economic Assessment in which I acted as Qualified Person.
11. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared in compliance with that Instrument. As of the effective date of the Technical Report, to the best of my knowledge, information and belief, the sections of the Technical Report for which I am responsible contain all scientific and technical information that is required to be disclosed to make those sections of the Technical Report not misleading.

Dated: September 14, 2023
"Signed and sealed"
Murray Brooker, M.Sc. Geol., M.Sc. Hydro.

Important Notice

This report was prepared as National Instrument 43-101 Technical Report for Alpha Lithium Corporation (Alpha Lithium) by Ausenco Chile Limitada (Ausenco), Groundwater Insight Inc., collectively the "Report Authors." The quality of information, conclusions, and estimates contained herein is consistent with the level of effort involved in the Report Authors' services, based on i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions, and qualifications set forth in this report. This report is intended for use by Alpha Lithium subject to terms and conditions of its contracts with each of the Report Authors. Except for the purposes legislated under Canadian provincial and territorial securities law, any other uses of this report by any third party are at that party's sole risk.

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1 SUMMARY

1.1 Introduction

Alpha Lithium Corp. (Alpha Lithium) commissioned Ausenco Chile Limitada (Ausenco) to compile a Preliminary Economic Assessment (PEA) of the Tolillar Project. The PEA was prepared in accordance with the Canadian disclosure requirements of National Instrument 43-101 (NI 43-101) and in accordance with the requirements of Form 43-101 F1.

The Project area is located in the Salar de Tolillar basin (the Salar) within the Salta provincial boundaries of the Puna Region in northwest Argentina.

The responsibilities of the engineering companies who were contracted by Alpha Lithium to prepare this report are as follows:

- Ausenco managed and coordinated the work related to the report, reviewed the metallurgical test results and developed a PEA-level design and cost estimate for the process plant infrastructure, general site infrastructure, environmental and economic analysis.
- Groundwater Insight, Inc. (GWI) completed the work related to geological setting, deposit type, exploration work, drilling, sample preparation and analysis, data verification and developed the mineral resource estimate for the Project.
- Hydrominex Geoscience Pty Ltd., (Hydrominex) completed the work related to the mine plan.

1.2 Terms of Reference

The report supports disclosures by Alpha Lithium in a news release dated August 14, 2023, entitled, "Alpha Lithium Updates and Improves Preliminary Economic Assessment for Tolillar Project in Argentina".

This report has been prepared in accordance with NI 43-101 Standards of Disclosure for Mineral Projects and with the requirements of Form 43-101 F1.

Mineral resources are reported in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (CIM, 2019).The estimates also incorporate guidance provided in the 2011 Ontario Securities Commission (OSC) document entitled OSC Staff Notice 43-704 – Mineral Brine Projects and National Instrument 43-101 Standards of Disclosure for Mineral Projects (2011 OSC Staff Notice).

Units used in the report are metric units unless otherwise noted. Monetary units are in United States dollars (US$) unless otherwise stated.

1.2.1 Effective Dates

This Technical Report has a number of significant dates, as follows:

- Tolillar mineral resource estimate: August 08, 2023
- Mineral Tenure: April 26, 2023.
- Financial analysis: August 10, 2023

The effective date of this report is based on the date of the financial analysis, which is August 10, 2023.

1.3 Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

The Project is situated in the Salar de Tolillar basin, located in the Salta Province of northwest Argentina. It is approximately 170 kilometers (km) west of Salta and 90 km south of Salar de Pocitos station. The Project is situated at an elevation of around 3,650 meters above sea level (masl) in the Argentinean Puna.

The Project is 100% owned by Alpha Lithium Argentina S.A., a company incorporated in Salta and controlled by Alpha Lithium Corp. of Canada.

Alpha Lithium currently holds 16 Exploitation Concessions and Exploration Permits totaling 28,030 hectares (ha) in the Province of Salta. Some of these titles are still awaiting the granting sentence from the Mining Court of Salta. The property agreements involve various parties, including Alpha Lithium Argentina S.A., the Province of Salta's Energy and Mining Resources of Salta company (REMSa), and vendors involved in the sale and purchase of concessions. The ownership and payment information has been verified in a title opinion prepared by a Salta-based attorney.

Regarding surface rights, in Argentina, mineral resources are owned by the provinces where they are located. The federal government and the provinces coexist with the Federal Congress enacting the National Mining Code and substantive mining legislation applicable across the country. However, the provinces have the authority to grant exploration permits and exploitation concession rights to private entities. There are two main types of mining rights: exploration permits and exploitation concessions. Exploration permits allow the holder to explore a designated area and, if mineral evidence is found, apply for an exploitation concession. Exploitation concessions have no time limit and require compliance with legal requirements such as annual payments, working and investment plans, and environmental impact assessments. The mining authority in Salta is the Mining Court, responsible for granting mining rights, while the Mining Secretariat handles mining environmental matters.

Regarding water rights, the only water permit currently held by Alpha Lithium is for well FWWALT-02 in Tolar Grande. This permit, registered in the census for the Secretariat of Water Resources, is specifically for industrial use and allows the extraction of groundwater at a rate of approximately 11 to 25 liters per second (L/s) for daily use. The permit, granted in 2022 under Administrative Resolution and Concession Act number 1,565, is limited to a depth of 153 meters (m). It should be noted that this permit is unrelated to mineral tenure rights.

1.4 Accessibility, Physiography, Climate, Local Resources and Infrastructure

The Tolillar Project is located in the Puna ecoregion of the Central Andes, characterized by a high Andean desert with elevations ranging from 3,600 to 6,000 masl. It is situated in an area with extensive depressions, basins, mountain ranges, and volcanic centers. The region, covering parts of Argentinean provinces of Jujuy, Salta, and Catamarca, is known for its Altiplano-Puna magmatic volcanic arc complex (APVC) consisting of stratovolcanoes and calderas. Dry salt lakes (salars) are prevalent, and the region experiences low humidity and limited soil development.

It is a hydraulically closed, endorheic basin, with water courses mainly found on the eastern edge and basin elevations reaching approximately 5,000 masl southwest of the Salar. Surface water inflow occurs during seasonal precipitation events, primarily between October and March. Average annual rainfall at stations of the zone varies from 44 to 77 mm. Solar radiation is intense leading to extremely high evaporation rates. Strong winds are frequent in the Puna, reaching speeds of up to 80 km/h during the dry season.

The vegetation in the region is adapted to extreme weather conditions. High altitude, xerophytic plants such as woody herbs, grasses, and cushion plants dominate the area. The Salar's core area lacks vegetation due to high salinity. The project area encompasses two phytogeographic provinces: Puneña Province and Altoandina Province. Puneña Province covers the largest area between 3,400 and 4,400 masl, gradually transitioning with the Altoandina Province. The latter is characterized by xerophilous grasses and typically occurs at higher altitudes above 4,400 masl, with adaptations to extreme cold and windy conditions.

Regarding accessibility and local resources, the nearest town with services (such as a hospital, lodging facilities, and a school) is San Antonio de los Cobres, which is 190 km driving from site. The nearest large city is Salta, located about 170 km to the northeast of the Project area. The most common access to the Project is from the city of Salta, along National Route RN-51. Local resources in the area are very basic. Most supplies are brought from Salta or San Antonio de Los Cobres. Main infrastructure in the zone consist in an electrical power line (375 kV), a natural gas pipeline (Gasoducto de la Puna) between Salta (Argentina) and Mejillones (Chile) and a railway between Antofagasta (Chile) and Salta (Argentina).

1.5 History

Several exploration activities have occurred on the Project area since 2012, carried out by Argañaraz & Associates.

- A surface water and brine sampling campaign was carried out in November, 2012 by Rafael Argañaraz (2013). A total of 12 brine samples were obtained and three solid samples were obtained, analyzed by Alex Stewart Laboratory (“ASA”).
- In mid-2014, several trenches were excavated with backhoe and ten brine samples were taken, analyzed by ASA.
- An exploration campaign was carried out in 2015 (Argañaraz, 2018a) where two shallow holes were drilled and five brine samples were taken, analyzed by ASA.
- A Vertical Electrical Sounding (“VES”) survey was carried out by Tecnología y Recursos (2017) with 26 survey points.
- Drilling, aquifer testing, and confirmation brine sampling from borehole DDHB-01 were conducted in 2018, by the QP responsible for the previous Resource Estimate (Montgomery, 2022). Brine samples were analyzed by ASA.

A private Argentine entity purchased and then developed the initial concessions until 2018 when they were sold to a private Canadian company. The property was then sold to Voltaic Minerals in two transactions, finalized at the beginning of 2020. Voltaic Minerals subsequently changed its name to Alpha Lithium Corp. in 2020 and has remained the owner and developer of the assets ever since.

Although the previous QP (Montgomery, 2022) and the current QP have examined the reported information from the historic exploration campaigns, they have not completed a full due diligence review this information. Therefore, the reported results should not be relied on as verified.

1.6 Geology and Mineralization

The Salar de Tolillar is located in the Geological Province of La Puna (Turner, 1972) and within the Puna Austral Geological Sub-province (Alonso et al., 1984a, 1984b). One of the most important characteristics that define the Geological Province of Puna, is the presence of evaporitic basins, or "salars", where important deposits of borates, sodium sulphate, and lithium can concentrate. Salars near the Tolillar Project area include: Hombre Muerto, Antofalla, Ratones, Pocitos, Centenario, and Diablillos.

One of the most important characteristics that define the Geological Province of La Puna, is the presence of evaporitic basins, where important deposits of borates, sodium sulphate, and lithium salts occur. The Salar de Tolillar occupies one of these endorheic (internally drained) basins. The oldest rocks in the area are the Tolillar Formation, which consists of graywackes and marine sediments assigned to the Tremadocian period (early Ordovician), mainly located North and South of the Salar. This formation is intruded by gabbro dikes that form part of the Ojo de Colorados Basic Complex, which are also assigned to the Tremadocian period.

The mineralization for the Project consists of a lithium-enriched brine that is contained within the pore spaces of the sedimentary strata in the salar basin in the upper several hundred meters of the basin, in the evaporite, alluvial, and colluvial sediments. The mineralization of the brine has occurred over a long period of time via evapo-concentration of the brine, which enriched the brine in lithium because lithium does not precipitate to a solid form in the brine. Except where there is a strong influx of freshwater to the salar basin, like in the north part of the property, the entire aquifer system is a lithium-enriched brine with generally uniform chemistry. Approximate average lithium concentration in undiluted brine ranges from about 200 - 350 mg/L.

The boundaries of the mineralization are suspected to be the fault-controlled, hard rock basin boundary, although some lithium-enriched brine may be contained in the fractures and/or pores of the rocks that form the basin boundary. Detailed distribution and chemical composition of the brine in the salar sediments is not currently known, although an area of non-mineralized freshwater occurs in the northern concessions in the uppermost part of the sedimentary sequence; thickness of this unmineralized freshwater is not known.

1.7 Deposit Types and Dimensions

Salar de Tolillar appears to be a relatively immature salar and the floor of the Salar consists of two distinct deposit types. The northern part of the Salar consists of an earthier crust weakly cemented with salt. To the south, the salt crust varies in thickness from several centimeters to 20 - 30 centimeters. The thicker saline crust allows for better road access than the earthy crust that tends to be softer, especially after precipitation.

Hydrogeologic sections created using information from the surface geology, results from exploration drilling, and geophysical interpretations were studied, showing there are effectively four sub-basins in the Tolillar basin within the concessions:

- a northeastern basin that is mostly separated from the south by shallow metamorphic rocks, also containing abundant freshwater in the far north part of the sub-basin;
- a south sub-basin appearing to become more clastic to the south, with abundant halite occurring in the north part of the sub-basin;
- a west sub-basin containing abundant halite; and
- an east sub-basin mostly devoid of halite, consisting predominantly of clastic basin-fill sediments.

Depth to bedrock is interpreted to be considerably deep below land surface based on VES geophysical surveys (Tecnología y Recursos, 2017), but because it appears to be variable throughout the Tolillar Project and was not encountered during exploration drilling, depth to bedrock is considered unknown.

The principal source of water entering the Project area is from surface water coming into the basin from the basin margins. To date, surface water flow has not been formally measured. Some groundwater also enters the basin from natural recharge along the mountain fronts via alluvial fans, but there appears to be limited mixing of the freshwater and brine in the basin due to density differences. As a result, the freshwater entering the Project tends to stay in the upper part of the aquifer system on the edges of the basin, without moving to the center part of the Salar. These freshwater discharge areas tend to support altiplanic vegetation. Evaporation of freshwater in the basin over time results in concentration of the dissolved minerals and ultimately results in brine generation.

1.8 Exploration

Vertical Electrical Sounding ("VES") surveys were conducted over the project during years 2020 - 2022 in order to obtain a preliminary understanding of the underlying stratigraphy of the Project property, identify potential geological structures, identify freshwater/brine interfaces (if present), and to be able to identify future locations for exploration wells.

- Twelve survey lines were conducted in the northern part of the Tolillar Project by Conhidro (2020a). In 2022, Conhidro conducted an additional VES survey in the northern concessions effectively extending the previous lines into unexplored areas where brine was expected to occur.
- Four survey lines conducted in the southern part of the Tolillar Project in by Conhidro (2020a).

The VES measurements and their interpretations appear to be in agreement with the information obtained from exploration drilling. At the edges of the basin, especially to the west and north, there is uncertainty as to whether the VES is measuring dry sediments, freshwater areas, or bedrock. In these relatively higher conductivity zones, they are not interpreted to be brine aquifer, and therefore, are not considered as part of the measured or indicated resource.

In the southern concessions, VES results suggest a potential zone for fresh or brackish water exploration. This is consistent with the results which showed only brackish water with little lithium.

1.9 Drilling

1.9.1 Exploration Drilling Program

Updated results of the year 2020 - 2022 and preliminary results of year 2023 exploration drilling and testing program are reported in herein. The current exploration well program was designed to obtain additional aquifer hydraulic parameters, to develop a conceptual hydrogeological model, and to obtain sufficient information to estimate an updated lithium resource. Drilling and construction of brine exploration wells WBALT-01, -02, -03, -04, -05, -06, -07, -09, -10, -11, -12, -13, -14, -15, -16, and -17, and piezometer WBALT-03P in the northern concession are documented in this Report. Drilling was done using conventional circulation mud rotary. Logs comprise descriptions of drill cuttings that were then stored in labeled plastic cutting boxes.

Pumping tests conducted at exploration wells included step-discharge and constant discharge tests. Pumping test equipment was provided by drilling and testing contractor Andina Perforaciones, a local drilling contractor based in Salta, Argentina. Aquifer test drawdown data were analyzed for aquifer transmissivity using the semi-logarithmic graphical method developed by Cooper and Jacob (1946) using Aqtesolv software (HydroSOLVE, 2008) and verified manually.

Transmissivity was also calculated using the Theis (1935) recovery method, which is generally considered to be more reliable.

Geophysical surveys in each well were performed by Zelandez, a multi-disciplinary consulting firm based in Salta province, Argentina. Geophysical logs performed by Zelandez included ultrasonic caliper, gamma, Short-Normal resistivity, Long-Normal resistivity, spontaneous potential, electrical conductivity, temperature, and borehole magnetic resonance ("BMR"). In particular, BMR was prioritized due to the strength of the technology as an indicator of total porosity, and for differentiating between porewater that is held immobile by capillary forces within the formation, and porewater that is mobile. This latter measure is comparable to drainable porosity or specific yield.

1.9.2 Freshwater Program

To date, the exploration program for freshwater has included drilling and construction of exploration wells FWBALT-01, -01A, -01B, and -02. In the southern sector, in the vicinity of the FWWALT-02 well, two piezometer wells were built. No aquifer tests were conducted at the freshwater wells.

Geophysical surveys in each well were performed by Zelandez, a geophysical logging company based in Salta province, Argentina. Geophysical logs performed by Zelandez included short-normal resistivity, long-normal resistivity, and spontaneous potential.

1.9.3 Piezometer Program

To date, three piezometer wells were constructed: WBALT-03P drilled at brine well WBALT-03, and PzWRALT-01 and PzWRALT-02 drilled in the southern area of the concessions. The latter two are located within proximity to the freshwater well FWWALT-02. Borehole PzWRALT-01 is considered to be optimal for taking piezometric level measurements for any future recharge studies conducted in the area. While borehole PzWRALT-02 is also considered optimal for measurements, it is intended to be the observation well for FWWALT-02.

1.10 Sample Collection, Preparation, Analysis and Security

Sampling information described herein entails the initial and second surface sampling programs conducted by Argañaraz & Associates, and also to the subsequent exploration drilling and testing program conducted by Alpha Lithium.

The brine samples were collected and transferred into either 1-liter or 250-milliliter plastic bottles, which were labeled and documented with sample information. After being sealed on site, samples were stored in a cool location, then shipped in sealed containers to the laboratories for analysis; no further preparation was conducted prior to shipment. Chain of custody sheets and field traffic reports were used to document the samples prior to transportation to the assay laboratory by the project geologists.

Sampling methodology was dependent on the type of exploration program and are listed here:

- Shallow surface sample collection in years 2012, 2014, and 2015: Samples were obtained manually from shallow hand-dug pits, trenches, and from shallow boreholes using plastic bottles and bailers.
- Brine samples collected during exploration well pumping tests in years 2018 and 2020 – 2023: Samples were collected at approximately 12-hour intervals during continuous pumping and at the end of the pumping period, collected directly from the discharge line.

- Depth specific brine sampling in years 2018 and 2020 – 2023: Collected via bailer.
- During the 2018 exploration drilling and testing program, depth specific sampling was carried out at well DDHB-01, via several methods including pumping from the bottom of the well and sampling with a bailer at intervals of 25 - 50 m. During the years 2020 - 2023 drilling and testing program, additional sampling using a bailer was attempted, but only shallow samples were collected.
- Depth specific brine sampling via Hydrasleeve from years 2020 - 2023: Samples were collected by Hydrasleeve model HS-2 of 600-mL capacity sampling bags that were lowered to a specific depth in selected wells, at 30 - 40 m intervals. At the desired sampling depth, the sample bag was allowed to wait 5 to 10 minutes prior to collecting the sample.

Brine samples from the years 2020 - 2023 pumping test program along with duplicate samples were sent to SGS Laboratory, Salta, Argentina. Brine samples from the 2018 drilling and testing program were sent to Alex Stewart Laboratory ("ASA") in San Salvador de Jujuy, Argentina, which is an ISO-certified lab and independent of the Issuer. An additional analysis of one duplicate sample collected from DDHB-01 was performed by Universidad de Antofagasta laboratory in Chile. While it is an unaccredited laboratory, it is used by many groups including SQM for the Salar de Atacama project, and is considered a reliable laboratory for lithium.

Analytical quality was monitored through the use of quality control samples, including blanks and duplicates, as well as check assays at independent laboratories. Each batch of samples submitted to the laboratory contained at least one blank, and one duplicate. All samples were labeled with permanent marker, sealed with tape and stored at a secure site, both in the field, and in Salta, Argentina. All field samples obtained during drilling and testing are currently being stored in the Argañaraz & Associates offices in Salta pending future submittal to a laboratory.

In the opinion of the QP, sample preparation, security, and analytical procedures were adequate for use in the updated Resource Estimate.

1.11 Data Verification

1.11.1 Mineral Resource Estimate

Dr. Mark King, the QP for the updated Resource Estimate conducted the following forms of data verification:

- Visited the Tolillar Project site and the Alpha office in Salta in March 2023;
- Obtained independent duplicate samples from WBALT-12 and WBALT-15, on March 24, 2023;
- Reviewed drill cuttings and descriptions from the previous drilling programs and from the ongoing program;
- Checked summary tables against original laboratory reports; and
- Checked receipt of regular field reports that document exploration progress.

It is the opinion of the current QP (Dr. Mark King) that the reported results for the previous and recent exploration programs are acceptable for use in the updated Resource Estimate.

1.11.2 Mineral Processing and Metallurgical Testing

Patricio Pinto (Ausenco QP) visited the Project site on 30 March 2023 and Alpha Lithium's head office in Salta on 31 March 2023. The head office houses the laboratory where the metallurgical tests were conducted. During the visit, the start of construction of the pilot plant, the staff camp and the laboratory was verified.

The QP conducted a verification of the information provided by Alpha Lithium, finding that the data provided is reasonable and the information obtained is in accordance with industry standards.

1.12 Mineral Processing and Metallurgical Testing

The design of the process to produce battery-grade lithium carbonate consists of capturing the lithium from the raw brine by means of direct lithium extraction (DLE) with adsorption resins, which is then recovered together with some contaminants by washing with water. This brine is concentrated by reverse osmosis to finally continue the lithium precipitation process by adding sodium carbonate.

Alpha Lithium has carried out DLE tests bringing brine from the Salar de Tolillar in contact with aluminate-based adsorption resin from the property. The tests were performed in July 2020 and in May 2022 at Alpha Lithium's laboratory, located in Salta province. The results obtained indicate that for brine containing 198 mg/L of lithium, a depleted brine with a lithium concentration ranging from 35 mg/L to 40 mg/L and an eluate with a lithium concentration ranging from 1,600 mg/L to 1,650 mg/L will be obtained. With respect to direct lithium extraction, values indicate an extraction of 65% to 71%, while the resin saturation concentration in lithium shows values of 4,000 mg/L of resin to 4,400 mg/L of resin, and the recovery of lithium from the resins is 74% to 81%.

The developed DLE tests for the Tolillar brine using self-developed resins show that it is feasible to consider this technology for extracting lithium from the raw brine.

Alpha Lithium is continuing with their laboratory investigation to obtain a lithium-specific adsorption resin with improved parameters considering that the resins currently on the market have extraction values of around 90% and lithium recovery values of around 100%. In parallel, a pilot plant is being built at the Salar property, which will allow verification of the variables and parameters that will validate the proposed design to produce 25,000 t/a of battery-grade lithium carbonate.

The available test information does not allow to elucidate with certainty the presence of deleterious elements and/or impurities, therefore the commercial impact that could be related to the presence of these elements requires verify their existence through laboratory tests.

Since the results delivered by the tests correspond to only one stage of the process, DLE, the development of the design will use benchmark data pending the development of Alpha Lithium's own resin to reach competitive values.

For the development of the economic model, the average of the lithium recovery rates reported in the market will be used, equal to 77%, considering that this is a conservative value.

1.13 Mineral Resource Estimation

An updated Mineral Resource Estimate for the Tolillar Project is provided in Table 1-1. The Estimate was developed using a polygon domain methodology, incorporating recent drilling and sampling results. The methods were generally similar to the previous Resource (Montgomery, 2022) with the following exceptions:

- Eleven additional boreholes were available to inform the updated Resource Estimate, for a total of 21.
- Indicated and Inferred Resource category assignment is based on depth-specific drill data and not on lateral boundaries as previously used.
- The footprint of the updated Resource zone is approximately 11% larger. The total polygon (and Resource) area increased from 90.58 to 102.0 km^2.
- Lithology profiles for each hole were reconstructed for the updated Resource. Since drainable porosity was assigned based on lithology, this resulted in some change to drainable porosity values and distribution.
- Additional drainable porosity information sources were compiled for the updated Resource.

A total of 150 borehole brine samples were used in the Resource Estimate, including:

- One hundred and two (102) composite brine samples (including four duplicates) collected during pumping tests;
- Thirty-three (33) step test samples (including two duplicates); and
- Fifteen (15) depth-specific samples, collected with Hydrasleeve HS-2 disposable samplers.

Technical oversight of the Resource Estimate was provided by the QP, working with Alpha and GWI specialists. The QP considers the input data and the results to be valid and appropriate for an Indicated and Inferred Mineral Resource Estimate. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

Table 1-1: Updated Resource Estimate (Effective Date August 08, 2023)

Resource Category	Updated Resource Estimate		Change From Previous Estimate	
	Indicated	Inferred	Indicated	Inferred
Brine Volume (m^3)	2,940,766,000	1,453,640,300	+1,293,066,000	+313,117,300
Avg. Li (mg/L)	232	180	-10	-11
In-situ Li (t)	681,000	262,000	+283,000	+44,000
LCE (t)	3,626,000	1,393,000	+1,507,000	+235,000
Avg. porosity	0.124	0.149	+0.025	+0.039
Avg. K (mg/L)	2361	1919	+10	-281
In-situ K (t)	6,942,000	2,790,000	+3,069,000	+280,000
KCl (t)	13,237,000	5,320,000	+5,850,000	+534,000

LCE: Lithium Carbonate Equivalent, calculated as in-situ lithium multiplied by the equivalency factor (5.3228).
KCl: Potassium Chloride (potash) Equivalent, calculated as in-situ potassium multiplied by the equivalency factor (1.91).
Product and sums not exact, due to rounding.

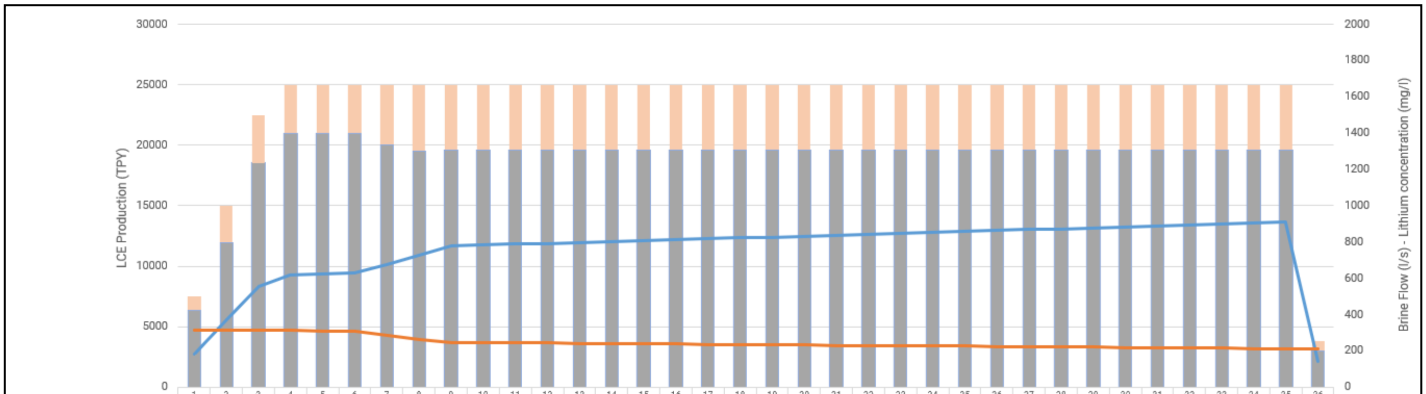
1.14 Mining Methods

The production process in the Tolillar Salar will operate through a conventional brine extraction wellfield. Brine will be accumulated in collection ponds and then boosted to the process plant. A maximum operating lifespan of 35.1 years has been estimated for an LCE production target of 25,000 t/y (Figure 1-1). From Year 1 to Year 6, brine from the highest lithium concentration areas will be extracted, followed by a gradual incorporation of the remaining resource polygons during Year 7 and Year 8, and then a stable extraction from all resource polygons from Year 9 onwards.

The production plan estimate considers the following considerations:

- The maximum extractable brine will be 30% of the estimated resource.
- Process plant efficiency is estimated in an average value of 77%.
- Annual dilution factors for Lithium concentration have been defined as follows: 0.3% for polygons within the salar; 0.6% for polygons partially in the salar and in surrounding detrital deposits; and 1.0% for polygons within detrital deposits.
- A production ramp-up has been defined, consisting of 30% of the annual LCE production target in Year 1, followed by 60% in year 2, 90% in Year 3, and 100% from year 4 onwards.

Figure 1-1: Production estimation.



Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
LCE Production (TPY) - Inferred	1125	3050	3965	3980	3980	3980	4960	5450	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377
LCE Production (TPY) - Indicated	6375	11950	18535	21020	21020	21020	20040	19550	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623
Total brine flow (l/s)	185	370	554	620	624	629	677	729	779	784	788	793	798	803	807	812	817	822
Weighted Li Concentration (mg/l)	314	314	314	312	310	308	286	265	248	247	245	244	242	241	240	238	237	235

Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
LCE Production (TPY) - Inferred	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	835
LCE Production (TPY) - Indicated	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	3006
Total brine flow (l/s)	827	832	837	842	847	852	858	863	868	873	879	884	889	895	900	906	911	141
Weighted Li Concentration (mg/l)	234	232	231	230	228	227	226	224	223	221	220	219	217	216	215	214	212	210

Year

Source: Ausenco, 2023.

According to pumping tests results, the pumping rates of individual future brine production wells will range between 4 L/s and 25 L/s. Approximately 40 wells are required to be drilled from year 1 to year 6, and around 108 wells will have been constructed over the project's lifespan. A maximum depth of 393 m is estimated for the production wells and 8- to 10-inch diameter stainless steel casing is considered for well installations.

Areas with an average lithium concentration close to the cut-off grade (100 mg/L) have not been considered in the production estimate. Grade control and production monitoring remarks have been made, as well as considerations regarding freshwater interaction monitoring and infiltration ponds optimization.

Future work recommended comprises diamond coreholes and packer tests to better characterize the hydraulic conductivity and brine chemistry of the different units encountered, as well as laboratory testing of representative sediment samples for total and drainable porosity combined with borehole magnetic resonance to reduce uncertainty in resource estimation. It is also recommended to use the numerical flow and transport model to simulate brine extraction in different scenarios, and brine chemistry mixing simulations to identify potential precipitation of salts inside pipelines and ponds. Additionally, new geophysical studies should be conducted to determine the basement topography in greater detail, interpreted in conjunction with the available stratigraphy from drilling wells. Finally, wellfield design optimization and establishing a monitoring well network is advisable to assess the risk of interaction with brackish or freshwater in the margins of the salar.

1.15 Recovery Methods

The Project considers the production of 25,000 tonnes per annum (t/a) of battery-grade lithium carbonate (Li_2CO_3). To meet this purpose, a brine with a flow of 60,912 m^3/d is used with a plant availability of 85%. The brine is obtained through brine extraction wells located in the Salar de Tolillar. This brine is conducted to the process plant where it will be processed.

For the Tolillar Project PEA, a process combining direct lithium extraction (DLE), reverse osmosis (RO), chemical plant, purification and dry product handling has been selected.

The process plant flowsheet is shown in Figure 1-2, this process consists of the following five main areas:

1. DLE area: aims to extract as much lithium as possible from the raw brine using resins as a highly selective adsorbent.
2. Reverse osmosis area: is intended to concentrate the lithium in the brine coming from the DLE columns and recover water by means of membranes.
3. Chemical plant:

The chemical plant is divided into three stages:

- Brine treatment: impurities such as Ca^{+2} and Mg^{+2} are removed;
- Carbonation: lithium carbonate is obtained employing sodium carbonate;
- Neutralization: strong centrate is neutralized with sulfuric acid eliminating free carbonates.

4. Purification area:

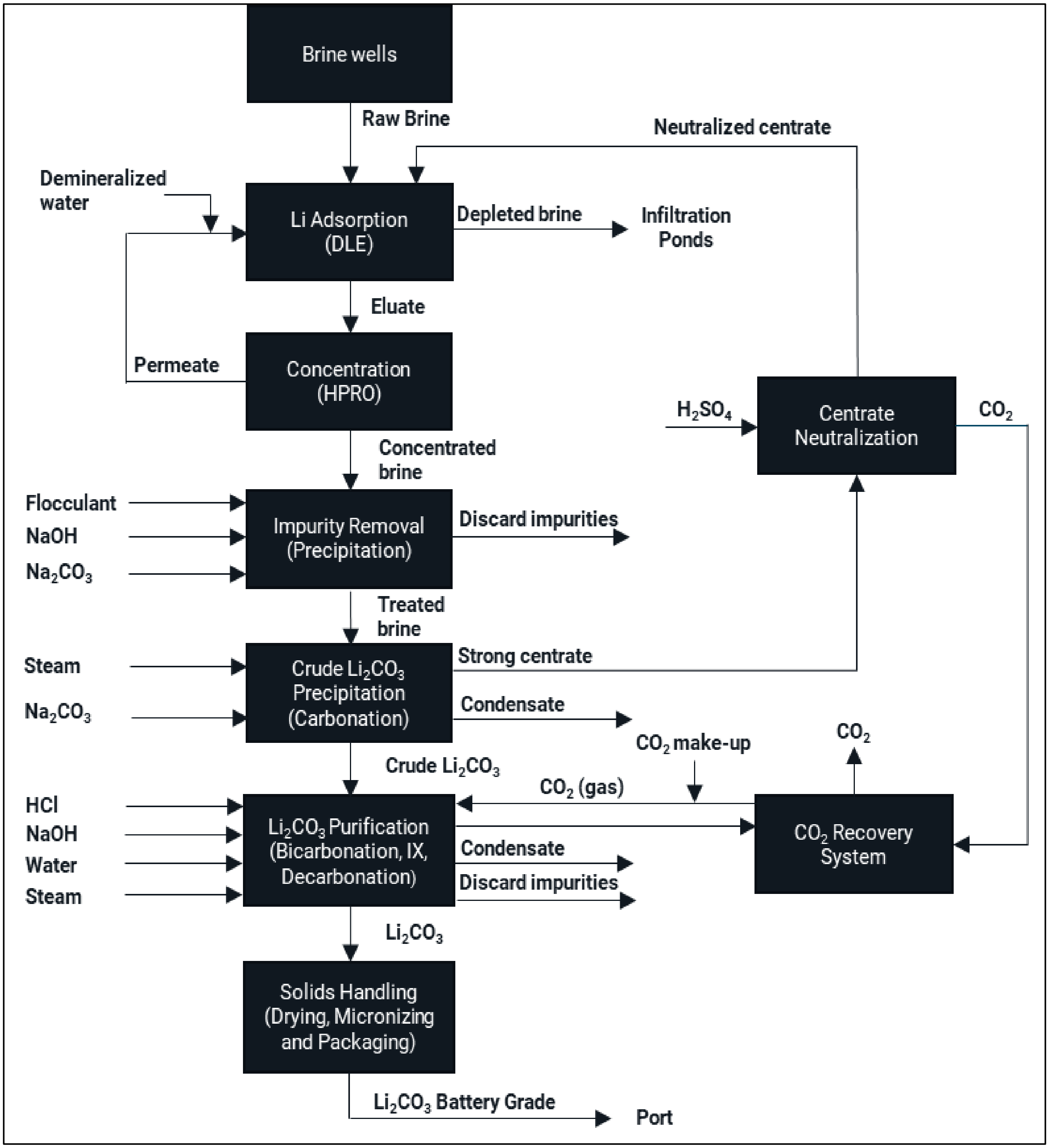
The purification area is conformed by the following stages:

- Bicarbonation: carbon dioxide reacts with lithium carbonate producing highly soluble lithium bicarbonate;
- Ion Exchange: traces of Ca^{+2}, Mg^{+2}, and B are removed;
- Decarbonation: it is a second lithium precipitation, which is done in crystallizing reactors increasing the temperature with steam to eliminate carbon dioxide.

5. Dry product handling area:

- Drying, micronizing, and packaging: the product undergoes moisture and size reduction and is sent to final packaging for subsequent export.

Figure 1-2: Process Block Diagram.



Source: Ausenco, 2023.

1.16 Project Infrastructure

The infrastructure present in the Tolillar Project will consist mainly of civil works, site/building facilities, freshwater, gas, electricity, and steam generation infrastructure. Plot Plant Layout is presented in Figure 1-3.

The process area will consist of DLE Plant, Reverse Osmosis, Chemical Plant, Purification, Dry Product Handling, Air and Steam, Administration Office, Dining Room, Change House, Policlinic and First Aid, Laboratory, Maintenance, Workshop and Warehouses.

The access routes from the city of Salta to the Project consist of National Route (RN) 51, Provincial Route No. 27, and Provincial Route No. 17 plus internal access roads. The nearest maritime port is the port of Antofagasta, 628 km away by land, in the Republic of Chile. As for airports, the Martín Miguel de Guemes International Airport is 338 km away by land, the Gobernador Horacio Guzmán International Airport is 443 km away by land and the Loa Airport (Chile) is 459 km away by land.

The camp is designed for 350 workers and consists of 6 two-story buildings.

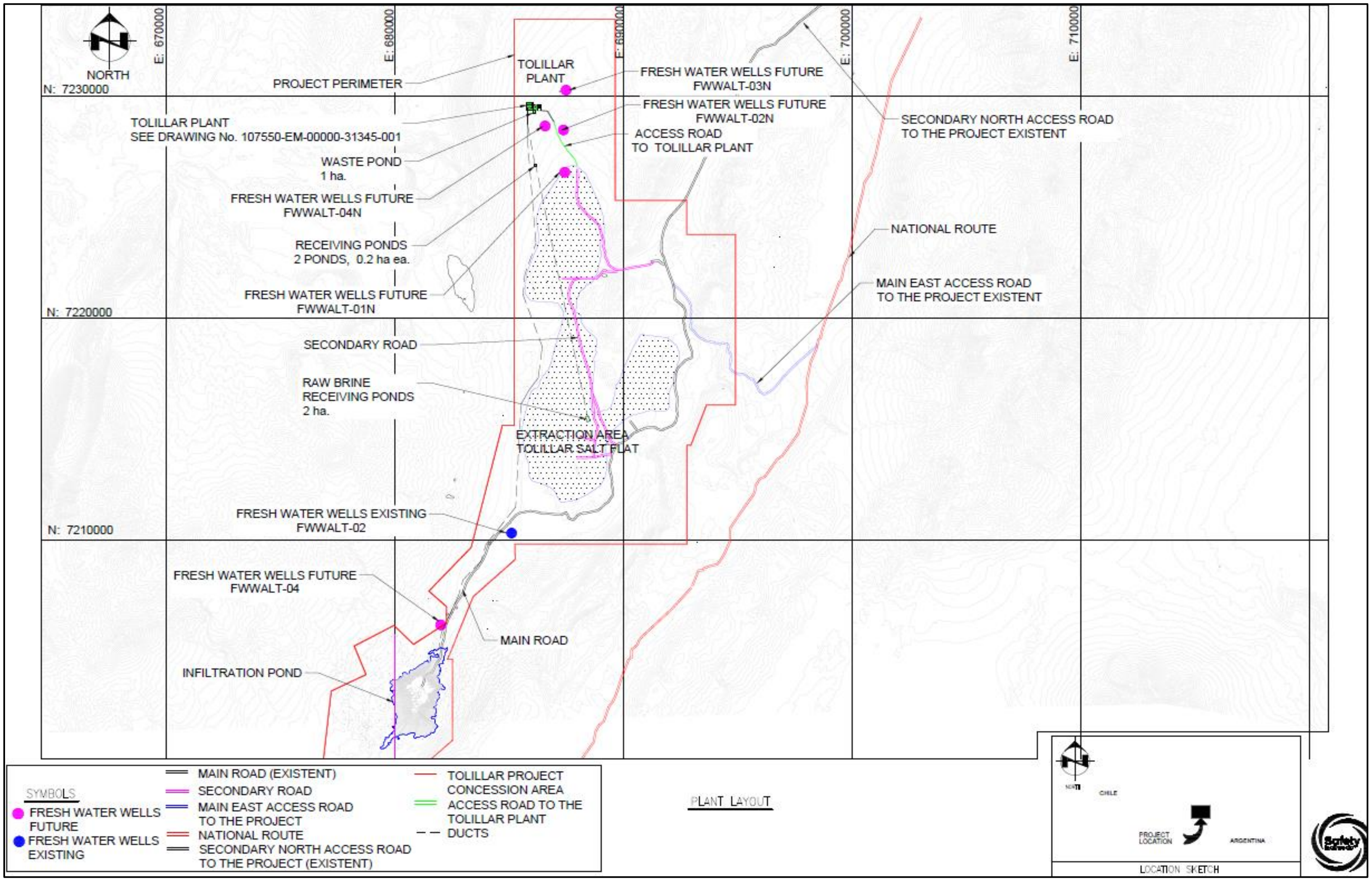
The Depleted Brine Infiltration Ponds will be located to the south of the Project with an area of 6,131,023 m^2.

The main power source for the Project will be a gas-fired electricity generation plant, which in turn will be haulage to the storage facility from where it will be transported by trucks and injected into the generation plant. This gas-fired generation source will be capable of supplying approximately 34 MW of power, which responds to the sum of the electrical power requirement, equals to 13 MW, and the heat power requirement, equal to 21 MW. Estimated average power consumption is on the order of 18,663 kW for installed mechanical equipment and 12,446 kW for installed electrical equipment.

The supply of fuel (LPG) will be done through haulage trucks from an external property to the Project according to the Project's requirements, using relevant cargo vehicles and machinery.

With respect to water supply, studies developed during 2022 estimate an extractable flow of 583 m^3/h without affecting the reservoir system. To date, only well FWWALT-02 is in place with an estimated flow of 75 m^3/h. It should be considered that based on the studies developed by Ausenco during 2023, the location of the Depleted Brine Infiltration Ponds has been defined in the southern area of the Project, specifically over the projected wells FWWALT-3 and 5, which would lead to the revaluation of the projected freshwater wells for future study stages. Human consumption is estimated at about 200 liters per day per person for 350 people when the plant is fully operational.

Figure 1-3: Plot Plant Layout



Source: Ausenco, 2023.

1.17 Markets and Contracts

The lithium market is in a period of transformation. In 2010, global demand for lithium chemicals was less than 100 kt of lithium carbonate equivalents (LCE), with sales spread across multiple market segments including: glass, greases, pharmaceuticals, synthetic rubber, and lithium-ion batteries; by then used primarily in cell phones and other portable electronics. By 2020, demand had grown to more than 300 kt of LCE, with battery-related use accounting for approximately 60% of the market, mainly due to increased demand for electric vehicles (EVs). By 2030, demand could exceed 3,000 kt, with more than 90% of the use related to lithium-ion batteries in both electric haulage and energy storage. Given the time it takes to develop and bring greenfield lithium projects into production, it is doubtful that the supply response will match demand growth for the rest of the decade.

Asia will remain the largest market for lithium chemicals for the remainder of the decade. China currently has 70% of lithium-ion battery production capacity and will remain the largest market for electric vehicles over the next decade. Korea and Japan are also major battery producers. The European Union (EU) is supporting the growth of lithium-ion batteries through its Green Deal with U.S.-like programs and a stated goal of making Europe the first carbon-neutral continent by 2050.

The supply of lithium chemicals is expected to be tight for the remainder of the decade and possibly longer. Due to the long and complex supply chain and rapid growth in demand, shortages of lithium chemicals may occur when the industry is operating above 90-95% of capacity. Demand is likely to outstrip total supply over the next decade. Quality requirements pose another challenge, as most batteries for electric vehicles have stringent qualification requirements.

The two lithium chemistries that will experience the fastest growth will be battery-grade hydroxide and carbonate for the remainder of this decade. These two chemistries are produced primarily from two types of resources: hard rock (spodumene) and brines, although there will be production from sedimentary assets (also called clays) later this decade. Lithium carbonate produced from brines is almost universally cheaper than that produced from hard rock, giving brines a competitive advantage should market conditions lead to an oversupply situation in the future.

Western Australia is currently the world's largest source of lithium, accounting for more than 40% of the total in 2022, mainly in the form of spodumene concentrate converted in China into chemical lithium. Chile is the second largest lithium producer and will supply approximately 30% of the world's LCE by 2022. Although China is the world's largest producer of lithium chemicals, most production comes from imported raw materials. By 2022, Argentina will be the world's fourth largest producer of lithium stock.

In recent years, the price of lithium has been volatile. In 2017, the price of lithium carbonate peaked at nearly $30/kg before several hard rock mines in Western Australia came online during 2018 and 2019, leading to a temporary oversupply situation where the price fell below $5/kg in China and as low as $8/kg for battery-grade carbonate in Korea. By the end of 2020, the growth of EVs in China and Europe brought the market back to a shortage situation. China's spot market saw the price of lithium carbonate briefly exceed $80/kg before moderating. Spot prices in China were very volatile from late 2022 through the first quarter of 2023, while contract prices outside of China remained in the $60/kg range on average through April 2023.

Global Lithium LLC estimates that large contract prices will remain between $50 and $60/kg through 2030, based on the assumption that demand will outstrip supply until at least the early 2030s. If the spodumene price remains above $2,500/t, the cost curve for converters will be above $25,000/t. Currently, spodumene prices are well above $2,500/t, yielding an implied cost curve more than $40,000/t. If the spodumene price were to drop significantly, vertically integrated lepidolite production in China would replace stand-alone spodumene converters as high-cost production, keeping the upper end of the cost curve in the $30,000/t range.

In estimating future cash flows from new projects, Global Lithium LLC recommends a very conservative approach using a price below the expected upper end of the cost curve, yielding conservative project economics that leave room for significant upside. Recommended price for the Preliminary Economic Assessment is shown in Table 1-2.

Table 1-2: Recommended Long Term Prices

Year	Li_2CO_3 Price (US$/t)
2023	33,750
2024	30,000
2025	22,500
2026	21,000
2027	21,000
2028	21,000
2029	21,750
2030	22,500
2031	22,500
2032	22,500
2033	22,500
2034	22,500
2035	22,500
Long Term	23,500

1.18 Environmental, Permitting and Social Considerations

Tolillar Project is located within the Puna and High Andean ecoregion in Los Andes Department in Salta Province, Argentina. This area is arid and windy; solar radiation is intense, especially from October to March. Both Indigenous and non-Indigenous communities are located in proximity to the Project. The main economic activities for the region include mining, farming, and tourism.

1.18.1 Environmental Considerations

The 2022 Environmental Impact Study presented environmental information that was bibliographic in nature and consisted of publicly available information to characterize the Project area and its surroundings; no fieldwork has been completed to date. Alpha Lithium has indicated that environmental baseline studies involving focussed fieldwork are currently being planned to develop a more comprehensive environmental baseline and supporting studies for the EIS, which is to be presented in 2024.

No permanent or temporary rivers or water channels have been identified in the Project area because rain infiltrates at the foothills to contribute to underground flows. The Project area is located in a hydraulically closed, endorheic basin, with surface water inflows during the rainy season. As detailed previously, the Project is located in the Puna ecoregion. However, Project surrounding areas are located in the high Andean ecoregion. In both of these ecoregions the vegetation is scarce and is often not present in extensive areas. However, their importance lies in that they serve as the main food source for many wildlife species, some of which are in a in a conservation state and form the basis of the Puna ecosystem.

There are no protected areas within the Tolillar Project concession area. However, some protected areas are located nearby. The nearest protected area is the *Los Andes* Wildlife Reserve, which is located 38 km north from the Project. The reserve's objectives are to preserve the area's wildlife, especially the vicuña (*Vicugna vicugna*), the flora and soil resources, and study and apply development techniques and rational use of these natural resources. The other reserve close to the project is the *Laguna Blanca* Reserve, 60 km south from the Project, which is located between the Belén and Antofagasta de la Sierra departments in Catamarca Province. The primary purpose of the reserve is to protect the vicuña populations that were at risk of disappearing. It also protects high-altitude wetlands and the Puna and High Andean ecosystems.

In terms of water management, the company will provide water for human consumption using public potable water stations, from which water will be transported using portable water tankers. Regarding process water, the Project will provide the resource from the salt flat during the exploration stage. During the operation stage, the Project will use freshwater from seven wells, to be located within the Project's concession area. Currently, Alpha Lithium has developed one well, with a maximum capacity of 70-75 m^3/h. At the time of this report, further re-evaluation work was in progress on optimized locations for the proposed Spent Brine Infiltration Ponds and the proposed freshwater wells. It is likely that the proposed freshwater wells will be adjusted to accommodate the proposed location of the Spent Brine Infiltration Ponds.

Monitoring and control activities for the exploration phase were identified in the 2022 EIS. The Project identifies potential mixing of saltwater and freshwater aquifers in the area as a significant environmental risk. Monitoring programs utilizing conductivity and physicochemical analysis have been developed to monitor freshwater aquifers over time. Water level monitoring measures and detects aquifer draw-down and depression caused by potential over pumping. Other control environmental control measures to mitigate other potential risks include speed reduction (controls dust), equipment maintenance, use of impermeable materials in storage areas (to minimize spills), and restricting vehicle usage to existing roads and routes (limits land disturbance).

Solid wastes will be generated during all phases of the Project. These will be classified in accordance with their nature as either recyclable, non-recyclable, or hazardous. Non-recyclable waste will be collected, properly bagged/packaged, and transported to the nearest town (San Antonio de Los Cobres), where it will be disposed of as urban solid waste. Recyclable wastes will be delivered, if possible, to non-profit organizations or to specialized facilities for this purpose. Finally, hazardous wastes will be stored in an appropriate storage area with impermeable base and containment capacity according to the volumes generated. All wastes will be transported by authorized external companies to their recycling or final disposal location. For the next EIS, the Project will include quantification of wastes and emissions for the construction and operation phases, as required by Argentinian regulations.

1.18.2 Closure and Reclamation Considerations

The Salta Province does not have a specific regulation for closure and reclamation. The Ministry of Production and Labor (*Ministerio de Producción y Trabajo*) released The Good Practice Resource Guide for Mine Closure (*Guía de Recursos de Buenas Prácticas para el Cierre de Minas*) in August 2019. The guide identifies seven aspects that should be addressed in the closure plan: physical stability, chemical stability, management of tailings, water management, biodiversity management, rehabilitation and restoration, and social management of closure.

The closure plan must ensure physical and chemical stability for each mining component during the closure and post-closure phases, ensure the state and safeguard full and timely compliance with the Mine Closure Plan under environmental protection standards, and include the community during the process.

The Tolillar Project will be required to consider all applicable recommendations outlined in the guide provided by the Ministry of Production and Labor and will need to produce a detailed closure and post-closure monitoring plan that is in line with the authorities' regulation and industry best practice.

The closure costs estimation is presented in Section 21. This cost will be refined further during the PFS and FS stage of the Project, since a detailed closure cost will need to be developed to meet applicable regulatory requirements, supported by feasibility level design.

1.18.3 Permitting Considerations

Argentina, being a federation, has a first level set of regulations corresponding to the National Law and a second level corresponding to the Provincial Law, which in this case corresponds to the Salta Province. For a mining operation, the National law requires obtaining an environmental permit and other specific permits, such as water permits, waste generation registration, chemical precursors registration, and municipal qualification for the infrastructure.

The Environmental Impact Assessment (EIS) permit is the instrument that regulates all exploration, construction, and exploitation activities of a project and must be updated every two years (Article 11 of National Law No. 24,585), which is part of the Argentinian Mining Code. The approval of the EIS generates a series of commitments and obligations, including, but not limited to, schedules, investment commitments, social obligations, effluent and emissions criteria, environmental monitoring and audits, and safety conditions. The scope of the EIS will depend on the phase of the Project. The regulation has three types of scope: Prospecting, Exploration, and Operation (named as exploitation in the law).

In February 2022, the provincial mining authorities approved an Environmental Impact Study to support the plans for the Project's evaporation testing and advanced exploration stages. The submission also included a description of the social and community aspects, and general information on the Project area, which was in Salta Province. The authority approved the activities through a *Declaración de Impacto Ambiental* (Environmental Impact Declaration) on December 26, 2022. As required by law, Alpha Lithium will submit a new EIS every two years to update the Project and to include required supporting baseline studies and analyses. This new EIS must be presented to the authorities in Salta Province.

The additional permits required for the project area are water permits, waste generation registration, chemical precursors registration, and municipal approval for the infrastructure, which are being processed in Salta Province. Most of these permits are currently in process, and the company expects to obtain them in the short term, although no specific dates have been indicated by the authority.

1.18.4 Social Considerations

Social baseline studies conducted as part of the 2022 EIS focussed on Indigenous and non-Indigenous founding communities. Los Andes department, part of the Salta Province, has seven communities that are part of the Kolla ethnic group, all of which are legal entities. *Comunidad Kolla del Salar de Pocitos* is the nearest Indigenous community to the Project. The community resides in *Estación Salar de Pocitos* town, located approximately 90 km from the Project concession area. The *Comunidad Kolla del Salar de Pocitos* consists of 50 people organized into 20 families, who periodically meet in a community center.

The two non-Indigenous communities included in the 2022 EIA study were *Estación Salar de Pocitos*, the nearest one to the Project, and *San Antonio de los Cobres*, where the government authorities and primary services are located. The *Estación Salar de Pocitos* has a total population of 76, organized into 23 families. Administratively, it is a municipal delegation that depends on the municipality of *San Antonio de Los Cobres*. The main route that connects *San Antonio de Los Cobres* with *Salta* (the capital city) is route RN 51, which is also the international connection to Chile. RN 51 connects with RN 27, the route to *Estación Salar de Pocitos*. RN 51 can be used throughout the year except during occasional inclement weather such as snowstorms or heavy precipitation.

The social perception (through interviews) of the community to mining activity is positive, based on the community expectation that benefits from the Project will flow to the community (non-indigenous and indigenous). Therefore, maintaining the social license will rely on ongoing benefits to the community. Alpha Lithium has a Corporate Social

Responsibility (CSR) plan that included several activities focused on the Indigenous and non-Indigenous communities. Information on engagement was provided up to February 2022; additional information since that time was not available.

1.19 Capital and Operating Cost Estimates

1.19.1 Capital Cost Estimate

The overall capital cost estimate was developed by Ausenco. Capital cost estimate is based on preliminary mechanical and electrical equipment list, Material Take-off for massive earthworks, concrete and structural buildings. Other commodities quantities were factored from mechanical direct cost based on benchmark projects in the region with similar technology and region within the Ausenco database.

Unit rates and pricing were based on the Ausenco's database for similar projects in the region. The cost estimates include the initial investment and sustaining capital for a lithium concentration plant with a capacity of 25,000 t LCE/a. The capital is split into direct cost, project indirect cost and contingency. The total initial capital cost is US$777 M.

Sustaining capital was based to number of wells required to continue with production over the LOM. The cumulative total LOM sustaining capital cost is US$306 M.

The Table 1-3 presents the capital cost summary.

Table 1-3: Summary of Capital Cost

Description	Initial Capital Cost US$M	Sustaining Capital Cost US$M	Total Capital Cost Project US$M
Mine Capital Cost	36	174	210
Plant Capital Cost	321	-	321
On-Site Infrastructure	43	-	43
Project Direct Cost	**400**	**174**	**574**
Project Indirect Cost (Including Owners)	138	61	199
Resin DLE (First Fill)	60	-	60
Total Indirect	**198**	**61**	**259**
Contingency	179	71	250
Total CAPEX	**777**	**306**	**1,082**

1.19.2 Operating Cost Estimate

The operating cost estimate for Tolillar Project was developed to a level of accuracy of ±30% and with a base date of Q2 2023 using Ausenco's in-house database of projects and studies and experience from similar operations. The estimate includes direct and indirect costs.

The distribution of the operating costs, shown in Table 1-4. The most relevant cost is reagents consumption (57%) followed by energy (18%). Both costs add up to US$ 96.81 M meaning 75% of the operating direct cost.

Table 1-4: Summary of Operating Cost

Description	US$M/a	US$/t Li_2CO_3
Direct Costs		
Chemical Reactive Substances and Reagents	73.40	2,936
Resin & Membrane replacement	11.73	469
Energy	23.41	936
Manpower	6.17	247
Catering and Camp Services	4.56	182
Maintenance	5.15	206
Site Vehicle Costs	0.29	11
Bus – In /Bus – Out Transportation	0.55	22
Consumables	0.63	25
Li_2CO_3 Transport to Antofagasta Port	2.88	115
Direct Cost Subtotal	**128.74**	**5,150**
Indirect Costs		
General and Administration	2.92	117
Indirect Costs Subtotal	**2.92**	**117**
Total Operating Cost	**131.66**	**5,266**

*Numbers may not add up due to rounding.

1.20 Economic Analysis

An engineering economic model was developed to estimate annual pre-tax and post-tax cash flows and sensitivities of the Project based on an 8% discount rate. It must be noted, however, that tax estimates involve many complex variables that can only be accurately calculated during operations and, as such, the after-tax results are only approximations. Sensitivity analyses were performed to assess the impact of variations in battery-grade lithium carbonate prices, operating costs, and capital costs.

The preliminary economic assessment is preliminary in nature, that it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

The economic analysis was performed using the following assumptions:

- Construction starts January 1, 2025.
- Ramp-up production start-up in 2027 and full process plant production will be achieved in 2029.
- Mine life of 35 years.
- Cost estimates in constant Q2 2023 US$.
- No price inflation or escalation factors were taken into account.
- Results are based on 100% ownership.
- Capital costs funded with 100% equity (i.e., no financing costs assumed).

- All cash flows discounted to beginning of construction January 1, 2025.
- All lithium carbonate products are assumed sold in the same year they are produced.
- Project revenue is derived from the sale of battery-grade lithium carbonate FOB Antofagasta.
- No binding contractual arrangements currently in place.

The pre-tax net present value discounted at 8% (NPV8%) is US$2,773 M, the internal rate of return (IRR) is 30.7%, and payback is 3.6 years. On an after-tax basis, the NPV8% is US$1,739 M, the IRR is 25.6%, and the payback period is 3.7 years. A summary of the Project economics is included in Table 1-5.

Table 1-5: Economic Analysis Summary

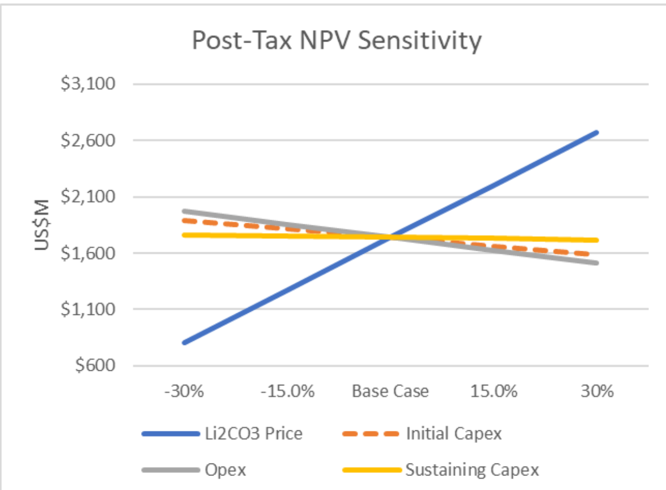
General	LOM Total/Avg.
Li_2CO_3 Price (US$/t) – Linear Avg.	$23,146
Operational Years (years)	35.2
Production – LOM	
Process Efficiency (%)	77%
LOM Li_2CO_3 Battery Grade (t/a)	24,143
Full Production Li_2CO_3 Battery Grade (t/a)	25,000
Total Payable Li_2CO_3 Battery Grade (t)	848,841
Operating Costs	
Processing Cost (US$/t Li_2CO_3)	$5,172
Transport Cost (US$/t Li_2CO_3)	$115
Total Operating Cost (Processing Cost + Transport Cost) (US$/t Li_2CO_3)	$5,287
Cash Costs (US$/t Li_2CO_3)*	$5,980
AISC (US$/t Li_2CO_3)**	$6,288
Capital Costs	
Initial Capital (US$M)	$777
Sustaining Capital (US$M)	$306
Closure Capital (US$M)	$54
Financials - Pre-Tax	
Pre-Tax NPV (8%) (US$M)	$2,773
Pre-Tax IRR (%)	30.7%
Pre-Tax Payback (years)	3.6
Financials - Post Tax	
Post-Tax NPV (8%) (US$M)	$1,739
Post-Tax IRR (%)	25.6%
Post-Tax Payback (years)	3.7

*Cash costs consist of mining costs, processing costs, G&A, transport cost and royalties. Export duty is excluded.
** AISC includes cash costs plus sustaining capital and closure cost

1.21 Sensitivity Analysis

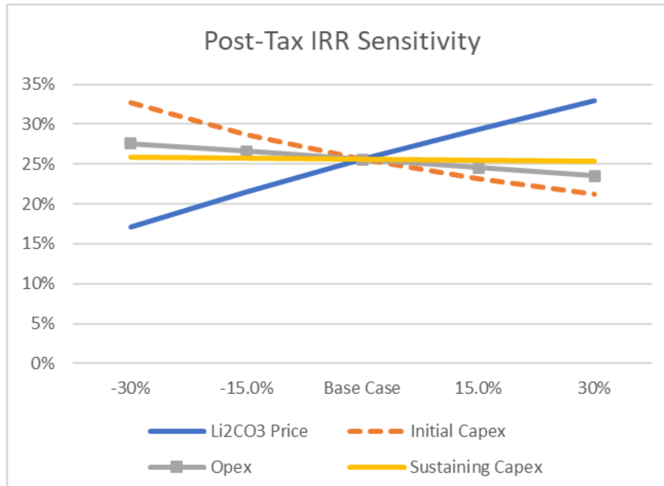
A sensitivity analysis was conducted on pre-tax and after-tax NPV and IRR of the Project (Figure 1-4, Figure 1-5, and Figure 1-6), using the following variables: battery-grade lithium carbonate price, discount rate, initial capital costs, sustaining capital, and operating costs. Analyses revealed the Project is most sensitive to changes in lithium carbonate price, initial capital, and to a lesser extent, operating cost and sustaining capital.

Figure 1-4: NPV Sensitivity Analysis Post-tax



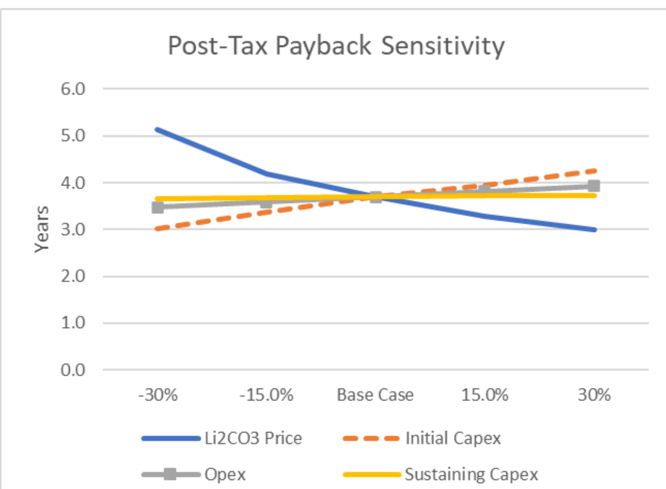
Source: Ausenco, 2023.

Figure 1-5: IRR Sensitivity Analysis Post-tax



Source: Ausenco, 2023.

Figure 1-6: Payback Sensitivity Analysis Post-tax



Source: Ausenco, 2023.

1.22 Interpretations and Conclusions

The QPs note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this Report.

1.22.1 Conclusions

1.22.1.1 Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

The ownership of the Tolillar Project lies with Alpha Lithium Argentina S.A., a company incorporated in Salta and controlled by Alpha Lithium Corp. The Project covers approximately 28,030 ha and consists of 16 Exploitation Concessions and Exploration Permits. The property agreements for the Tolillar Project involves various parties and are subject to royalties. Alpha Lithium Argentina S.A. holds valid ownership of the concessions and permits, and some titles are awaiting granting sentences from the Mining Court.

1.22.1.2 Exploration, Drilling and Analytical Data Collection

Results from recent exploration activities support the concept that brine enriched in lithium occurs at the Tolillar Project in large quantities and may be favorable for production. The elevated concentrations of lithium observed in the Tolillar Project area justify continued exploration activities and resource characterization. The overall geometry of the basin continues to become better known, and will be important for development of a numerical groundwater flow model capable of conducting wellfield simulations and supporting lithium Reserve Estimates.

1.22.1.3 Mineral Resource Estimate

The updated Mineral Resource Estimates conform with National Instrument 43-101 (NI 43-101) and the Canadian Institute of Mining, Metallurgy, and Petroleum Definition Standards for Resources and Reserves (CIM Standards). The updated Resource Estimate includes:

- An estimated 3,626,000 tonnes LCE of Indicated Resources, at an average lithium grade of 232 mg/L, and
- An estimated 1,393,000 tonnes LCE of Inferred lithium Resources, at an average grade of 180 mg/L.

These Resources are estimated relative to a 100 mg/L lithium cut-off grade. It is noted that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

The additional exploration work conducted since the last Resource Estimate has further improved the understanding of the Salar de Tolillar basin. The Indicated and Inferred Resource estimates will change as more information becomes available. Additional recommended activities (Section 26) are intended to:

- Further increase the Resource;
- Upgrade the Resource (from Inferred to Indicated and from Indicated to Measured); and
- Collect additional hydrogeology information (e.g., permeability, hydraulic boundary conditions, brine chemistry boundary conditions) that would contribute to estimation of Reserves.

1.22.1.4 Metallurgical Testwork and Recovery Plan

The proposed design considers direct lithium extraction, reverse osmosis, impurities removal, carbonation, purification, and dry product handling (micronizing, drying, and packaging). The parameters and assumptions made during the development of this design and the proposed process must be verified with tests in a pilot plant, especially the one related to the purification stage with carbon dioxide, whose implementation depends on the amount of impurities dragged from the absorption stage The tests will minimize the risks of the process and confirm a design that adjusts to a capital and operating cost in order to be competitive in a highly demanding market.

1.22.1.5 Mining Methods

The production process in the Tolillar Salar will operate through a conventional brine production wellfield. A maximum operating lifespan of 35.1 years has been estimated for an LCE production of 25,000 t/y. The average annual brine feed rate is estimated at 776 L/s, and lithium concentration gradually decreases from 314 mg/L in the first year to 210 mg/L in the last year.

Pumping rates of individual future brine production wells will range between 4 L/s and 25 L/s. Therefore, approximately 40 wells are required to be drilled in the first six years, and then at the end of the project's lifespan around 108 wells will have been constructed. A maximum depth of 393 m is estimated for production wells, with brine capture zones primarily focused on sand and gravel units.

1.22.1.6 Infrastructure

The infrastructure to support the Tolillar Project during the LOM will consist of the listing of process buildings, buildings for personnel, depleted brine infiltration pond, power supply and water supply.

1.22.1.7 Markets and Contracts

The demand for lithium in the last few decades has increased considerably, growing in the order of 300% compared to 2010 and is estimated to reach 3,000 kt by 2030, mainly related to lithium-ion batteries for electric vehicles. In an emerging market, lithium-ion batteries will play a key role in the global energy transition, so meeting the growing demand is a global concern. Demand is expected to outstrip supply in the remainder of the decade, so optimizing the complex lithium supply chain will generate added value. Among the main current and potential lithium producers are China, Chile, Australia, and Argentina. Lithium prices have been volatile in recent times and Global Lithium has recommended keeping the price estimate on the conservative side at around $22,500/t to $23,500/t for the long term.

1.22.1.8 Environmental, Permitting and Social Considerations

The Project has an approved EIS from the province's environmental authority and a hazardous waste generator permit to support advanced exploration. The other permits required are still in process, and the company expects to gain their approval in the short term, most likely in the course of 2023.

The lack of environmental data information for the region in which the Project is located affects the assessment of risks related to ecosystem fragility within the Project area, in particular there are some key environmental data gaps related to wildlife in conservation states and quality and quantity of freshwater (both groundwater and seasonal surface water).

Local communities and Indigenous communities are located near to the Project area. As part of the last EIA, the company reportedly developed a Corporate Social Responsibility (CSR) plan to engage with the communities and maintain ongoing fluent and meaningful engagement and communication. A number of activities were reported to have occurred as part of the CSR plan prior to February 2022. No further information since that time has been provided.

The completion of additional environmental and socio-economic baseline studies and modeling/analyses will support the further refinement of project designs to the feasibility level by means of a better understanding of environmental and community constraints. These same baseline studies will also satisfy the regulatory requirements for the subsequent EIS and other permits for the operation.

1.22.1.9 Capital and Operating Cost Estimates

The capital and operating cost estimates presented in this PEA provide substantiated costs that can be used to assess the preliminary economics of the Tolillar Project. The estimates are based on well field, construction of a process plant, and infrastructure, as well as indirect cost, first fills, owner's costs and contingency. Estimate accuracy is reflective of the stage of project development and classified as an AACE International Class 5 Order of Magnitude/Conceptual Study estimate with an expected accuracy range of -20% to -50% on the lower range, and +30% to +100% on the higher range.

1.22.1.10 Economic Analysis

The Tolillar Project PEA has provided a robust design and positive economics on which to further advance the Project.

The preliminary economic assessment is preliminary in nature, that it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

1.22.2 Risks

1.22.2.1 Mineral Resources

Estimates to date are limited to Indicated and Inferred Resources. Mineral resources that are not mineral reserves do not have demonstrated economic viability. A particular consideration (and associated risk) for evaluating the transition from Resources to Reserves at this deposit is the potential for dilution of brine during recovery pumping. The QP considers that this will be a significant criteria for any future production design.

Further, all conceptual models (including the polygon methodology used herein to estimate resources) have a degree of risk and uncertainty that should be considered when evaluating the project.

1.22.2.2 Mineral Processing and Metallurgical Testwork

- There is insufficient information to confirm the representativeness of the sample used in the adsorption tests versus the brine that will feed the processing plant;
- Due to the resins are still in the study phase, the results of the adsorption tests carried out are preliminary, therefore they are not sufficient to support the proposed design;
- As a consequence of the lack of metallurgical test data, the process design was carried out using benchmark data, thus generating the risk that this design may not be the most optimal possible.

1.22.2.3 Mining Methods

During brine extraction from the production wells, it is likely that a mixture between brines from different aquifers will be generated, whose chemical interaction may lead to the precipitation of salts in the wells. This could seal their slots, affecting their extraction capacity, and could also generate corrosion in the casing, which may lead to well loss in the long term, considering the extended operation time of the project (35.1 years). To account for this risk, well replacement is considered for around 75% of the total wells, considering an average life of wells of around 20 years, which is included in the project's cost estimation.

On the other hand, pumping from the salar is likely to influence the interaction between brine and brackish water around the salar margins. This implies a risk of brine dilution, decreasing its lithium concentration as it is extracted from the production wells.

No numerical flow model has been developed to evaluate the interaction between brines or with the brackish water mentioned above, or to simulate and optimize the extraction of brine from the project, which causes uncertainty regarding the possible impact on production.

The drainable porosity values used to estimate brine volumes are based on literature values and results obtained from other projects, which generates considerable uncertainty regarding the hydrological characterization of the units in this area and resource estimation, given the importance of drainable porosity in the estimation.

Uncertainty is also identified in the vertical variation of brine chemistry, since most brine samples were collected during pumping tests, representing composite samples. Only a few depth-specific samples are available, collected using the Hydrasleeve system, which has allowed only minor resource differentiation on the basis of Lithium concentration variations with depth.

Finally, the deposition of spent brine in infiltration ponds implies a risk of salt precipitation at the base of the ponds due to evaporation, which is likely to significantly reduce the permeability and interfere with the planned infiltration.

1.22.2.4 Recovery Methods

- The mixture of brine extracted from wells located in different parts of the Salar de Tolillar can produce unforeseen crystallizations that have an impact on the final concentration of the brine that feeds the plant producing the risk of not complying with the proposed mining plan;
- The proposed lithium recovery flowsheet was selected based on available benchmark data and therefore there is a risk that it may not be optimal and should be reviewed and supported by vendor testing and/or information; and
- The available water is not sufficient to meet the water requirement indicated for the proposed process therefore availability of freshwater supply by water wells needs to be probed.

1.22.2.5 Infrastructure

- Due to lack of data, a benchmark value for the infiltration rate was used for the Project to calculate the required infiltration area, so there is a risk that there may be a difference between the rates that could have an impact on the footprint of the infiltration ponds.

1.22.2.6 Environmental, Permitting and Social Considerations

- Lack of detailed information about the terrestrial environment within and adjacent to the study area. The current publicly available data for the general area indicates a locally fragile ecosystem and some wildlife species that are in a sensitive conservation state. Therefore, there is a strong potential that the project will require measures to avoid, mitigate, or potentially compensate impacts from the operation to local ecosystems;
- Lack of hydrological and hydrogeological baseline studies and modelling efforts for the Project that could help determine quantitative and qualitative impacts to freshwater (groundwater and seasonal surface water) arising from current and future operations. Impacts could include changes to local freshwater aquifers that could affect human health, cause ecological impacts to plants and wildlife; and
- The available data of the interactions of the Project with the local communities in the area indicates non-Indigenous and Indigenous communities are largely habituated to mining operations in the area and without apparent opposition to the Tolillar Project. The available data do not provide information that indicates Corporate Social Responsibility (CSR) activities have been ongoing since February 2022. The specific risk is losing the social license, which can occur at any stage of the Project, resulting in difficulties in obtaining permits and maintaining site activities.

1.22.2.7 Market Studies and Contracts

- Commodity prices can be volatile, and there is the potential for deviation from the forecast.

1.22.3 Opportunities

1.22.3.1 Mineral Resources

The QP considers that additional exploration zones with potential to increase the Resource occur primarily at depth, either:

- Within the deep salar in-fill materials in the central (deeper) zones of the salar, or
- Within potentially permeable basement rock immediately underlying the in-fill materials.

The wells that have been drilled into basement to date provide some indication that this material may be permeable at some locations. Further, it is reasonable to expect that dense brine would invade any drainable porosity within these materials.

1.22.3.2 Mineral Processing and Metallurgical Testwork

- Since Alpha Lithium has its own selective lithium adsorption resin, there is an opportunity to further develop studies and laboratory tests in order to obtain better lithium capture, contaminant reduction and water requirement results than those obtained with the resins currently on the market.

1.22.3.3 Mining Methods

At a later stage, there is an opportunity to develop a numerical flow and transport model to optimize wellfield layout and to evaluate interaction with brackish water and associated dilution. To control mixing with brackish water from the margins of the salar, a wellfield layout that minimizes the brine extracted from the upper levels of the salar should be considered, along with taking advantage of the natural confining layers to reduce the effect of pumping close to the surface. Additionally, a network of monitoring wells installed on the margins of the salar would allow controlling this possible interaction.

The current scenario presents the opportunity to take advantage of upcoming drilling campaigns to take representative samples for laboratory testing of total and drainable porosity and to undertake geophysical logging of holes with a borehole magnetic resonance tool, for measurements of in-situ drainable porosity. This will allow adequate characterization of the drainable porosity of the aquifers and reduce the uncertainty in the resource estimation.

Uncertainty in vertical variations in brine chemistry can be reduced in subsequent stages of the project with depth-specific brine sampling in exploration wells using the inflatable packer system.

It is also recommended to develop brine chemistry mixing simulations in order to identify potential precipitation of salts inside lines or ponds.

Regarding infiltration ponds, on-site and numerical modeling studies are required to evaluate what volumes of brine can be infiltrated without causing surface flooding and runoff. It is also possible to consider spent brine reinjection, which involves evaluating reinjection rates and a location that minimizes the risk of dilution of the natural resource.

1.22.3.4 Recovery Methods

- A resin with better lithium recovery could be selected for the direct lithium extraction (DLE) process; and
- The possibility of eliminating the purification step could be verified and by substituting some unit operations the desired battery grade product could be obtained directly from the carbonation step (first crystallization).

1.22.3.5 Environmental, Permitting and Social Considerations

- Expediting environmental and socio-economic baseline projects so that any construction and operational constraints can be identified;
- Cost savings can be realized if the environment team collaborates closely with the exploration and hydrogeological drilling teams to identify opportunities where hydrogeological and hydrological monitoring and testing to support environmental studies can be incorporated into a single program; and
- Working closely with the feasibility design team to ensure that required environmental measures are identified early, adopted and integrated into the Project so that avoidance or mitigation of potential impacts can be achieved.

1.23 Recommendations

Based on the assumptions and parameters presented in this report, the PEA shows positive economics ($1,739 million post-tax NPV (8%) and 25.6% post-tax IRR). The PEA supports a decision to carry out additional detailed studies. There is a recommended work program totalling $11.05 million including recommendations pertaining to geology and exploration, mining engineering, metallurgical testwork, geotechnical and infrastructure studies, environmental and community impact studies, and a prefeasibility study which are outlined below.

1.23.1 Exploration Program

Based on the initial results of exploration to date, additional exploration activities are justified to better characterize the subsurface brine in the Project concessions. Additional drilling and testing will allow for expansion of the resource laterally throughout the entire concession area, and deeper, potentially into bedrock.

We recommend eight coreholes (drilled to a maximum of about 400 mbgs). The coreholes will include:

- Depth-specific brine sampling using an inflatable packer, and

- Laboratory analysis of core for drainable porosity values.

Additional drilling and testing will allow for improved estimation of the lithium resource and will support increasing the Indicated Resource to Measured. In addition, additional core and brine sampling will increase understanding of the hydrogeological units and allow for a more confident construction of a groundwater flow model to obtain an estimated lithium reserve.

If the results of the proposed exploration program continue to be favorable and support feasibility of a lithium extraction Project, additional studies should include the following:

- Freshwater study to identify a long-term supply for the Tolillar Project, and
- Development of a hydrogeological flow model to allow estimation of an initial reserve estimation.

1.23.2 Mining Methods

For further explorations stages, diamond drilling coreholes and packer tests need to be performed to characterize hydraulic conductivity. Also, laboratory testing of representative samples for total and drainable porosity should be considered to reduce uncertainty in the resource estimation, preferably in addition to profiling holes with a borehole magnetic resonance tool to measure in-situ drainable porosity. Sampling protocols for discrete sampling using packer testing have to be developed to properly describe the brine chemistry of the different units encountered.

It is recommended to use the hydrogeological flow model for the initial reserve estimation to simulate brine extraction in different scenarios, thus optimizing wellfield configuration. Also, it is considered that brine chemistry mixing simulations need to be developed to identify potential precipitation of salts inside pipelines or ponds.

Additionally, it is recommended to conduct new surface-based geophysical studies to determine the basement topography in greater detail. The information obtained should be interpreted in conjunction with the available stratigraphy of the diamond and rotary drilling wells.

It is recommended to consider a wellfield layout that minimizes the brine extracted from the upper levels of the salar, in order to control mixing with brackish water from the margins of the salar. Also, a network of monitoring wells should be installed on the margins of the salar to monitor this risk.

Given the possible decrease in permeability because of salt precipitation in infiltration ponds, on-site and numerical modeling studies are recommended to assess maximum volumes of infiltrated brine, thus avoiding surface flooding and runoff. Brine reinjection could also be considered, including field trials to determine potential reinjection rates. Drilling would be required to the bedrock depth, to establish the sedimentary units present throughout the salar basin and where an optimum location for reinjection would be located, minimising risk of dilution of the naturally occurring resource.

1.23.3 Metallurgical Testwork Program

Due to the novel nature of the proposed process technology in the direct lithium extraction and downstream unit operation to obtain battery grade lithium carbonate it is recommended to simulate the proposed process design on a laboratory scale and in the pilot plant in order to verify parameters and variables considered in the evaluation of the process recovery method.

Metallurgical recommended testwork cost are shown in Table 26-1, which includes laboratory and pilot plant testwork detailed below.

1.23.3.1 Laboratory recommended testwork

1.23.3.1.1 Direct Lithium Extraction (DLE)

- Verify the direct extraction of lithium from brine;
- Verify the drag of impurities and deleterious elements;
- Verify the composition of lithium and impurities in eluent and depleted brine;
- Verify water consumption in lithium recovery;
- Selection of the resin that maximizes lithium recovery and consumes the least amount of freshwater;
- Verify the lithium retention capacity in the resin; and
- Verify the ability to remove lithium by washing.

1.23.3.1.2 High Pressure Reverse Osmosis (HPRO)

- Perform reverse osmosis tests using high pressure with the eluents produced in the laboratory and verify performance, energy consumption and the composition of lithium obtained along with impurities; and
- Evaluate the possibility of using nanofiltration technology to concentrate lithium and evaluate its contribution to the process.

1.23.3.1.3 Impurity removal

- Verify the reduction of calcium and magnesium of the HPRO brine product;
- Verify calcium and magnesium solubility data; and
- Verify the use of ion exchange for the reduction of calcium, magnesium and boron.

1.23.3.1.4 Carbonation

- Verify the parameters used in process design;
- Verify the solubility of lithium once lithium carbonate has precipitated; and
- Verify if the precipitated product meets battery grade quality to avoid purification stage through carbon dioxide use.

1.23.3.1.5 Purification

- Verify consumption and solubility of carbon dioxide in brine at 25°C;
- Verify lithium composition once lithium carbonate has been solubilized and then precipitated at 80°C; and
- Verify carbon dioxide recovery for recycling to process.

1.23.3.2 Pilot Plant recommended testwork includes:

- Verify parameters, process variables along with reagent consumption;
- Select through tests the equipment technology that fits quality capital costs and operating costs;

- Verify process options that allow reducing unit operations and achieving the same quality and lower costs;
- Verify freshwater consumption required by process design;
- Verify obtaining commercial quality product; and
- Verifies proposed plant performance along with checking equipment efficiency, washing efficiency, required materiality, adequate instrumentation and waste management, as well as verifying that the proposed final disposal of depleted brine is adequate.

1.23.4 Infrastructure Studies

Prior to the pre-feasibility study it is recommended to perform the following investigation:

- Geotechnical and Soil Mechanics Studies
  - Identify sites for extraction of backfill material for the construction;
  - Carry out a study of the area to determine the best place for the location of the ponds, industrial plants and any other structure or infrastructure necessary for the operation of the Project;
  - Determine the bearing capacity of the soil for the different sites;
  - Recommendations for foundations;
  - Geological study of the site;
  - Schedule a geologist site visit to take a soil sample for lab analysis; and
  - Processing of soil laboratory data and geotechnical report.
- Perform a site test for infiltration rates in the potential locations to build the Infiltration Rate Studies.
- Analyze the alternative to a different location for the purification plant. Alternatives should include the location of the purification plan at site, close to Salta and a port in Argentina and Chile in order to have logistics, energy and manpower savings.
- An Infiltration Pond location study should be performed for an optimal design considering earthworks, potential impact on freshwater available at site and permitting.

1.23.5 Environmental Studies

The following recommendations are made with regard to the design and implementation of environmental and socio-economic baseline studies. Qualified professionals should be retained to design and oversea the implementation of each of these studies. A review of available data should be undertaken as part of the design and scoping of these studies, prior to field implementation:

- Environmental baseline field studies and analyses should be completed in the following subject areas:
  - Hydrological and Hydrogeological Water Balance: Completing a quantitative surface and groundwater monitoring and testing program for the Project area that will support a hydrogeological and water balance model. The model should provide emphasis on seasonal recharge of the freshwater aquifers within and near the Project area and the potential drawdown from ongoing freshwater extraction as planned for the operation and the determination of sustainable yields that will be protective of sensitive ecosystems and human use and health. There is potential to work closely and collaborate with the hydrogeological production teams on the above initiatives, especially in regard to developing a conceptual and numerical three dimensional groundwater model.

- Water Quality Studies and Predictions: The groundwater and seasonal surface water (if present) of the study area should be sampled and analyzed for water quality to use for modelling and to establish a baseline that can be used as an early warning to predict the potential for freshwater – saltwater mixing.
- Air Quality: Baseline conditions for air quality should be established for near field and further afield operations.
- Near Surface Soil Characterizations: Near surface soil textures and chemistry should be established as part of the baseline program.
- Flora, Fauna, and sensitive ecosystems – A survey of flora and fauna throughout the Project area should be conducted with an emphasis on identifying species that are listed in conservation status and areas that can be considered sensitive ecosystems on that basis. If identified, these areas should be noted as potential constraints during the development of feasibility level designs.

- Additional socio-economic and cultural baseline studies should also be considered:
  - A gap analysis should be completed on current understanding of socio-economic conditions related to Indigenous and non-Indigenous communities near the site. The purpose of the gap assessment would be to identify current socio-economic information gaps related to nearby populations and community land use activities around the site and any potential future land use conflicts. Land use activities could include local harvesting of plants, wildlife, cattle grazing, human/agricultural water use, and tourism.
  - Studies to understand how best to provide benefits to the community and consideration given to establishing Impact Benefit or Cooperation agreements with nearby communities.
  - A conflict resolution procedure should be established that allows individuals in communities to lay complaints against the company and requires a prompt and meaningful response from the Company and action as warranted.
  - Ongoing engagement with the local communities should continue with regular community meetings as determined by local community needs and requests.
  - The current CSR plan should be regularly reviewed and updated based on the results of studies and feedback from the community. A system of recording community comments along with company response and feedback should be implemented.
  - A qualitied archaeologist should be retained to complete a desktop study of the Project area to assess the potential for encountering and disturbing cultural artifacts. If there is a high potential for encounters, field studies should be implemented for those high potential areas and mitigation plans put in place as required.

2 INTRODUCTION

2.1 Introduction

Alpha Lithium Corp. (Alpha Lithium) commissioned Ausenco Chile Limitada (Ausenco) to compile a Preliminary Economic Assessment (PEA) of the Tolillar Project. The PEA was prepared in accordance with the Canadian disclosure requirements of National Instrument 43-101 (NI 43-101) and in accordance with the requirements of Form 43-101 F1.

The Project area is located in the Salar de Tolillar basin (the Salar) within the Salta provincial boundaries of the Puna Region in northwest Argentina.

The responsibilities of the engineering companies who were contracted by Alpha Lithium to prepare this report are as follows:

- Ausenco managed and coordinated the work related to the report, reviewed the metallurgical test results and developed a PEA-level design and cost estimate for the process plant infrastructure, general site infrastructure, environmental and economic analysis.
- Groundwater Insight, Inc. (GWI) completed the work related to geological setting, deposit type, exploration work, drilling, sample preparation and analysis, data verification and developed the mineral resource estimate for the Project.
- Hydrominex Geoscience Pty Ltd., (Hydrominex) completed the work related to the mine plan.

2.2 Terms of Reference

The report supports disclosures by Alpha Lithium in a news release dated August 14, 2023, entitled, "Alpha Lithium Updates and Improves Preliminary Economic Assessment for Tolillar Project in Argentina".

This report has been prepared in accordance with NI 43-101 Standards of Disclosure for Mineral Projects and with the requirements of Form 43-101 F1.

Mineral resources are reported in accordance with the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definition Standards for Mineral Resources and Mineral Reserves (CIM, 2014) and the CIM Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines (CIM, 2019).The estimates also incorporate guidance provided in the 2011 Ontario Securities Commission (OSC) document entitled OSC Staff Notice 43-704 – Mineral Brine Projects and National Instrument 43-101 Standards of Disclosure for Mineral Projects (2011 OSC Staff Notice).

Units used in the report are metric units unless otherwise noted. Monetary units are in United States dollars (US$) unless otherwise stated.

2.3 Qualified Persons

The Qualified Persons for the report are listed in Table 2-1. By virtue of their education, experience and professional association membership, they are considered qualified person as defined by National Instrument 43-101, Standards of Disclosure for Mineral Projects, and in compliance with Form 43-101F1.

Table 2-1: Report Contributors

Qualified Person	Professional Designation	Position	Employer	Independent of Alpha Lithium Corp.	Report Section
James Millard	P.Geo.	Director, Strategic Projects	Ausenco Sustainability Inc.	Yes	1.18, 1.22, 1.22.1.8, 1.22.2.6, 1.22.3.5, 1.23, 1.23.5, 20, 25.1, 25.9, 25.12.1.6, 25.12.2.6, 25.13, 26.1, 26.6 and 27
Patricio Pinto	R.M.	Principal Process Engineer	Ausenco	Yes	1.1 to 1.4, 1.11.2, 1.12, 1.15 to 1.17, 1.19 to 1.21, 1.22, 1.22.1.1, 1.22.1.4, 1.22.1.6, 1.22.1.7, 1.22.1.9, 1.22.1.10, 1.22.2.2, 1.22.2.4, 1.22.2.5, 1.22.2.7, 1.22.3.2, 1.22.3.4, 1.23, 1.23.3, 1.23.4, 2 to 5, 12.2, 13, 17 to 19, 21 to 24, 25.1, 25.2, 25.5, 25.7, 25.8, 25.10, 25.11, 25.12.1.2, 25.12.1.4, 25.12.1.5, 25.12.1.7, 25.12.2.2, 25.12.2.4, 25.12.2.5, 25.13, 26.1, 26.4, 26.5 and 27
Mark King	P.Geo.	President	Groundwater Insight Inc	Yes	1.5 to 1.10, 1.11.1, 1.13, 1.22, 1.22.1.2, 1.22.1.3, 1.22.2.1, 1.22.3.1, 1.23, 1.23.1, 6 to 11, 12.1, 14, 25.1, 25.3, 25.4, 25.12.1.1, 25.12.2.1, 25.13, 26.1, 26.2 and 27
Murray Brooker	MAIG	Geologist and Hydrogeologist	Hydrominex Geoscience Pty Ltd	Yes	1.14, 1.22, 1.22.1.5, 1.22.2.3, 1.22.3.3, 1.23, 1.23.2, 15, 16, 25.1, 25.6, 25.12.1.3, 25.12.2.3, 25.13, 26.1, 26.3 and 27

2.4 Site Visits and Scope of Personal Inspection

Mr. Mark King conducted a visit to the project concessions on March 22-24, 2023 and met with the Alpha Lithium expert team, at the Alpha Lithium office in Salta on March 28, 2023. During his time at the project site, Dr Mark King obtained independent duplicate samples from WBALT-12 and WBALT-15, on March 24, 2023 and reviewed drill cuttings and descriptions from the previous drilling programs and from the ongoing program.

Mr. Patricio Pinto conducted a visit to the Tolillar Project site on March 30, 2023, followed by a visit to the Alpha Lithium head office in Salta on March 31, 2023. During his time at the project site, Mr. Pinto examined the current wells, road accessibility, site office, exploration camps, as well as potential areas for constructing the processing plant and other necessary infrastructure. Subsequently, at the Salta head office, he visited the laboratory facilities.

2.5 Effective Dates

This Technical Report has a number of significant dates, as follows:

- Tolillar mineral resource estimate: August 08, 2023

- Mineral Tenure: April 26, 2023.
- Financial analysis: August 10, 2023

The effective date of this report is based on the date of the financial analysis, which is August 10, 2023.

2.6 Information Sources and References

This Technical Report is based on internal company reports, maps, published government reports, and public information as listed in Section 27. Additionally, it is based on information cited in Section 3.

2.6.1 Previous Technical Reports

The following Technical Reports related to the Tolillar Project were filed on SEDAR:

- Montgomery. (2019). *Initial Exploration Results Salar de Tolillar Project, Salta Province, Argentina*. Prepared for Alpha Lithium Corporation. Effective date is October 01, 2019.
- Montgomery. (2022). Results of Years 2020/2021/2022 Exploration Activities and Lithium Resource Estimate Salar de Tolillar Project Salta Province, Argentina. Prepared for Alpha Lithium Corporation. Effective date is September 08, 2022.
- Ausenco. (2023). Tolillar Project NI 43-101 Technical Report on Preliminary Economic Assessment. Prepared for Alpha Lithium Corporation. Effective date is July 04, 2023.
- Groundwater Insight. (2023). Updated Resource Estimate Report, Salar de Tolillar Project, Salta Province, Argentina, NI 43-101 Report prepared for: Alpha Lithium Corporation, Effective date is August 08, 2023

2.7 Definitions

Common standard abbreviations and unit of measurements were used wherever possible as it follows in Table 2-2 and Table 2-3.

Table 2-2: Abbreviations and Acronyms

Abbreviation	Description
A&A	Argañaraz & Associates
AACE	Association for the Advancement of Cost Engineering
ADJ	Adjacent
AIS	Air-Insulated Switchgear
AISC	All-in sustaining costs
ALA	Alpha Lithium Argentina S.A.
APVC	Altiplano-Puna magmatic volcanic arc complex
ASA	Alex Stewart Laboratories
B	Boron
BG	Battery-grade
BMR	Borehole magnetic resonance
BV	Bed volume

Abbreviation	Description
Ca	Calcium
Capex	Capital Expenditures
CF	Cash flow
DDH	Diamond drilling hole
DL	Detection limit
DLE	Direct lithium extraction
E	East, indicating a directional trend
E & C	Engineering and Contingency
EA	Economic assessment
EC	Electrical Conductivity
EIR	Environmental Impact Report
EIS	Environmental Impact Study
Eramet	Établissements Peugeot Frères Company
EU	European Union
EVs	Electric vehicles
FAA	Federal Aviation Administration
FFCC	Ferrocarril (Railway)
FIBC	Flexible intermediate bulk containers
FLI	Forward-Looking Information
FOB	Free on Board
GIS	Gas-Insulated Switchgear
LPG	Liquid Petroleum Gas
GPS	Global Positioning System
HDPE	High-Density Polyethylene
HMN	Hombre Muerto Norte
HMW	Hombre Muerto West
HSE	Health, Safety, and Environment
In situ	In its original place
IRR	Internal Rate of Return
ISO	International Standards Organization
JUJ	Gobernador Horacio Guzmán International Airport
K	Potassium
KCl	Potassium Chloride
LAT	Latitude
LCE	Lithium Carbonate Equivalent
Li	Lithium
Li_2CO_3	Lithium carbonate
LOM	Life of Mine
LONG	Longitude
M&A	Montgomery and Associates

Abbreviation	Description
Mg	Magnesium
MR	Mineral Resource
NA	Not Applicable
NE	Northeast, indicating a directional trend
NE-SW	Northeast-southwest, indicating a directional trend
NI 43-101	National Instrument
Nº	Number
NPV	Net Present Value
N-S	North-south, indicating a directional trend
NSR	Net Smelter Return
NT	Sample ID for Brine samples
NW-SE	Abbreviation for northwest-southeast, indicating a directional trend
OC	Ownership Certificate
OR	Ownership Report
PEA	Preliminary Economic Assessment
POSGAR	Geodetic reference system used in Argentina
Q1	First quarter
Q2	Second quarter
QP	Qualified Person
REMSa	Energy and Mining Resources of Salta
RN	National Route
RNPQ	National Register of Chemical Precursors
RP	Provincial Route (highway)
SAC	San Antonio de Los Cobres
SASA - ICAO	Code for Martín Miguel de Guemes International Airport
SEDAR	System for Electric Document Analysis and Retrieval
SEV	Survey point code
SGS	SGS Laboratory of Salta
SGS	Société Générale de Surveillance
SLA	Martín Miguel de Guemes International Airport
SLTO	Social licence to operate
ST	Sample ID for Brine and Soil samples
STC	Station code
SW	Southwest
TBD	To be determined
TL	Station code
US	United States
USD/US$	United States Dollars
UTM	Universal Transverse Mercator
VES	Vertical Electrical Sounding

Abbreviation	Description
W	West, indicating a directional trend.
WBALT	Well name or identifier
WBS	Work Breakdown Structure
W-E	West-east, indicating a directional trend.
X	Coordinate
Y	Coordinate

Table 2-3: Unit Abbreviations

Abbreviation	Description
%	percent
°C	degrees Celsius
BV/h	bed volume (expressed in milliliters) per hour
d	day
GWh	gigawatt hour
ha	hectare
h	hour
kg	kilogram
km	kilometer
kPa	kilopascal
kt	kilotonne
kV	kilovolt
L/s	liters per second
L/s/m	Liters per second per meter
M	million
m	meter
m^2	square meter
m^2/d	square meters per day
m^3	cubic meter
m^3/a	cubic meters per annum
m^3/d	cubic meters per day
m^3/h	cubic meters per hour
Ma	mega-annum (unit of geological time equal to one million years)
masl	meters above sea level
mbmp	meters below measuring point
mbgs	meters below ground surface
mg/L	milligrams per liter
mL	milliliter
mm	millimeter
Mt	million metric tonnes
t	metric tonne

Abbreviation	Description
MW	megawatt
MWh	Megawatt hour
ppb	parts per billion
ppm	parts per million
t/a	tonnes per annum
% w/w	weight/weight percentage

3 RELIANCE ON OTHER EXPERTS

3.1 Introduction

The QPs have relied upon the following other expert reports, which provided information regarding mineral rights, surface rights, property agreements, royalties, taxation, and marketing for sections of this Report.

3.2 Property Agreements, Mineral Tenure, Surface Rights and Royalties

The QPs have not independently reviewed ownership of the Project area and any underlying property agreements, mineral tenure, surface rights, or royalties. The QPs have fully relied upon, and disclaim responsibility for, information derived from Argañaraz & Associates retained by Alpha Lithium for this information through the following documents:

- Argañaraz & Associates (2023). *Alpha Lithium Corp. ("the Corporation") – Argentina Projects*. Report prepared for Alpha Lithium Corp., April 26, 2023. 6 pp.

This information is used in Section 4 of the Report. The information is also used in support of Sections 1.3, 14, 20, 22 and 25.2 of the Report.

3.3 Environmental, Permitting, Closure, Social and Community Impacts

The QPs have fully relied upon, and disclaim responsibility for, information supplied by Alpha Lithium and experts retained by Alpha Lithium for information related to environmental (including tailings and water management) permitting, permitting, closure planning and related cost estimation, and social and community impacts as follows:

- Conhidro S.R.L. (2022a). *Estudio de la Recarga en Salar de Tolillar*. Internal document prepared for Alpha Lithium
- Ganám Maurell, C. E. (2022). Renovación Bianual del Estudio de Impacto Ambiental y Social e Informe de Impacto Ambiental Etapa Ensayos de Evaporación Etapa de Exploración Avanzada Proyecto Tolillar. Prepared for the Secretary of Mining, Salta Province. February, 2022.
- Mining Intelligence. (2022). *Community Engagement and CSR Initiatives, internal presentation*. Prepared by Mining Intelligence for Alpha Lithium S.A. for internal purposes.

This information is used in Section 20 of the Report. The information is also used in support of Sections 1.18, 14, 22, and 25.8.

3.4 Taxation

The QPs have fully relied upon, and disclaim responsibility for, information supplied by experts retained by Alpha Lithium for information related to taxation as applied to the financial model as follows:

- "Financial Model – Tolillar v8 CS.xlsx" received by email sent by Alpha Lithium on July 04, 2023.
- "Resultados Modelo Económico - PEA 2 - DRAFT" received by email sent by Credit Suisse on August 10, 2023.

This information is used in Section 22 of the Report. The information is also used in support of the sections 1.20,1.21, 1.22 and 25.12.

3.5 Markets

The QPs have not independently reviewed the marketing or price projection information. The QPs have fully relied upon, and disclaim responsibility for, information derived from Alpha Lithium and experts retained by Alpha Lithium for this information through the following documents:

- Lowry, J. (2023). *Alpha Lithium Marketing Section 05312023 Final*. Report prepared for Alpha Lithium Corp., March 31, 2023. 6 pp.
- Mr. Lawry is the founder and President of Global Lithium™ which provides compensated lithium advisory services including: supply & demand analysis, strategic reviews, negotiations support, sales services, price data, competitive intelligence and more to lithium producers, consumers, investors, and governments on five continents leveraging more than 20 years of lithium experience in the US, Japan and China.
- The qualified person has reviewed these analyses and that the results support the assumptions in the Technical Report. It must be noted, that commodity prices can be volatile, and there is the potential for deviation from the forecast.

This information is used in Section 19 of the Report. The information is also used in support of the financial analysis on Sections 1.17, 22 and 25.7 of the Report.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Introduction

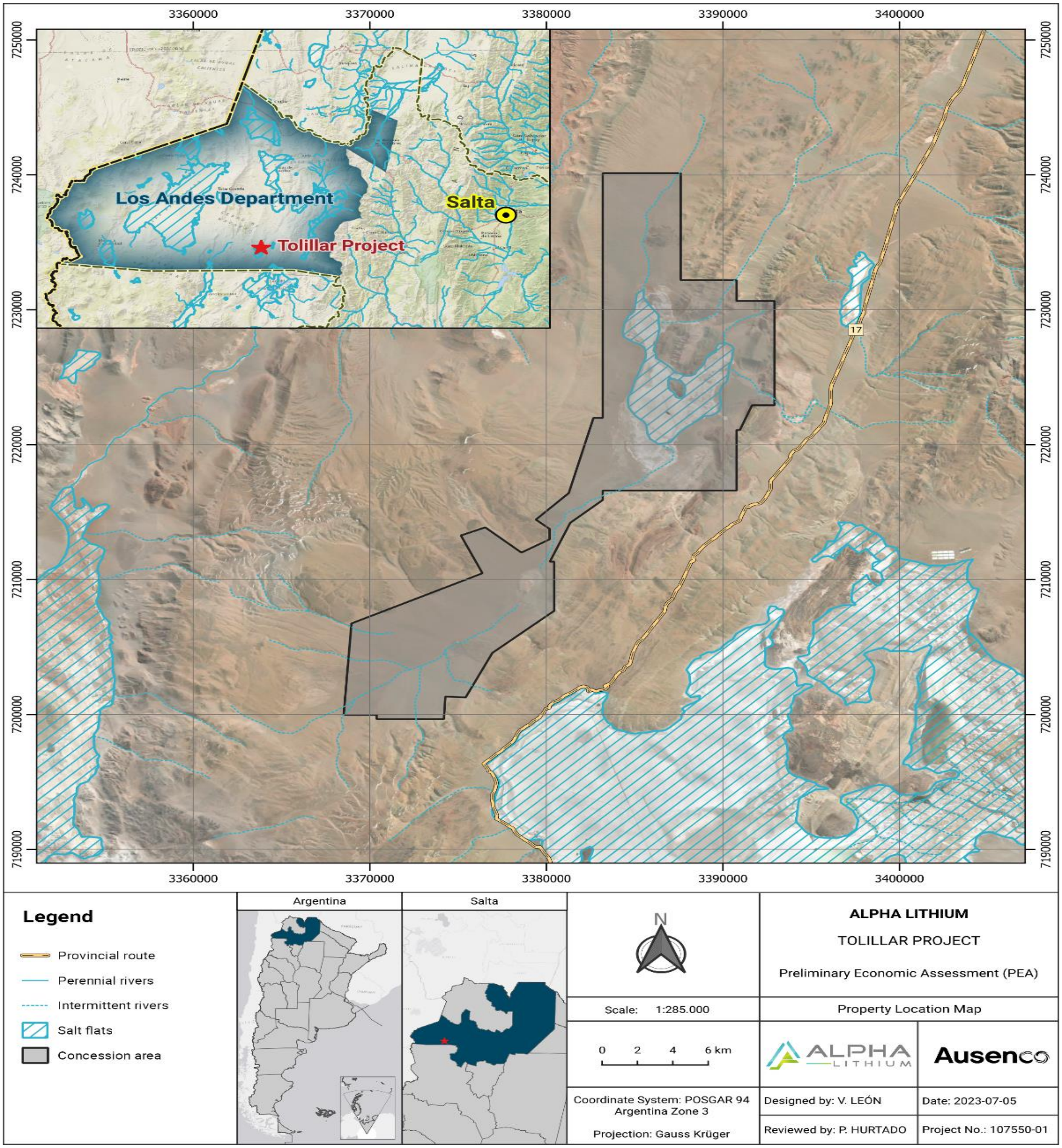
The Project is located in the Salar de Tolillar basin (the Salar), in the Salta Province, in northwest Argentina, about 170 km from Salta, and approximately 90 km south of the town of Estación Salar de Pocitos. Tolillar coordinates are shown in Table 4-1.

Table 4-1: Salar de Tolillar Coordinates

Description	Unit	Value
UTM Zone	-	19 J
UTM East Coordinate	M	689,020.95 m E
UTM North Coordinate	M	7,221,130.88 m S
Latitude		-25.089988
Longitude		-67.110797

The Project is in the Argentinean Puna, at an elevation of approximately 3,650 masl. Project location is shown on Figure 4-1. The Salar de Tolillar is located about 15 km to the northwest of the Salar del Hombre Muerto, where Livent's Phoenix project is located. The Tolillar Project currently consists of 16 Concessions totaling approx. 28,030 ha in the Province of Salta.

Figure 4-1: Regional Location Map of the Project Concession Areas



Source: Ausenco, 2023

4.2 Property and Tile in (Jurisdiction)

The Republic of Argentina is a federal republic. The federal government coexists with the governments of twenty-three autonomous and pre-existing provinces and the city of Buenos Aires. According to Argentine Law, mineral resources belong to the provinces where the resource is located. Such province has the authority to grant exploration permits and exploitation concession rights to private applicant entities. However, the Federal Congress is entitled to enact the National Mining Code and any substantive mining legislation which is similarly applicable in all of the country. Provinces have the authority to regulate the procedure aspects of the National Mining Code and to organize each enforcement authority within its territory.

There are basically two mining rights that can be awarded to a private individual under the Argentinean National Mining Code, while there are different actions through which such rights are awarded by the proper provincial mining authority.

1) **The Exploration Permit:** The holder of this right can explore an area during the period granted. In case of discovering mineral evidence, the holder has an exclusive right to apply for an exploitation concession. The only way to acquire an exploration permit is through an application to the proper mining authority to explore an area which is free of other mining tenements.

2) **The Exploitation Concession:** It has no time limit, provided the holder complies with the requirements of law, which are basically, the annual payment of a cannon, the compliance of the working and investment plan, and the measurement obligations of the exploitation concession. For mining activity in the area, the submission of an Environmental Impact Assessment that must be updated every two years is also required. There are different ways of acquiring an exploitation concession: (a) by discovering mineral as a consequence of an exploration process as described in action 1, above; (b) when mineral samples are discovered by "Chance," that is, without a previous exploration permit in a free of mining tenements area and (c) when an exploitation right has been declared and posted in the register as "vacant" due to a non-compliance with the requirements settled by law by the previous exploitation concession owner.

3) **The Vacant Mine:** When an exploitation concession is cancelled as a consequence of a previous holder non-compliance to the requirements briefly described in section 2 above, the mine is declared and registered as vacant. Once a mining property is registered as vacant, any third party may apply for its concession, provided that the mining authority has publicized the vacancy in accordance to the Mining code requisites and the mandatory time-period has elapsed. Vacant mine appliers shall pay at the moment of request of the vacant mine any canon fees due when submitting its application form.

It should also be noted that the mining authority activity with jurisdiction over the grant of mining rights is limited to the confirmation of compliance by petitioner of the requirements set by the Argentinean mining law. Such mining authority has no discretion, and therefore, the obligation, to grant a mining right which application is consistent with those such legally set requirements.

Furthermore, any mining right petition – exploration permit, exploitation concession and/or vacant mine petition is transferrable to third parties without any need of previous discretionary approval and/or consent from the applicable mining authority, without prejudice of the registration formalities that need to be met.

In Salta the mining authority is the Mining Court and the mining environmental authority is the Mining Secretariat.

All the freshwater available in the Province of Salta belongs to the province is governed by the Water Code of Salta. The application authority for the usage of freshwater is the Secretariat of Water Resources (*Secretaría de Recursos Hídricos*) of Salta.

4.3 Project Ownership

The entity that owns the project is Alpha Lithium Argentina S.A., a company duly incorporated in Salta, Argentina, controlled by Alpha Lithium Corp. (Canada).

The Tolillar Project currently consists of 16 Exploitation Concessions and Exploration Permits totaling 28,030 ha registered in the Province of Salta, and owned by Alpha Lithium Argentina, S.A.; some of these titles are still awaiting the granting sentence to be issued by the Mining Court of Salta. This area will be slightly less, (closer to 27,000) when the Mining Cadaster rules out overlapping areas between the exploration permits; the final value is not yet known. The Tolillar Project is located in what is called The Lithium Triangle, formed by the provinces of Jujuy, Salta and Catamarca in the Puna Argentina, the demand for the mineral has led to the commencement of exploration activities in the Salar de Tolillar the Province of Salta. The locations for project concessions are shown on Figure 4-2 in Item 4.5 of the present report.

The ownership, payment, and location information included in this report section has been verified in a title opinion prepared by Salta-based attorney Rafael Argañaraz Olivero and titled "Alpha Lithium Corporation ("the Corporation") – Argentina Projects" and dated April 26th, 2023.

Alpha Lithium Argentina S.A. has been incorporated, is organized and is a valid and subsisting corporation under the laws of Argentina and has all requisite corporate power and capacity to carry on its business as now conducted and to own or lease and operate the property and assets thereof.

The corporation is 99.98 % owner: Alpha Lithium Argentina S.A. (Controlled by Alpha Lithium Corp.)

In order to keep the titles in good standing the company needs to comply with the requirements of the Mining Code throughout the life of the concession, including, but not limited to, the fulfilment of certain investment obligations, the payment an annual fee to the province (canon) and the submission of the EIR every two years.

4.4 Property Agreements

The following parties have been involved in the most recent sale and purchase of the 16 concessions. Titles comprising the Tolillar Project include the following agreements:

- Titles Nº 1 to 9 (as set out in Table 4-2):
  - (a) Alpha Lithium Argentina S.A. (ALA) is the valid 100% legal recorded holder of these claims and interests pursuant to applicable laws in Argentina ("Applicable Law"). Some of these titles are still awaiting the granting sentence to be issued by the Mining Court of Salta as set out in Table 4-2.
  - (b) On 20/Jul/2021 the deed perfecting the transfer of these titles to ALA was signed and submitted to the Mining Court.
  - (c) Other than the filing of environmental impact reports and the payment of the biannual patent fee to Province of Salta in respect of these claims, no filings, proceedings or other actions are required to be taken by ALA in order to maintain valid 100% legal recorded ownership of these claims and interests as set out in Table 4-2 pursuant to Applicable Law.
  - (d) These titles are subject to a 2% NSR royalty in the aggregate to the vendors.
  - (e) An additional submission was done at the court to reflect the NSR percentages and owners of it on the titles.
- Title Nº 10 (as set out in Table 4-2):

(a) This is the file started by the Province of Salta through its mining and energy company, Recursos Energéticos y Mineros de Salta (REMSa) in which the tender process for the REMSa area was conducted.

(b) This area was awarded to Vendor A on May 30th, 2018. This file reflects all the events of the tender process which concluded in the signing of an agreement with Vendor A on January 23, 2019, aiming at the acquisition and exploration of the area comprised in this file.

(c) The rights to this area were included in the Bonvini Agreement.

(d) Vendor A notified to REMSa on April 30th, 2020 the transfer of its rights and interests under the agreement to Alpha Lithium Corp. ("ALLI").

(e) The agreement signed with REMSa stablishes the following commitments to acquire the area.

(f) A spending commitment of US$1.00 M to maintain its interests and rights in the REMSa Property to be completed within twelve months of obtaining the approval of its environmental impact report. This approval was awarded on February 13th, 2020.

(g) A guarantee of 10% of the amount committed for spending.

(h) An environmental insurance.

(i) A total purchase price of US$ 210,000 to be paid as follows:

  (i) An initial payment of US$ 10,000 to REMSa on signing of the agreement (Art.5.1.1) (i) - Paid);

  (ii) A payment of US$ 10,000 to REMSa upon approval of its EIR (Art. 5.1.1) (ii) - Paid);

  (iii) A payment of US$ 40,000 to REMSa on the first anniversary of the signing date of the Final Agreement (Art. 5.1.2). The deadline to comply with this payment and the ones listed below was suspended on April 30th, 2020 in mutual agreement between Vendor A and REMSa. Notwithstanding this suspension, an advance of US$ 10,000 of this payment was paid to REMSa.

  (iv) A payment of USD 75,000 to REMSa on each of the second and third anniversaries of the signing date of the Final Agreement (Art. 5.1.3 and 5.1.4). The deadline to comply with this payment was suspended on the 30th of April 2020 in mutual agreement between Vendor A and REMSa.

(j) On the 30th of April 2020 Vendor A and REMSa mutually agreed and signed a temporary suspension to these obligations due to lockdowns in place in the Province of Salta and until Titles Nº 11 to 14 are formally granted by the court. This suspension includes the obligations under (a), (d).iii and (d).iv. It could be argued by REMSA that the suspension of (a) is no longer in effect since the beginning of the works in the Project in November 2020.

(k) On November 2021 REMSa was notified of the assignment of Alpha Lithium Corp. to Alpha Lithium Argentina of all its rights and obligations under the agreement.

(l) On November 9th 2022, REMSa approved the investment obligations under the agreement on Resolution 34/22.

(m) On November 10th 2022, ALA paid the outstanding balance of 179.960 USD and the REMSa agreement was mutually terminated between REMSa and ALA, leaving ALA with no further obligations towards REMSa under the agreement.

- Titles Nº 11 to 14 as set out in Table 4-2:

(a) Alpha Lithium Argentina is the valid 100% legal recorded holder of these claims and interests pursuant to applicable laws in Argentina ("Applicable Law"). These are still awaiting the granting sentence to be issued by the Mining Court of Salta.

(b) These were filed within the REMSa area, which contained vacant mines and free areas. The award of the area on title Nº 10 gave Vendor A priority right to claim those vacant mines and free areas. As a result, titles 11 to 14 were claimed and are currently in the process of being granted to him. The area occupied by former titles Nº 19,122 and 19,164 to which Vendor A had priority has been claimed under titles Nº 24,392 and 24,393.

(c) On July 20, 2021 the deed perfecting the transfer of these titles to Alpha Lithium Argentina was signed and submitted to the Mining Court.

(d) Other than the filing of environmental impact reports and the payment of the biannual patent fee to Province of Salta in respect of these claims, no filings, proceedings, or other actions are required to be taken by Alpha Lithium Argentina in order to maintain valid 100% legal recorded ownership of these claims and interests as set out in Table 4-2 pursuant to Applicable Law.

(e) These titles are subject to a 2% NSR royalty in the aggregate to the vendors.

(f) An additional submission was done at the court to reflect the NSR percentages and owners of it on the titles.

- Titles Nº 15 to 16 as set out in Table 4-2:

(a) ALA filed at the Mining Court of Salta these claims for easements in the area of Salar de Tolillar.

(b) The court has not yet granted these to ALA.

4.5 Mineral Tenure

Mineral concessions or Mineral tenure information were given by the Mining Court of Salta in order to keep the titles in good standing. Concession titles are shown in Table 4-2 and shown in Figure 4-2. Mining concessions do not have an expiration date as long they comply with the provisions of the mining code. ALA has the right to undertake mineral exploration activities on the Mineral Titles.

Each of the mineral concessions comprising the Mineral Titles is in good standing under Applicable Law until the effective date of the present Report. Among the main obligations to retain mineral tenures, but not the only ones established by the Mining Code, are:

- Pay the mining fee semi-annually from the moment it is due, 3 years after registration. All Alpha Lithium properties with a due fee have paid it on time and in the proper form.
- Submission of the Environmental Impact Study (in spanish, Informe de Impacto Ambiental) and its biannual renewal.
- Comply with the legal investments, articles 217 and 218 of the Mining Code. For all Tolillar properties, Alpha submits sworn statements declaring that the legal investments have been complied with.

The provinces of Salta and Catamarca maintain a decades long dispute over some of their borders. It's a faculty of Argentina Congress to resolve this dispute. The Supreme Court of Argentina ("SCA") set principles in some cases involving this dispute, in particular jurisdiction conflicts involving private mining companies. Under the SCA criteria, in the case of mining claims filled at both jurisdictions and overlapping in the dispute area, the first claim in time in the area of the overlap will have the priority and the courts of the jurisdiction under which it was filled will be the mining authority over that claim in charge of enforcing the Mining Code obligations to that claimant.

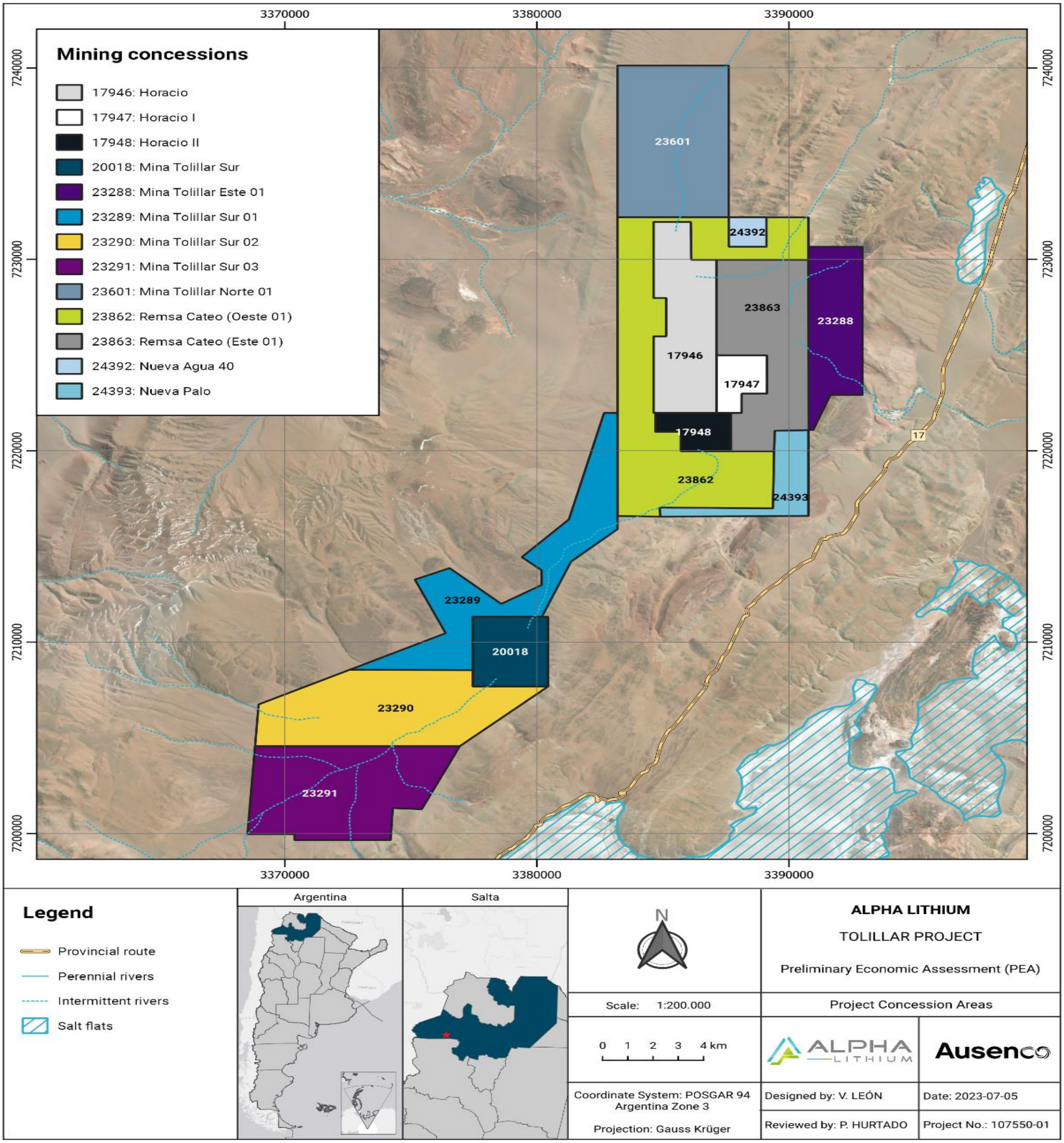
A small area to the south of the Tolillar project falls within the area disputed between the provinces. And even though there may exist overlapping claims filled in Catamarca, the Companies claims were filled first in time in Salta. Thus, following the SCA jurisprudence, the Companies' claims would prevail over those filled in Catamarca and the Mining Court of Salta should be the application authority for the claims of the Company.

Table 4-2: File Information for The Project Property Areas

#	File #	Concession Name	Recorded Legal	OC[1]	OR[2]	Status in Mining Court	Area (ha)
1	17,946	Horacio	ALA[3]	No	Yes	Granted	2,200.00
2	17,947	Horacio I	ALA	No	Yes	Granted	500.00
3	17,948	Horacio II	ALA	No	Yes	Granted	500.00
4	20,018	Tolillar Sur	ALA	Yes	Yes	Awaiting	1,090.09
5	23,288	Tolillar Este 01	ALA	Yes	Yes	Granted	1,757.82
6	23,289	Tolillar Sur 01	ALA	Yes	Yes	Awaiting	2,784.57
7	23,290	Tolillar Sur 02	ALA	Yes	Yes	Awaiting	3,458.61
8	23,291	Tolillar Sur 03	ALA	Yes	Yes	Awaiting	3,319.43
9	23,601	Tolillar Norte 01	ALA	Yes	Yes	Awaiting	3,500.00
10	22,764	Remsa XII	REMSa	Yes	Yes	Granted	-
11	23,862	Remsa Cateo (Oeste 01)	ALA	Yes	Yes	Awaiting	4,916.61
12	23,863	Remsa Cateo (Este 01)	ALA	Yes	Yes	Awaiting	2,995.68
13	24,392	Nueva Agua 40	ALA	Yes	Yes	Awaiting	231.37
14	24,393	Nueva Palo	ALA	Yes	Yes	Awaiting	776.09
15	779,376	Easement Camp[4]	ALA	Yes	Yes	Awaiting	0.88
16	779,377	Easement Ponds[4]	ALA	Yes	Yes	Awaiting	1.92
							28,033.07

[1] OC: Original Claimant: "No" means the property was acquired from a third party
[2] OR: Ownership recorded on title at the MC (either arising from a transfer of ownership or from the initial claim)
[3] ALA: Alpha Lithium Argentina S.A
[4] The court has not yet granted this title to ALA.

Figure 4-2: Location Map of the Project Concession Areas



Source: Ausenco, 2023.

4.6 Surface Rights

Provinces in Argentina control property mineral resources, so they have authority to grant mining rights to private applicant entities and have the authority to implement the National Mining Code and to regulate its procedural aspects and to organize each enforcement authority withi0n its territory. Two types of mineral tenure granted by provinces according to Argentina mining laws are Exploitation Concessions and Exploration Permits.

- Exploitation Concessions, sometimes referred to as "Minas" or "Mining Permits", are licenses that allow the property holder to exploit the mineral resources of the property, providing environmental approval is obtained. These permits have no time limit as long as obligations in the National Mining Code are abided.
- Exploration Permits referred to as "Cateos" have time limits that allow the property holder to explore the property for a period of time that is related to the size of the property. Exploration Permits also require environmental permitting.

Depending on the province, exploitation concessions are granted by either a judicial or administrative decision. An exploration permit can be transformed into an exploitation concession any time before its expiration period by filing a report and paying a canon fee. The condition under which exploitation concessions are held is indefinite providing that annual payments are made.

Neither exploitation nor exploration cannot start without obtaining the EIA permit. Permitting for drilling in areas of both types of mineral tenure must specify the type of mineral the holder is seeking to explore and exploit. Claims cannot be over-staked by new claims specifying different minerals.

There are no private owners of the surface rights in the project area, and the surface area is therefore owned by the province, in which each concession is located.

4.7 Water Rights

For water rights, well FWWALT-02, located in the area of Tolar Grande in Los Andes region, was registered in the census for the Secretariat of Water Resources, a Public Services Regulator, which is the only water permit held by Alpha Lithium to date. This permit corresponds to a groundwater extraction right for industrial use only (see details in census) reaching from 11 to 25 L/s approximate for daily use.

The permit is an Administrative Resolution, with a Concession Act number of 1,565 granted in 2022. It is clarified that the declarant has an adjudicated permit for this type of use (Act 1,565 of the year 2022), with a depth of 153 m (it does not indicate the uptake's name).

This permit would not be part of the mineral tenure rights.

4.8 Royalties and Encumbrances

Other than the following royalties, none of the mineral titles are subject to any mortgage, lien, charge, pledge, security interest, claim, demand or other similar encumbrance:

1. Titles Nº 01 to 03, as set out in Table 4-2, are subject to:
   (a) A royalty due to underlying vendors as defined in the Final Agreement equal to 1.78% of the net smelter return (NSR) in respect of production from these properties. This royalty can be bought back for US$ 4.00 M payable to the vendors.

(b) A royalty due to (a) Vendor A and (b) Vendor B equal to 0.22% of the net smelter return in respect of production from these properties.

2. Titles Nº 04 to 14 (excluding N°10), as set out in Table 4-2, are subject to a royalty due to (a) Vendor A and (b) Vendor B equal to 2% of the net smelter return in respect of production from these properties.
3. The royalties described in 1(b) and in 2 can be bought back for $1.00 M 12 months following completion of a feasibility study in respect of any or all of the Assets; or within five years from the date of the Final Agreement (December 2, 2018).
4. All titles set out in Table 4-2 are subject to a 3% NSR royalty payable to the Province of Salta.

4.9 Environmental Considerations

In November 2021 an Environmental Impact Study (EIS) was submitted to the provincial mining authorities for the Project's exploration activities, including the social and community aspects, to provide general information on the Project area. As required by the authority, in February 2022, Alpha conducted the biannual renewal of the environmental and social impact study for the evaporation testing and advanced exploration stages. The authority has not yet granted the environmental license for the Project.

The information available for the project area indicates the potential presence of sensitive elements, such as protected fauna and fragile ecosystems, such as high Andean meadows, as well as indigenous communities. These characteristics could result in environmental liabilities for the Project, which will be reviewed in detail in the subsequent EIS as required by the authority.

Detailed information on the environmental studies and management measures is provided in Section 20.1 of this report.

The company obtained the Environmental Impact Permit ("DIA") in December 2022 under Resolution Nº 207/22 of the Mining Secretary.

4.10 Permitting Considerations

Concerning the permits that the Project must have, these are classified in environmental permits and other authorizations required for operation. Information on the environmental permit can be found in the previous section and Section 20.1 of this report.

The other authorizations are:

- Permit for the consumption of water for process and human consumption.
- Registration in the Registry of Hazardous Waste Generators.
- Registration in the National Register of Chemical Precursors (RNPQ).

The Project is already registered in the Registry of Hazardous Waste Generators, valid until September of 2023. The Project still needs to request other permits. More information can be found in Section 20.3 of this report.

4.11 Social License Considerations

Indigenous communities have been identified near the project area. Social License Considerations and community related activities are included in Section 20.4 of this report.

4.12 Comments on Property Description and Location

To the extent known, there are not any foreseeable risks or uncertainties regarding property ownership, surface/legal access, environmental issues, and social license.

5 ACESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE AND PHYSIOGRAPHY

5.1 Physiography

The Tolillar Project is in a Puna ecoregion corresponding to a high elevated plateau within the Central Andes that covers parts of the Argentinean provinces of Jujuy, Salta, and Catamarca. It is characterized because is a high Andean desert with elevations that ranged between 3,600 masl in the depressions to about 6,000 masl in the high mountains of the volcanic arc. The physiography of the region is characterized by extensive depressions and basins separated by mountain ranges, with marginal canyons cutting through the Western and Eastern Cordilleras and numerous volcanic centers, particularly in the Western Cordillera.

The Altiplano-Puna magmatic volcanic arc complex (commonly APVC in literature) is located between the Altiplano and Puna. It is associated with numerous stratovolcanoes and calderas. Recent studies have shown that the APVC is underlain by an extensive magma chamber at 4 to 8 km deep (de Silva, 1989) and potentially the ultimate source of anomalously high values of lithium in the region. Abundant dry salt lakes (salars) fill many basins in general terms, it is a zone with low humidity and limited soil development.

Locally, the Project is in the Salar de Tolillar basin. The elevation at the surface of the Salar is approximately between 3,600 and 3,650 masl and in the concession areas of the Project, elevation ranges between 3,600 and 4,000 masl. The Salar is located within a hydraulically closed, endorheic basin, with water courses mainly developed on the eastern edge of the Salar, with basin elevations that reach approximately 5,000 masl, at the southwest of the Salar.

Surface water inflow to the Salar is marked by seasonal precipitation events, mainly in the period between October and March.

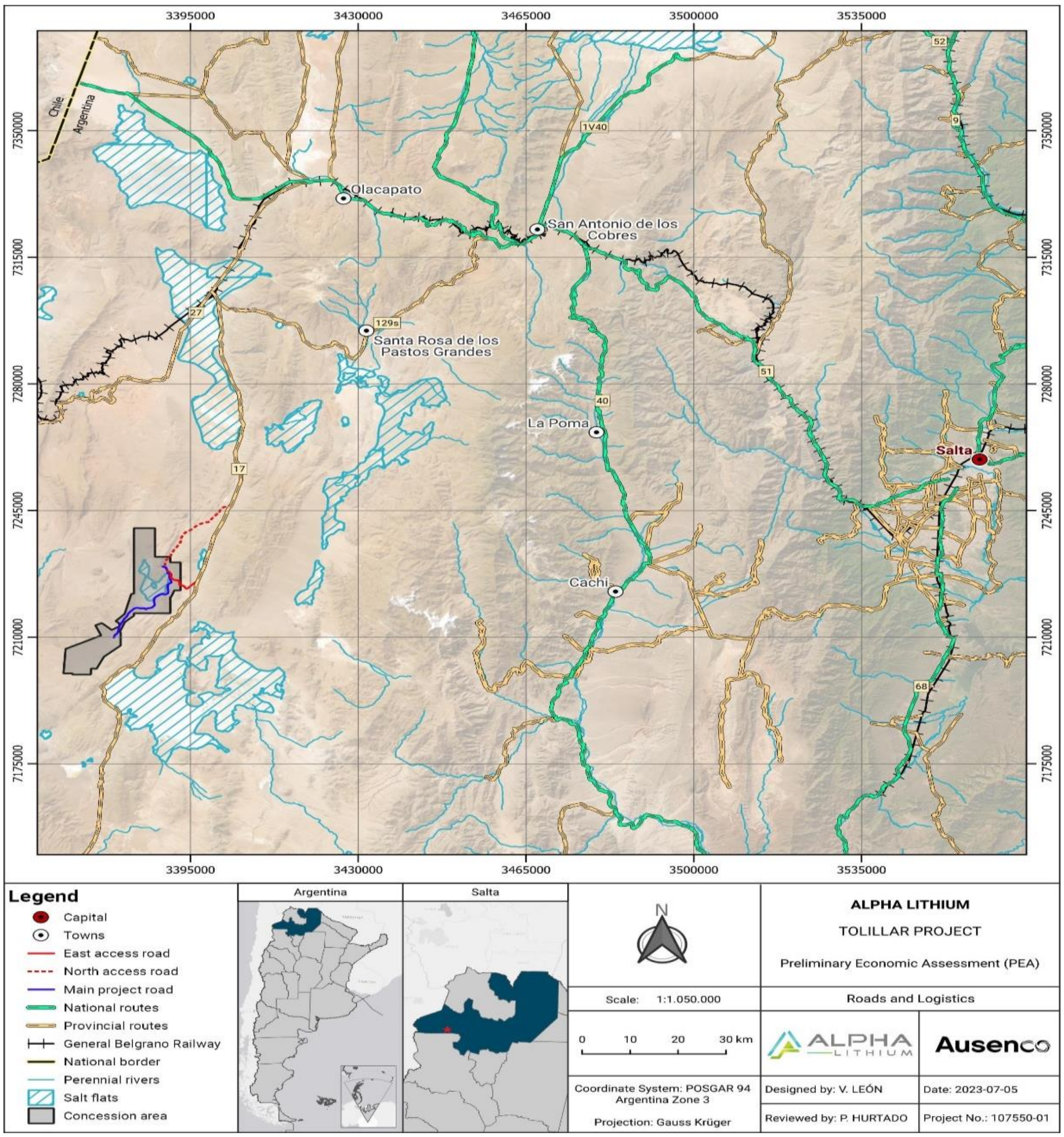
Due the extreme weather conditions in the region, the predominant vegetation is high altitude, xerophytic type plants, dominated by woody herbs, grasses, and cushion plants. Due to the high salinity on the salar surface, the core area of the Salar is devoid of vegetation. In the Project area, two phytogeographic provinces exist and have been described by Cabrera (1994): the Puneña Province and the Altoandina Province. The two are included in the more general Andean-Patagonian domain. The division into provinces within the Andean-Patagonian domain is based on the differences of some genera and species:

- Puneña Province: With a predominance of bushes of the Fabiana genera, Parastrephia, Acantholippia, Senecio, Nardophyllum, Baccharis, Junellia, and others. The Puneña Province occupies the largest area in the study area, between 3,400 and 4,400 masl although in vast sectors of the area it rises only up to about 3,900 masl. Above this altitude is a gradual transition and the coexistence of floristic elements of this Province and the Altoandina Province. The dominant vegetation is that of "Estepa Arbustiva". Towards the north and the east, the greater humidity favors the increase of the diversity. Towards the south and the west, the aridity increases, and is the reason why the plant communities are less abundant and why sometimes the vegetation disappears completely.
- Altoandina Province: With predominance of xerophilous grasses of the genera. Festuca, Deyeuxia, Stipa, Poa, and others. The Altoandina Province typically includes the higher altitude areas, above 4,400 masl, although in the study area it is also presented at lower altitudes (4,000 masl) in transition with the Puneña Province. The dominant vegetation is the Steppe Herbaceous or Graminosa type. All the plants have adapted to living in extreme cold and windy conditions. Although this Province has three Districts, in the Project area only the Altoandina Quichua District is represented, until 5,600 masl.

5.2 Accessibility

The Salar de Tolillar is in the department of Los Andes, Province of Salta, approximately 370 km from the city of Salta. It is accessed by National Route No. 51 which, from Salta Capital, heads west until it reaches the town of San Antonio de Los Cobres, after traveling about 160 km. From here it continues for about 60 km to Puesto Cauchari, where Provincial Route No. 27 begins and heads south, until it reaches the town of Salar de Pocitos, after traveling about 50 km. From this last place, you continue along Provincial Route No. 17, heading south. The first of the accesses is located at about 60 km following this route and 20 km of internal road to reach the project site (North access road). An alternative access is about 80 km along Provincial Route 17 plus 10 km of internal road (East access road). Figure 5-1 shows the layout of the accesses to the Tolillar Project.

Figure 5-1: Tolillar Project Access Routes



Source: Ausenco, 2023.

5.3 Climate

The Climate of the Tolillar Project area corresponds to a typical climate of the “Puna Argentina”, which is of an intense Andean continental type, reaching desert climate conditions. The area presents scarce liquid precipitation, mostly originated by the Atlantic air masses coming from the east. The main rainy season is between December through March. The period between April and November is typically dry, with an average annual rainfall of 160 mm/a.

The average annual temperature is 6.5° C with absolute maximum and minimum temperatures of 25.9° C and -19.1°C and relative humidity generally does not exceed 25%. During the winter months there are heavy snowfalls in the mountain systems. Little is known about solid precipitation (hail and snowfall), which undoubtedly must have a significant relevance in the hydrological cycle of the region. The existence of snowfalls from June to August and hail in April - May and September - October is common in almost the entire Puna Region.

Radiation is considered one of the factors with the greatest impact on daily and annual temperature trends in the Puna, Due to the very low relative humidity, it enhances the nocturnal radiation of the surface, resulting in a pronounced daily thermal amplitude. As a result, the air becomes highly evaporative, defining a desert climate.

The daily temperature range is recorded both in winter and summer, with values reaching up to 35ºC difference between daily highs and lows. The intense sunlight leads to significant evaporation, further increasing the dryness of the soil, resulting in a shrubby xerophytic vegetation.

The prevailing winds are almost constant, predominantly blowing from the west, west-northwest, and west southeast. They are extremely dry, with temperatures ranging between 5ºC and 20ºC. The most common wind speeds range from 7 to 80 km/h (sometimes exceeding 100 km/h), and they typically occur between midday and early afternoon.

Table 5-1 presents a summary of the climatological conditions of the Tolillar sector.

Table 5-1: Project Climatological Conditions

Item	Environmental Conditions	Units	Value
Temperature	Wet bulb	°C	14.3
	Medium	°C	6.5
	Absolute maximum	°C	25.9
	Absolute minimum	°C	-19.1
	Average maximum	°C	18.9
	Average minimum	°C	-7.6
Humidity	Medium	%	25
	Maximum	%	96.5
	Minimum	%	0.5
	Average maximum	%	76.4
	Average minimum	%	2.2
Air Pressure	Ambient pressure for modelling	kPa	65.8
Wind	Predominant direction	NA	N 292.5°
	Medium velocity	km/h	12.24
	Maximum velocity	km/h	155.5
	Average maximum velocity	km/h	104.7

Item	Environmental Conditions	Units	Value
Solar radiation	Net annual average	W/m²	88.7
	Maximum annual net average	W/m²	823.2
	Annual absolute maximum	W/m²	1,267.6
Storms	Isokeraunic level (according to Norm IRAM 2184-1- 1: 1997)	days	45
Rainfall	Average yearly	mm/a	160
	Nominal annual mean water evaporation rate	mm	2,044
Snow	Design charge	kN/m²	0.9
	Total snow	mm/a	50
Freezing	Freeze level	m	1.1

5.4 Local Resources and Infrastructure

A camp is located northeast of the Salar de Tolillar with the purpose of provide lodging for its own personnel and for contractors carrying out exploration work; currently, this camp has a capacity for up to 100 workers (Figure 5-2).

Figure 5-2: Actual Camp Facilities

Source: Ausenco, 2023.

The Tolillar Project plans to build a new camp for its operational phase, the description and characteristics of which are described in Section 18.

5.4.1 Electrical Power

A 600-MW, 375 kV power line between Salta and Mejillones in Chile passes about 150 km north of the Property. The line reportedly transmits 110 MW from Mejillones to the Argentinean Interconnected System. Also, two photovoltaic plants, La Puna Solar and Altiplano are located near the town of Olacapato (east from Pocitos), in the department of Los Andes. Since October 2021, both plants are connected to the Argentina Interconnection System.

5.4.2 Natural Gas Pipeline

A natural gas line (Gasoducto de la Puna) passes along provincial highway RP.17 south of Salar de Pocitos. This pipeline is less than 10 km east from the project area.

5.4.3 Railway Antofagasta-Salta

The nearest rail line in the region is an existing narrow-gauge railway between Salta, Argentina and Antofagasta, Chile. Figure 5-1 shows the location of the track. Two companies administrate it: the Chilean Ferrocarril Antofagasta – Bolivia (Chilean Luksic Group) and the Argentinean state owned Ferrocarril General Belgrano. Currently, the track from La Polvorilla to Salta is operated by the Tren de las Nubes and is not currently in use east from San Antonio de Los Cobres.

5.4.4 Road Connections

The Project is connected to Salta, Salar de Pocitos and San Antonio de Los Cobres by the way of a well maintained, paved and unpaved road network. RP-17, which is a gravel and dirt road, passes within 10 km of the Project.

5.4.5 General Services

Communities: The nearest community with services is the town of Antofagasta de la Sierra, located south of the Project along RP-17 and RP-43. The town of Pocitos is located north of the Project on provincial road RP-17 at the north end of Salar de Pocitos about the same distance from site but has very limited services. The nearest town with full services, including fuel and medical services, is San Antonio de Los Cobres, located about 3-hour drive from the site, and Salta, located about 6 hours from the site.

Water Supply: Freshwater is believed to occur mostly as groundwater in the area. A preliminary freshwater exploration program has been started in the area near the Project; freshwater has been identified in several wells, but a sustainable supply has yet to be identified.

Camp: There is currently an exploration camp with facilities on site to support the ongoing exploration activities.

Communications: Currently, only satellite phone and internet communication are available at the Project location.

5.5 Seismicity

In accordance with the IMPRES-CIRSOC 103 Standard, which establishes the requirements of constructions that can be subjected to loads dynamics due to seismic actions, zoning the territory of the Republic Argentina in five (5) zones depending on the danger generated by the events, the area under study would be in Zone II, classified as moderately dangerous seismic.

6 HISTORY

6.1 Overview

Several exploration activities have occurred on the Tolillar Project area since 2012. These included surface brine sampling campaigns in 2012 and 2015, carried out by Argañaraz & Associates. In addition, a VES survey was carried out by Tecnología y Recursos (2017). Drilling and testing, and confirmation sampling were conducted in 2018, by the QP responsible for the previous Resource Estimate (Montgomery, 2022). Although the previous QP and the current QP have examined the reported information from the historic exploration campaigns, they have not completed a full due diligence review this information. Therefore, the reported results should not be relied on as verified.

6.2 Prior Ownership

A private Argentine entity purchased and then developed the initial concessions until 2018 when they were sold to a private Canadian company. That private Canadian company paid the final two remaining property payments to the underlying vendors and then sold the property to Voltaic Minerals in two transactions, the first occurring at the end of 2019 and the second, at the beginning of 2020. Voltaic Minerals subsequently changed its name to Alpha Lithium Corp. in 2020 and Alpha Lithium has remained the owner and developer of the assets ever since.

6.3 Surface Brine Sampling - 2012

A surface water and brine sampling campaign was carried out in November, 2012 by Rafael Argañaraz (2013). A total of 12 brine samples were obtained and three solid samples were obtained and analyzed by Alex Stewart Laboratory ("ASA"). All brine samples were obtained by hand at depths less than one meter below ground surface ("mbgs"). Locations for the samples are given in Table 6-1 and shown on Figure 6-1. All samples were obtained within the current property boundaries.

Table 6-1: Trench Brine Samples in 2012

Sample ID	Type	GPS 1 LAT	GPS 2 LONG	Y	X
NT 1	Brine	-25 02 12.2	-67 07 26.8	3,386,549.929	7,231,372.699
NT 2	Brine	-25 02 14.5	-67 07 43.1	3,386,093.519	7,231,298.116
NT 3	Brine	-25 02 39.8	-67 07 44.5	3,386,060.762	7,230,519.199
NT 4	Brine	-25 03 08.2	-67 08 01.7	3,385,585.881	7,229,641.177
NT 5	Brine	-25 03 40.6	-67 08 01.8	3,385,591.436	7,228,644.064
NT 6	Brine	-25 04 12.8	-67 07 59.2	3,385,672.621	7,227,653.739
ST 1	Brine	-25 08 06.8	-67 07 12.0	3,387,055.327	7,220,463.538
ST 2	Brine	-25 07 35.7	-67 07 22.4	3,386,756.011	7,221,418.206
ST 3	Soil	-25 07 05.2	-67 07 34.9	3,386,397.971	7,222,353.911
ST 4	Soil	-25 06 33.7	-67 07 43.5	3,386,148.907	7,223,321.297
ST 5	Brine	-25 06 01.8	-67 07 51.4	3,385,919.324	7,224,301.152
ST 6	Brine	-25 05 29.4	-67 07 54.6	3,385,821.297	7,225,297.495
ST 7	Brine	-25 04 56.5	-67 07 53.0	3,385,857.659	7,226,310.351
ST 8	Soil	-25 06 32.9	-67 06 56.4	3,387,468.459	7,223,356.887
ST 9	Brine	-25 06 59.2	-67 06 40.0	3,387,934.654	7,222,551.309

Table 6-2: Laboratory Analytical Results for 2012 Brine Surface Samples

Liquid Samples	B (mg/L)	Ba (mg/L)	Ca (mg/L)	Fe (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Mn (mg/L)	Na (mg/L)	Sr (mg/L)
LC1	1	0.01	2	0.3	2	1	1	0.01	2	0.5
NT 1	<10	<0.10	1057	4.8	74	<10	65	0.91	2234	5.6
NT 2	<10	<0.10	3680	6.1	168	12	223	0.73	18,340	17.4
NT 3	54	<0.10	3152	4.1	828	63	562	0.70	79,702	77.8
NT 4	13	<0.10	2539	6.1	511	30	257	0.73	112,724	30.9
NT 5	<10	<0.10	1642	6.5	346	33	153	0.70	121,715	29.9
NT 6	67	<0.10	804	4.1	1317	101	915	<0.10	117,142	21.3
ST 1	127	<0.10	1012	4.9	1598	244	825	0.20	65,692	28.1
ST 2	24	<0.10	1161	8.1	788	76	436	0.89	118,546	19.6
ST 5	<10	<0.10	1552	5.2	190	<10	28	0.22	117,177	24.8
ST 6	21	<0.10	1886	4.8	231	21	65	0.31	112,902	17.9
ST 7	<10	<0.10	1738	<3.0	254	12	47	0.21	103,746	14.9
ST 9	128	<0.10	629	5.6	1949	161	1501	0.15	113,379	32.0
DUP NT 5	<10	<0.10	1638	6.8	318	34	158	0.72	121,759	29.8

Note: The limits of quantification (LC) correspond to those obtained from the validation of the method where no dilutions are carried out. The LC values reported other than the above are those obtained when dilutions are applied to the test sample.
Source: Laboratory reports from Alex Stewart Argentina, S.A.

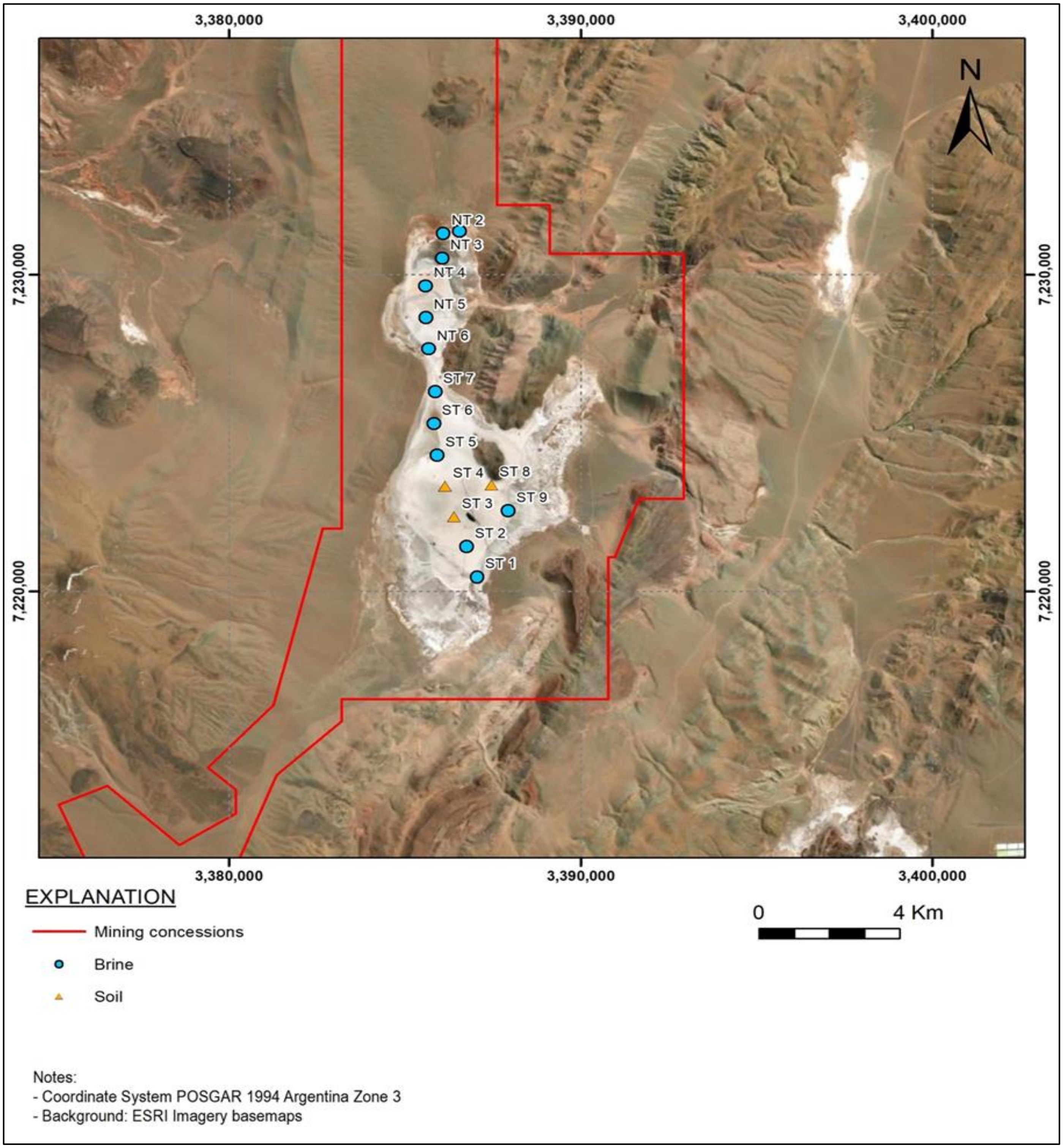
Results of laboratory analyses are given in Figure 6-2. With the exception of samples NT01 and NT02 in the far north part of the north sampling area (Figure 6-1), lithium concentrations ranged from 30 to 101 mg/L. Samples NT01 and NT02 appear to be diluted with freshwater. Regarding the south sampling area, with the exception of samples ST06 and ST07 in the south area (Figure 6-1), lithium concentrations reportedly ranged from 76 to 244 mg/L. Samples ST06 and ST07 appear to be diluted by freshwater that is coming into the basin from the north.

A duplicate brine sample was obtained at sample location NT05. Results of the duplicate sample are considered acceptable.

6.4 Brine Sampling Campaign – 2014

Following the exploration program in December 2012, where lithium concentrations up to 311 mg/L were reported in surface brine samples, Trendix Mining (2016) advanced an exploration phase with the purpose of determining the contents of lithium, potassium, and magnesium in the subsurface brines. In mid-2014, several trenches were excavated with a backhoe to the maximum depth allowed by the backhoe. In trenches that showed water, field personnel collected a sample of brine and measured pH, temperature, and electrical conductivity. The sample was then placed in a 1-liter plastic bottle. In each trench, 4-inch PVC slotted tubing was installed and labeled to allow for future sampling. The site visit by the previous QP (Michael Rosko) in December, 2018 confirmed that at least some of these PVC tubes are still in place. Trench coordinates are given in Table 6-3. Figure 6 3 shows the trench locations and photos of the field operations are shown in Figure 6-2. Field parameters are given in Table 6-4. The brine samples were analyzed at ASA and results are summarized in Table 6-5. A typical lithologic profile of the trenches is shown in Table 6-6.

Figure 6-1: 2012 Sampling Locations at the Tolillar Project



Source: Modified from Argañaraz, 2013

Table 6-3: Summary of Trench Brine Samples in 2014

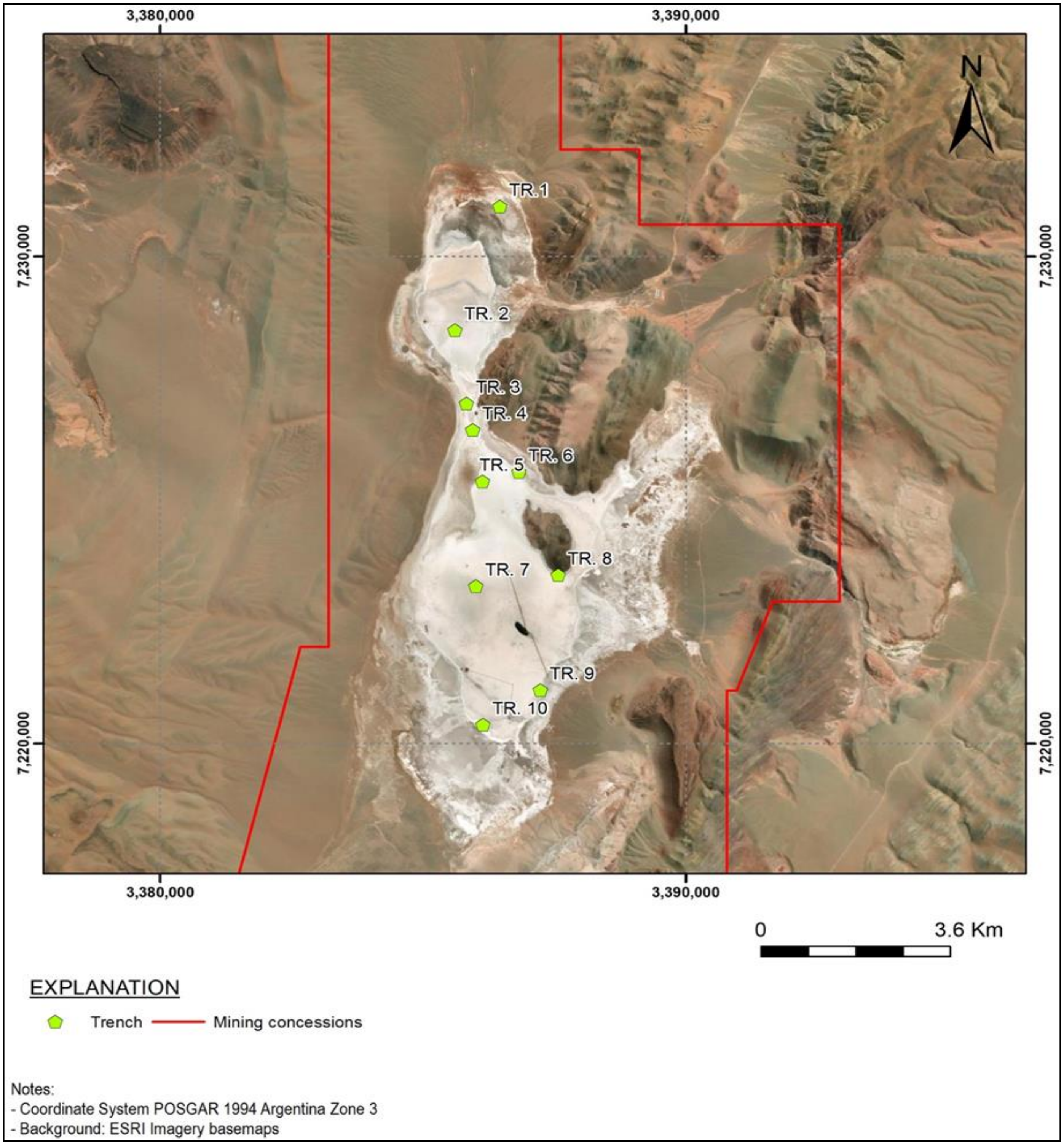
Sampling Points	Geodetic Coordinates WGS 84		Gauss Krüger Coordinates WGS 84	
	S	W	X	Y
TR.1	25° 05' 22.8"	67° 07' 31.1"	3,386,465	7,231,028
TR. 2	25° 03' 45.2"	67° 08' 0.8"	3,385,613	7,228,484
TR. 3	25° 04' 35.0"	67° 07' 53.8"	3,385,832	7,226,977
TR. 4	25° 04' 52.2"	67° 07' 50.1"	3,385,950	7,226,439
TR. 5	25° 05' 26.9"	67° 07' 43.5"	3,386,141	7,225,381
TR. 6	25° 05' 20.9"	67° 07' 18.7"	3,386,835	7,225,572
TR. 7	25° 06' 36.5"	67° 07' 48.5"	3,386,010	7,223,234
TR. 8	25° 06' 29.7"	67° 07' 52.5"	3,387,578	7,223,458
TR. 9	25° 07' 46.4"	67° 07' 05.3"	3,387,238	7,221,093
TR. 10	25° 08' 09.0"	67° 07' 44.4"	3,386,148	7,220,388
South River	25° 07' 53.8"	67° 07' 55.9"	3,385,822	7,220,853

Source: Trendix, 2016.

Figure 6-2: 2014 Trench (left) and PVC Tube Installed After Trenching (Right)

Source: Photos courtesy of Trendix, 2016.

Figure 6-3: Location Map for 2014 Trench Samples at the Tolillar Project



Source: Trendix, 2016.

Table 6-4: Summary of 2014 Trench Brine Field Parameters

Sampling Points	Final Depth Hole (mbgs)	pH	Conductivity (ms)	Temperature (°C)
TR. 1	4.50	6.53	20	10.4
TR. 2	2.00	6.30	20	0.2
TR. 3	4.90	6.16	20	7.7
TR. 4	1.50	6.19	20	6.1
TR. 5	1.00	6.58	20	11
TR. 6	3.00	6.80	20	4.9
TR. 7	1.10	dry	dry	dry
TR. 8	3.50	7.00	20	10
TR.9	4.20	7.04	20	8.7
TR. 10	4.00	7.02	20	9.0

Source: Trendix (2016)

Table 6-5: Summary of 2014 Trench Brine Chemistry Results

Sample	LAT	LONG	Lab	B (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	Depth (m)	pH	Temp °C
TR.1	25°05'22.8"	67°07'31.1"	ASA	23	352	27	330	4.50	6.53	10.40
TR.2	25°03'45.2"	67°08'00.8"	ASA	<10	590	56	272	2.00	6.30	0.20
TR.3	25°04'35.0"	67°07'53.8"	ASA	38	934	58	635	4.50	6.16	7.70
TR.4	25°04'52.2"	67°07'50.1"	ASA	64	1513	90	1119	1.50	6.19	6.10
TR.5	25°05'26.9"	67°07'43.5"	ASA	<10	547	11	70	1.00	6.58	11.00
TR.6	25°05'20.9"	67°07'18.7"	ASA	57	1527	82	1076	3.00	6.80	4.90
TR.8	25°06'29.7"	67°06'52.5"	ASA	27	1017	57	532	3.50	7.00	10.00
TR.9	25°07'46.4"	67°07'05.3"	ASA	99	2312	208	1249	4.20	7.04	8.70
TR.10	25°08'09.0"	67°07'44.4"	ASA	73	1657	133	1029	4.00	7.02	9.00

Source: Modified from Trendix (2016)

Table 6-6: Summary of Upper Lithology Encountered During 2014 Program

Depth Interval (mbgs)	Description
Land surface to 0.3	Semi-hard salt and sand crust
0.3 to 0.7	Mostly sand and silt
0.7 to total depth	Hard salt deposit

Source: Trendix (2016)

Table 6-7: Summary of 2015 Shallow Borehole Chemistry Results

Sample	LAT	LONG	B (mg/L)	K (mg/L)	Li (mg/L)	Mg (mg/L)	DEPTH (m)
DDH 1-4	25°03’45.2”	67°08’00.8”	<10	696	60	277	4
DDH 1-8	25°03’45.2”	67°08’00.8”	<10	745	63	288	8
DDH 1-12	25°03’45.2”	67°08’00.8”	<10	763	62	284	12
DDH 2-4	25°05’26.9”	67°07’43.5”	94	2258	194	817	4
DDH 2-8	25°05’26.9”	67°07’43.5”	268	5089	504	1897	8

6.5 Geochemical Sampling - 2015

Another exploration campaign was carried out in 2015 (Argañaraz, 2018a). Two shallow holes were drilled with rotary drilling. Locations for the boreholes are shown on Figure 6-4. Table 6-7shows the location, sampling depth, and laboratory results of each sample collected from the boreholes. The brine samples were analyzed at ASA. Figure 6-4 and Table 6-7 supports the thought that slightly elevated concentrations of lithium are located in the surface brine.

6.6 VES Geophysical Survey

A VES geophysical survey covering a substantial part of the Tolillar Project area was conducted in 2017 for former owner Argañaraz & Associates by Tecnología y Recursos (2017). Locations for the 26 survey points are shown on Figure 6-5. Goals of the survey were to obtain a preliminary understanding of the underlying stratigraphy, to identify potential geological structures, and to be able to identify future locations for exploration wells.

Based on the conceptualization of the salar system, it is assumed that the Salar is likely to be uniformly saturated with brine, with possible fresh or brackish water areas in the upper part of the system, and/or along the margins of the Salar. Based on the results of the survey, Tecnología y Recursos (2017) identified the following units:

- an upper conductive layer, believed to be a clastic unit likely interbedded with halite;
- a semi-resistive layer similar to the upper unit, but possibly more compact;
- a lower conductive layer above the basement is found throughout the Salar that was interpreted to be older Tertiary sediments with lower porosity; and
- a basal, low conductive unit interpreted as Ordovician basement.

The survey measurements also suggest that the basin is fault-bounded on the west side.

6.7 Drilling and Testing Programs

The 2018 exploration drilling and testing program was conducted by former owner Argañaraz & Associates, and was designed to support eventual development of a Resource Estimate, and to demonstrate that brine could be pumped from the Salar to eventually support development of a lithium brine extraction project. Specifically, the short-term goal of the program was to determine the chemistry of the brine in the north part of the Tolillar Project. In addition, drilling of DDHB-01 well was also carried out to allow calibration of the existing geophysics and to help identify potential next exploration targets.

Drilling and construction of exploration well DDHB-01 was done by PerTerSer S.R.L during the period of April 22 to July 28, 2018 using conventional mud rotary drilling methods. Drilling, construction, and testing were monitored by consulting geologist Paola Luna of Aminco S.R.L. The location for the well DDHB-01 is shown on Figure 6-6.

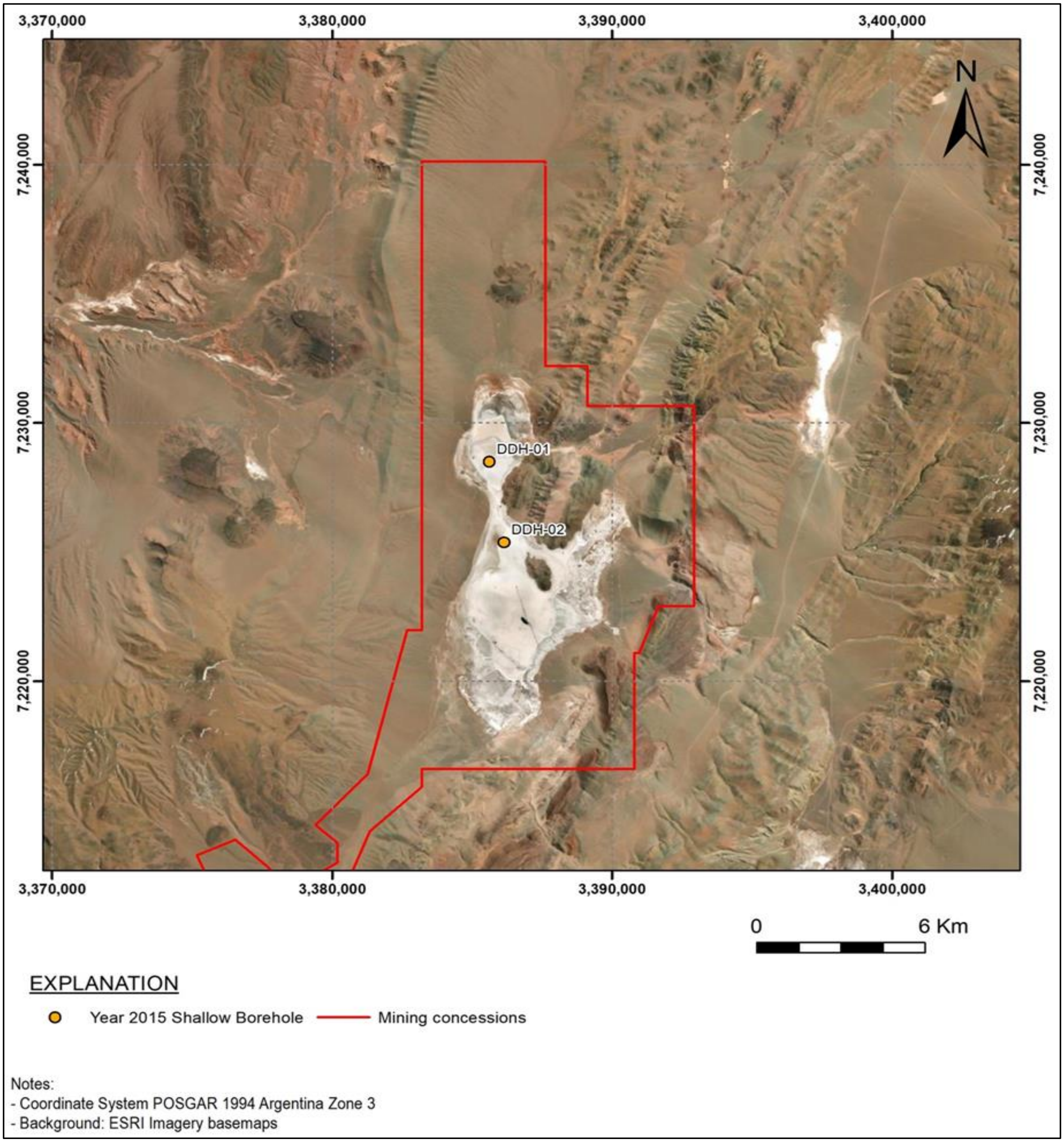
Location information for the exploration well is given in Table 6-8. A photo of the drill cuttings is shown on Figure 6-7.

Table 6-8: Location and Depth for Pumping DDHB-01

Exploration Well Identifier	Total Depth Drilled (m)	Easting (m, UTM)	Northing (m, UTM)
DDHB-01	208.35	3,385,840	7,228,666

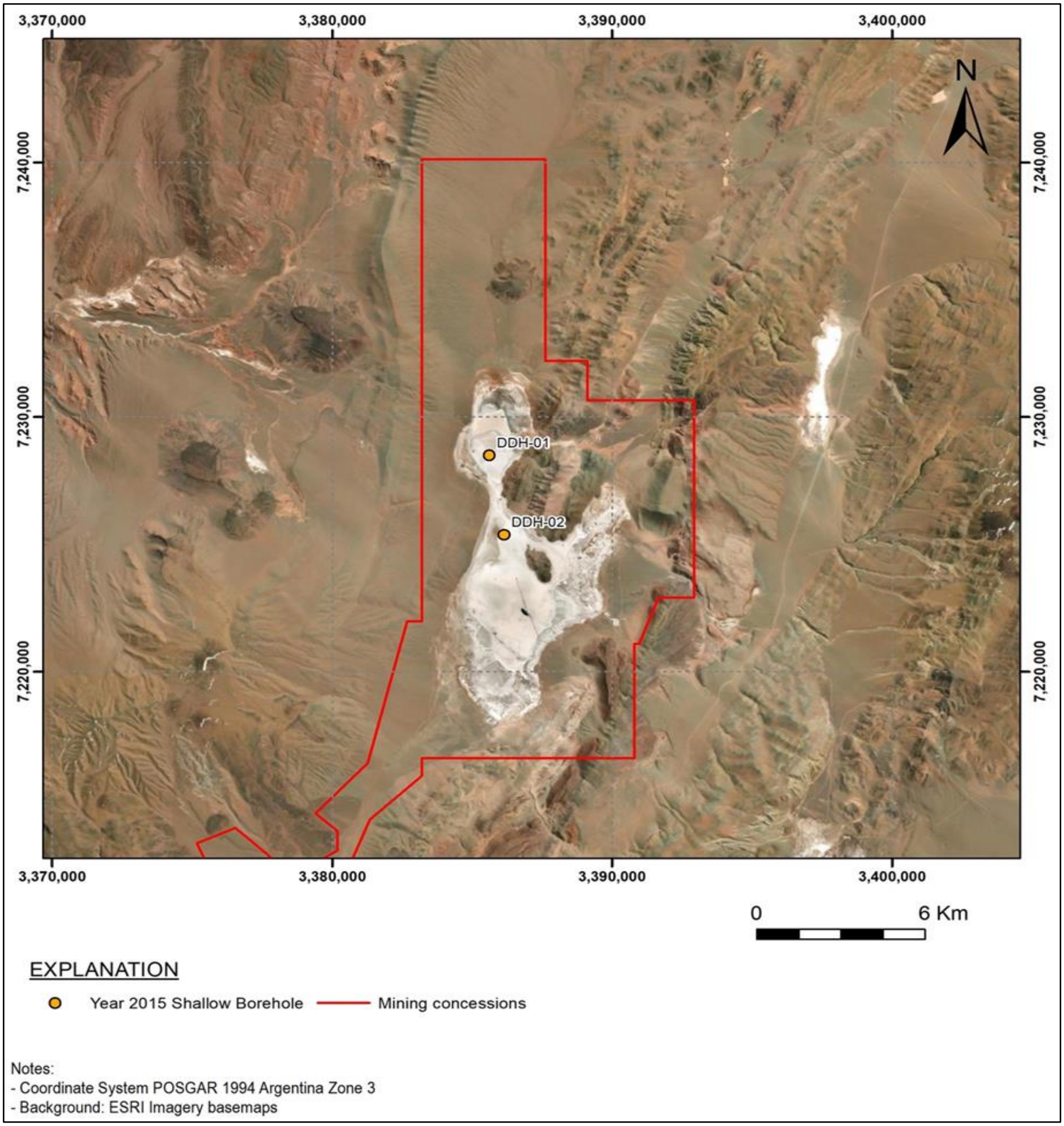
Easting and Northing from a hand-held portable GPS. Datum Gauss Krüger – Posgar

Figure 6-4: Location Map for Year 2015 Shallow Borehole



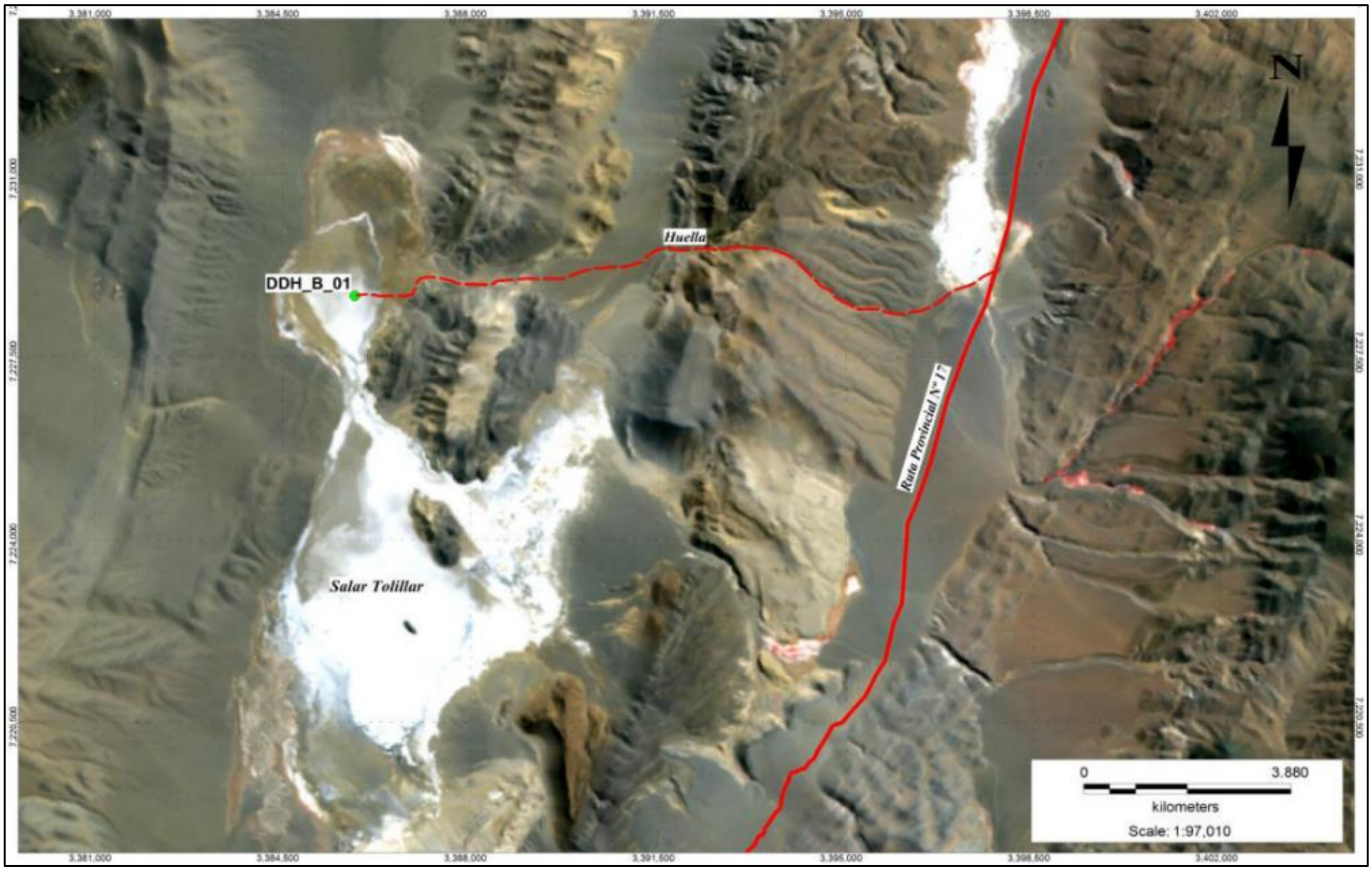
Source: Modified from Argañaraz, 2018b.

Figure 6-5: 2017 VES Locations for the Tolillar Project



Source: Modified from Tecnología y Recursos, 2017.

Figure 6-6: Location Map for Well DDHB-01



Source: Aminco, 2018.

The following is a list of equipment and methods used during well construction.

- Drilled using conventional circulation mud rotary. Drilling fluid was polymer-based.
- Pilot borehole diameter was 8.5-inch from land surface to a depth of 208.35 m, and subsequently reamed to 12.25-inch diameter to a depth of 205 m.
- Unwashed and washed drill cuttings were collected every 2 m and described and stored in labelled plastic cutting boxes.
- A borehole geophysical survey was conducted.
- Once drilling was completed, 6-inch PVC casing and screen was installed from 0 to 198 m depth.
- After casing installation, gravel pack was installed in the annular space surrounding the well screen and the well was developed via injection of clean water, jetting, and pump development.

6.7.1 Lithological Descriptions for Subsurface Sediments

During drilling, cuttings samples were obtained at 2 m intervals, described on site, and placed in plastic cuttings boxes. Drill cuttings are currently stored at the Argañaraz & Associates office in Salta. Below is a brief summary of the major hydrogeological units (Argañaraz, 2018a) and Photo 6 2 shows the drilling cuttings from exploration well DDHB-01.

- 0-18 m Halite
- 18-50 m Mostly clay and silt with minor sand
- 50-58 m Silt and sand
- 58-96 m Fine gravel and sand, with some silt
- 96-200 m Coarse sand with lesser gravel and silt
- 200-208 m Sandy silt

Figure 6-7: Drill Cuttings from Exploration Well DDHB-01

Source: Aminco, 2018.

6.7.2 Geophysical Logging Results For Exploration Well DDHB-01

Borehole logging was conducted at well DDHB-01 prior to installation of the casing, and included spontaneous potential, Single Point Resistivity, Short-Normal Resistivity, and Long-Normal Resistivity. Although the halite unit in the upper part of the borehole shows reasonably good correlation with the drill cuttings, the correlation with the lower units is not as obvious. In addition, a reduction in silt and clay in the lower part of the hole is generally observed in both the cuttings and in the geophysical survey.

6.7.3 Aquifer Testing At Exploration Well DDHB-01

The pumping test at well DDHB-01 started on July 27, 2018 with an average flow rate of 2 L/s. Testing details are given in Table 6-9. Drawdown and recovery graphs for the pumped well, and nearby observation well DDHB-01, are shown on Figure 6-6. Results are tabulated in Table 6-9 and Table 6-10. Water level was measured in the pumped well with a graduated sounder. During the test, field parameters (pH, temperature (°C), electrical conductivity ("EC"), and density) were measured. Density was measured with a hydrometer with a consistent density value of 1.2 grams per cubic centimeter. pH values ranged from 5.8 to 6.4; EC from 139.5 to 141.4 microseimens per centimeter. Temperature ranged from 16.7 to 17.1 ˚C. The pumping test stopped on July 27, 2018 after 18 hours of pumping and 24 hours of recovery measurements.

Table 6-9: Pumping Test Results for Well DDHB-01

Well Identifier	Date Pumping Started	Pumping Duration (Hours)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 18 Hours of Pumping (m)	Specific Capacity (L/s/m)
DDHB-01	26-Jul-2018	18	0.66	2	4.1	0.49

L/s = liters per second
L/s/m = liters per second per meter of drawdown

Table 6-10: Summary of Computed Aquifer Parameters for Well DDHB-01

Pumped Well Identifier	Average Pumping Rate (L/s)	Cooper Jacob (1946) Drawdown method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
DDHB-01	2	100	60

L/s = liters per second
m^2/d = square meters per day

Transmissivity is the rate at which water is transmitted through a unit width of aquifer under a unit hydraulic gradient, and has unit of meters squared per day (m^2/d). For analysis, drawdown data were analyzed for aquifer transmissivity using the logarithmic graphical method developed by Cooper and Jacob (1946). Water level recovery measurements were analyzed using the Theis (1935) semi-logarithmic graphical recovery method. Both methods were analyzed using Aqtesolv software (HydroSOLVE, 2008) and verified manually. Because recovery water level measurements tend to be more reliable for analysis, the operative transmissivity for well DDHB-01 is judged to be about 60 m^2/d and is considered to be good for finer-grained salar sediments (Table 6-10).

6.7.4 Brine Sampling at Exploration Well DDHB-01

During drilling of DDHB-01, brine samples were obtained. On June 3, 2018, the well was pumped and a total of 13 brine samples were collected from various pump depth settings using a depth-specific bailer.

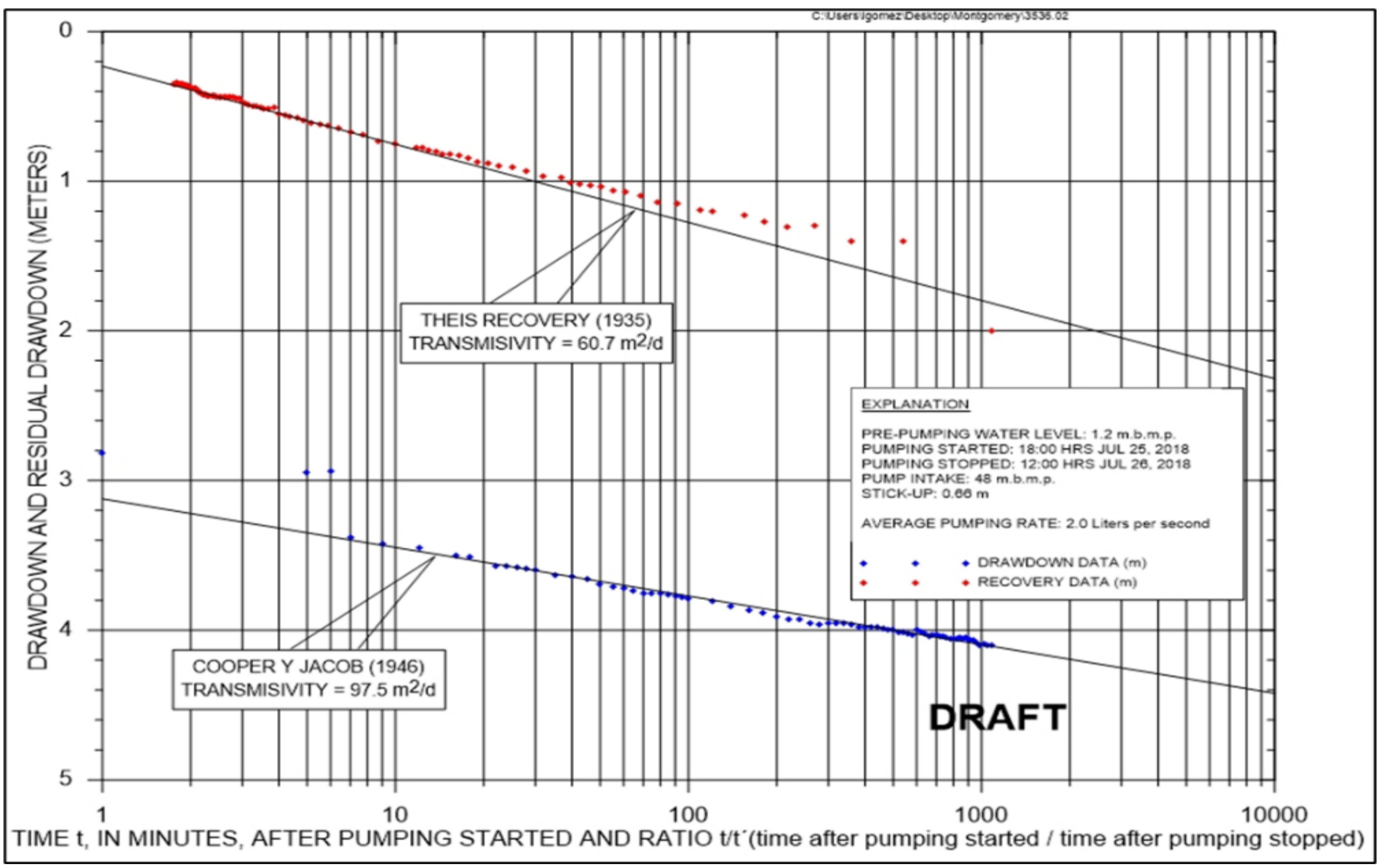
Table 6-11 is a summary of the samples obtained during the first round. On June 23, 2018, a second round of 10 brine samples were collected during the drilling process; samples are currently stored in the Argañaraz & Associates office in Salta.

Five brine samples were also collected during the period July 25-27, 2018, directly from the discharge pipe at regular intervals during the aquifer test at well DHHB-01. A summary of the brine samples obtained during testing is given in Table 6-13. Two of these samples were submitted to Alex Stewart Laboratory in November, 2018 for analyses. Results from the two samples are given in Table 6-14. Laboratory results for the pumped brine samples show effectively no difference in chemical composition after pumping for 17 hours.

A duplicate, depth-specific brine sample was obtained at a depth of 52 mbgs at well DDHB-01 by previous QP Michael Rosko on December 2, 2018 (Montgomery, 2022). The sample was analyzed by the University of Antofagasta laboratory in Chile. Summary of laboratory results are given in Table 6-16. Laboratory results for the sample are consistent with brine previously sampled at a depth of 50 m (Table 6-15 and Table 6-16).

Following testing, depth-specific samples were obtained at exploration well DDHB-01 (Saravia, 2018). A summary of laboratory results is given in Table 6-15. Table 6-12 is a summary of the samples obtained during the second round. Neither sets of these samples were submitted for laboratory analyses; samples are currently stored in the Argañaraz & Associates office in Salta.

Figure 6-8: Pumping Test Results for Exploration Well DDBH-01



Source: Modified from Aminco, 2018.

Table 6-11: Summary of Depth-Specific Brine Samples From Well DDHB-01, June 3, 2018.

Number of Samples	Conductivity (mS/cm)	Temp (°C)	Density (g/cm³)	pH	Date	Hour	Observations	Pumping Rate (L/s)	Volume (L)
1	151.3	12.0	1.225	6.08	3/06/2018	0:49	30 minutes pumping	2.4	5
2	147.8	11.0	1.225	6.1	3/06/2018	1:53	10 minutes pumping	2.4	2
1	150.8	11.0	1.225	5.8	3/06/2018	2:20	10 minutes pumping	2.4	5
2	149.8	10.8	1.225	6.40	3/06/2018	2:35		2.4	2
2	147.3	11.3	1.225	6.35	3/06/2018	2:40	Fine, slightly cloudy sand	2.4	2
1	144.2	11.3	1.225	6.34	3/06/2018	3:10	Fine, slightly cloudy sand	2.4	5
2	142.2	11.5	1.225	6.34	3/06/2018		Fine, slightly cloudy sand	2.4	2
2	138.0	11.0	1.220	6.46	3/06/2018	4:10	Fine, slightly cloudy sand	2.4	2

Source: Aminco, 2018.

Table 6-12: Summary of Depth-Specific Brine Samples From Well DDHB-01, June 23, 2018.

Number of Samples	Conductivity (mS/cm)	Temp (°C)	Density (g/cm³)	pH	Observations	Volume (L)
1	146.9	10.9	1.225	6.59	Clean and crystal-clear water	1
1	147.1	10.1	1.200	6.60	Clean and crystal-clear water	1
1	139.8	9.8	1.200	6.60	Clean and crystal-clear water	1
1	140.1	9.5	1.200	6.53	Clean and crystal-clear water	1
1	136.8	9.5	1.200	6.56	Clean and crystal-clear water	1
1	133.1	7.5	1.200	6.48	Clean and crystal-clear water	1
1	129.1	8.3	1.200	6.51	Clean and crystal-clear water	1
1	126.1	8.5	1.200	6.47	Clean and crystal-clear water	1
1	121.0	8.9	1.200	6.48	Clean and crystal-clear water	20
1	118.0	8.7	1.200	6.48	Cloudy water made to check the effectiveness of sampling	1

Source: Aminco, 2018.

Table 6-13: Summary of Pumped Brine Samples From Well DDHB-01.

Sampling Date	Parameter Measurement Date	CE (mS/cm)	T (°C)	pH	Density (g/cm^3)
25/07/2018	14/08/2018	139.5	17.1	6.40	1.2
25/07/2018	14/08/2018	140.0	16.7	6.37	1.2
25/07/2018	14/08/2018	140.0	1.6	5.84	1.2
25/07/2018	14/08/2018	140.3	17.1	6.33	1.2
25/07/2018	14/08/2018	141.4	16.9	6.38	1.2

Parameter measurement date of 14/08/2018.
Source: Aminco, 2018.

Table 6-14: Results of Laboratory Analyses From Brine Samples Obtained During The 2018 Pumping Test

Sample	Hours after pumping	Li (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Observations
AK46	1	201	595	1493	119,600	2146	Alex Stewart Laboratory (ASA)
AK47	17	203	584	1504	120,038	2194	ASA

Source: Aminco, 2018.

Table 6-15: Results Of Analyses From August 2018 Depth-Specific Sampling

Sample	Depth (m)	Li (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Observations
PTO-075	75	175	684	1241	117,735	1741	Alex Stewart Laboratory (ASA)
PTO-50	50	122	826	1047	119,227	1412	ASA
PTO-100	100	196	615	1438	118,231	1895	ASA
PTO-150	150	193	615	1424	120,371	1764	ASA
PTO-190	190	204	597	1442	115,120	1846	ASA

Source: Aminco, 2018.

Table 6-16: Results of Analyses From December 2018 Depth-Specific Sampling.

Sample	Depth (m)	Li (mg/L)	Ca (mg/L)	Mg (mg/L)	Na (mg/L)	K (mg/L)	Observations
DDH-B-01-1	52	150	718	1145	121,500	1418	University of Antofagasta

Source: Aminco, 2018.

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Salar de Tolillar is located in the Geological Province of La Puna (Turner, 1972) and within the Puna Austral Geological Sub-province (Alonso et al., 1984a, 1984b). One of the most important characteristics that define the Geological Province of Puna is the presence of evaporitic basins, or “salars”, where important deposits of borates, sodium sulphate, and lithium can concentrate. Salars near the Tolillar Project area include: Hombre Muerto, Antofalla, Ratones, Pocitos, Centenario, and Diablillos. Figure 7 1 shows the geological map for the area and the associated stratigraphic explanations for the units.

The oldest rocks outcropping in the region correspond to the metamorphic rocks of the Pachamama Formation (Aramayo, 1986; Hongn & Seggiaro, 2001) of Neoproterozoic age. The Ordovician is represented by graywackes, marine clay sediments, and lava from the Tolillar Formation (Zappettini et al., 1994; Zimmermann et al., 1999) and Falda Cienaga (Aceñolaza et al., 1975, 1976).

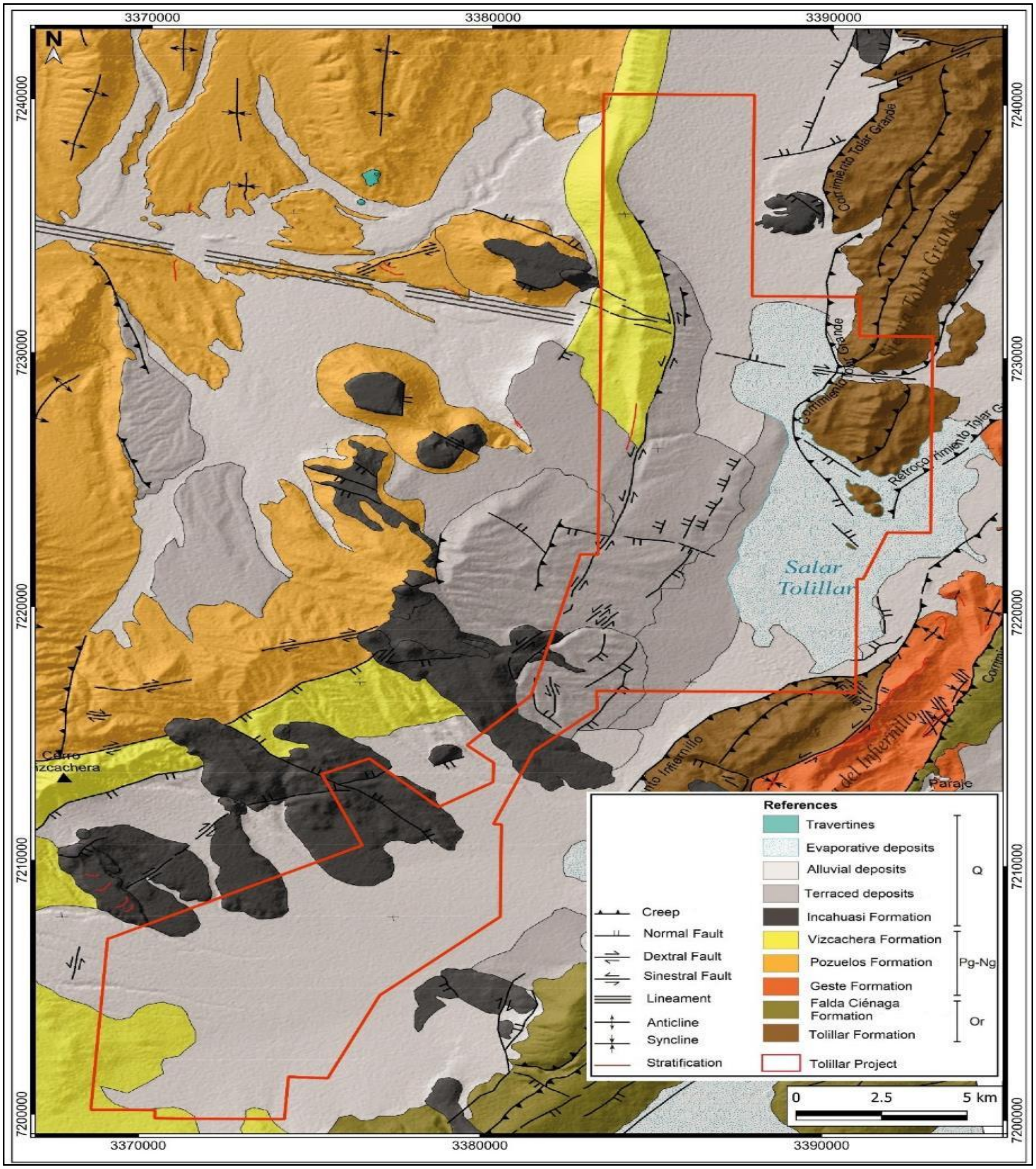
Conglomerates and red sandstones of the Geste Formation (Turner, 1964) assigned to the Middle Eocene (Alonso & Gutiérrez, 1986) unconformably overlie older rocks. Overlying the Geste Formation are younger conglomerates, sandstones and red mudstones with gypsum, and eolianites of the Miocene Vizcachera Formation (Donato & Vergani, 1985; Hongn & Seggiaro, 2001). The Catal Formation overlies the Vizachera Formation (Alonso & Gutiérrez, 1986), age-dated between 15.0 ± 2.4 Ma to 7.2 ± 1.4 Ma (Alonso, 1991). The next youngest units in the area include sedimentary evaporites (borates and halite) of the Sijes Formation (Turner, 1964) which have been dated to be 5.86 ± 0.14 Ma (Watson, in Alonso et al., 1984a).

Volcanic units in the area include dacites and andesites of the Tebenquicho Formation, age dated to be 14 ± 5 to 11 ± l Ma (Gonzales, 1983). La Ratones Andesite (Gonzales, 1983) was dated as 7.1 ± 0.2 Ma (Vandervoort, 1993). Dacitic ignimbrites are widely distributed in the area with age dates of between 2.56 ± 0.14 Ma and 2.03 ± 0.07 Ma (Francis et al., 1983; Sparks et al., 1985). Quaternary deposits are represented by clastic, evaporitic sediments and the basaltic volcanics of the Incahuasi Formation (Aceñolaza et al., 1976) dated at 0.754 ± 0.02 Ma (Alonso et al., 1984b).

7.1.1 Soils

According to the 1976 taxonomic classification of the Organización de las Naciones Unidas para la Alimentación y la Agricultura (F.A.O.), the following soil types are found in the study area: Lithosols, Fluvisols, and Solonchaks. The Lithosols are associated with rocky outcrops, have poor soil development, and consist mostly of unweathered or partly weathered rock material. The Fluvisols occupy the low areas of the closed salar basins in the region, including Salar de Tolillar. Fluvisols tend to be moderately alkaline to neutral have a clear evidence of stratification, with weakly developed, but with a possible topsoil horizon. The Solonchak soils (Russian for “salt marsh”) develop in the peripheries of the saline bodies and in alluvial fan material where it meets the Salar. They are immature, moderately alkaline soils, with the presence of white saline crusts at land surface.

Figure 7-1: Geological Map of the Tolillar Project Area



Source: Segemar, 2001.

7.2 Local Geology

One of the most important characteristics that define the Geological Province of Puna, is the presence of evaporitic basins, where important deposits of borates, sodium sulphate, and lithium salts occur. The Salar de Tolillar occupies one of these endorheic (internally drained) basins. The oldest rocks in the area are the Tolillar Formation, which consists of graywackes and marine sediments assigned to the Tremadocian period (early Ordovician). They are mainly located North and South of the Salar. This formation is intruded by gabbro dikes that form part of the Ojo de Colorados Basic Complex, which are also assigned to the Tremadocian period.

Outcrops of the Falda Cienaga Formation (Middle Ordovician) formed by marine sediments occur east of the Salar area. The stratigraphic sequence continues with younger continental sediments of the Geste Formation (Eocene) which includes conglomerates, sandstones, and mudstones. The Pleistocene sediments consist of terrace deposits composed of conglomerates with intercalated sandstones, mudstones, and tuffs. The youngest formation consists of Holocene alluvial and colluvial deposits (gravels, sands, and clays) that occur on the margins of the Salar, and evaporite deposits which occur in the Salar proper.

The floor of the Salar consists of two distinct deposit types. The northern part, of the Salar consists of an earthier crust weakly cemented with salt. To the south, the salt crust varies in thickness from several centimeters to 20-30 centimeters. The thicker saline crust allows for better road access than the earthy crust that tends to be softer, especially after precipitation.

Inspection of a satellite image for the Salar de Tolillar shows a series of outcrops that range down from the north part of the Salar and into the center and center-south (Figure 4-2). The trend is NE-SW and is consistent with the structure of the mountains that bound the basin to the north (Figure 7-1). Recent drilling and geophysical surveys confirm this interpretation.

Using information from the surface geology, results from exploration drilling, and geophysical interpretations, hydrogeological sections have been prepared for the basin. Figure 7-2 shows a base map with the locations for the sections. A north-south section is shown on Figure 7-3, and a west-east section is shown on Figure 7-4.

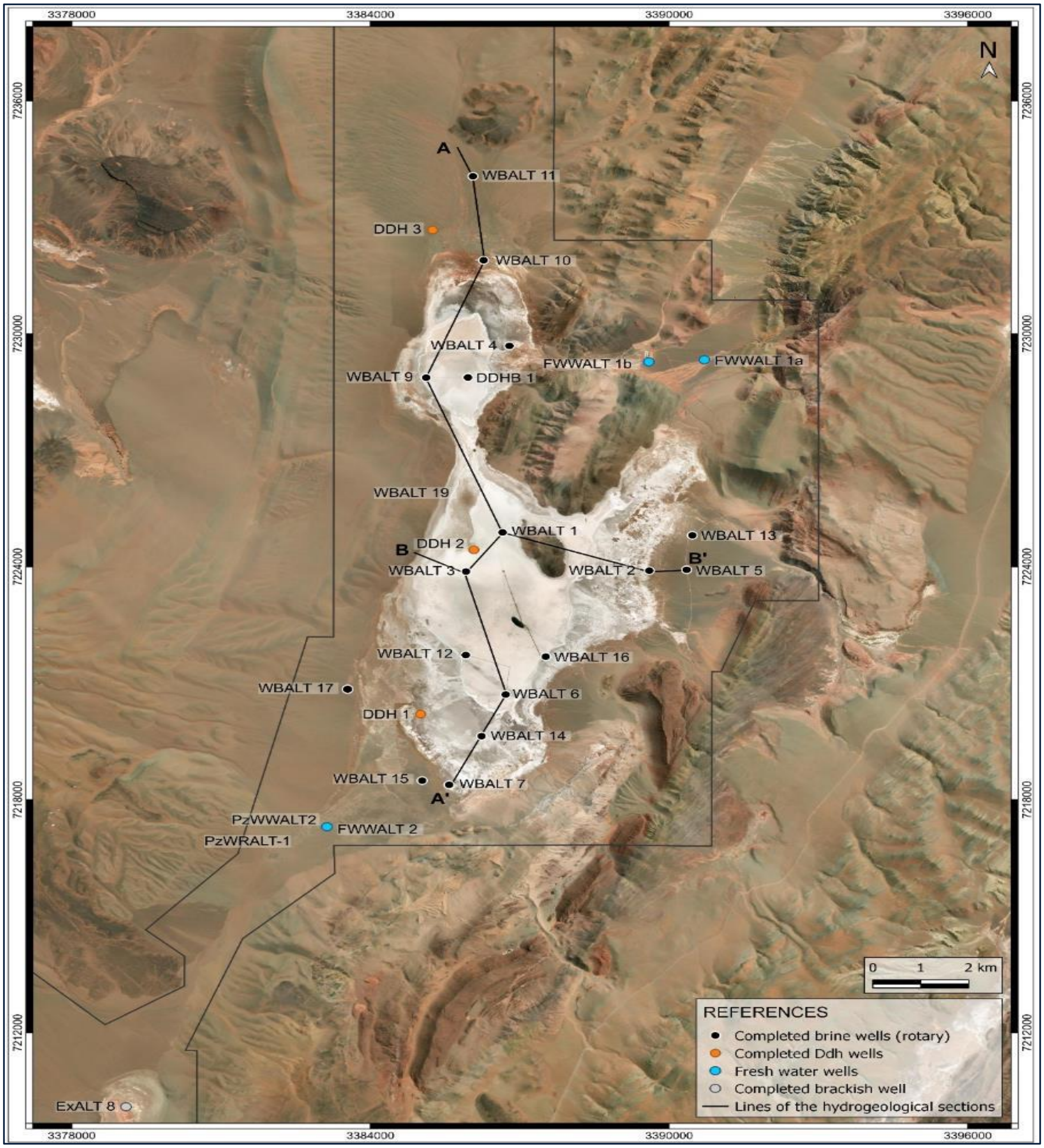
Inspection of the sections shows that there are effectively four sub-basins in the Tolillar basin within the concessions. Figure 7-3 shows that there is a northeastern basin that is mostly separated from the south by shallow metamorphic rocks. This northeast sub-basin also contains abundant freshwater in the far north part of the sub-basin. The south sub-basin appears to become more clastic to the south, with abundant halite occurring in the north part of the sub-basin near WBALT-03 and WBALT-06 (Figure 7-3). Figure 7-4 shows the west and east sub-basins. The west sub-basin has abundant halite, where the east sub-basin is mostly void of halite, consisting mostly of basin-fill sediments.

7.3 Mineralization

The mineralization for the Tolillar Project consists of a lithium-enriched brine that is contained within the pore spaces of the sedimentary strata in the salar basin in the upper several hundred meters of the basin, in the evaporite, alluvial, and colluvial sediments (Figure 7-1). The mineralization of the brine has occurred over a long period of time via evapo-concentration of the brine, which enriched the brine in lithium because lithium does not precipitate to a solid form in the brine. Except where there is a strong influx of freshwater to the salar basin, like in the north pert of the property, the entire aquifer system is a lithium-enriched brine with generally uniform chemistry. Approximate average lithium concentration in undiluted brine ranges from about 200 – 350 mg/L.

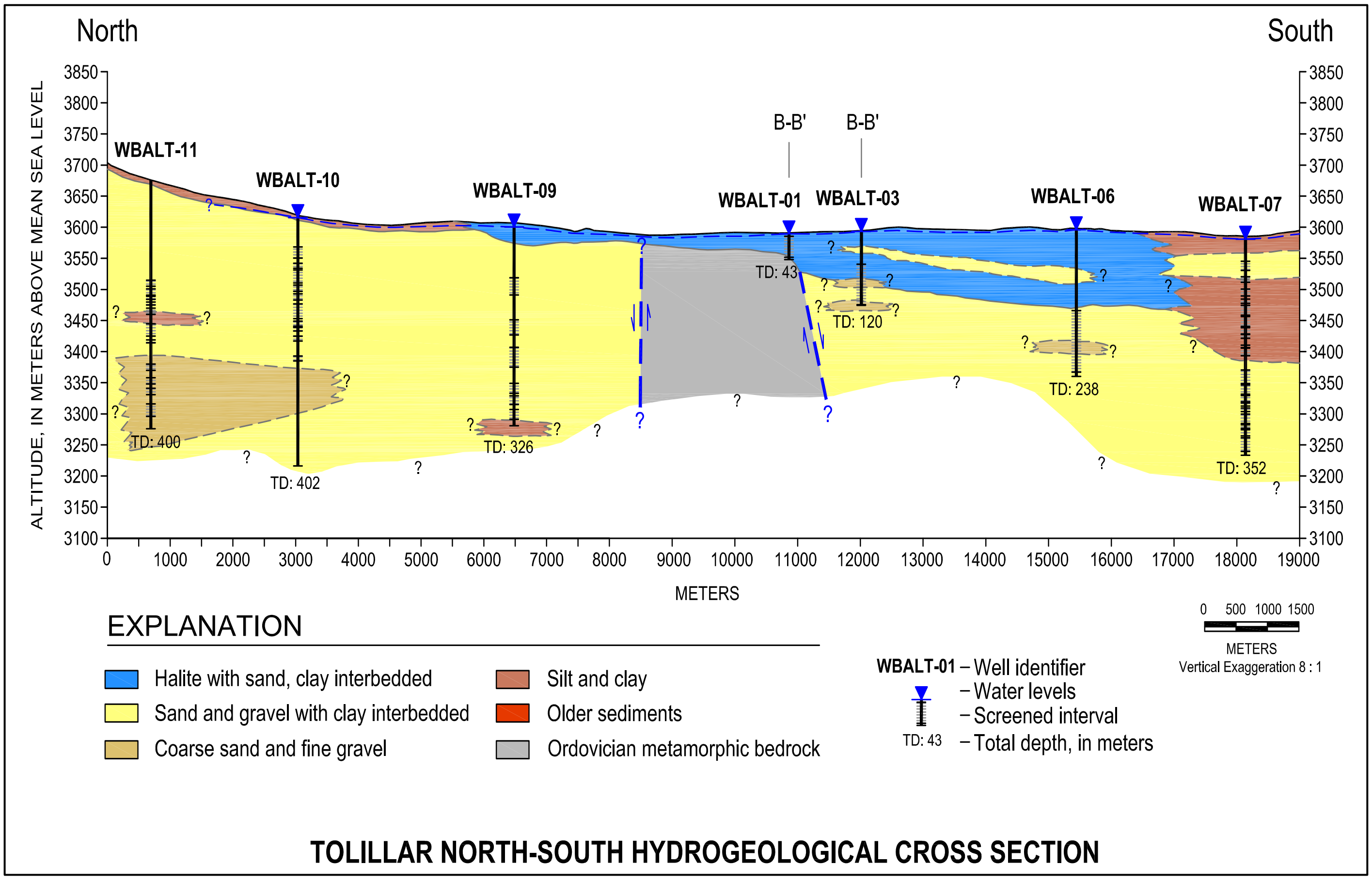
The boundaries of the mineralization are suspected to be the fault-controlled, hard rock basin boundary, although some lithium-enriched brine may be contained in the fractures and/or pores of the rocks that form the basin boundary. Detailed distribution and chemical composition of the brine in the salar sediments is not currently known, although an area of non-mineralized freshwater occurs in the northern concessions in the uppermost part of the sedimentary sequence; thickness of this unmineralized freshwater is not known.

Figure 7-2: Map Showing Locations For Hydrogeological Sections



Source: Montgomery, 2022.

Figure 7-3: North-South Hydrogeological Section A-A'



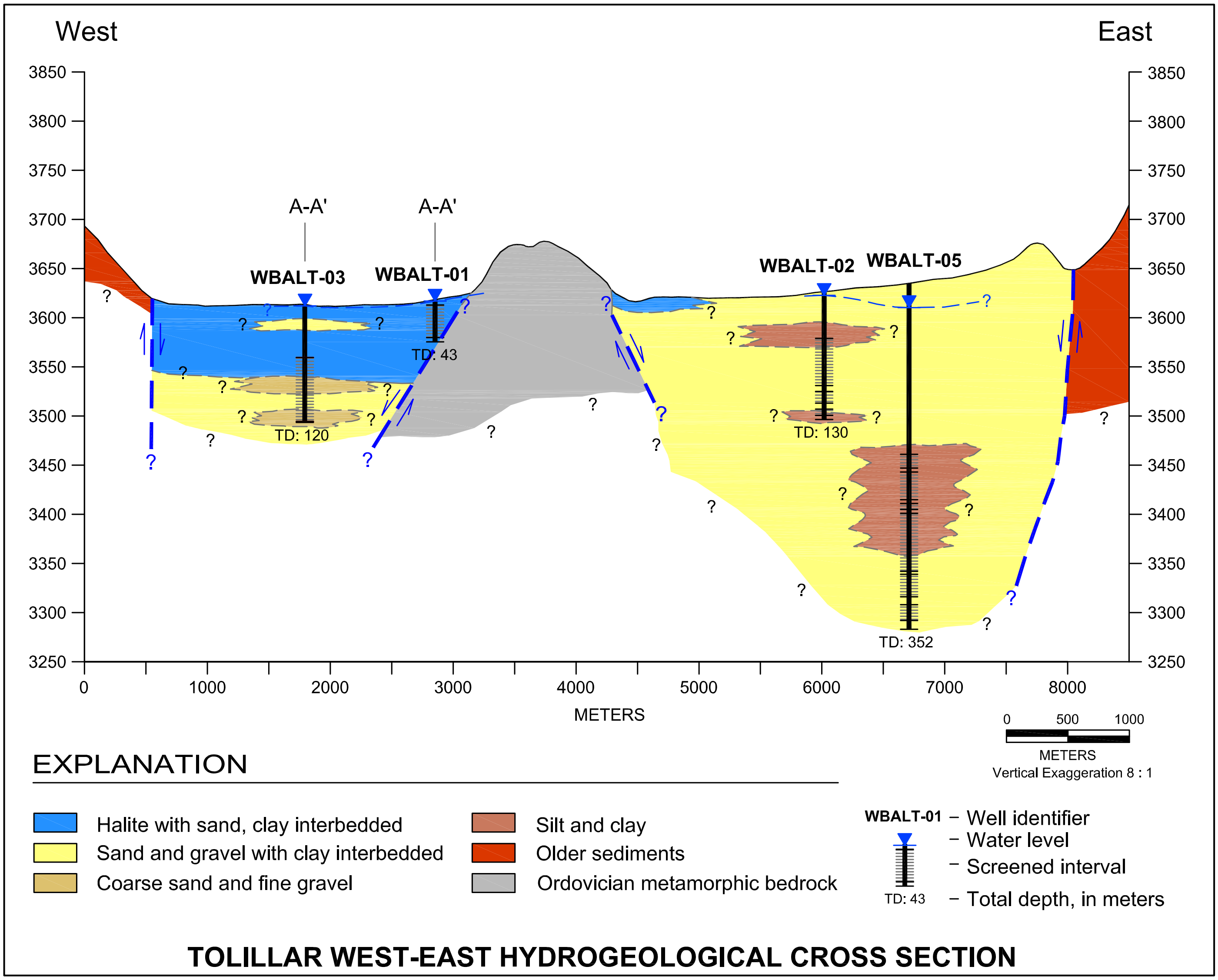
Source: Montgomery, 2022.

7.4 Conceptual Model of Salar de Tolillar

Based on the available information, Salar de Tolillar appears to be a relatively immature salar. Although evaporites and brine occur, a well-developed halite core typically associated with more mature salars, such as Salar de Arizaro, Salar de Hombre Muerto, and others, does not appear to exist. Basin margins are interpreted to be fault controlled. The margin of the basin is dominated by Ordovician crystalline rocks. Volcanic units are not known to occur in the basin, but may be deeper than 208 m in the north part of the basin, or in the south part of the Project that has yet to be drilled. Depth to bedrock is considered to be unknown.

Ordovician bedrock is expected to have low hydraulic conductivity and should approximate a "no-flow" groundwater boundary during extraction of brine from basin fill deposit aquifers by future pumping wells. Fine-grained lacustrine deposits and interbedded halite in the upper part basin are interpreted to have relatively low hydraulic conductivity based on results of aquifer testing at well DDHB-01 (Figure 6-5). In other basins, highly permeable halite occurs in the upper parts of the Salar where intercrystalline porosity is high; however, based on exploration drilling, very little halite occurs in the north part of the concession.

Figure 7-4: West-East Hydrogeological Section B-B'



Source: Montgomery, 2022.

Coarser-grained clastic units encountered during drilling are believed to be moderately permeable and should be able to provide brine to properly constructed production wells.

The principal sources of water entering the Tolillar Project area are from surface water coming into the basin from the basin margins. To date, surface water flow has not been formally measured. Some groundwater inflow from natural recharge along the mountain fronts via alluvial fans is also believed to exist. In both cases, there appears to be limited mixing of the freshwater and brine in the basin due to density differences. As a result, the freshwater entering the Tolillar Project tends to stay in the upper part of the aquifer system on the edges of the basin, without moving to the center part of the Salar. These freshwater discharge areas tend to support altiplanic vegetation. Evaporation of freshwater in the basin over time results in concentration of the dissolved minerals and ultimately results in brine generation.

8 DEPOSIT TYPES

8.1 Deposit Model

The conceptual model for salar basins, and associated brine aquifers, is based on exploration and studies of similar salar basins in Chile, Argentina, and Bolivia. Salar basin locations and basin depths are typically structurally controlled but may be influenced by volcanism that may alter drainage patterns. Basin-fill deposits within salar basins typically contain bedded evaporite deposits in the deeper, low-energy portion of the basin, together with thin to thickly bedded low-permeability lacustrine clays. Coarser-grained, higher permeability deposits associated with active alluvial fans can typically be observed along the edges of the Salar. Similar alluvial fan deposits, associated with ancient drainages, may occur buried within the basin-fill deposits.

Salar basins are characterized by closed topography and interior drainage. Typically, no significant amount of groundwater discharges from these basins as underflow. Effectively, all groundwater discharge that occurs within the basin is via evapotranspiration. All surface water that flows into the basin is either evaporated directly or enters the groundwater circulation system and is evaporated at a later time. If lithium occurs in the surface water, the evaporation concentrates the lithium and other constituents in the water, resulting in a lithium-enriched brine. Water levels tend to be relatively shallow in the flat part of the Salar. Figure 8-1 shows conceptual diagrams of mature and immature salar basins that host brine aquifers.

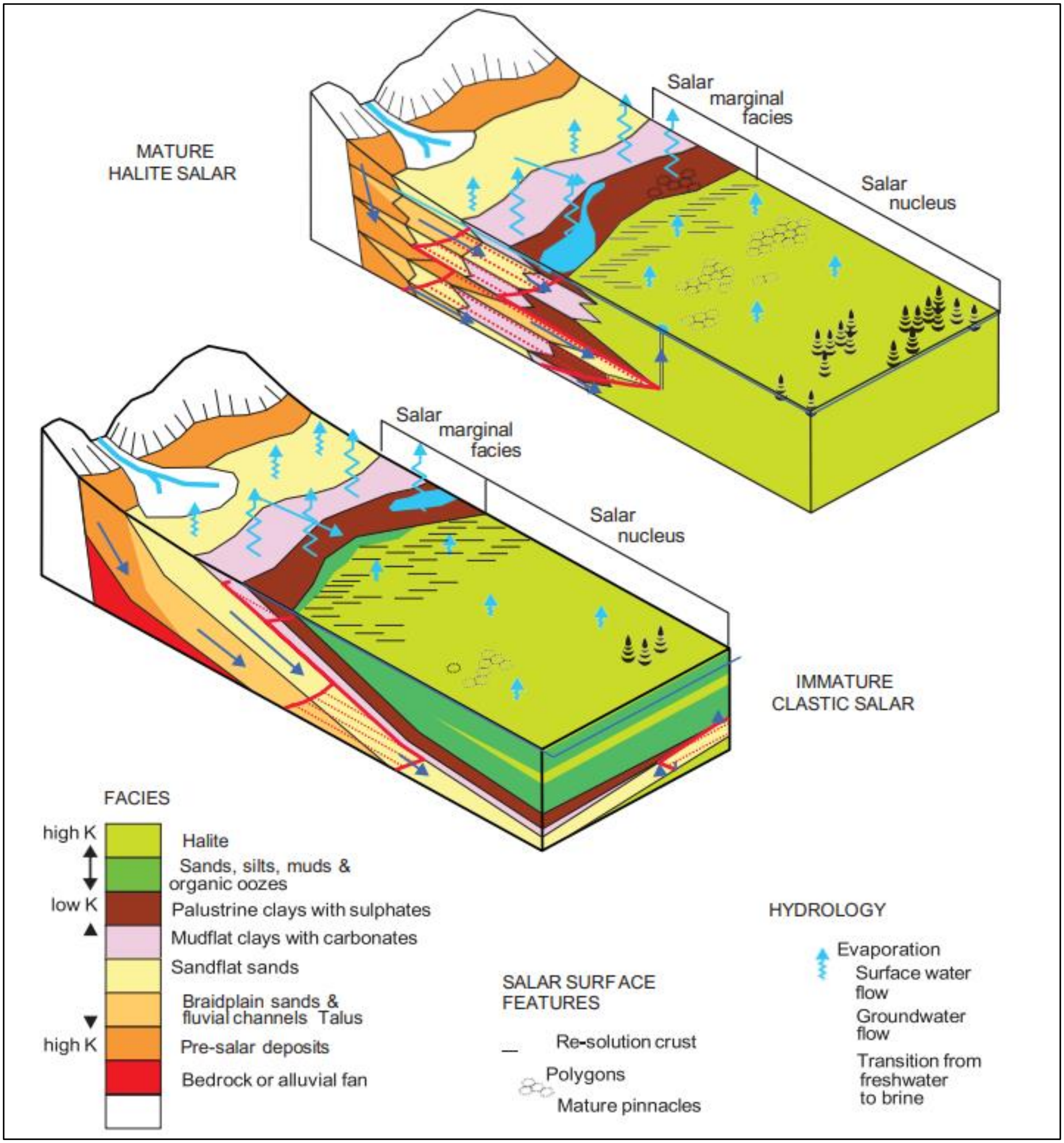
8.2 Conceptual Model of Salar de Tolillar

Based on the available information, Salar de Tolillar appears to be a relatively immature salar. Although evaporites and brine occur, a well-developed halite core typically associated with more mature salars, such as Salar de Arizaro, Salar de Hombre Muerto, and others, does not appear to exist. Basin margins are interpreted to be fault controlled. The margin of the basin is dominated by Ordovician crystalline rocks. Volcanic units are not known to occur in the basin, but may be deeper than 208 m in the north part of the basin, or in the south part of the Tolillar Project that has yet to be drilled. Depth to bedrock is interpreted to be considerably deep below land surface based on VES geophysical surveys (Tecnología y Recursos, 2017), but because it appears to be variable throughout the Tolillar Project and was not encountered during exploration drilling, depth to bedrock is considered unknown.

Ordovician bedrock is expected to have low hydraulic conductivity and should approximate a “no-flow” groundwater boundary during extraction of brine from basin fill deposit aquifers by future pumping wells. Fine-grained lacustrine deposits and interbedded halite in the upper part basin are interpreted to have relatively low hydraulic conductivity based on results of aquifer testing at well DDHB-01 (Table 6-10) In other basins, highly permeable halite occurs in the upper parts of the salar where intercrystalline porosity is high; however, based on exploration drilling, very little halite occurs in the north part of the concession. Coarser-grained clastic units encountered during drilling are believed to be moderately permeable and should be able to provide brine to properly constructed production wells.

The principal sources of water entering the Tolillar Project area are from surface water coming into the basin from the basin margins. To date, surface water flow has not been formally measured. Some groundwater inflow from natural recharge along the mountain fronts via alluvial fans is also believed to exist. In both cases, there appears to be limited mixing of the freshwater and brine in the basin due to density differences. As a result, the freshwater entering the Tolillar Project tends to stay in the upper part of the aquifer system on the edges of the basin, without moving to the center part of the Salar. These freshwater discharge areas tend to support altiplanic vegetation. Evaporation of freshwater from the basin over time results in concentration of the dissolved minerals and ultimately results in brine generation.

Figure 8-1: Conceptual Diagrams of Mature and Immature Salar Basin Systems



Source: Houston et al. , 2011.

9 EXPLORATION

9.1 Exploration Overview

VES surveys were conducted on July 15, 2020 by Conhidro (2020a) for the north concessions owned by Alpha Lithium. Conhidro (2020b) subsequently did an additional survey for Alpha Lithium's southern concessions. Goals of the surveys were to obtain a preliminary understanding of the underlying stratigraphy of the Tolillar Project property, identify potential geological structures, identify freshwater/brine interfaces (if present), and to be able to identify future locations for exploration wells. An additional VES survey was conducted by Conhidro (2022) for the northern concessions. The survey points were effectively extensions of the previous lines into unexplored areas where brine was expected to occur.

9.2 Year 2020 - 2022 VES Results for The Northern Concessions

Locations of the VES survey points conducted by Conhidro during years 2020 and 2022 for the northern concessions are shown on Figure 9-1.

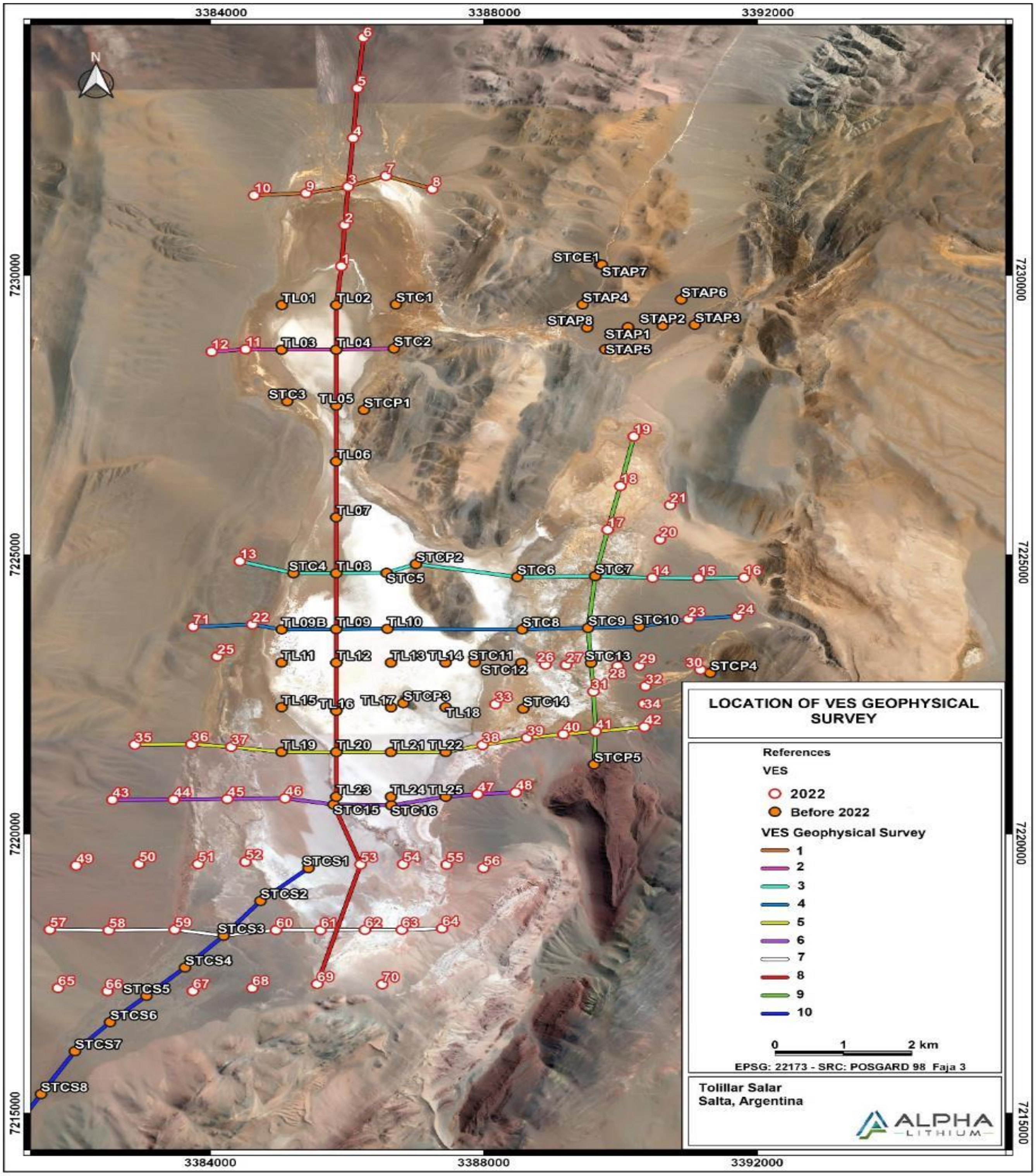
The orientation and reference for the VES survey lines in the north part of the Tolillar Project are as follows:

- Line 1-1': Oriented W-E – (Conhidro, 2022b)
- Line 2-2': Oriented W-E – (Conhidro, 2020a)
- Line 3-3': Oriented W-E – (Conhidro, 2020a, 2022b)
- Line 4-4': Oriented W-E – (Conhidro, 2020a)
- Line 5-5': Oriented W-E – (Conhidro, 2020a, 2022b)
- Line 6-6': Oriented W-E – (Conhidro, 2020a, 2022b)
- Line 7-7': Oriented W-E – (Conhidro, 2020a)
- Line 8-8': Oriented W-E – (Conhidro, 2022b)
- Line 9-9': Oriented W-E – (Conhidro, 2022b)
- Line 10-10': Oriented W-E – (Conhidro, 2022b)
- Line 11-11': Oriented N-S through central part of the Salar – (Conhidro, 2020a, 2022b)
- Line 12-12': Oriented N-S through eastern side of the Salar – (Conhidro, 2020a, 2022b)

Figure 9-2 shows the interpreted section for Line 1-1', located farthest north from the main Salar; it has an extension of 2.7 km. Furthermore, Figure 9-3 shows the interpreted section for Line 2-2', located about 1 km south from Line 1; it has an extension of 2.4 km. In this section, basement is interpreted to be approximately at an altitude of 3430 m with an estimated sediment thickness of a little over 200 m. Well WBALT-04 near station STC1 was drilled to a total depth of 79 m and did not encounter bedrock.

Line 3-3' is shown on Figure 9-4 and is located in the northern part of the Salar and immediately south of Line 2-2'. It has an extension of 2.8 km. In this section basement according to resistivity values is at an altitude of 3375 m suggesting an estimated sediment thickness of 255 m at this northern part of the Salar and deepening to the west. Well DDHB-01 near station TL4 corroborates this thickness until 208.4 m of depth. Well WBALT-09 is located at station TL03, has a depth of 325 m; basement was not encountered at well WBALT-09.

Figure 9-1: Location Map of VES Survey Points In The Northern Concessions From Years 2020 and 2022



Source: Modified from Conhidro, 2020b.

Line 4-4’ is shown on Figure 9-5 and is located toward the narrow area separating the north-most sub-basin and the main Salar basin; it has an extension of 2.0 km. The easternmost survey point is located at bedrock and the VES interpretation agrees with this. Bedrock apparently deepens to the west.

Line 5-5’ is shown on Figure 9-6and is located in the central part of the Salar. It has an extension of 7.5 km. In this section, the large outcrop (Figure 9-1) is clearly defined at survey point STCP2 and STCP2a. This bedrock appears to be an extension of the mountains to the north, and is likely also connected to the outcrops to the southwest (Figure 9-1). Moving east and west from this central outcrop shows basin sediments, with sediments to the west thickening substantially – likely due to faulting. Both wells WBALT-01 and -02 corroborate this interpretation. Well WBALT-13 is located near station SEV14, with a total depth of 269 m; basement was not encountered. The same bedrock outcrops that can be seen on Figure 9-1 occur at the east side of this section.

Line 6-6’ is shown on Figure 9-7 and is located in the central part of the Salar; it has an extension of 8.2 km. In this section, the same shallow bedrock that occurs near the central part of the section, similar to Line 5-5’ is also here at survey points STCP2b and 2c. Similar to section 5-5’ to the north, there are sedimentary basins both east and west and the hills recognized in the east of the Salar (Figure 9-1) are recognized in the section. At station TL09, well WBALT-02 is nearby with a depth of 127 m; basement was not recognized. On the east side of the line, WBALT-05, with a depth of 352 m, the Geste Formation was recognized.

Line 7-7’ is shown on Figure 9-8 and is located in the center part of the Salar; it has an extension of 6.75 km. In this section, the central, shallow bedrock associated with the outcrops to the north and south is evident, even though there is no physical outcrop. The shallow bedrock appears to be farther west than in the north. Between survey points TL11 to TL13, it is possible to observe very shallow bedrock about 25 mbgs.

Line 8-8’ is shown on Figure 9-9 and is located in the center-south part of the Salar; it has an extension of 7.6 km. To the west part of the profile, high resistivity values are recognized and can be associated to dry clastic sediments and to east, the same hills recognized in Lines 6-6’ and 7-7’. To the east, the basement is recognized at 200 m (survey point 39) and shallows to the east, which is consistent with the outcrops recognized on Figure 9-1.

Line 9-9’ is shown on Figure 9-10 and is located southern part of the Salar; it has an extension of 6.2 km. In both the west and east parts of the profile, high resistivity values are recognized and likely associated with dry clastic sediments. In the eastern half of the section, high resistivity values are recognized and can be associated with massive halite in the area.

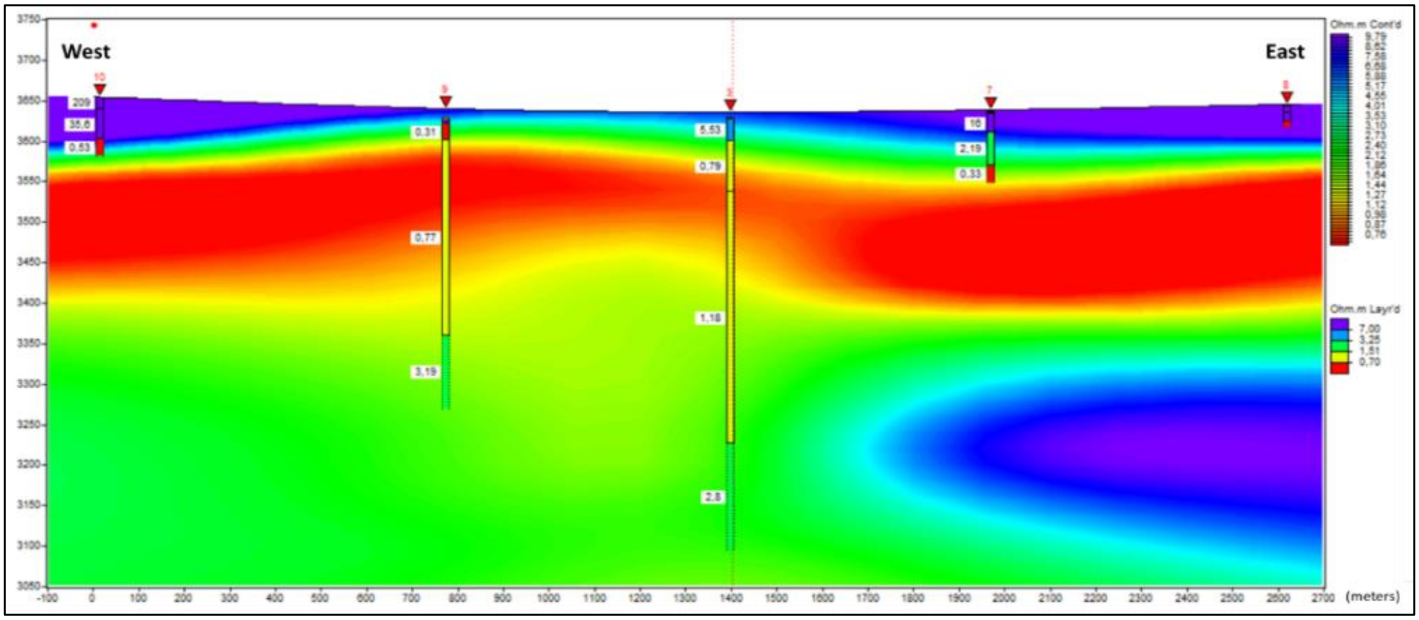
Line 10-10’ is shown on Figure 9-11 and is located in the southern-most of the Salar; it has an extension of 6.0 km. To the west part of the profile, high resistivity values are recognized and can be associated to dry clastic sediments in the upper part and can be associated to the hills recognized on Figure 9-11.

This section is characterized by low resistivity values characteristic of a brine aquifer in most of the profile. Between survey points 61 and 62, well WBALT-07 was drilled to a depth of 352 m without encountering bedrock, which is also consistent with the resistivity values.

Line 11-11’ is shown on Figure 9-12 and is located toward central part of both salar areas, and is oriented N-S; it has an extension of 17.0 km. It includes survey points from E-W Lines 1 to 10 (Figure 9-1). Several wells are located along the section line, including WBALT-11, -10, -03, and -07. The interpretations from the VES survey are consistent with the hydrogeological units encountered in the wells, and also the surface outcrops of bedrock in the basin. In the farthest north part of this section, high resistivity values occur, and appear associated with dry clastic sediments, and/or freshwater in the upper part of the aquifer.

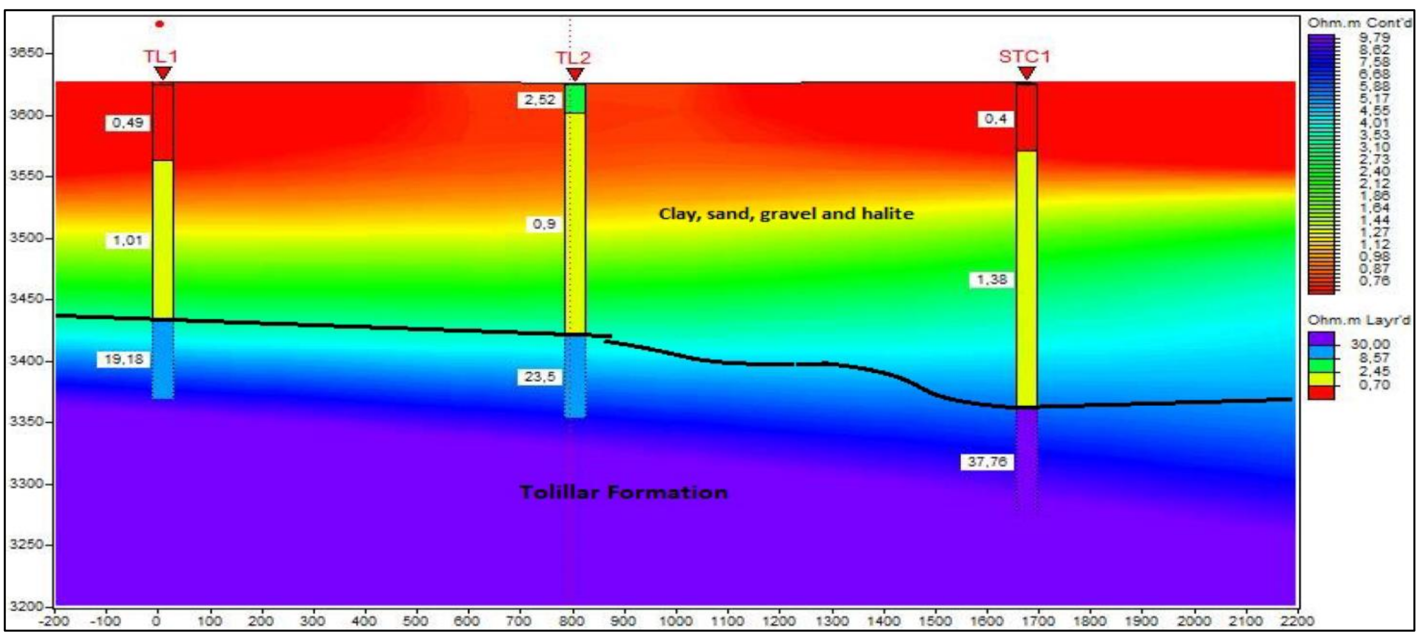
Line 12-12’ is a N-S section in the eastern half of the basin to the east of the bedrock outcrops (Figure 9-1), and is shown on Figure 9-13; it has an extension of 6.0 km. Well WBALT-03 is located at survey point TL09, and was drilled to a depth of 120 m; and well WBALT-02 is located at survey point STC9, and was drilled to a depth of 127 m. In both cases basement is not recognized. South of this profile, high resistivity values are associated with the outcrops recognized on Figure 9-13.

Figure 9-2: Interpreted Section for VES Line 1-1'



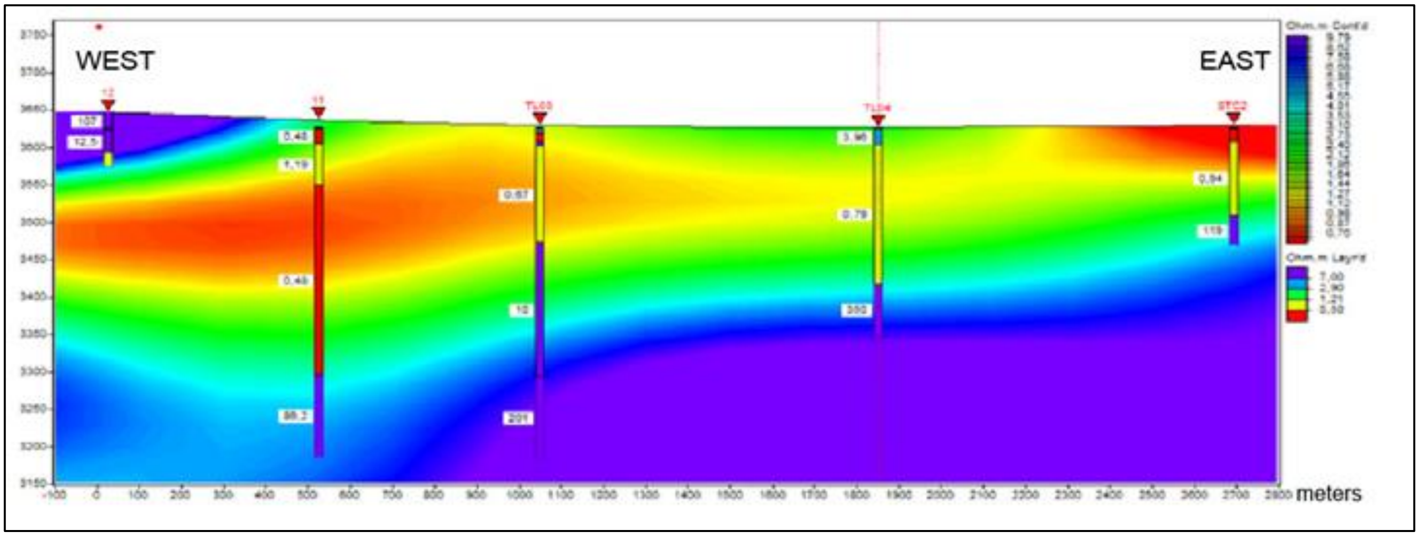
Source: Conhidro, 2022b.

Figure 9-3: Interpreted Section for VES Line 2-2'



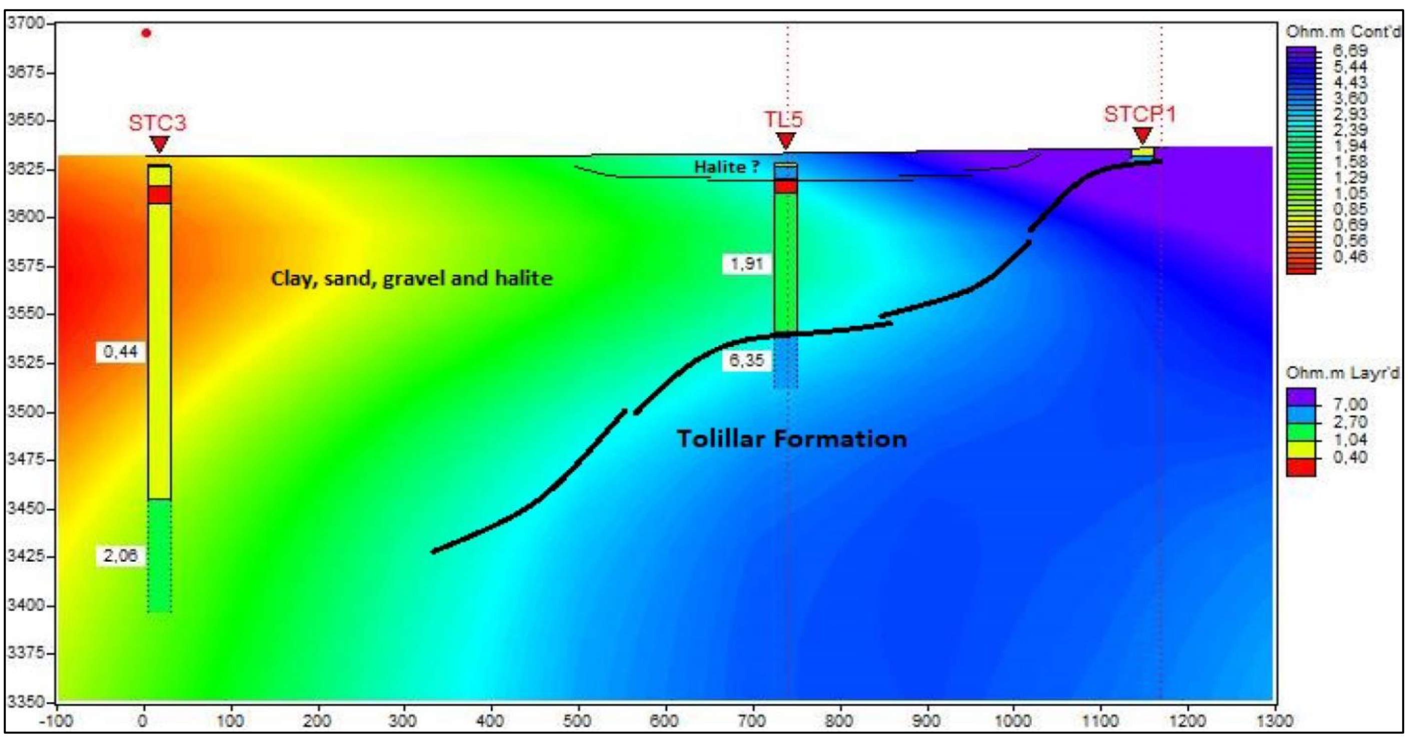
Source: Conhidro, 2020a.

Figure 9-4: Interpreted Section For VES Line 3-3’



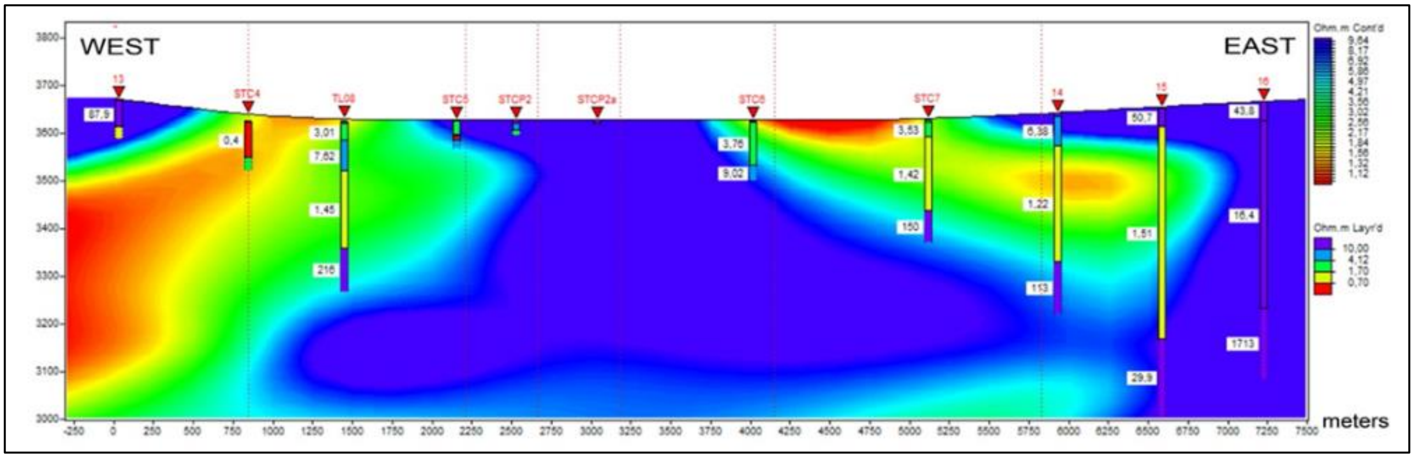
Source: Conhidro, 2020a, 2022b.

Figure 9-5: Interpreted Section For VES Line 4-4’



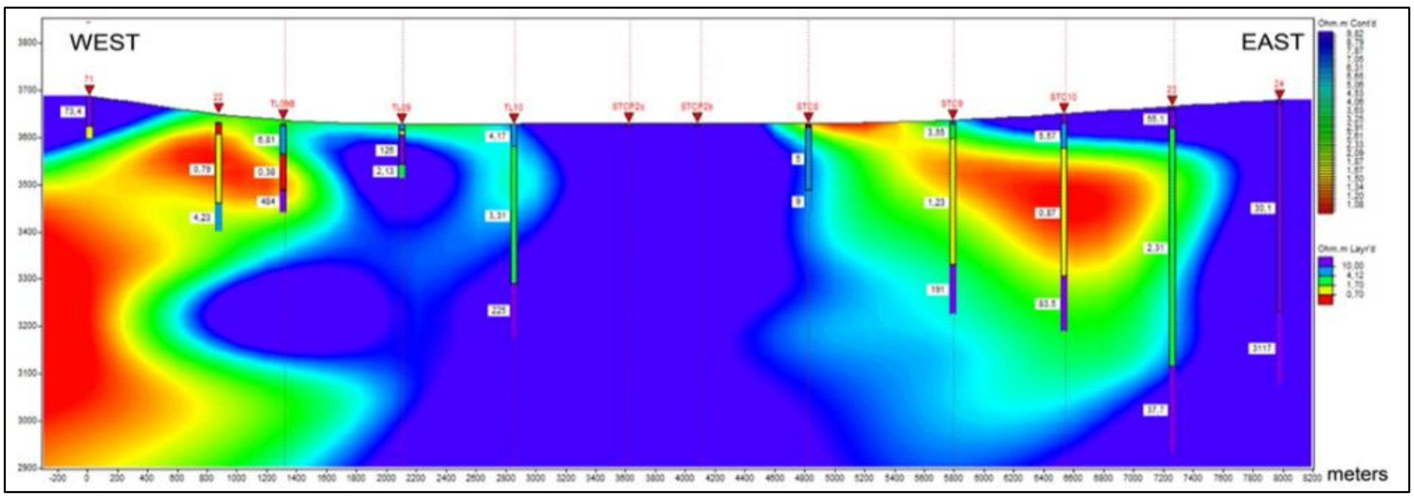
Source: Conhidro, 2020a.

Figure 9-6: Interpreted Section For VES Line 5-5'



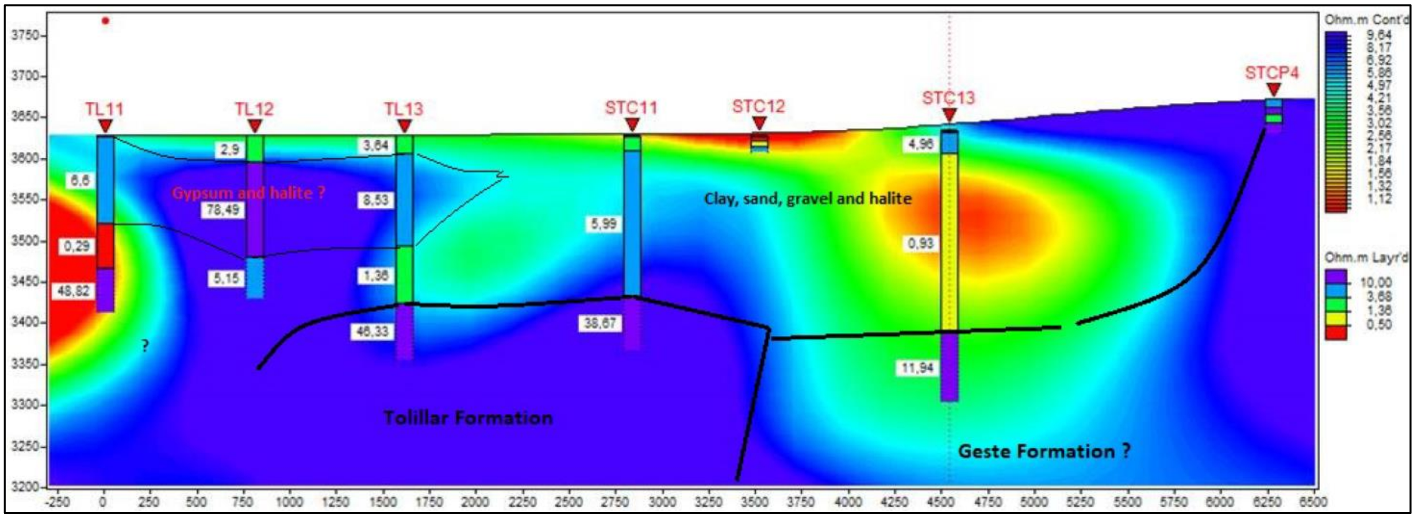
Source: Conhidro, 2020a, 2022b.

Figure 9-7: Interpreted Section For VES Line 6-6'



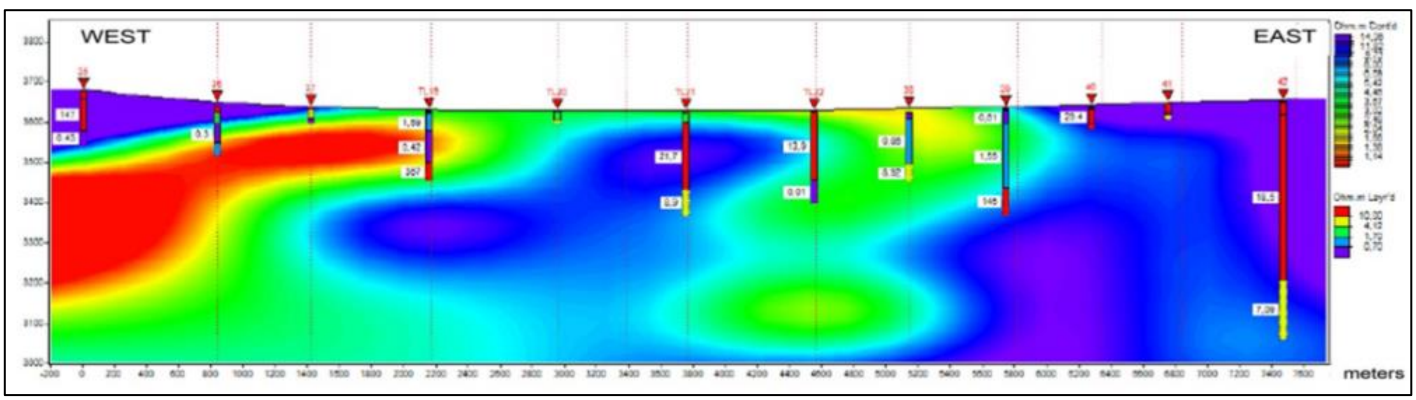
Source: Conhidro, 2020a, 2022b.

Figure 9-8: Interpreted Section For VES Line 7-7'



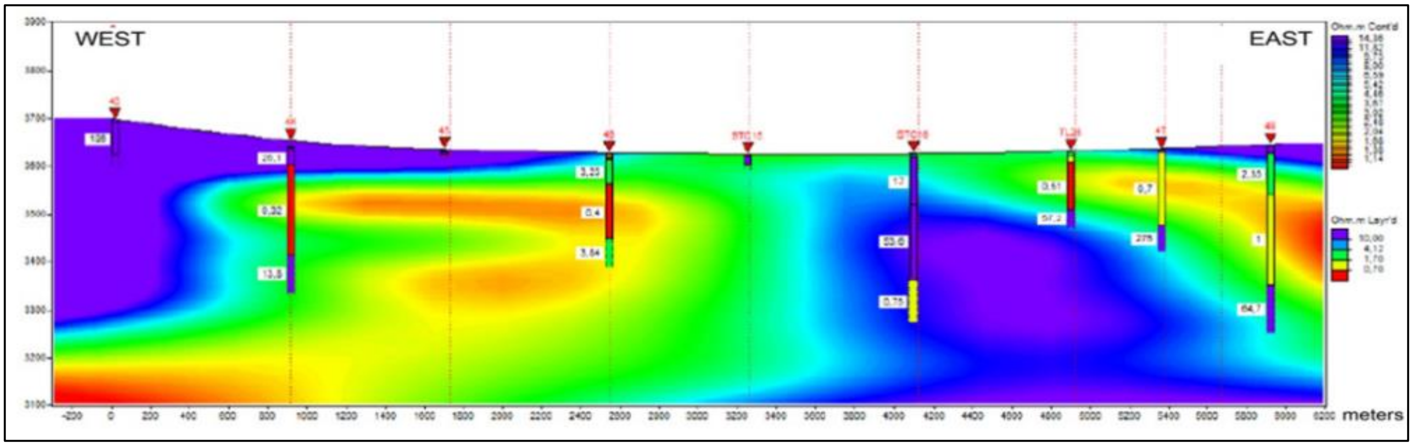
Source: Conhidro, 2020a.

Figure 9-9: Interpreted Section For VES Line 8-8'



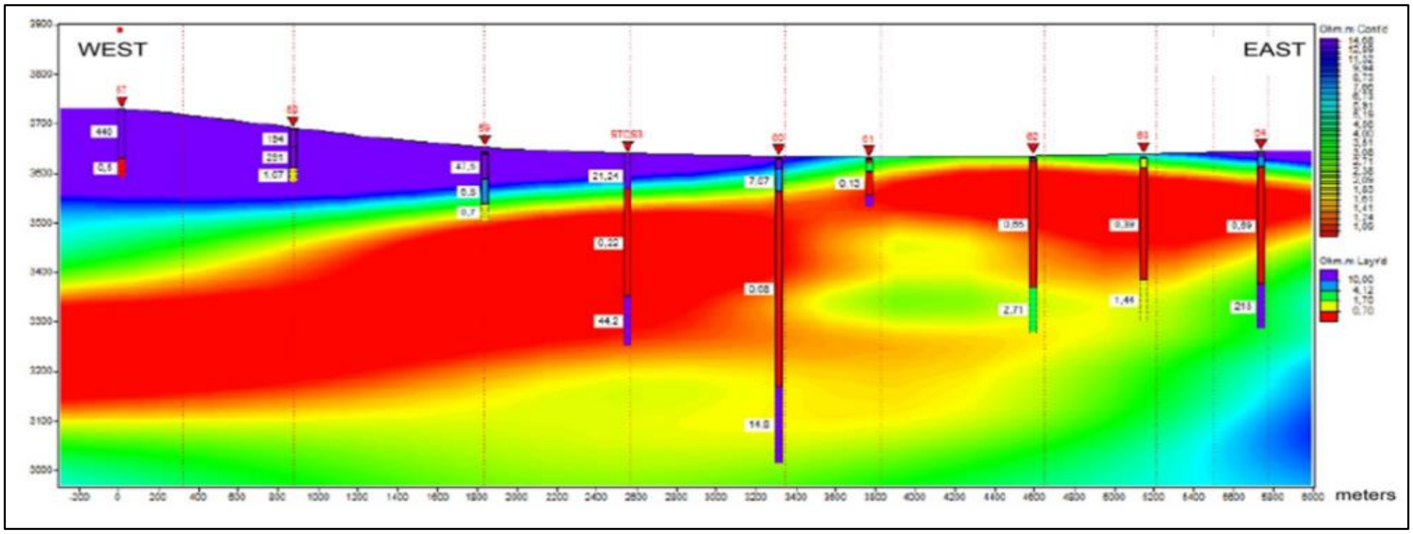
Source: Conhidro, 2022b.

Figure 9-10: Interpreted Section For VES Line 9-9’



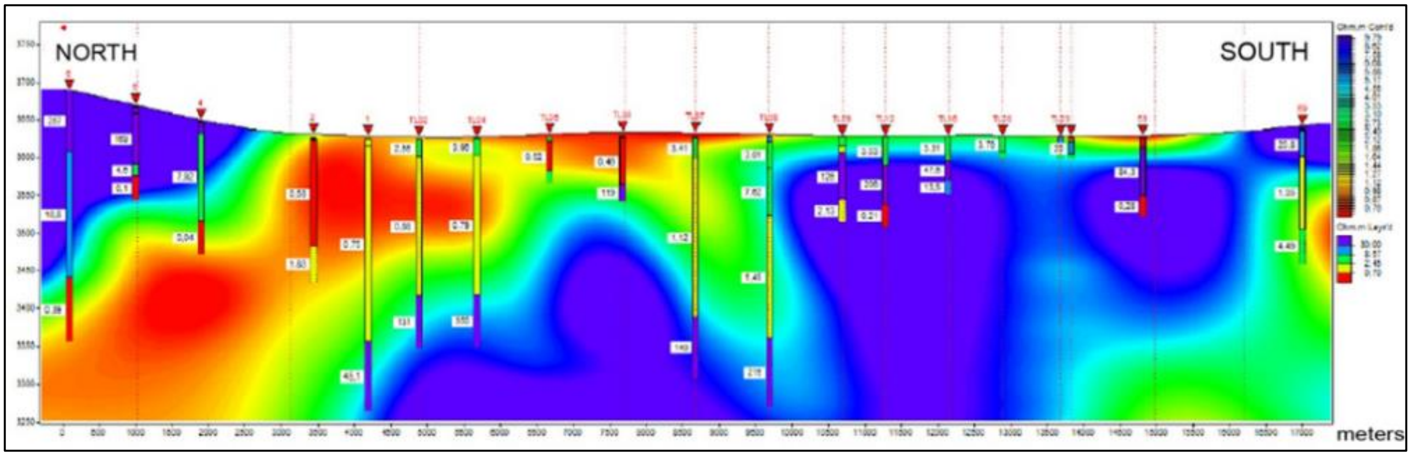
Source: Conhidro, 2022b.

Figure 9-11: Interpreted Section For VES Line 10-10’



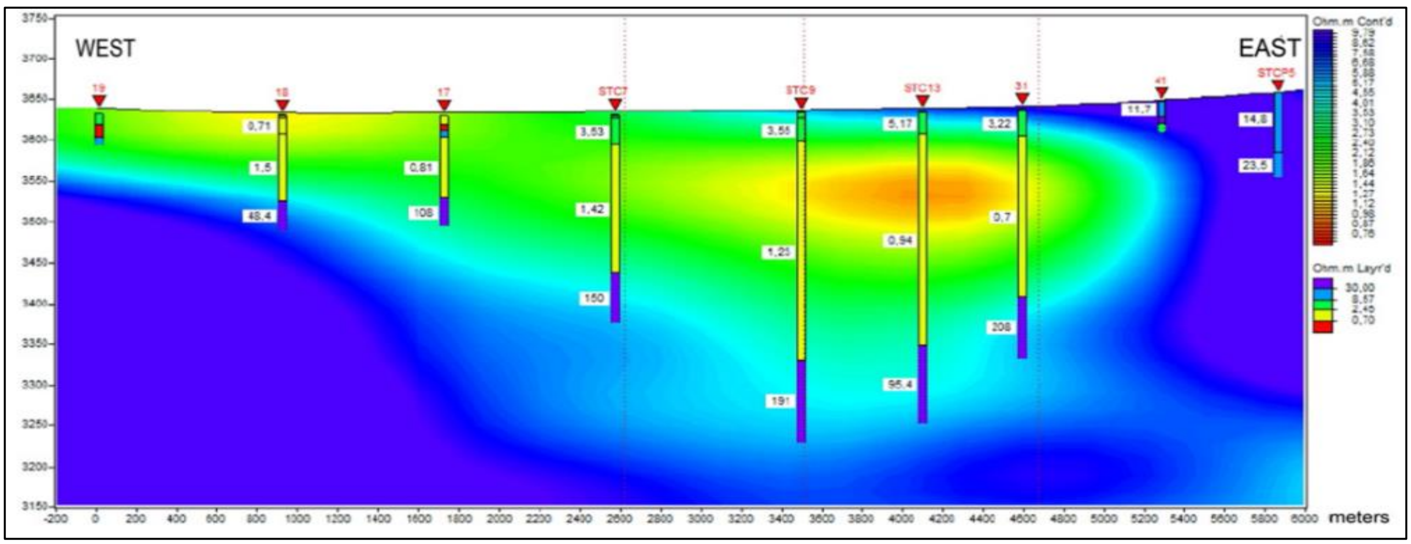
Source: Conhidro, 2022b.

Figure 9-12: Interpreted Section For VES Line 11-11'



Source: Conhidro, 2020a, 2022b.

Figure 9-13: Interpreted Section For VES Line 12-12'



Source: Conhidro, 2020a, 2022b.

9.3 Year 2020 VES Results for The Southern Concessions

Locations of the VES survey points conducted by Conhidro during September 2020 are shown on Figure 9-14.

The orientation and reference for the VES survey lines in the south part of the Tolillar Project are as follows:

- Line A-A': Oriented NE-SW– (Conhidro, 2020b)
- Line B-B': Oriented E-W– (Conhidro, 2020b)
- Line C-C': Oriented E-W– (Conhidro, 2020b)
- Line D-D': Oriented NW-SE– (Conhidro, 2020b)

Line A-A' is shown on Figure 9-15 and starts at the south end of the main Salar de Tolillar and continues to the farthest southern part of the exploration concession. It has an extension of approximately 20 km. South of survey points SEV-1 and -2, brine is potentially diluted by fresher water. Unit 1 resistivity zone is interpreted to be unsaturated sediments and is consistent with the slight increase in land surface altitude and increased depth to water. The increasing resistivity in Units 4 and 2 moving north may be due to increased influence of freshwater as the survey points get farther from the Salar.

The south half of Line A-A' (stations SEV-12 to SEV-20) is located in the southern sub-basin and is shown on Figure 9-16. Similar to the north part of the section outside of the Salar, there appears to be a relatively thick unsaturated zone, with underlying sediments. A moderate resistivity anomaly shows up in SEV-17 at around 80 mbgs, whereas in the other survey points, such as SEV-18, this unit tends to be deeper.

Line B-B' is a W-E line and is shown on Figure 9-17; it has an extension of 3.6 km. Depth to the low resistivity unit is shallowest at survey point SEV-12 at about 120 mbgs. This location may represent the best location for further exploration in this part of the sub-basin if the Unit 3 conductive zone is associated with lithium brine.

Line C-C' is a NW-SE line and is shown on Figure 9-18; it has an extension of about 4 km. The NW survey point is in unsaturated bedrock and has the highest resistivity levels in the sub-basin. A moderate resistivity anomaly is located with a maximum depth from surface at station FW5, and the lowest resistivity zone along the line is at 270 mbgs.

Line D-D' is an E-W line and is shown on Figure 9-19; it has an extension of 2 km. Depth to the low resistivity unit is shallowest at survey point SEV-16 at about 120 mbgs. This location may represent the best location for further exploration in this part of the sub-basin if the Unit 3 conductive zone is associated with lithium brine.

Figure 9-14 to Figure 9-19 are sourced from Conhidro 2020b.

9.4 Interpretation Based on VES Survey Results

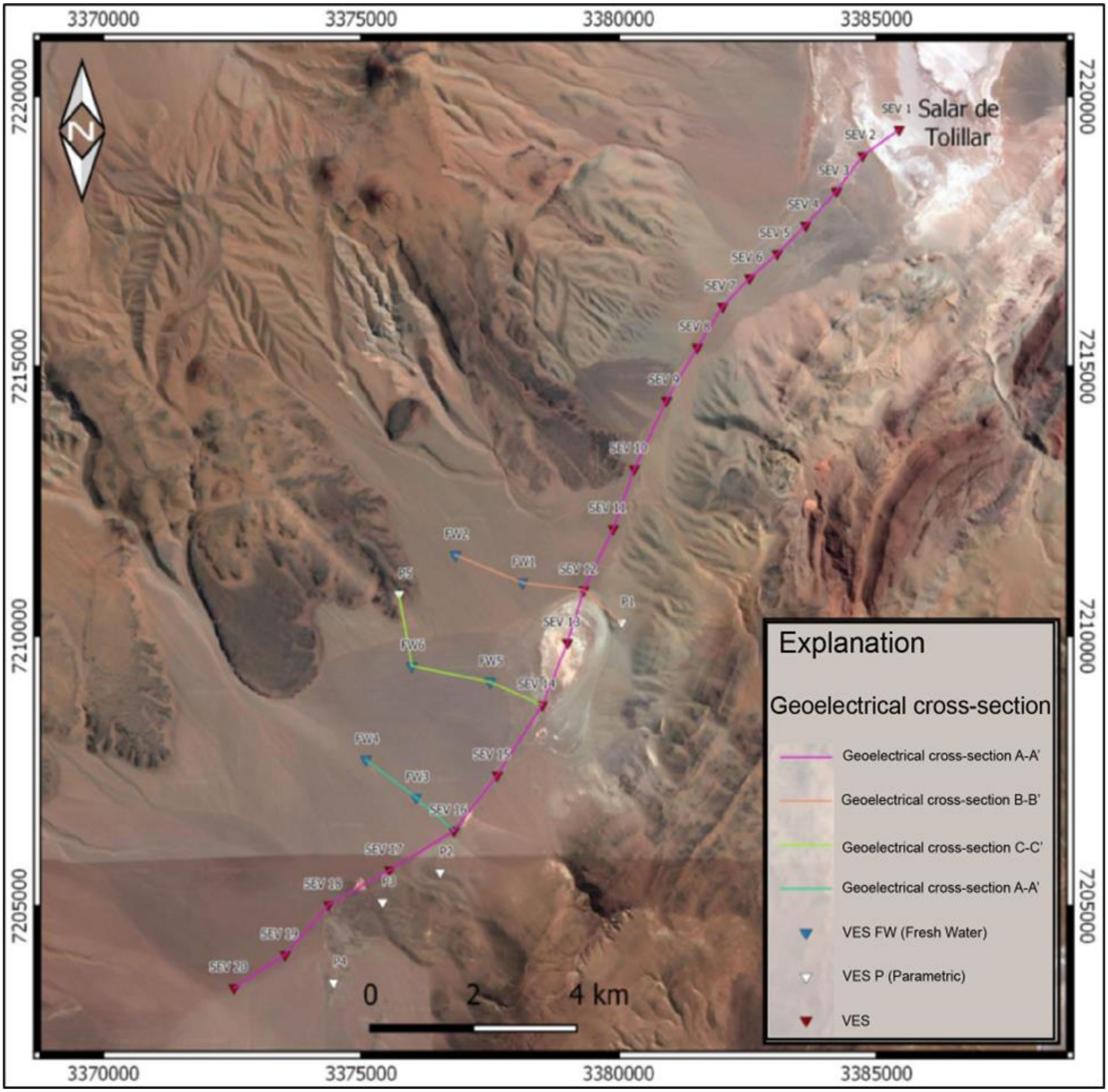
VES geophysical surveys were conducted by Conhidro in years 2020 and 2022 for the concessions owned by Alpha Lithium. The main objectives for these surveys were to understand stratigraphic sequence, geological structures, hard rock boundaries both within the basin and at the boundaries, and freshwater/brine interfaces at the edges of the Salar. In general, the VES measurements and their interpretations appear to be reasonable and in agreement with the information obtained from exploration drilling. At the edges of the basin, especially to the west and north, there is some uncertainty as to whether the VES is measuring dry sediments, freshwater areas, or bedrock. These relatively higher conductivity zones are not interpreted to be brine aquifer and therefore, are not considered part of the Measured or Indicated Resource.

In the southern concessions, VES results suggest a potential zone for fresh or brackish water exploration. This is consistent with the results from exploration well Ex-ALT-08 drilled near station SEV-13 (Figure 9-14) which showed only brackish water with little lithium.

VES surveys were conducted on July 15, 2020 by Conhidro (2020a) for the north concessions owned by Alpha Lithium. Conhidro (2020b) subsequently did an additional survey for Alpha Lithium's southern concessions. Goals of the surveys were to obtain a preliminary understanding of the underlying stratigraphy of the Tolillar Project property, identify potential geological structures, identify freshwater/brine interfaces (if present), and to be able to identify future locations for exploration wells.

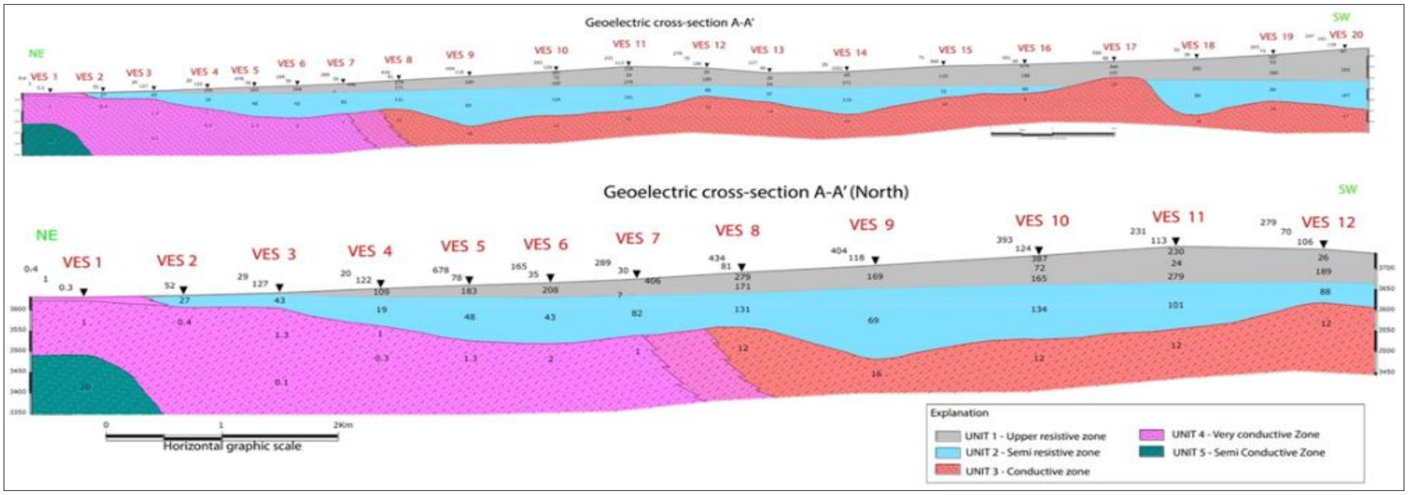
An additional VES survey was conducted by Conhidro (2020b) for the northern concessions. The survey points were effectively extensions of the previous lines into unexplored areas where brine was believed to occur.

Figure 9-14: Location Map of VES Survey Points In The Southern Concessions



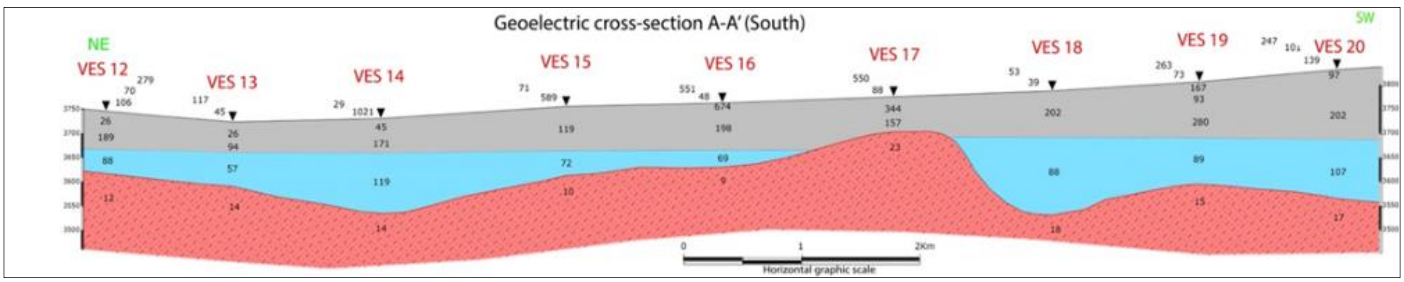
Source: Conhidro, 2020b.

Figure 9-15: Entire VES Section A-A' And Expanded Northern Section



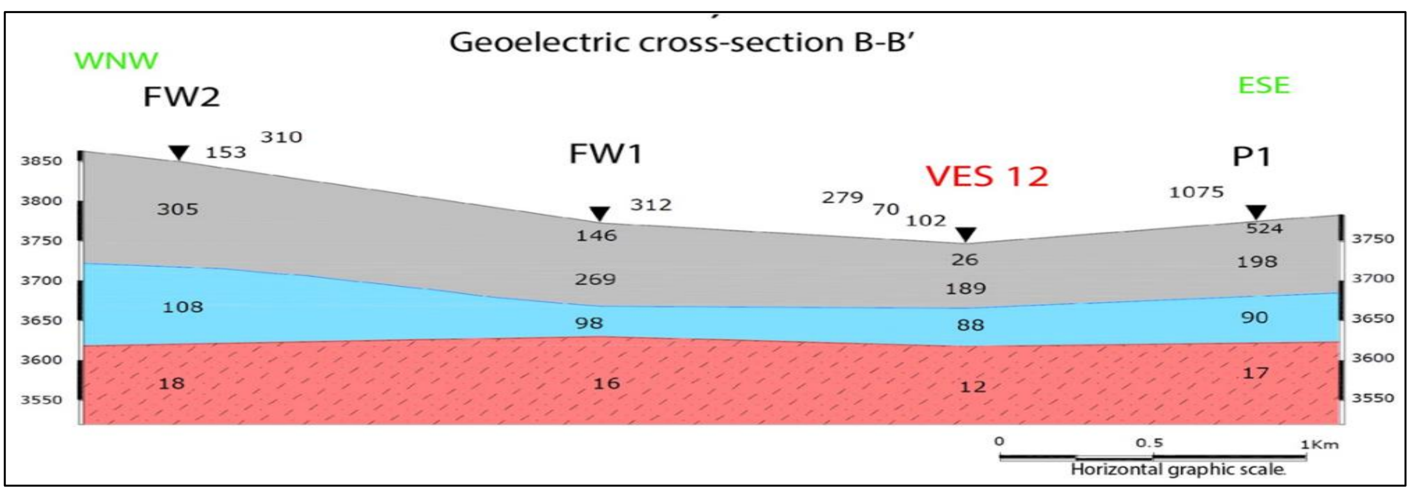
Source: Conhidro, 2020b.

Figure 9-16: VES Expanded South Section Of Line A-A'



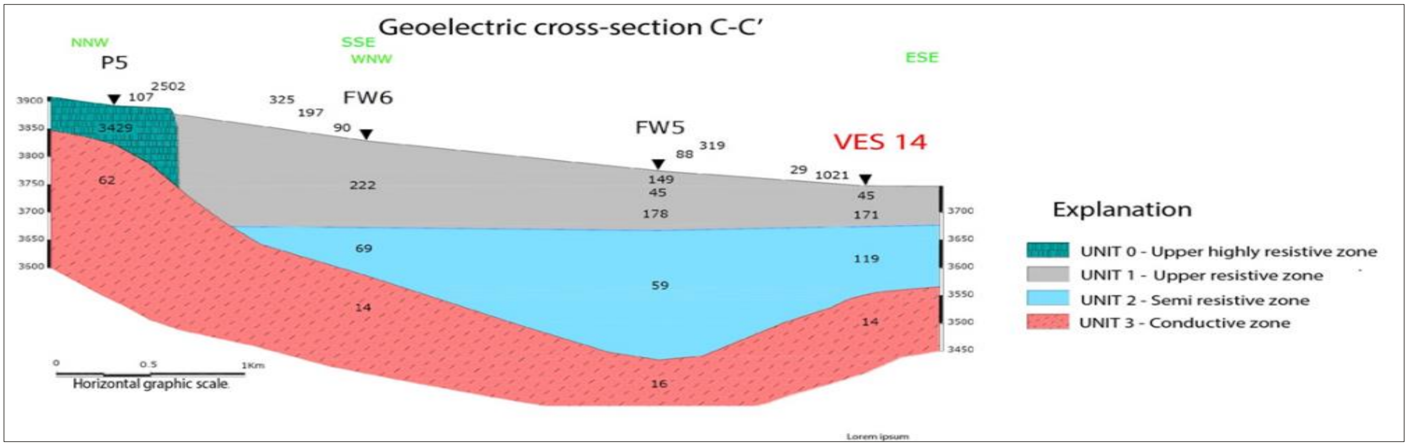
Source: Conhidro, 2020b.

Figure 9-17: VES Section B-B'



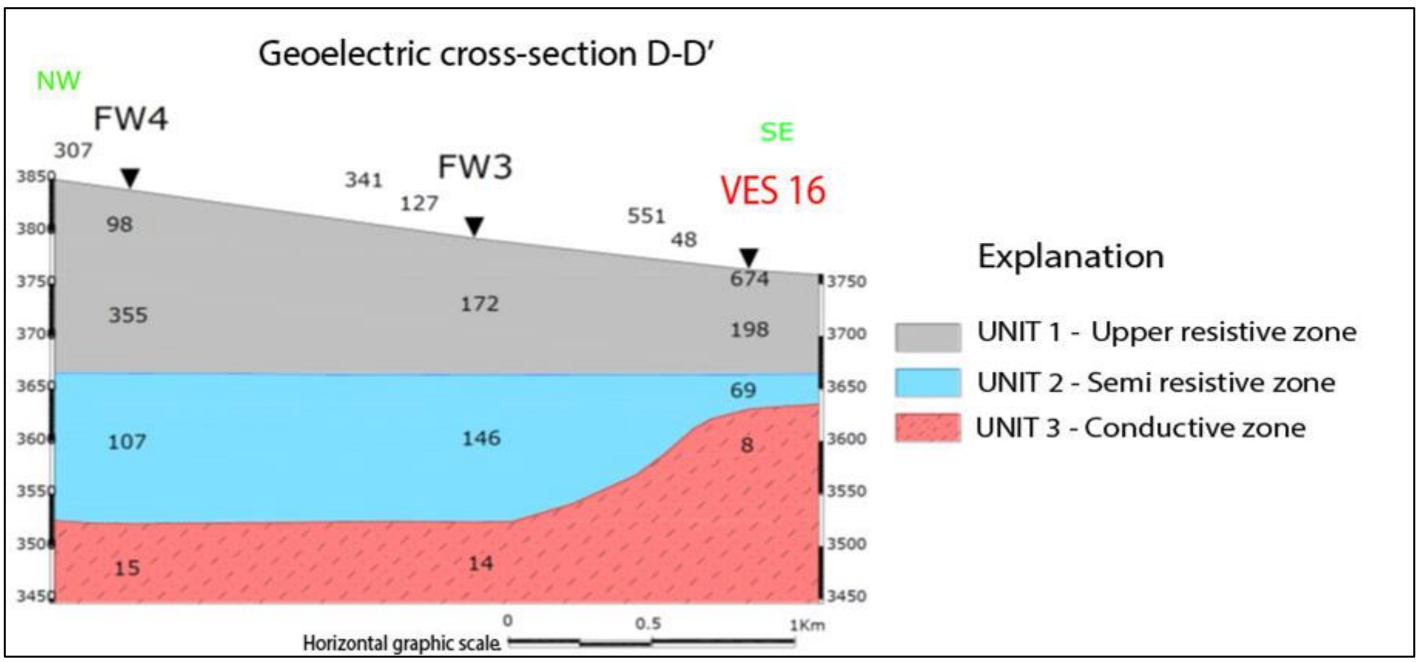
Source: Conhidro, 2020b.

Figure 9-18: VES Section C-C'



Source: Conhidro, 2020b.

Figure 9-19: VES Section D-D'



Source: Conhidro, 2020b.

10 DRILLING

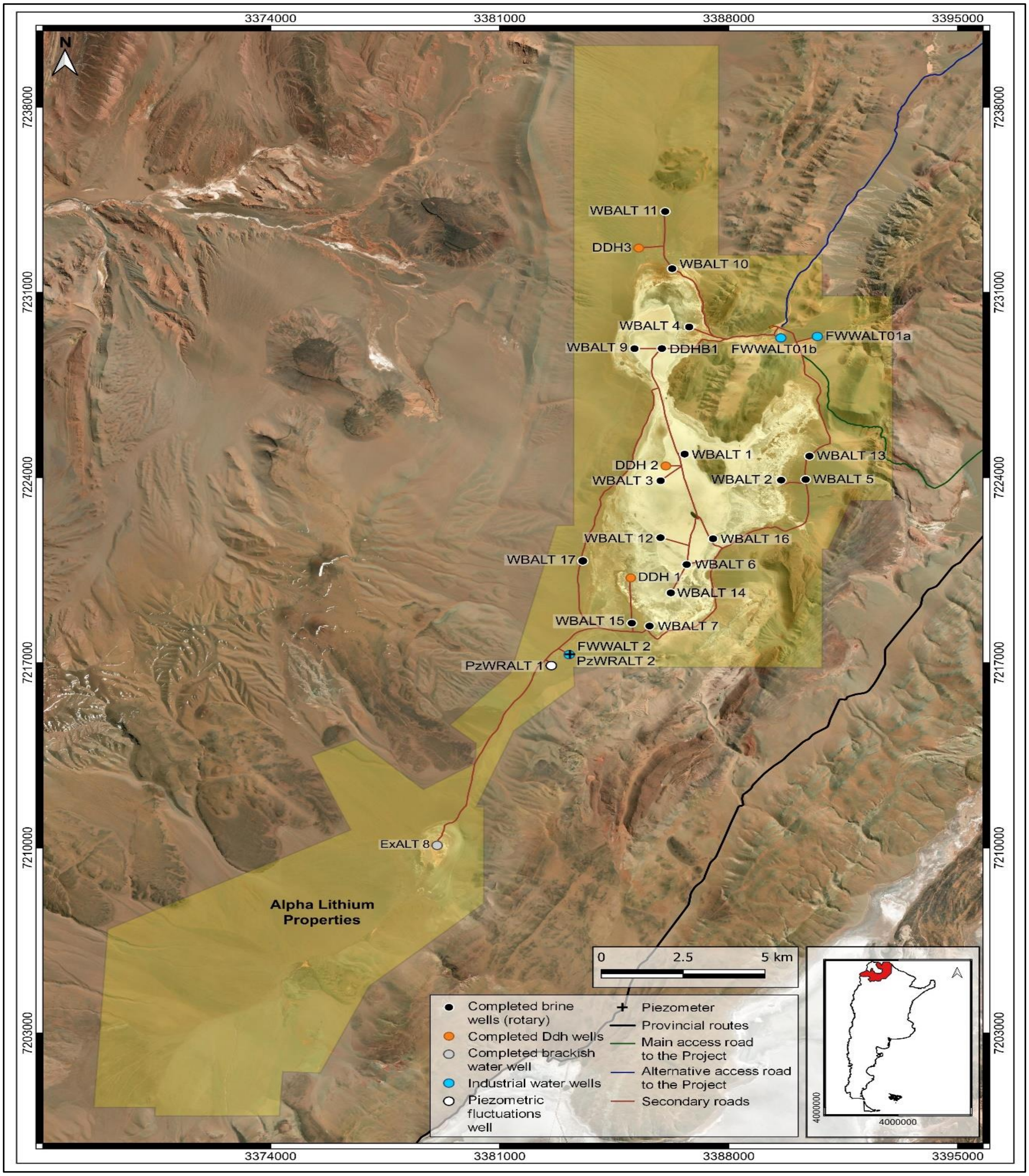
10.1 Overview

Updated results of the year 2020 - 2022 and preliminary results of year 2023 exploration drilling and testing program are reported herein. The current exploration well program is designed to obtain additional aquifer hydraulic parameters, to develop a conceptual hydrogeological model, and to obtain sufficient information to estimate an updated lithium resource. Locations for all brine wells are shown in Table 10-1 and Figure 10-1.

Table 10-1: Summary of Locations and Depths Drilled for Year 2020 - 2023.

Well ID	Type	Date Completed (mm-yyyy)	Total Depth Drilled (m)	UTM Easting (m, POSGAR 94)	UTM Northing (m, POSGAR 94)
DDHB-01	rotary	07-2022	204	3,385,840	7,228,666
WBALT-01	rotary	12-2020	43	3,386,592	7,224,686
WBALT-02	rotary	02-2021	130	3,389,527	7,223,693
WBALT-03	rotary	09-2021	120	3,385,842	7,223,667
WBALT-04	rotary	05-2021	79	3,386,714	7,229,475
WBALT-05	rotary	03-2021	352	3,390,256	7,223,716
WBALT-06	rotary	02-2022	238	3,385,731	7,220,505
WBALT-07	rotary	10-2021	352	3,385,499	7,218,187
EX-ALT-08	rotary	12-2021	372	3,379,316	7,210,856
WBALT-09	rotary	03-2022	326	3,385,042	7,228,654
WBALT-10	rotary	07-2022	402	3,386,194	7,231,682
WBALT-11	rotary	08-2022	400	3,385,980	7,233,844
WBALT-12	rotary	09-2022	361	3,385,836	7,221,513
WBALT-13	rotary	07-2022	269	3,390,388	7,224,598
WBALT-14	rotary	04-2023	280	3,386,153	7,219,425
WBALT-15	rotary	10-2022	363	3,384,960	7,218,281
WBALT-16	rotary	02-2023	272	3,387,443	7,221,472
WBALT-17	rotary	10-2022	355	3,383,463	7,220,633
DDH-01	diamond	04-2023	401	3,384,938	7,220,000
DDH-02	diamond	06-2023	191	3,385,999	7,224,224
DDH-03	diamond	01-2023	506	3,385,172	7,232,461
FWWALT-01	rotary	11-2022	44	3,389,517	7,229,061
FWWALT-01A	rotary	06-2021	89	3,390,624	7,229,094
FWWALT-01B	rotary	11-2021	103	3,389,700	7,230,171
FWWALT-02	rotary	06-2022	151	3,383,076	7,217,166
WBALT-03P	piezometer	07-2021	36	3,385,842	7,223,670
PzWRALT-01	piezometer	10-2022	53	3,402,083	7,206,129
PzWRALT-02	piezometer	10-2022	95	3,402,083	7,206,120
Total			**6594**		

Figure 10-1: Location Map for Exploration Wells



Source: GWI, 2023.

10.2 Years 2020 - 2023 Drilling and Testing Program

10.2.1 Exploration Wells

Drilling and construction of brine exploration wells WBALT-01, -02, -03, -04, -05, -06, -07, -09, -10, -11, -12, -13, -14, -15, -16, and -17, and piezometer WBALT-03P in the northern concession are documented in this section.

Pumping tests conducted at exploration wells included step-discharge and constant discharge tests. The step-discharge test was conducted to evaluate drawdown and specific capacity at different pumping rates for determination of sustainable pumping capacity of the wells, both for the constant-discharge tests, and for selection of long-term sustainable pumping rate. The constant-discharge test was conducted to further evaluate sustainable yield and to provide data to estimate aquifer hydraulic parameters. Pumping test equipment was provided by drilling and testing contractor Andina Perforaciones, a local drilling contractor based in Salta, Argentina. Locations and total depths drilled for exploration wells are given in Table 10-1. Aquifer test drawdown data were analyzed for aquifer transmissivity using the semi-logarithmic graphical method developed by Cooper and Jacob (1946) using Aqtesolv software (HydroSOLVE, 2008) and verified manually. Transmissivity was also calculated using the Theis (1935) recovery method, which is generally considered to be more reliable.

Drilling was done using conventional circulation mud rotary. Drilling fluid was a polymer mud mixed with brine. For each well, time to drill one meter was recorded to monitor penetration rate. Unwashed and washed drill cuttings were described and stored in labeled plastic cutting boxes.

Geophysical surveys were conducted on each well after pilot borehole drilling was completed. The surveys were performed by Zelandez, a multi-disciplinary consulting firm based in Salta province, Argentina. Geophysical logs performed by Zelandez included ultrasonic caliper, gamma, Short-Normal resistivity, Long-Normal resistivity, spontaneous potential, electrical conductivity, temperature, and borehole magnetic resonance (BMR).

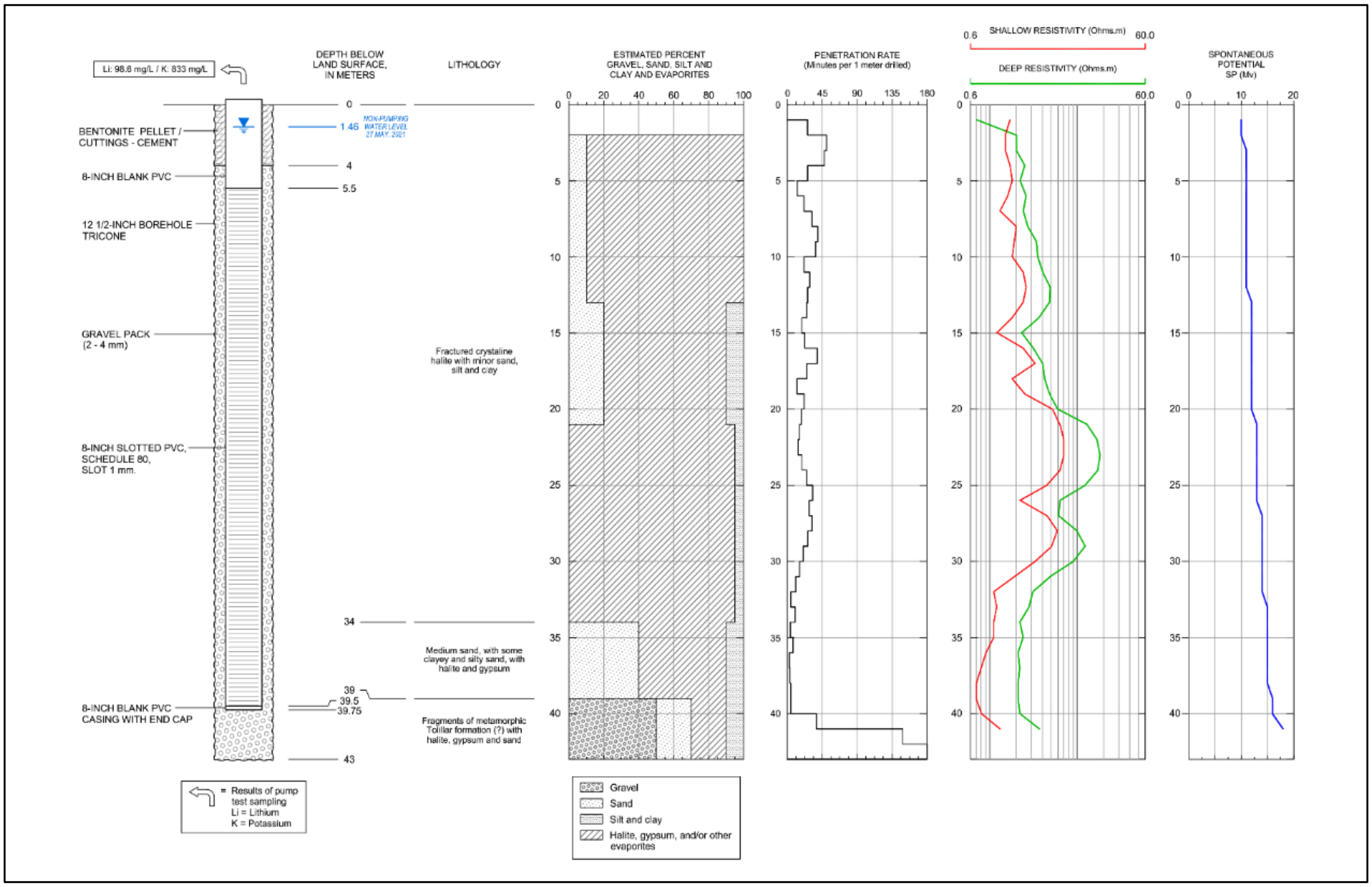
All downhole geophysical results were considered, in assigning drainable porosity estimates to the various borehole lithologies (Section 14). In particular, BMR was considered, due to the strength of the technology as an indicator of total porosity, and for differentiating between porewater that is held immobile by capillary forces within the formation, and porewater that is mobile. This latter measure is comparable to drainable porosity or specific yield.

10.2.1.1 Exploration Well WBALT-01

Drilling activities for exploration well WBALT-01 started on November 27, 2020, reaching the depth of 43 mbgs on December 02, 2020. Construction schematic for well WBALT-01 is shown in Figure 10-2.

On December 17, 2020, a step-discharge test was conducted at well WBALT-01 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 8:30 AM. Average pumping rate, drawdown, and computed specific capacity for each 120-minute step are summarized in Table 10-2. The step-discharge test consisted of three 120-minute steps and the pre-pumping water level was at a depth of 1.57 m below measuring point (“mbmp”).

Figure 10-2: WBALT-01 Well Diagram



Source: Montgomery, 2022.

Table 10-2: Summary of The Step-Discharge Test at Exploration Well WBALT-01

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)*
WBALT-01	12/17/2020	1	1.7	8.29	0.21
		2	2.8	16.92	0.17
		3	4.2	29.65	0.14

*Specific capacity of a well is computed by dividing the average pumping rate by the maximum water level drawdown at that rate and is expressed as liters per second per meter of drawdown.

A constant-rate pumping test at well WBALT-01 started on December 18, 2020 with an average flow rate of 3.8 L/s; pre-pumping water level was 1.57 mbmp. A summary of the test is given in Table 10-3. The pumping test stopped on December 20, 2020 after 48 hours; water level recovery measurements were then manually measured for 5 hours.

Table 10-3: Pumping Test Summary for Exploration Well WBALT-01

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping/ Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 5 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-01	12/18/2020	48/5	1.57	3.8	28.93	0.12	0.13

A summary of computed aquifer parameters is given in Table 10-4. Analysis of the trend of groundwater level drawdown for the period 100 minutes after pumping started until end of the test, indicates a transmissivity of about 90 m^2/d. Analysis of the trend of groundwater level recovery for the late period after pumping stopped indicates a transmissivity of about 60 m^2/d. Analysis for calculation of transmissivity was performed using recovery data measured for a period of 5 hours. A reasonable estimation of the "operative" transmissivity for well WBALT-01 is considered to be 60 m^2/d.

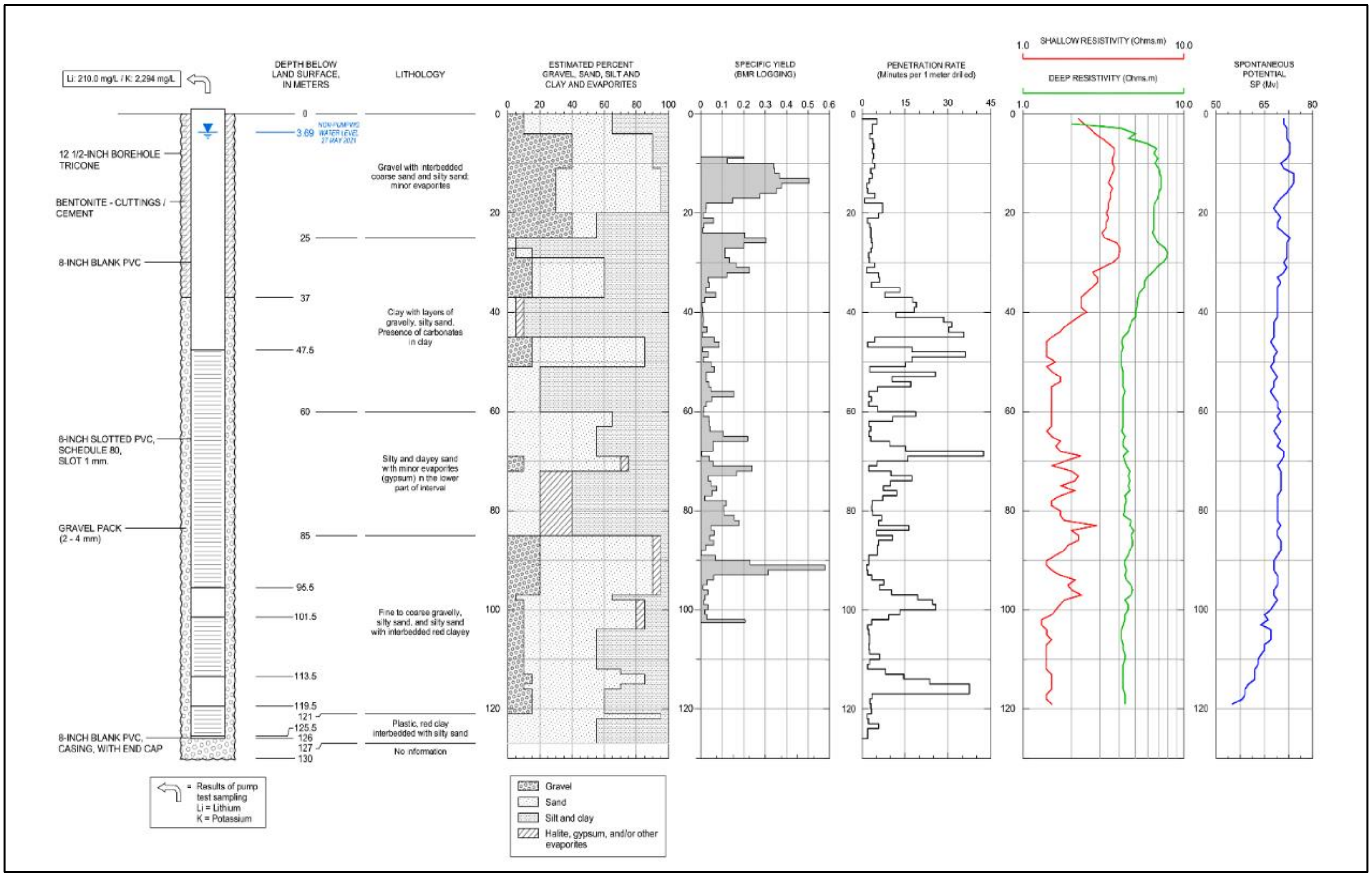
Table 10-4: Summary of Computed Aquifer Parameters at Well WBALT-01

Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-01	3.8	90	60

10.2.1.2 Exploration Well WBALT-02

Drilling activities for exploration well WBALT-02 started on January 13, 2021, reaching the depth of 130 mbgs on January 23, 2021. Construction schematic for well WBALT-02 is shown in Figure 10-3. On February 22, 2021, a step-discharge test was conducted at well WBALT-02 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 3:00 PM. The step-discharge test consisted of three 90-minute steps and the pre-pumping water level was at a depth of 3.63 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 90-minute step are summarized in Table 10-5.

Figure 10-3: WBALT-02 Well Diagram



Source: Montgomery, 2023.

Table 10-5: Summary of The Step-Discharge Test at Exploration Well WBALT-02

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-02	02/22/2021	1	4.9	21	0.23
		2	7.7	41.42	0.19
		3	14.6	83.12	0.18

A constant rate pumping test at well WBALT-02 started on February 18, 2021 with an average flow rate of 17.2 L/s; pre-pumping water level was 3.84 mbmp. A summary of the test is given in Table 10-6. The pumping test stopped on February 20, 2021 after 48 hours; water level recovery measurements were then manually measured for the same period.

Table 10-6: Pumping Test Summary for Exploration Well WBALT-02

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-02	02/18/2021	48/48	3.84	17.2	88.35	-0.21	0.19

A summary of computed aquifer parameters is given in Table 10-7. Analysis of the trend of groundwater level drawdown for the period 210 minutes after pumping started until end of the test, indicates a transmissivity of about 135 m^2/d. Analysis of the trend of groundwater level recovery for the late period after pumping stopped indicates a transmissivity of about 110 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-01 is considered to be 110 m^2/d.

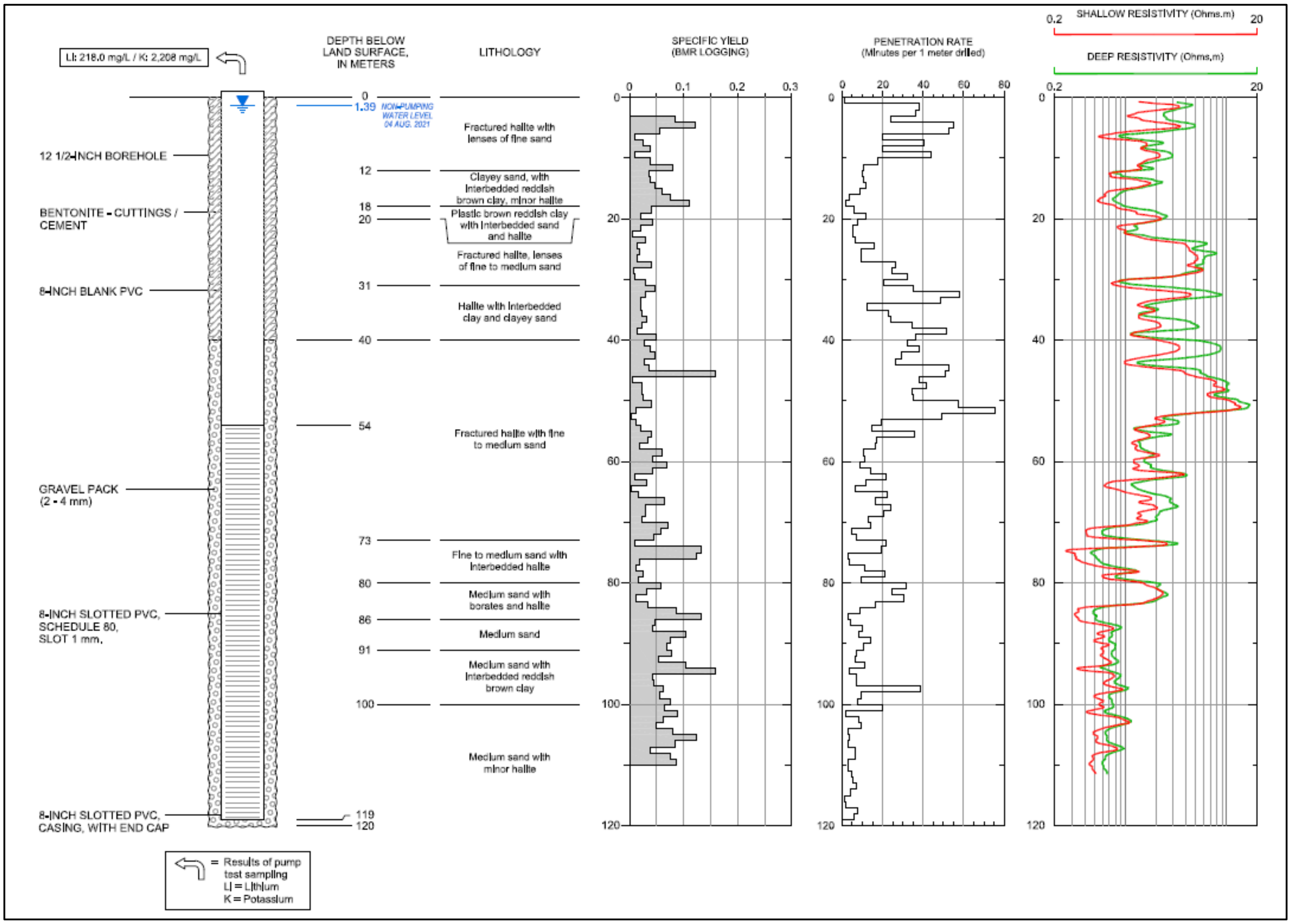
Table 10-7: Summary of Computed Aquifer Parameters at Well WBALT-02

Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-02	17.2	135	110

10.2.1.3 Exploration Well WBALT-03

Drilling activities for exploration well WBALT-03 started on June 26, 2021, reaching the depth of 120 mbgs in June 30, 2021. Construction schematic for well WBALT-03 is shown in WBALT-03 Well Diagram Figure 10-4.

Figure 10-4: WBALT-03 Well Diagram



Source: Montgomery, 2022.

On September 17, 2021, a step-discharge test was conducted at well WBALT-03 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 2:00 PM. The step-discharge test consisted of three 120-minute steps and the pre-pumping water level was at a depth of 2.33 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 120-minute step are summarized in Table 10-8.

Table 10-8: Summary of The Step-Discharge Test at Exploration Well WBALT-03

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-03	09/17/2021	1	5.8	8.38	0.69
		2	8.0	12.78	0.63
		3	10.5	16.40	0.64

A constant rate pumping test at well WBALT-03 started on September 13, 2021, with an average flow rate of 10.3 L/s; pre-pumping water level was 2.11 mbmp. A summary of the test is given in Table 10-9. The pumping test stopped on September 16, 2021, after 72 hours; water level recovery measurements were then manually measured for 27.5 hours.

Table 10-9: Pumping Test Summary For Exploration Well WBALT-03

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 27.5 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-03	09/13/2021	72/27.5	2.11	10.3	17.6	0.22	0.59

A summary of computed aquifer parameters is given in Table 10-10. Analysis of the trend of groundwater level drawdown, for the period of 300 minutes after pumping started until end of the test, indicates a transmissivity of about 350 m^2/d. Analysis of the trend of groundwater level recovery for the late period after pumping stopped indicates a transmissivity of about 125 m^2/d. Analysis for calculation of transmissivity was performed using recovery data only for a period of 27.5 hours. A reasonable estimation of the "operative" transmissivity for well WBALT-03 is considered to be 125 m^2/d.

Table 10-10: Summary of Computed Aquifer Parameters at Well WBALT-03

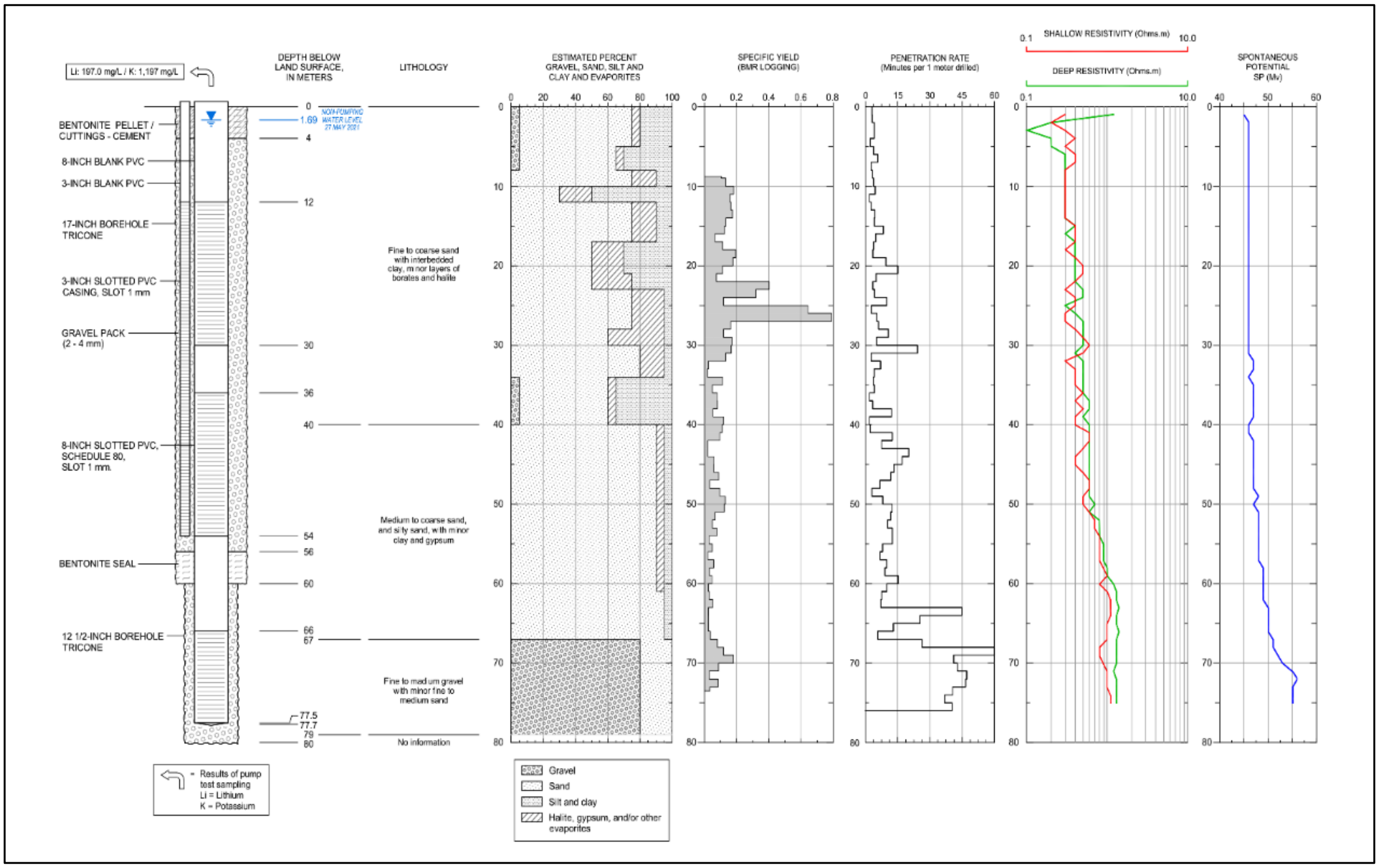
Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-03	10.3	350	125

10.2.1.4 Exploration Well WBALT-04

Drilling activities for exploration well WBALT-04 started on March 11, 2021, reaching the depth of 79 mbgs on March 20, 2021. Construction schematic for well WBALT-04 is shown in Figure 10-5.

On April 27, 2021, a step-discharge test was conducted at well WBALT-04 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 8:30 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 1.67 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-11.

Figure 10-5: WBALT-04 Well Diagram



Source: Montgomery, 2022.

Table 10-11: Summary of The Step-Discharge Test at Exploration Well WBALT-04

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-04	04/27/2021	1	4.4	4.23	1.04
		2	8.3	8.0	1.04
		3	19.6	19.93	1.00

A constant rate pumping test at well WBALT-04 started on April 28, 2021 with an average flow rate of 19.9 L/s; pre-pumping water level was 1.8 mbmp. A summary of the test is given in Table 10-12. The pumping test stopped on April 30, 2021 after 48 hours; water level recovery measurements were then manually measured for 20 hours.

Table 10-12: Pumping Test Summary For Exploration Well WBALT-04

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 20 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-04	04/28/2021	48/20	1.8	19.9	22.12	0.31	0.9

A summary of computed aquifer parameters is given in Table 10-13. Analysis of the trend of groundwater level drawdown after pumping started until end of the test, indicates a transmissivity of about 160 m^2/d. Analysis of the trend of groundwater level recovery after pumping stopped indicates a transmissivity of about 200 m^2/d. Analysis for calculation of transmissivity was performed using recovery data for 20 hours. A reasonable estimation of the "operative" transmissivity for well WBALT-04 is considered to be 200 m^2/d.

Table 10-13: Summary of Computed Aquifer Parameters at Well WBALT-04

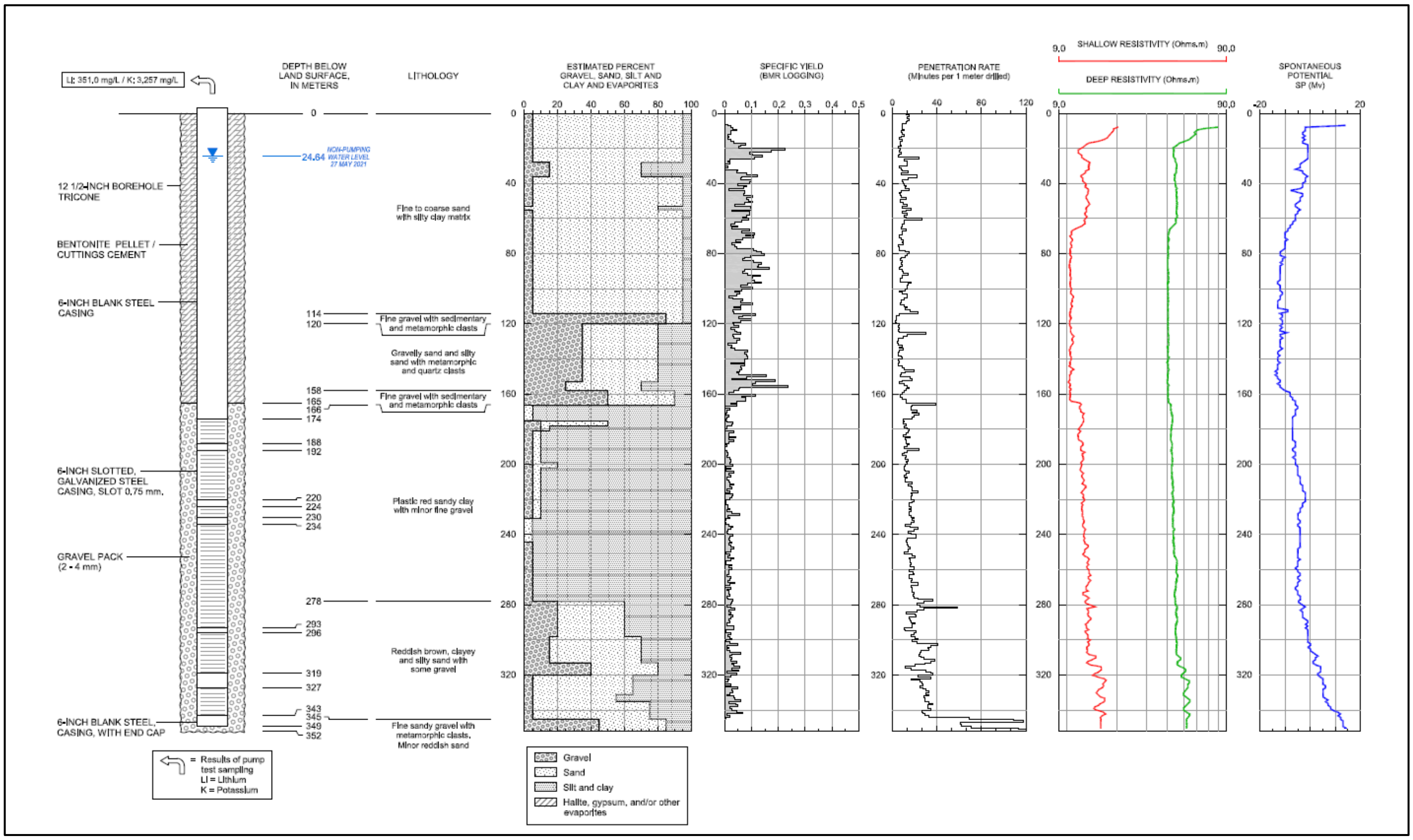
Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-04	19.9	160	200

10.2.1.5 Exploration Well WBALT-05

Drilling activities for exploration well WBALT-05 started on January 10, 2021, reaching the depth of 352 mbgs on January 25, 2021. Well schematic for well WBALT-05 is shown in Figure 10-6.

On March 29, 2021, a step-discharge test was conducted at well WBALT-05 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 2:00 PM. The step-discharge test consisted of three 150-minute steps and the pre-pumping water level was at a depth of 27.51 mbmp. It is important to mention that 84 minutes before last step started pump equipment stopped and recovery measurements started. Average pumping rate, drawdown, and computed specific capacity for each 150-minute step are summarized in Table 10-14.

Figure 10-6 WBALT-05 Well Diagram



Source: Montgomery, 2022

Table 10-14: Summary of The Step-Discharge Test at Exploration Well WBALT-05

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-05	03/29/2021	1	0.31	16.65	0.019
		2	0.65	33.49	0.019
		3	0.92	55.09	0.017

A constant rate pumping test at well WBALT-05 started on March 27, 2021 with an average flow rate of 0.73 L/s; pre-pumping water level was 26.08 mbmp. A summary of the test is given in Table 10-15. The pumping test stopped on March 28, 2021 after 18 hours due to problems with the pumping equipment; water level recovery measurements were then manually measured during 18 hours.

Table 10-15: Pumping Test Summary for Exploration Well WBALT-05

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 22 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-05	03/27/2021	18/18	26.08	0.73	41	1.58	0.018

A summary of computed aquifer parameters is given in Table 10-16. Analysis of the trend of groundwater level drawdown for the period 130 minutes after pumping started until end of the test, indicates a transmissivity of about 40 m^2/d. However, it appears that flow rate may not have been kept constant, effectively invalidating the calculated transmissivity. Analysis of the trend of groundwater level recovery for the late period after pumping stopped indicates a transmissivity of about 1 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-05 is considered to be 1 m^2/d.

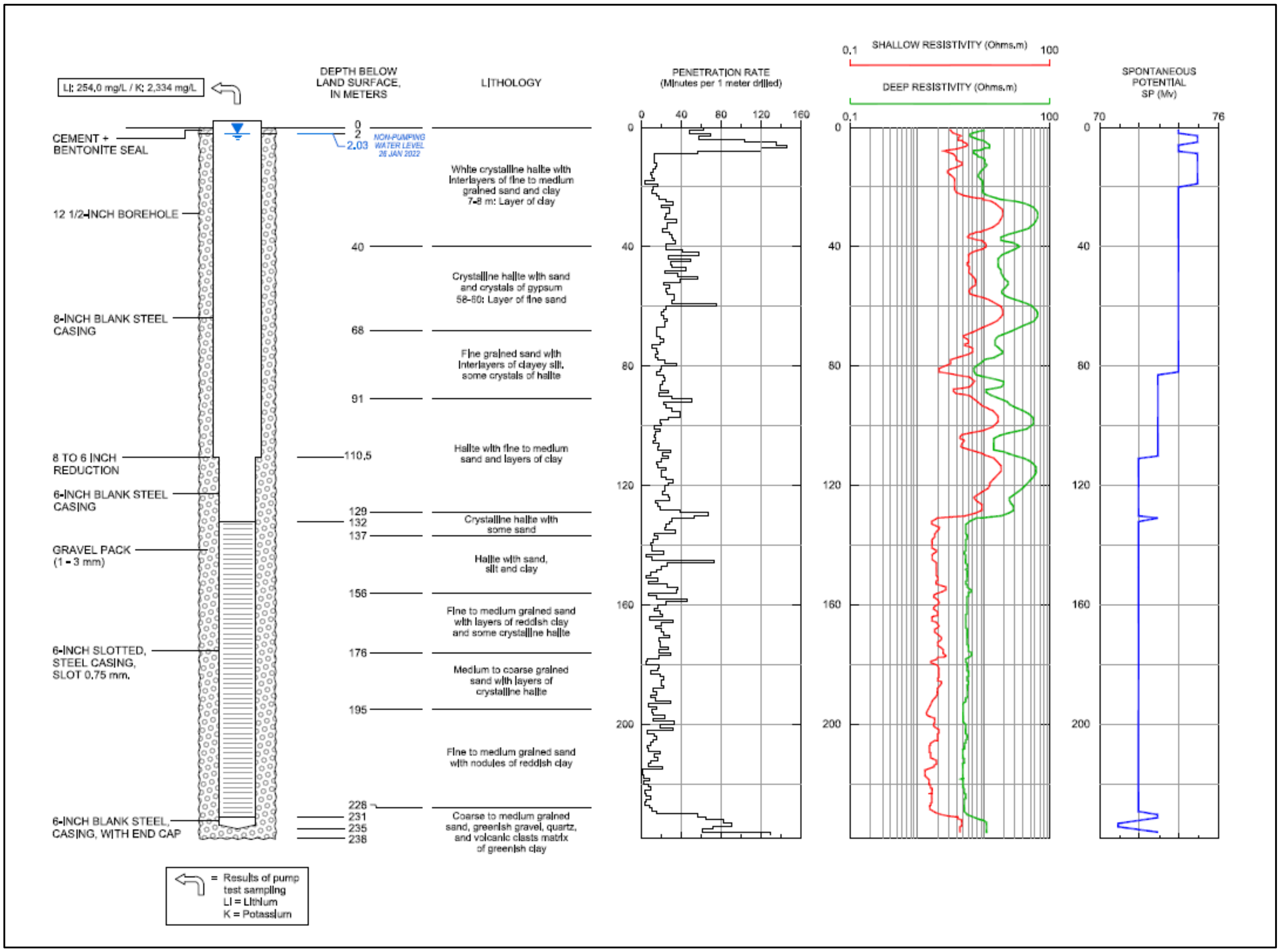
Table 10-16: Summary of Computed Aquifer Parameters At Well WBALT-05

Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-05	0.73	40	1

10.2.1.6 Exploration Well WBALT-06

Drilling activities for exploration well WBALT-06 started on October 29, 2021, reaching the depth of 238 mbgs on November 19, 2021. Well schematic with most updated construction information for well WBALT-06 is shown in Figure 10-7.

Figure 10-7: WBALT-06 Well Diagram



Source: Montgomery, 2022

Table 10-17: Summary of The Step-Discharge Test at Exploration Well WBALT-06.

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-06	01/26/2022	1	4.4	14.97	0.294
		2	7.7	26.81	0.287
		3	16.5	58.74	0.281

A constant rate pumping test at well WBALT-06 started on January 26, 2022 with an average flow rate of 17.2 L/s; pre-pumping water level was 3.17 mbmp. A summary of the test is given in Table 10-18. After about 1800 minutes into pumping, issues with generator caused variance in the pumping rate. The pumping test stopped on January 28, 2022 after 48 hours; water level recovery measurements were then manually measured during the following 59 hours.

Table 10-18: Pumping Test Summary For Exploration Well WBALT-06

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 59 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-06	01/26/2022	48/59	3.17	17.2	60.87	0.98	0.28

A summary of computed aquifer parameters is given in Table 10-19. Analysis of the trend of groundwater level drawdown for the period 100 minutes after pumping started until about 1800 minutes into the test, indicates a transmissivity of about 60 m^2/d. Analysis of the trend of groundwater level recovery for the period after pumping stopped indicates a transmissivity of about 40 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-06 is considered to be 40 m^2/d.

Table 10-19: Summary of Computed Aquifer Parameters at Well WBALT-06

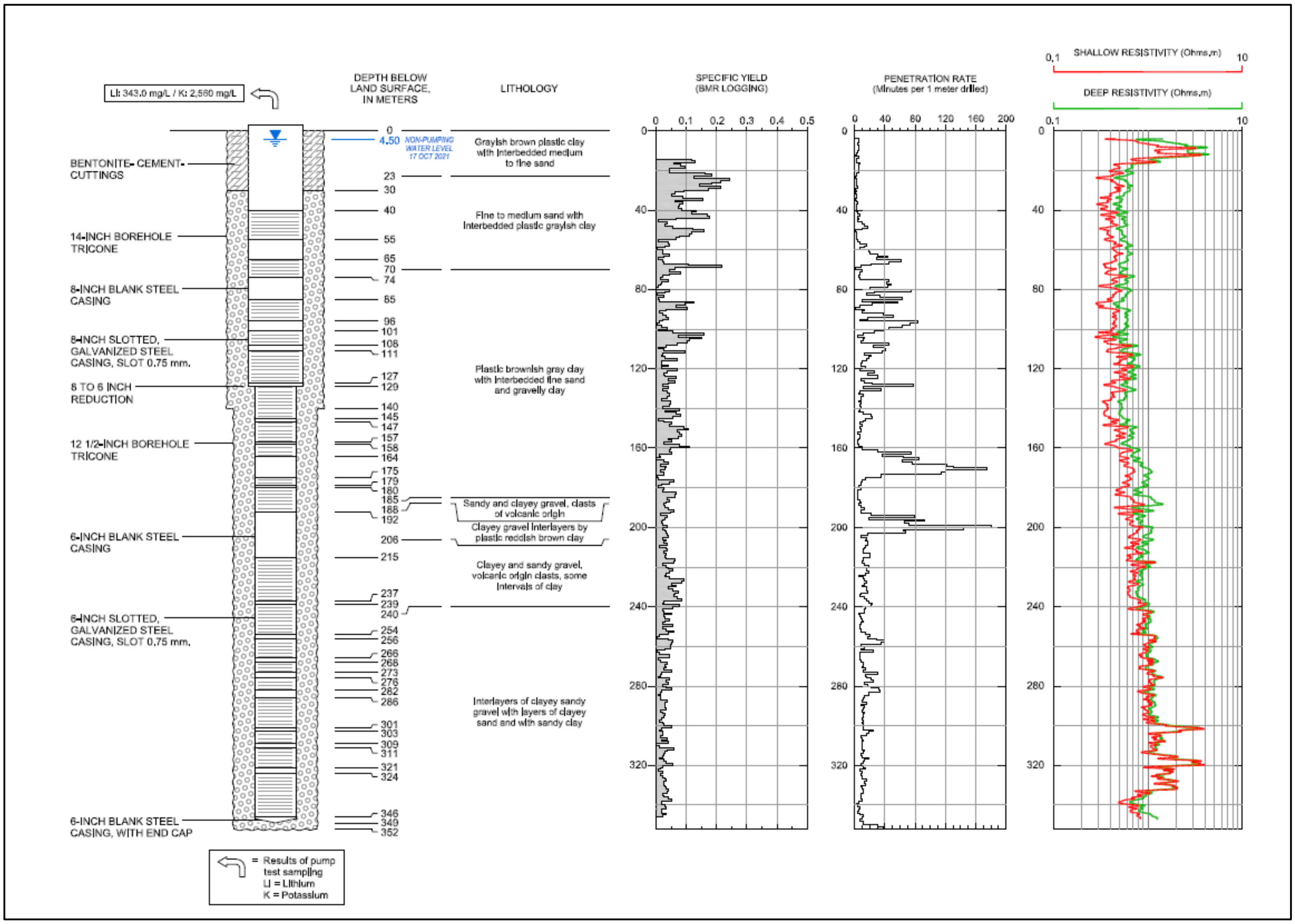
Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-06	17.2	60	40

10.2.1.7 Exploration Well WBALT-07

Drilling activities for exploration well WBALT-07 started on May 15, 2021, reaching the depth of 352 mbgs at the beginning of June, 2021. Well schematic for well WBALT-07 is shown in Figure 10-8.

On October 10, 2021, a step-discharge test was conducted at well WBALT-07 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 9:00 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 4.96 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-20.

Figure 10-8: WBALT-07 Well Diagram



Source: Montgomery, 2022.

Table 10-20: Summary of The Step-Discharge Test at Exploration Well WBALT-07

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-07	10/10/2021	1	6.3	5.51	1.143
		2	10.3	9.34	1.103
		3	17.4	15.82	1.100

A constant rate pumping test at well WBALT-07 started on October 17, 2021 with an average flow rate of 17.6 L/s; pre-pumping water level was 5.0 mbmp. A summary of the test is given in Table 10 21. The pumping test stopped on October 20, 2021, after 72 hours; water level recovery measurements were then manually measured for 7.5 hours.

Table 10-21: Pumping Test Summary For Exploration Well WBALT-07

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 7.5 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-07	10/17/2021	72/7.5	5.0	17.6	16.67	0.76	1.06

A summary of computed aquifer parameters is given in Table 10-22. Analysis of the trend of groundwater level drawdown for the period 200 minutes after pumping started until 1500 minutes, indicates a transmissivity of about 230 m^2/d. Analysis of the trend of groundwater level recovery for the late period after pumping stopped indicates a transmissivity of about 190 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-07 is considered to be 190 m^2/d.

Table 10-22: Summary of Computed Aquifer Parameters at Well WBALT-07

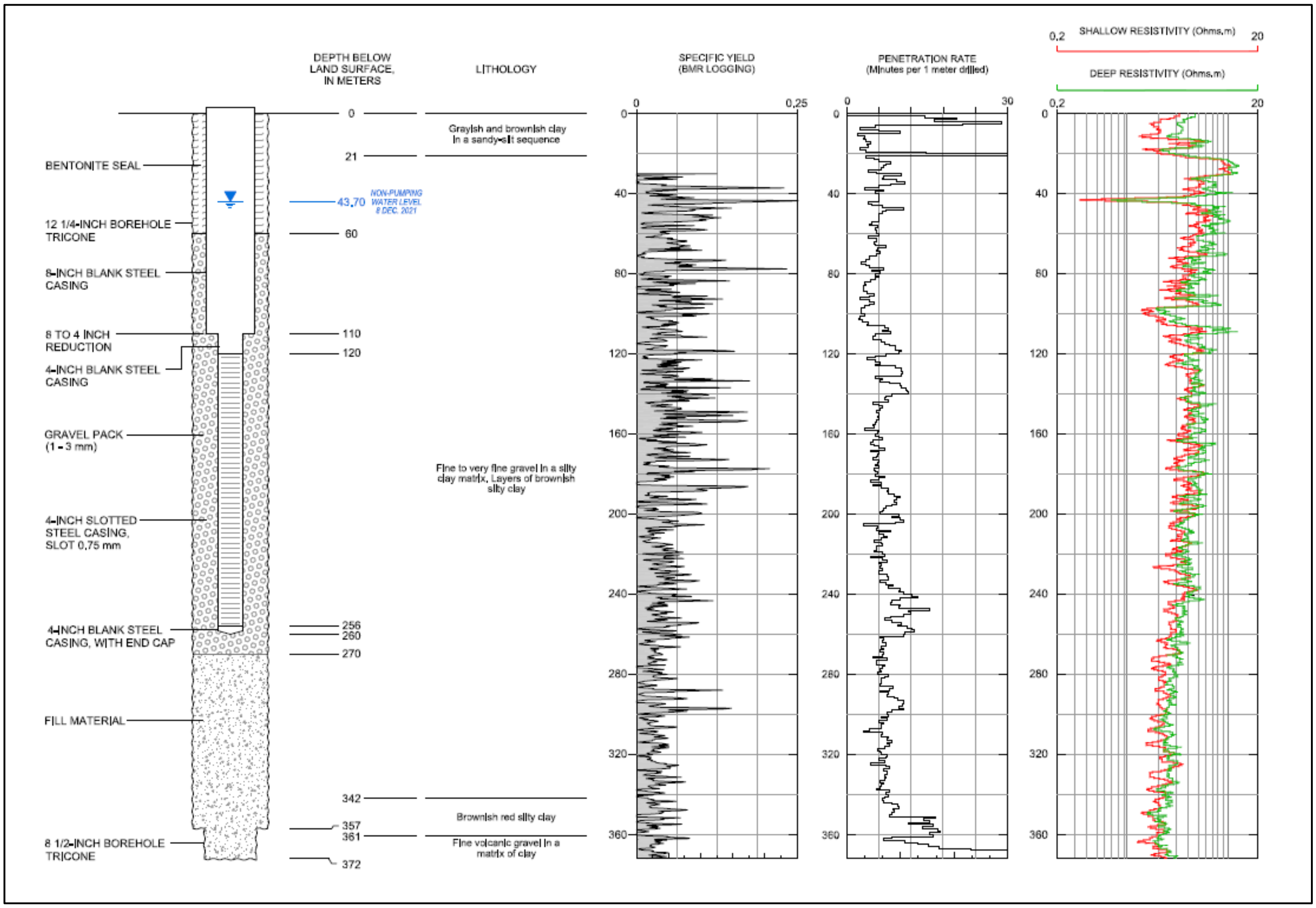
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-07	17.6	230	190

10.2.1.8 Exploration Well EX-ALT-08

Drilling activities for exploration well EX-ALT-08 started on August 18, 2021, reaching the depth of 352 mbgs on September 17, 2021. Well schematic for well EX-ALT-08 is shown in Figure 10-9.

On December 12, 2021, a step-discharge test was conducted at well EX-ALT-08 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 5:45PM. The step-discharge test consisted of two steps. The first one for 240 minutes and the second and last step for 120 minutes. Due to problems with the sounder, water level was measured with a pressure transducer only. The pre-pumping water level was at a depth of 45.70 mbmp. Average pumping rate, drawdown, and computed specific capacity for each step are summarized in Table 10-23.

Figure 10-9: EX-ALT-08 Well Diagram



Source: Montgomery, 2022.

Table 10-23: Summary of The Step-Discharge Test at Exploration Well EX-ALT-08L

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
ExALT-08	12/12/2021	1	2.4	20.75	0.12
		2	3.0	26.16	0.11

A constant rate pumping test at well Ex-ALT-08 started on December 02, 2021 with an average flow rate of 3.9 L/s; pre-pumping water level was 43.7 mbmp. A summary of the test is given in Table 10-24. The pumping test stopped on December 06, 2021 after 96 hours; water level recovery measurements were then manually measured for the following 48 hours.

Table 10-24: Pumping Test Summary For Freshwater Well EX-ALT-08

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 96 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
ExALT-08	12/02/2021	96/48	45.70	3.9	34.66	0.02	0.11

A summary of computed aquifer parameters is given in Table 10-25. Analysis of the trend of groundwater level drawdown for the duration of the test, indicates a transmissivity of about 60 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 40 m^2/d. A reasonable estimation of the "operative" transmissivity for well Ex-ALT-08 is considered to be 40 m^2/d.

Table 10-25: Summary of Computed Aquifer Parameters at Well EX-ALT-08

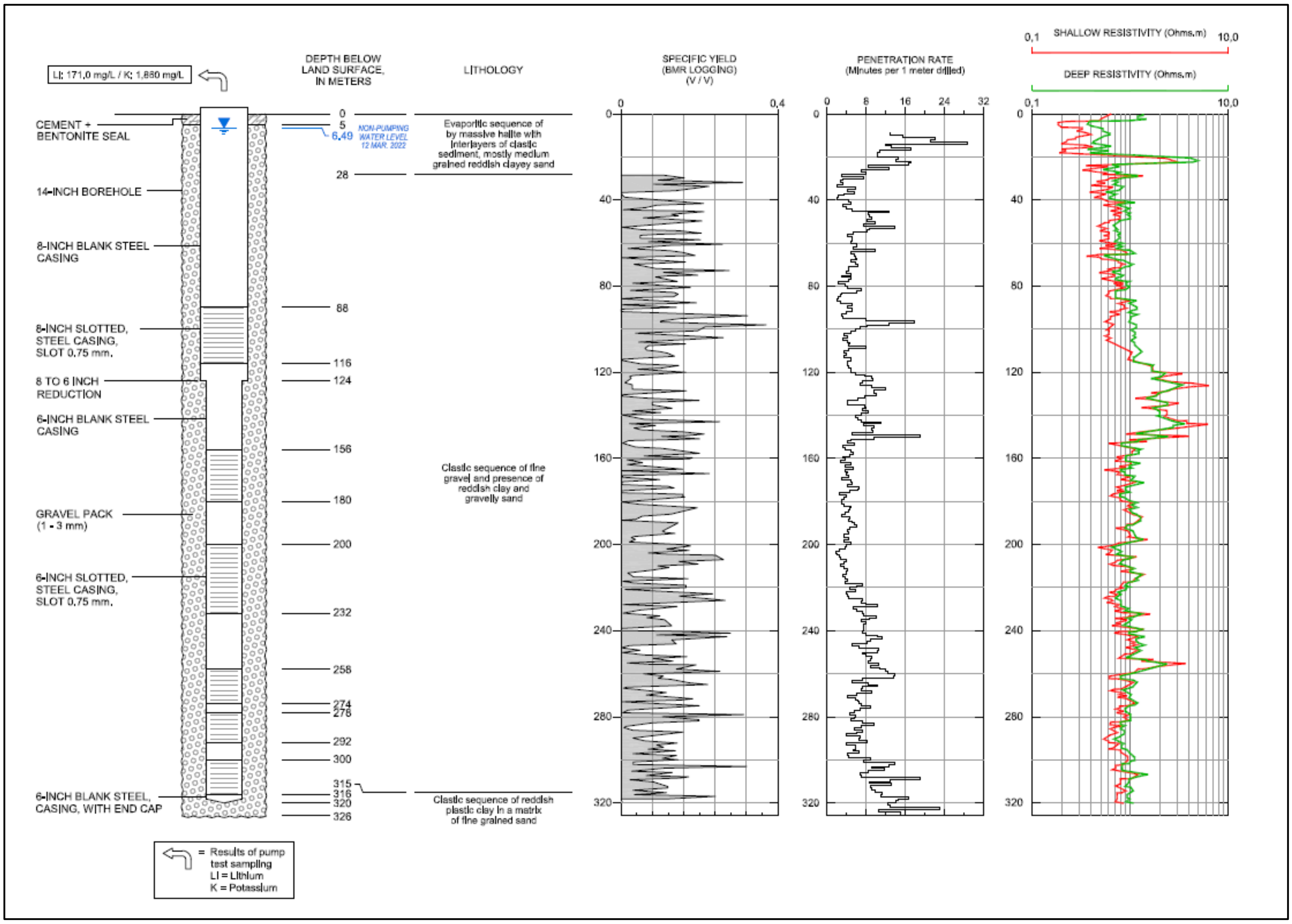
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2d)
Ex-ALT-08	3.9	60	40

10.2.1.9 Exploration Well WBALT-09

Drilling activities for exploration well WBALT-09 started on December 13, 2021 reaching the depth of 326 mbgs on March 17, 2022. Well schematic for well WBALT-09 is shown in Figure 10-10.

On March 11, 2022, a step-discharge test was conducted at well WBALT-09 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 9:00 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 6.54 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-26.

Figure 10-10: WBALT-09 Well Diagram



Source: Montgomery, 2022.

Table 10-26: Summary of The Step-Discharge Test At Exploration Well WBALT-09

Well ID	Test Date(mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
ExALT-08	03/11/2022	1	5.6	4.20	1.3
		2	13.3	11.05	1.2
		3	20.3	17.40	1.2

A constant rate pumping test at well WBALT-09 started on March 12, 2022 with an average flow rate of 20.2 L/s; pre-pumping water level was 6.49 mbmp. A summary of the test is given in Table 10-27. The pumping test stopped on March 15, 2021 after 72 hours; water level recovery measurements were then manually measured during the following 48 hours.

Table 10-27: Pumping Test Summary For Exploration Well WBALT-09

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WBALT-09	03/12/2022	72/48	6.49	20.2	20.02	0.085	1.01

A summary of computed aquifer parameters is given in Table 10-28. Analysis of the trend of groundwater level drawdown for the duration of the test, indicates a transmissivity of about 170 m^2/d. Analysis of the trend of groundwater level recovery after pumping stopped indicates a transmissivity of about 115 m^2/d. A reasonable estimation of the “operative” transmissivity for well WBALT-09 is considered to be 115 m^2/d.

Table 10-28: Summary of Computed Aquifer Parameters at Well WBALT-09.

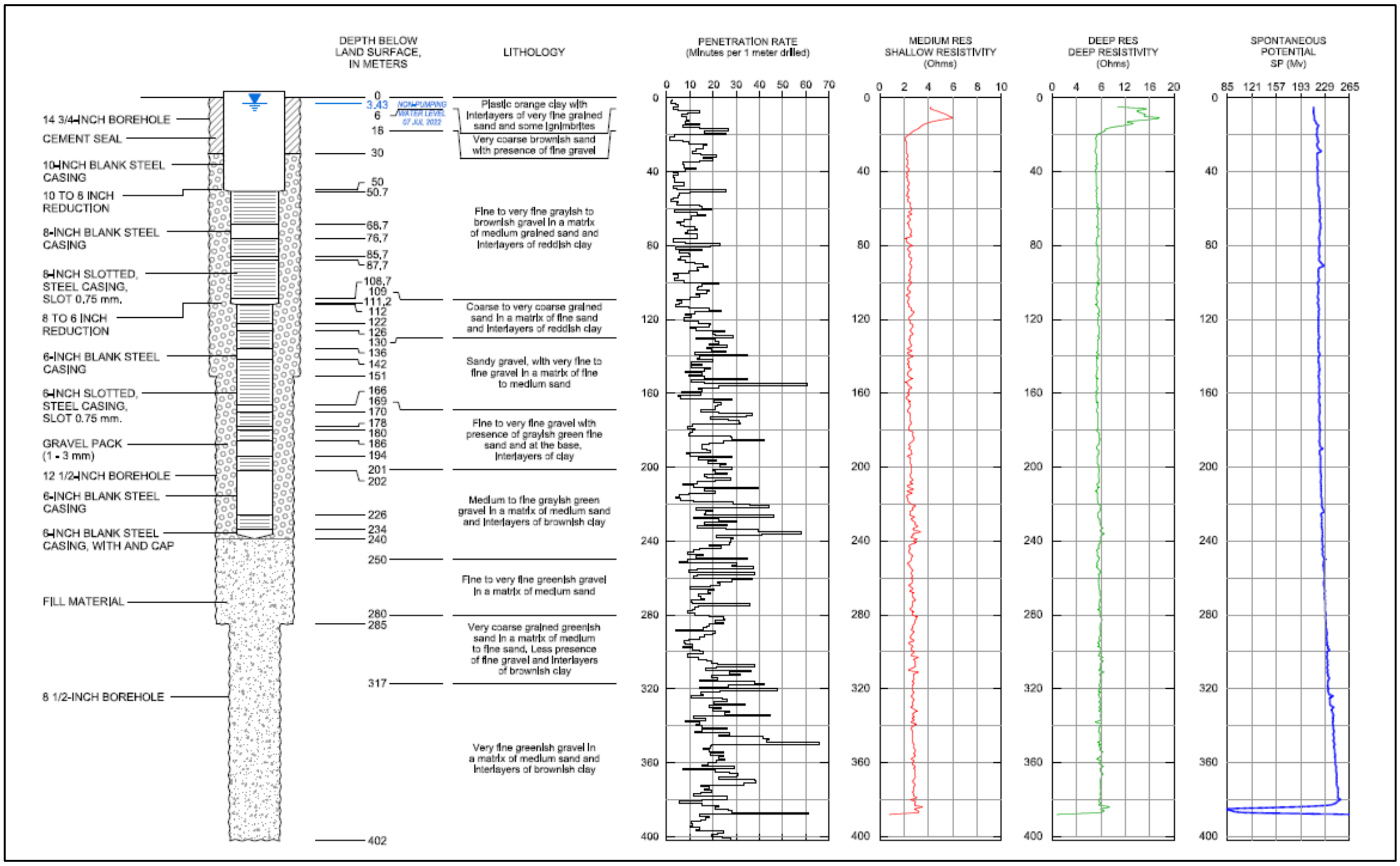
Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-09	20.2	170	115

10.2.1.10 Exploration Well WBALT-10

Drilling activities for exploration well WBALT-10 started on February 07, 2022, reaching the depth of 402 mbgs on March 03, 2022. Well schematic for well WBALT-10 is shown in Figure 10-11.

On July 06, 2022, a step-discharge test was conducted at well WBALT-10 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Manual water level measurements were not taken during testing. Pumping for the step-discharge test commenced at 9:00 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 3.40 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-29.

Figure 10-11: WBALT-10 Well Diagram



Source: Montgomery, 2022.

Table 10-29: Summary of The Step-Discharge Test at Exploration Well WBALT-10

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-10	07/06/2022	1	6.9	3.69	1.9
		2	15.0	8.25	1.8
		3	20.4	11.21	1.8

A constant rate pumping test at well WBALT-10 started on July 07, 2022 with an average flow rate of 20.2 L/s; pre-pumping water level was 3.43 mbmp. A summary of the test is given in Table 10-30. The pumping test stopped on July 10, 2021 after 72 hours; water level recovery measurements were then manually measured during the following 72 hours.

Table 10-30: Pumping Test Summary For Exploration Well WBALT-10.

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WBALT-10	07/07/2022	72/72	3.43	20.2	11.82	0.24	1.71

A summary of computed aquifer parameters is given in Table 10-31. Analysis of the trend of groundwater level drawdown for the duration of the test, indicates a transmissivity of about 550 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 550 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-10 is considered to be 550 m^2/d.

Table 10-31: Summary of Computed Aquifer Parameters at Well WBALT-10

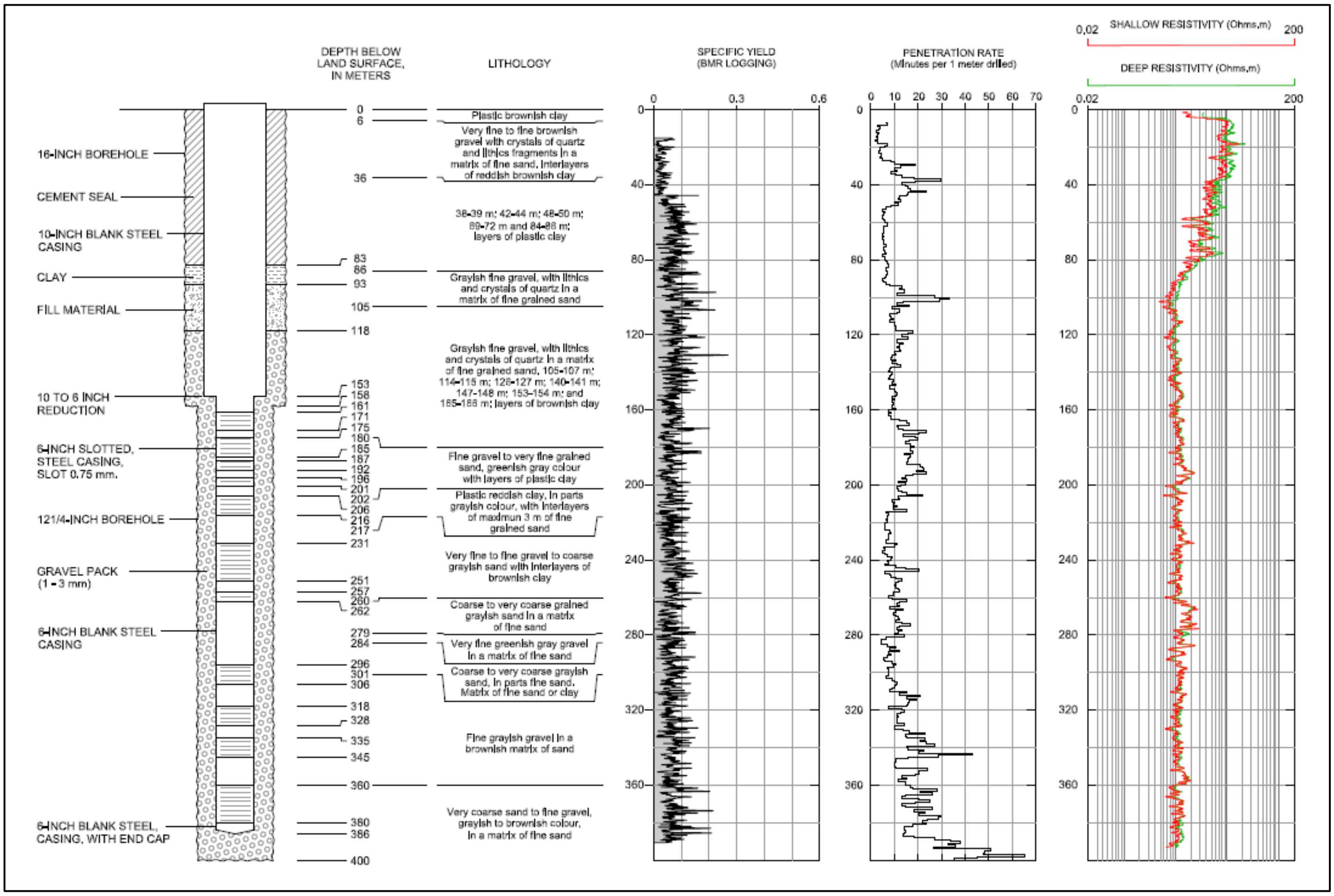
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-10	20.2	550	550

10.2.1.11 Exploration Well WBALT-11

Drilling activities for exploration well WBALT-11 started on January 27, 2022, reaching the depth of 400 mbgs on February 10, 2022. Well schematic for well WBALT-11 is shown in Figure 10-12.

On August 20, 2022, a step-discharge test was conducted at well WBALT-11 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 10:00 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 58.95 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-32.

Figure 10-12: WBALT-11 Well Diagram



Source: Montgomery, 2022.

Table 10-32: Summary of The Step-Discharge Test at Exploration Well WBALT-11.

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-11	08/20/2022	1	2.09	5.79	0.36
		2	4.03	12.78	0.32
		3	10.25	28.49	0.36

A constant rate pumping test at well WBALT-11 started on August 13, 2022 with an average flow rate of 9.2 L/s; pre-pumping water level was 57.57 mbmp. A summary of the test is given in Table 10-33. The pumping test stopped on August 16, 2022 after 72 hours; water level recovery measurements were then manually measured during the following 72 hours.

Table 10-33: Pumping Test Summary For Exploration Well WBALT-11.

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 72Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WBALT-11	08/13/2022	72/72	57.57	9.32	31.73	1.37	0.29

A summary of computed aquifer parameters is given in Table 10-34. Analysis of the trend of groundwater level drawdown for the duration of the test indicates a transmissivity of about 50 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 80 m^2/d. A reasonable estimation of the “operative” transmissivity for well WBALT-11 is considered to be 80 m^2/d.

Table 10-34: Summary of Computed Aquifer Parameters At Well WBALT-11

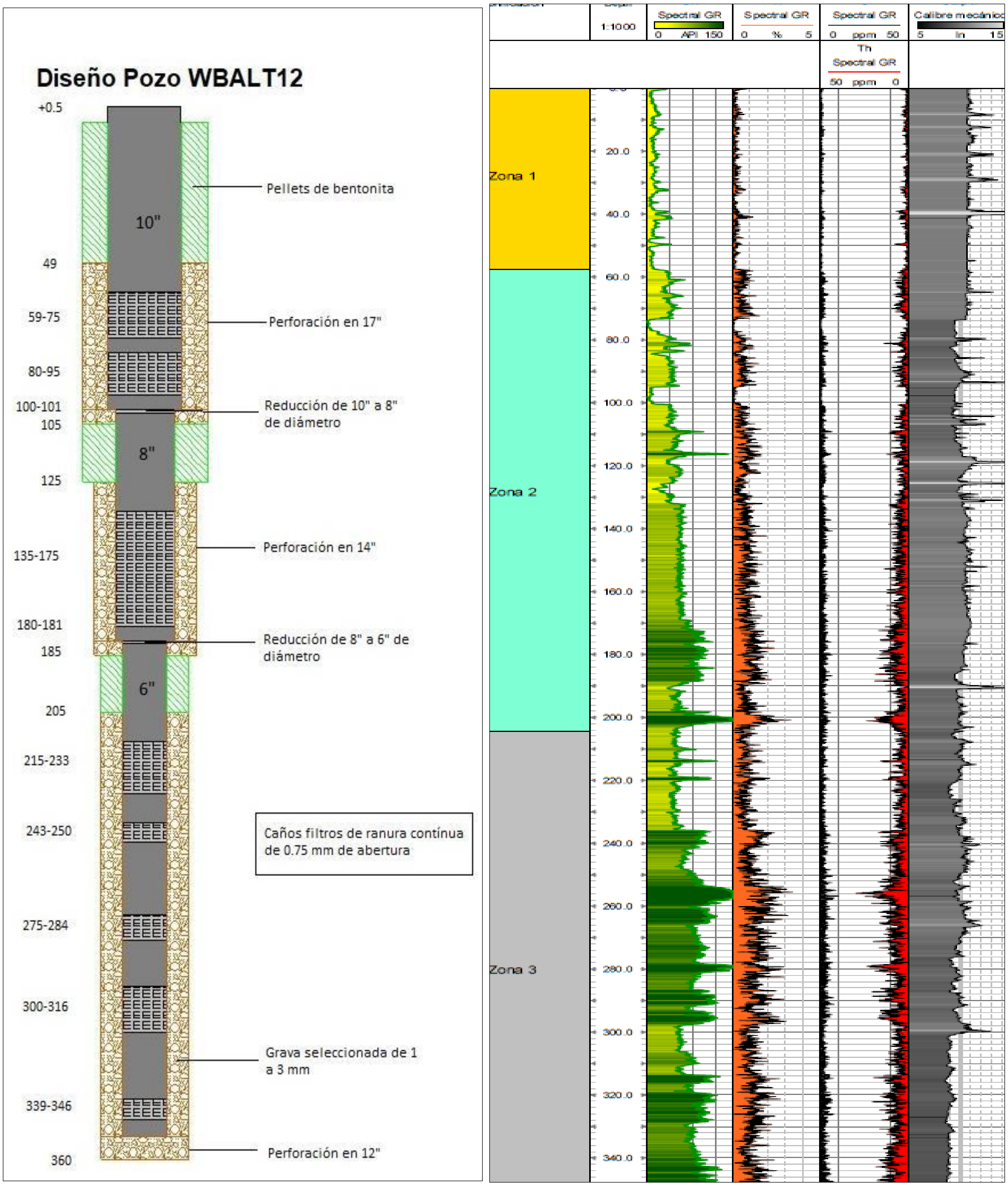
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-11	9.2	50	80

10.2.1.12 Exploration Well WBALT-12

Drilling activities for the WBALT-12 exploration well commenced on July 25, 2022, reaching a depth of 361 mbgs on September 9, 2022. Well schematic for well WBALT-12 is shown in Figure 10-13.

On April 08, 2023, a step-discharge test was conducted at well WBALT-12 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 2.52 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-35.

Figure 10-13: WBALT-12 Well Diagram



Source: Conhidro, 2022b.

Table 10-35: Summary of The Step-Discharge Test at Exploration Well WBALT-12.

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-12	04/08/2023	1	7.22	7.68	0.94
		2	16.94	17.04	0.99
		3	22.78	20.69	1.10
		Additional 1	3.19	2.41	1.32
		Additional 2	22.32	22.05	1.01

A constant rate pumping test at well WBALT-12 started on April 02, 2023 with average flow rate of 22.325 L/s. A summary of the test is given in Table 10-36. The pumping test stopped after 72 hours; water level recovery measurements were then manually measured during the following 72 hours.

Data from both assays were used to calculate the transmissivity of the aquifer. Table 10-37 shows a summary of the data obtained.

Table 10-36: Pumping Test Summary for Exploration Well WBALT-12

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WBALT-12	04/02/2023	72/48	3.075	22.325	22.055	-0.405	1.01

Table 10-37: Summary of Computed Aquifer Parameters at Well WBALT-12

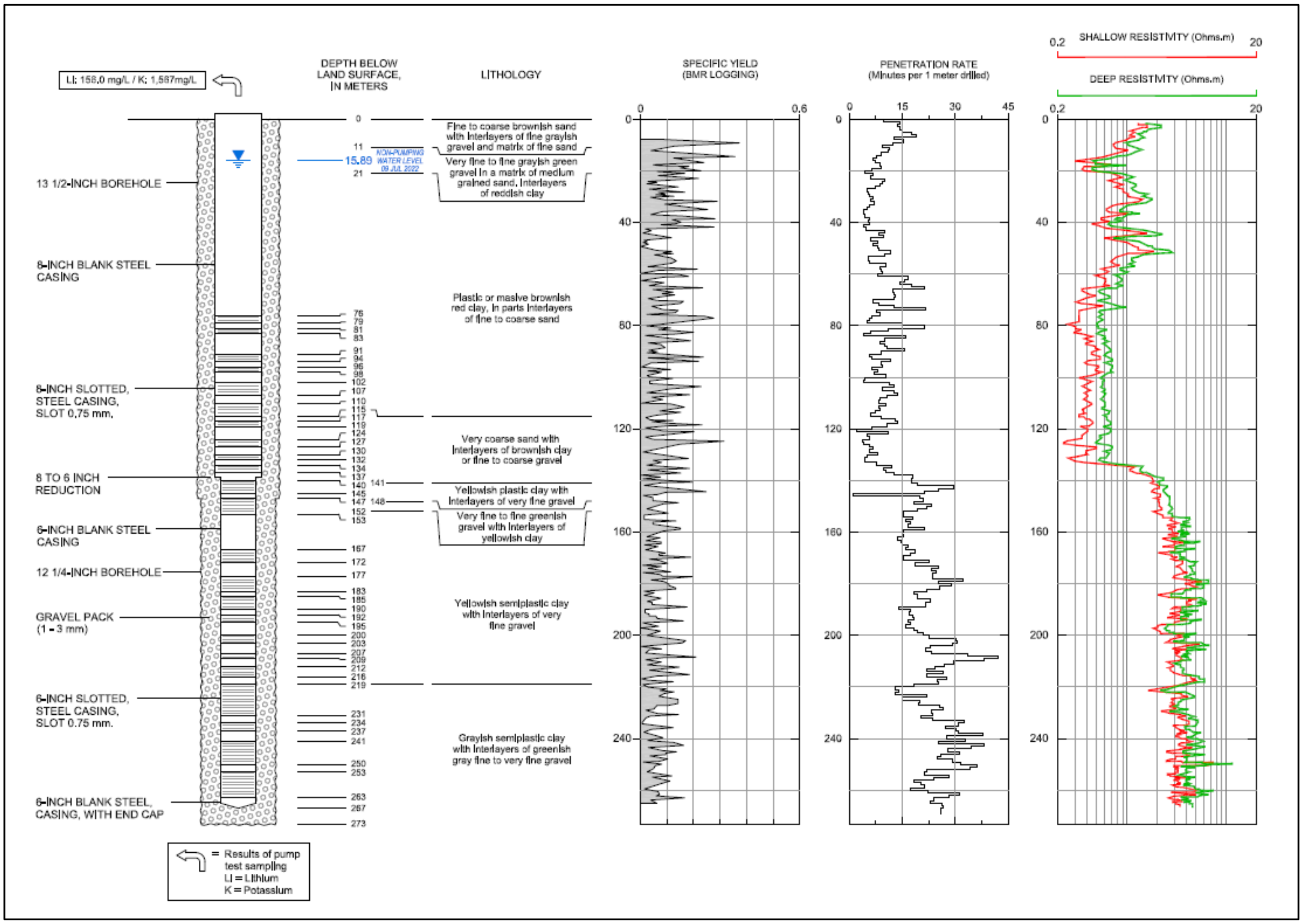
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-12	22.325	72.75	159.9

10.2.1.13 Exploration Well WBALT-13

Drilling activities for exploration well WBALT-13 started in the beginning of 2022, reaching the depth of 269 mbgs in the first half semester of 2022. Well schematic for well WBALT-13 is shown in Figure 10-14.

On July 06, 2022, a step-discharge test was conducted at well WBALT-13 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 8:40 AM. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 15.93 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-38.

Figure 10-14: WBALT-13 Well Diagram



Source: Montgomery, 2022.

Table 10-38: Summary of The Step-Discharge Test at Exploration Well WBALT-13.

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-13	07/06/2022	1	0.4	10.02	0.04
		2	0.6	27.49	0.02
		3	1.1	44.96	0.02

A constant rate pumping test at well WBALT-13 started on July 09, 2022 with an average flow rate of 1.2 L/s; pre-pumping water level was 15.89 mbmp. A summary of the test is given in Table 10-39. The pumping test stopped on July 12, 2022 after 72 hours; water level recovery measurements were then manually measured during the following 72 hours.

Table 10-39: Pumping Test Summary For Exploration Well WBALT-13

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WBALT-13	07/09/2022	72/72	15.89	1.2	56.97	-0.13	0.02

A summary of computed aquifer parameters is given in Table 10-40. Analysis of the trend of groundwater level drawdown for the duration of the test, indicates a transmissivity of about 3 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 5 m^2/d. A reasonable estimation of the "operative" transmissivity for well WBALT-13 is considered to be 5 m^2/d.

Table 10-40: Summary of Computed Aquifer Parameters at Well WBALT-13

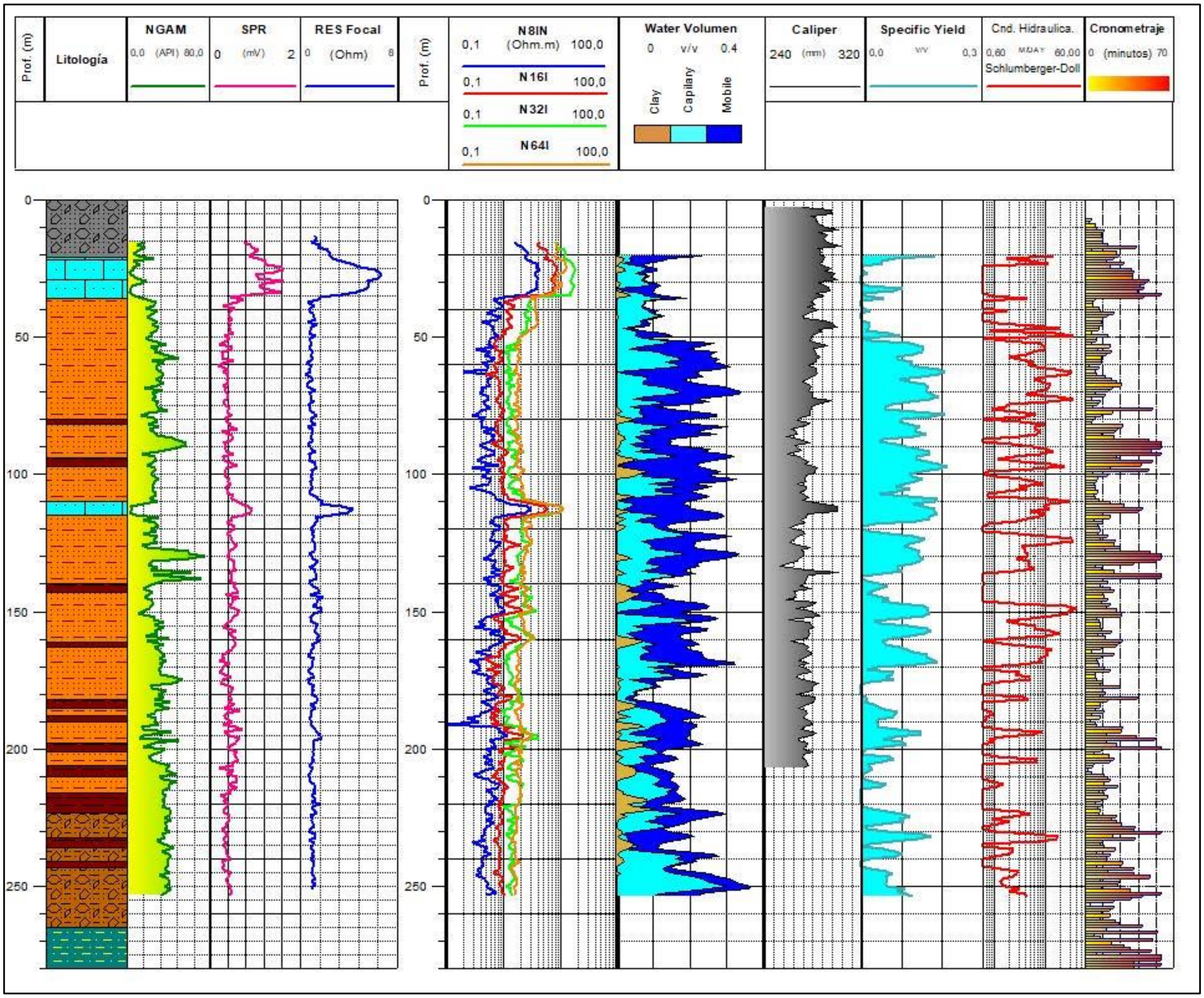
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-13	1.2	3	5

10.2.1.14 Exploration Well WBALT-14

Drilling activities for the WBALT-14 exploration well commenced on December 9, 2022, reaching a depth of 280 mbgs on April 15, 2023. Well schematic for well WBALT-14 is shown in Figure 10-15.

On Apr 08, 2023, a step-discharge test was conducted at well WBALT-14 to evaluate drawdown and well efficiency at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. The step-discharge test consisted of three 180-minute steps and the pre-pumping water level was at a depth of 4.3 mbmp. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-41.

Figure 10-15: WBALT-14 Well Diagram



Source: Conhidro, 2023a.

Table 10-41: Summary of The Step-Discharge Test at Exploration Well WBALT-14

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown(m)	Specific Capacity (L/s/m)
WBALT-14	04/08/2023	1	4.69	2.13	2.20
		2	9.81	4.61	2.13
		3	22.08	10.79	2.05

A constant rate pumping test at well WBALT-14 started on April 9, 2023 with an average flow rate of 22.49 L/s; pre-pumping water level was 4.21 mbgs. A summary of the test is given in Table 10-42.

Table 10-42: Pumping Test Summary For Exploration Well WBALT-14

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 48 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-14	04/09/2023	72/72	4.21	22.49	11.99	0.03	1.88

A summary of computed aquifer parameters is given in Table 10-43. Analysis of the trend of groundwater level drawdown for the duration of the test, indicates a transmissivity of about 113.3 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 290.8 m^2/d.

Table 10-43: Summary of Computed Aquifer Parameters at Well WBALT-14

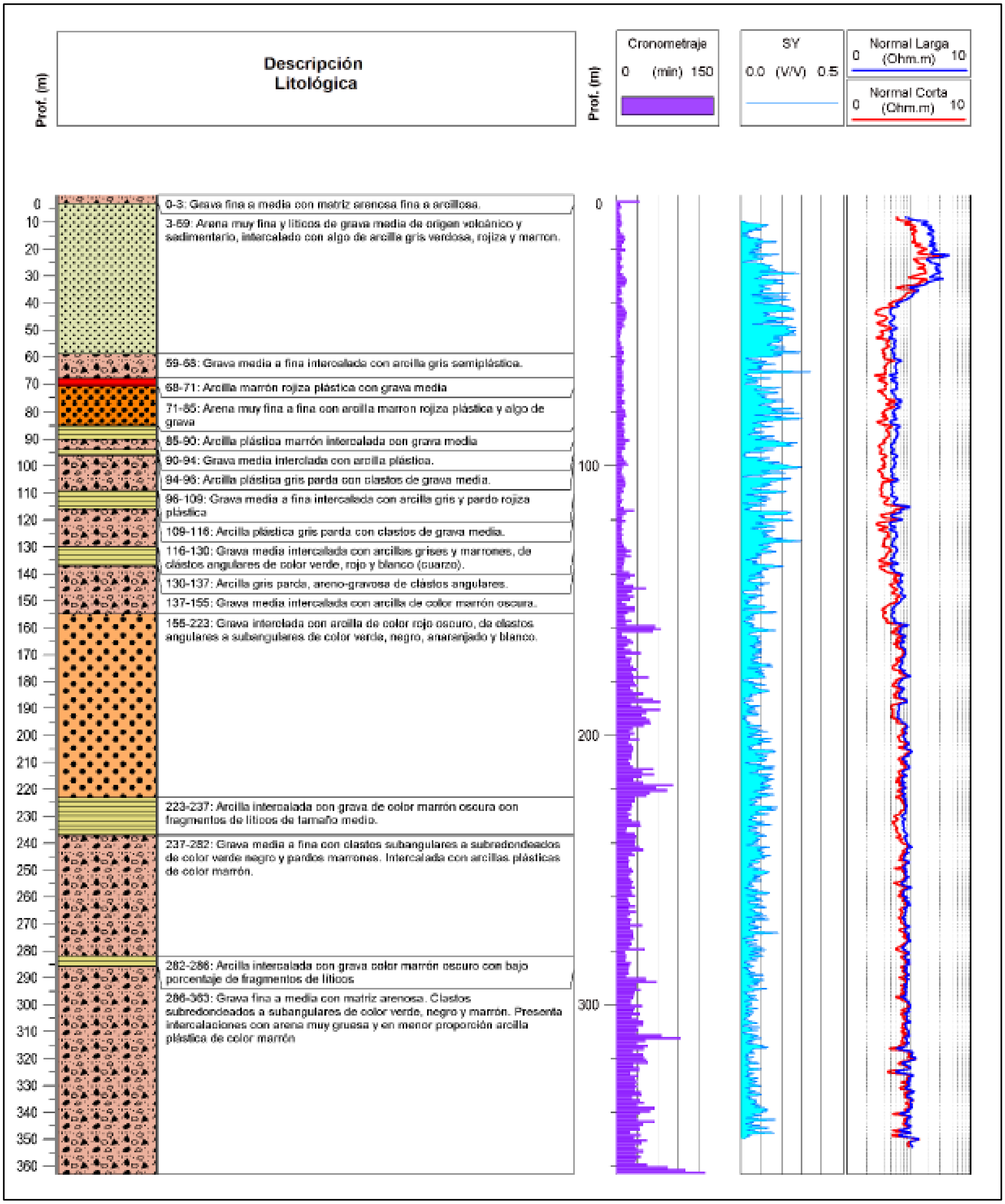
Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-14	22.49	113.3	290.8

10.2.1.15 Exploration Well WBALT-15

Drilling activities for the WBALT-15 exploration well commenced on July 22, 2022, reaching a depth of 363 mbgs on August 12, 2022. Well schematic for well WBALT-15 is shown in Figure 10-16.

A step-discharge pumping test was carried out with three increasing, constant and different flow rates, which were applied for 180 minutes each. Before starting the test, the static level was 9.07 mbgs. Average pumping rate, drawdown, and computed specific capacity for each 180-minute step are summarized in Table 10-44.

Figure 10-16: WBALT-15 Well Diagram



Source: Conhidro, 2022c.

Table 10-44: Summary of The Step-Discharge Test at Exploration Well WBALT-15.

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
WBALT-15	11/01/2022	1	3.83	1.29	2.97
		2	5.75	2.99	1.92
		3	10	6.86	1.45

A constant rate pumping test at well WBALT-15 started on October 25, 2022 with an average flow rate of 11.94 L/s; pre-pumping water level was 8.7 mbmp. A summary of the test is given in Table 10-45.

Table 10-45: Pumping Test Summary For Exploration Well WBALT-15

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 72 Hours of Pumping (m)	Residual Drawdown After 24 Hours of Recovery (m)	Specific Capacity (L/s/m)
WBALT-15	10/25/2022	72/24	8.7	11.94	7.79	0.68	1.53

A summary of computed aquifer parameters is given in Table 10-46. Analysis of the trend of groundwater level drawdown after pumping started until end of the test, indicates a transmissivity of about 177 m^2/d. Analysis of the trend of groundwater level recovery after pumping stopped indicates a transmissivity of about 289 m^2/d.

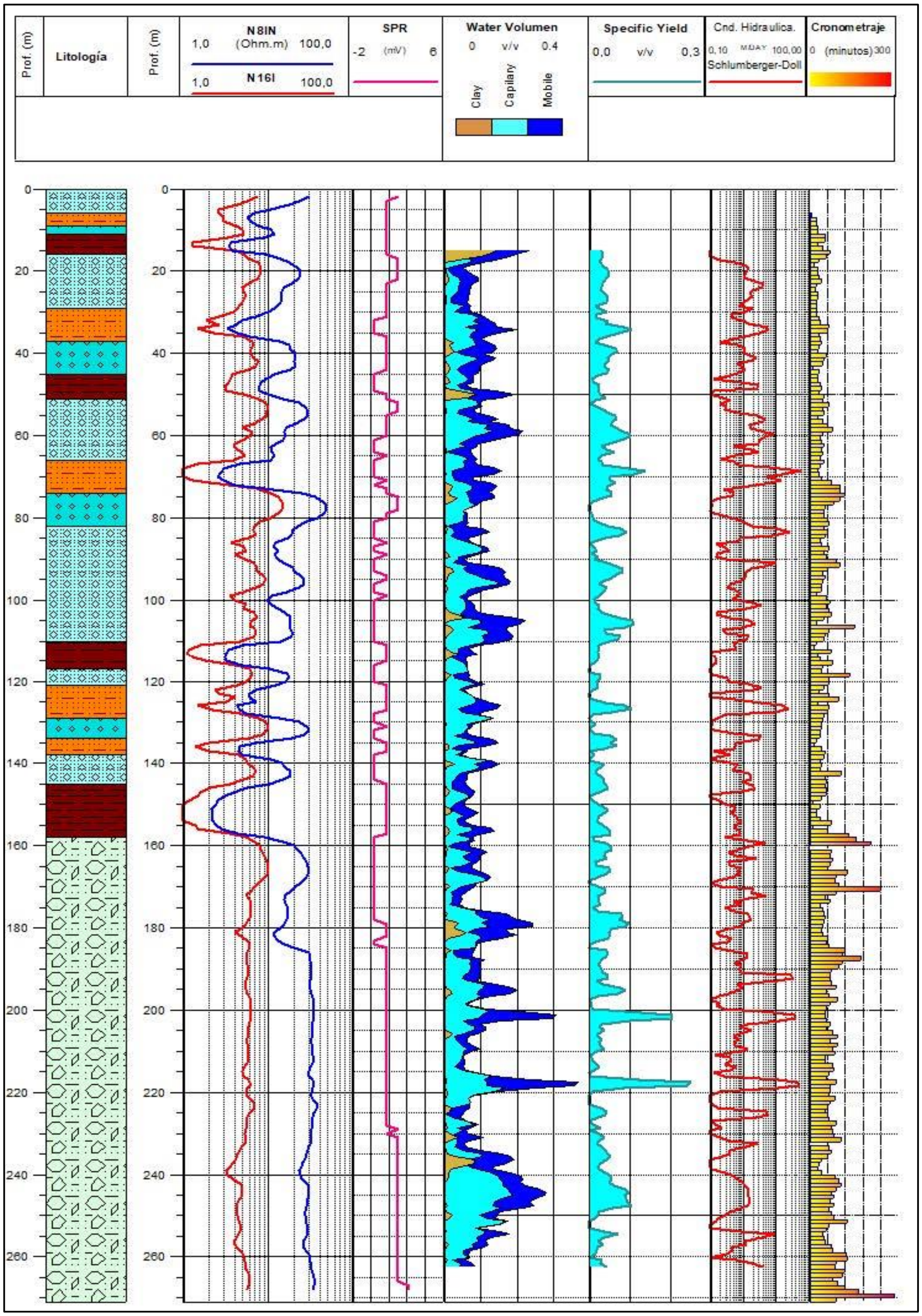
Table 10-46: Summary of Computed Aquifer Parameters at Well WBALT-15

Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
WBALT-15	11.94	177.4	288.8

10.2.1.16 Exploration Well WBALT-16

Drilling activities for the WBALT-16 exploration well commenced on January 18, 2023, reaching a depth of 272 mbgs on February 7, 2023. Well schematic for well WBALT-16 is shown in Figure 10-17. The results of the pumping tests were deemed inconclusive and repeat tests should be conducted.

Figure 10-17: WBALT-16 Well Diagram

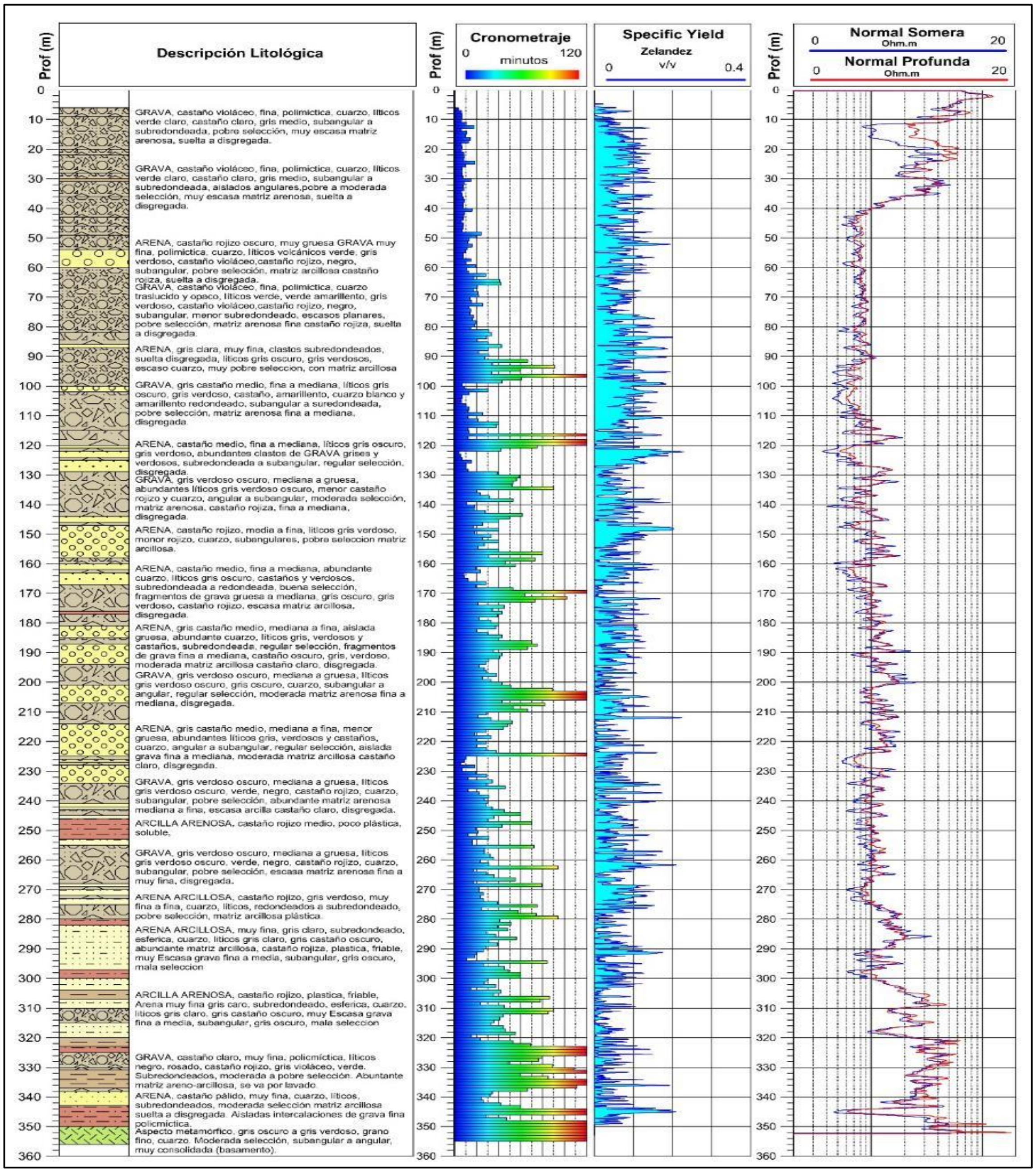


Source: Conhidro, 2023c.

10.2.1.17 Exploration Well WBALT-17

Drilling activities for the WBALT-17 exploration well commenced on October 2, 2022 reaching a depth of 355 mbgs on October 24, 2022. Well schematic for well WBALT-17 is shown in Figure 10-18. The results of the pumping tests were deemed inconclusive and repeat tests should be conducted.

Figure 10-18: WBALT-17 Well Diagram



Source: Conhidro, 2023b.

10.2.1.18 Exploration DDH-01

Drilling activities for the DDH-01 exploration well began on January 27, 2023, reaching a depth of 401 mbgs on March 24, 2023. The objective of the drilling was to extract core for in-depth analysis regarding information at depth under the Salar.

A circulation mud specially designed and adjusted for the particular conditions of a salt flat environment was used, but it was not possible to profile the well due to the instability of its walls. Brine samples were extracted using a packer system, but results were inconclusive.

10.2.1.19 Exploration DDH-02

Drilling activities for the DDH-02 exploration well began on April 17, 2023, reaching a depth of 191 mbgs on June 4, 2023. The objective of the drilling was to extract core for in-depth analysis regarding information at depth under the Salar. A circulation mud specially designed and adjusted for the particular conditions of a salt flat environment was used.

Once the exploratory drilling was completed, geophysical profiling of the well was carried out by Zelandez. Brine samples were extracted using a packer system, but results were inconclusive.

10.2.1.20 Exploration DDH-03

Drilling activities for the DDH-03 exploration well began on November 9, 2022, reaching a depth of 506 mbgs on December 04, 2022. The objective of the drilling was to extract core for in-depth analysis regarding information at depth under the Salar. A circulation mud specially designed and adjusted for the particular conditions of a salt flat environment was used.

Once the exploratory drilling was completed, geophysical profiling of the well was carried out by Zelandez. Brine samples were extracted using a packer system, but results were inconclusive.

10.2.1.21 Summary of Exploration Well Program

The exploration well program documented herein was designed to obtain additional aquifer hydraulic parameters, to develop a conceptual hydrogeological model, to obtain information to estimate an updated Mineral Resource Estimate, and to demonstrate that brine could be pumped from the salar to eventually support development of a lithium brine extraction project. Eighteen brine exploration wells (DDHB-01, WBALT-01, -02, -03, -04, -05, -06 -07, -09, -10, -11, -12, -13, -14, -15, -16, and -17, and Ex-ALT-08 in the southern concession area) are documented in this report. The wells were drilled up to a maximum depth of approximately 500 mbgs, and completed with 6- and 8-inch, 8-inch, or 10-inch and 6-inch PVC casing, except WBALT-05, which was completed with 6-inch galvanized steel casing.

The exploration wells in the basin identified a brine aquifer in the majority of the basin. Laboratory results confirm that enriched lithium occurs in the basin. Brine samples were collected during testing and sent for analysis to SGS Laboratory in Salta.

Pumping test results indicate that brine can be pumped from the wells and supports the premise that the basin represents a viable lithium exploitation project. Step-discharge and constant-discharge tests were conducted in completed exploration wells to estimate sustainable pumping capacity and aquifer parameters. According to pumping test results, transmissivity values ranged between 40 and 200 m^2/d for most of the wells, with wells WBALT-05 and -13 being less than 10 m^2/d. Pumping rates were typically between 10 - 20 L/s. In the southern concession, well EX-ALT-08 had a transmissivity of about 40 m^2/d and a pumping rate of about 4 L/s.

Exploration well EX-ALT-08 was drilled and tested in the south concession; groundwater encountered was fresh to brackish, and suggests that a freshwater source overlying a brine aquifer may occur in this part of the concession.

Overall, the QP believes that the results from the drilling exploration program are sufficient to update the lithium Resource Estimate.

10.2.2 Freshwater Wells

To date, the exploration program for freshwater has included drilling and construction of exploration wells FWBALT-01, -01A, -01B, and -02. No aquifer tests were conducted at the freshwater wells.

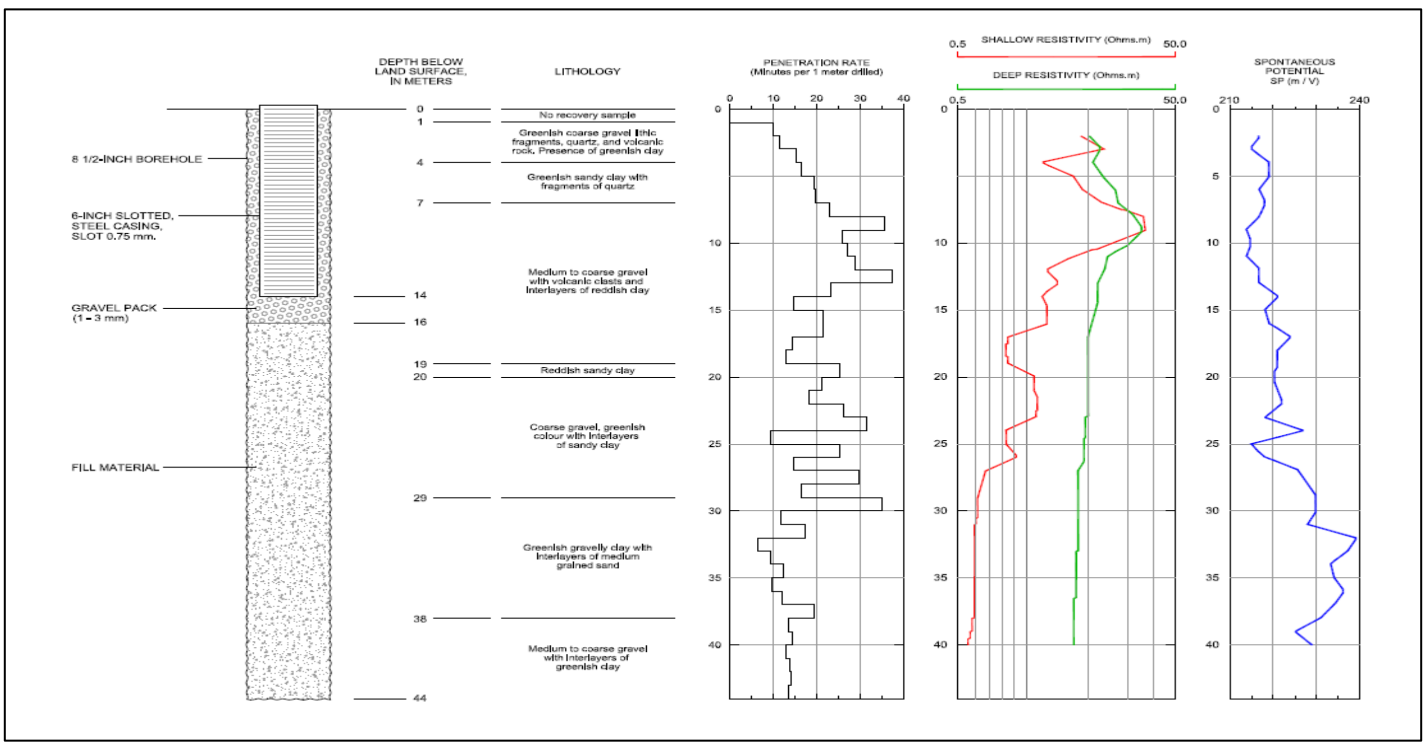
In the southern sector, in the vicinity of the FWWALT-02 well, a piezometer and a piezometric fluctuations well were built. Locations and total depths drilled for exploration wells are given in Table 10-1.

Geophysical surveys were conducted after pilot borehole drilling was completed. The surveys were performed by Zelandez, a geophysical logging company based in Salta province, Argentina. Geophysical logs performed by Zelandez included short-normal resistivity, long-normal resistivity, and spontaneous potential.

10.2.2.1 Freshwater Well FWWALT-01

Drilling activities for exploration well FWWALT-01 started in November 27, 2021, reaching the depth of 44 mbgs in the same month. Construction schematic for well FWWALT-01 is shown in Figure 10-19.

Figure 10-19: Freshwater FWWALT-01 Well Diagram

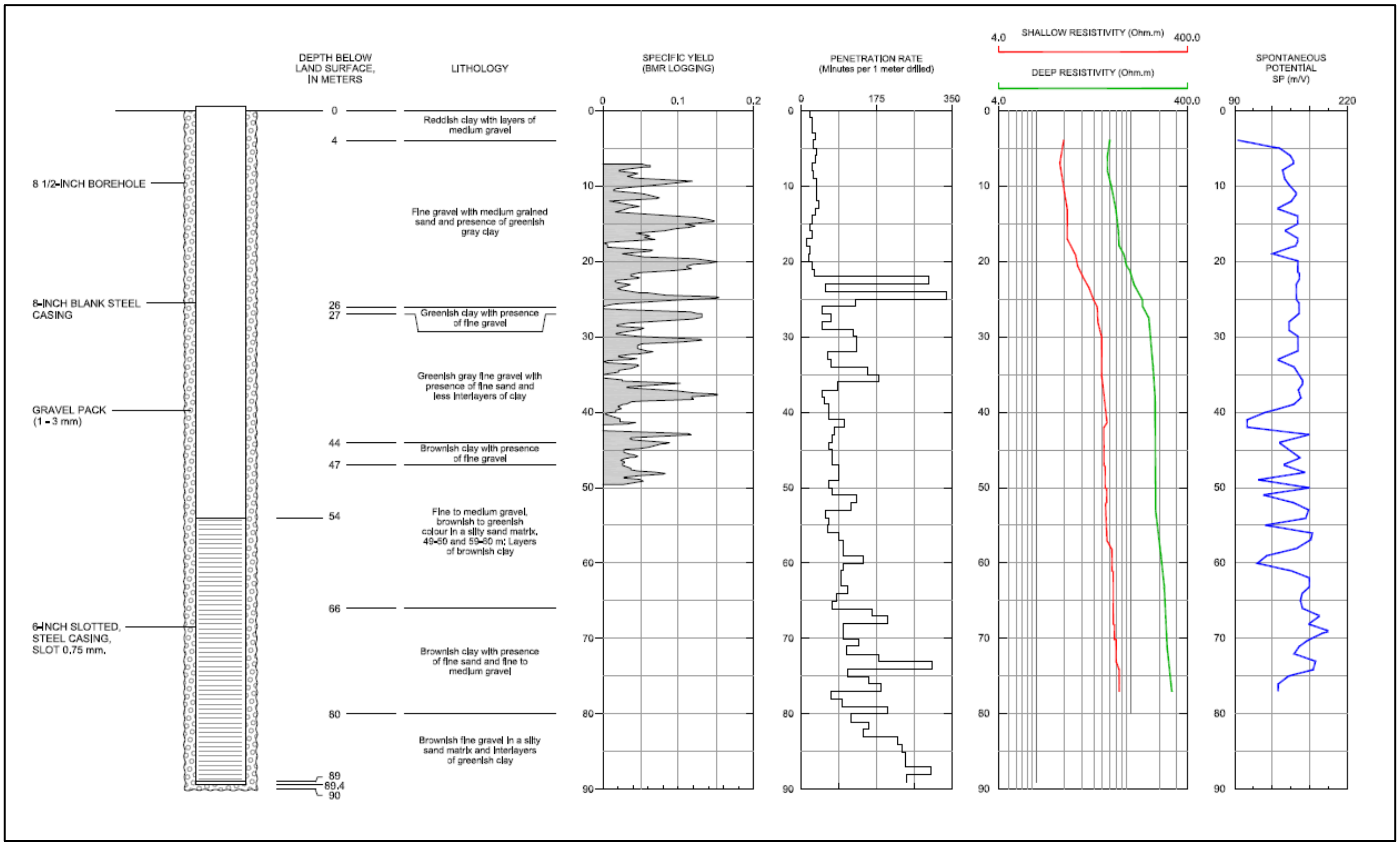


Source: Montgomery, 2022.

10.2.2.2 Freshwater Well FWWALT-01A

Drilling activities for exploration well FWWALT-01A started on June 03, 2021, reaching the depth of 89 mbgs in the same month. Construction schematic for well FWWALT-01A is shown in Figure 10-20.

Figure 10-20: Freshwater FWWALT-01A Well Diagram

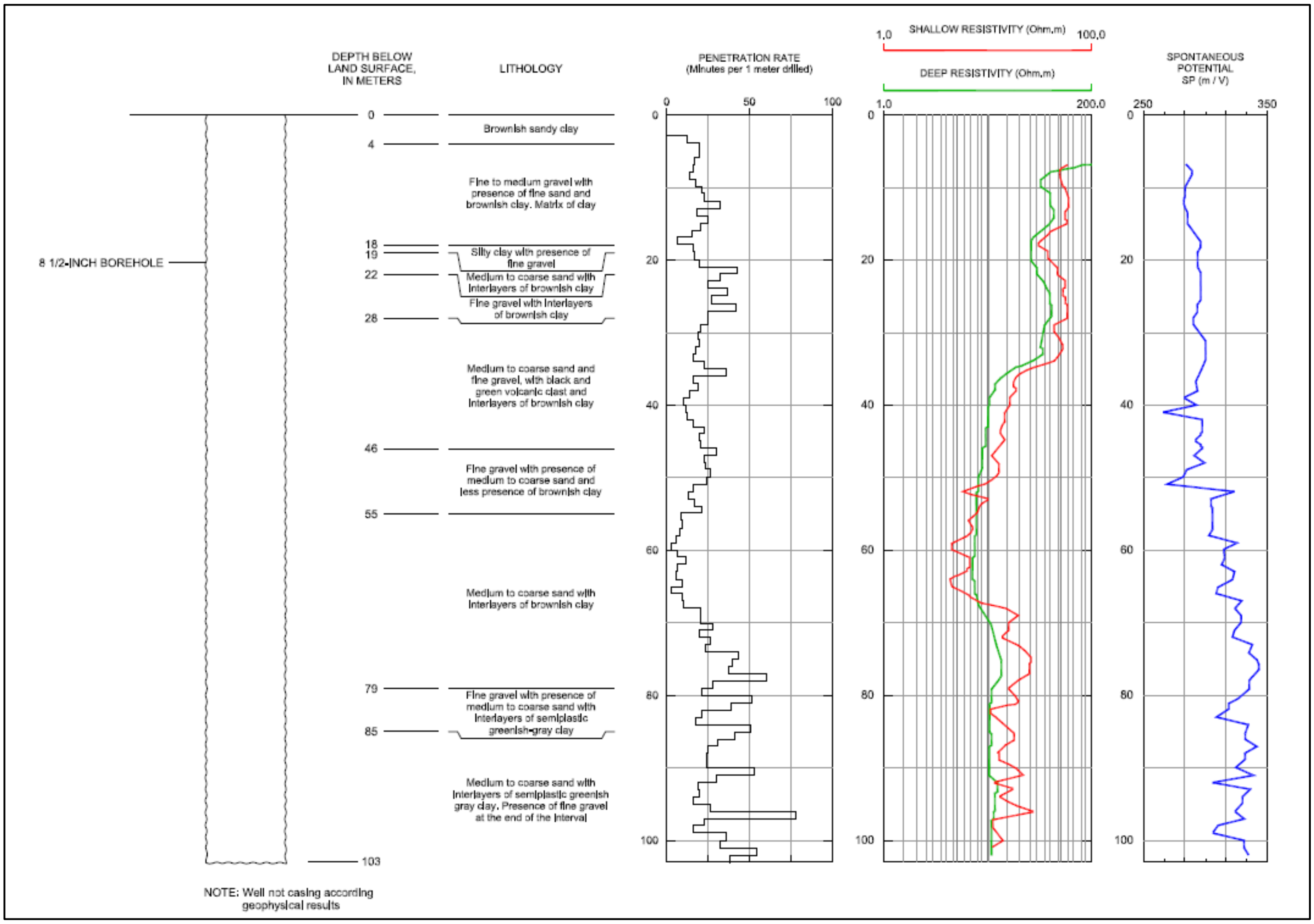


Source: Montgomery, 2022.

10.2.2.3 Freshwater Well FWWALT-01B

Drilling activities for exploration well FWWALT-01B started on October 01, 2021, reaching the depth of 103 mbgs in the same month. Construction schematic for well FWWALT-01B is shown in Figure 10-21. According to the results of the geophysical logging, and after a pumping test was conducted in the uncased hole, it was decided not to case the well, and it was abandoned.

Figure 10-21: Freshwater FWWALT-01B Well Diagram



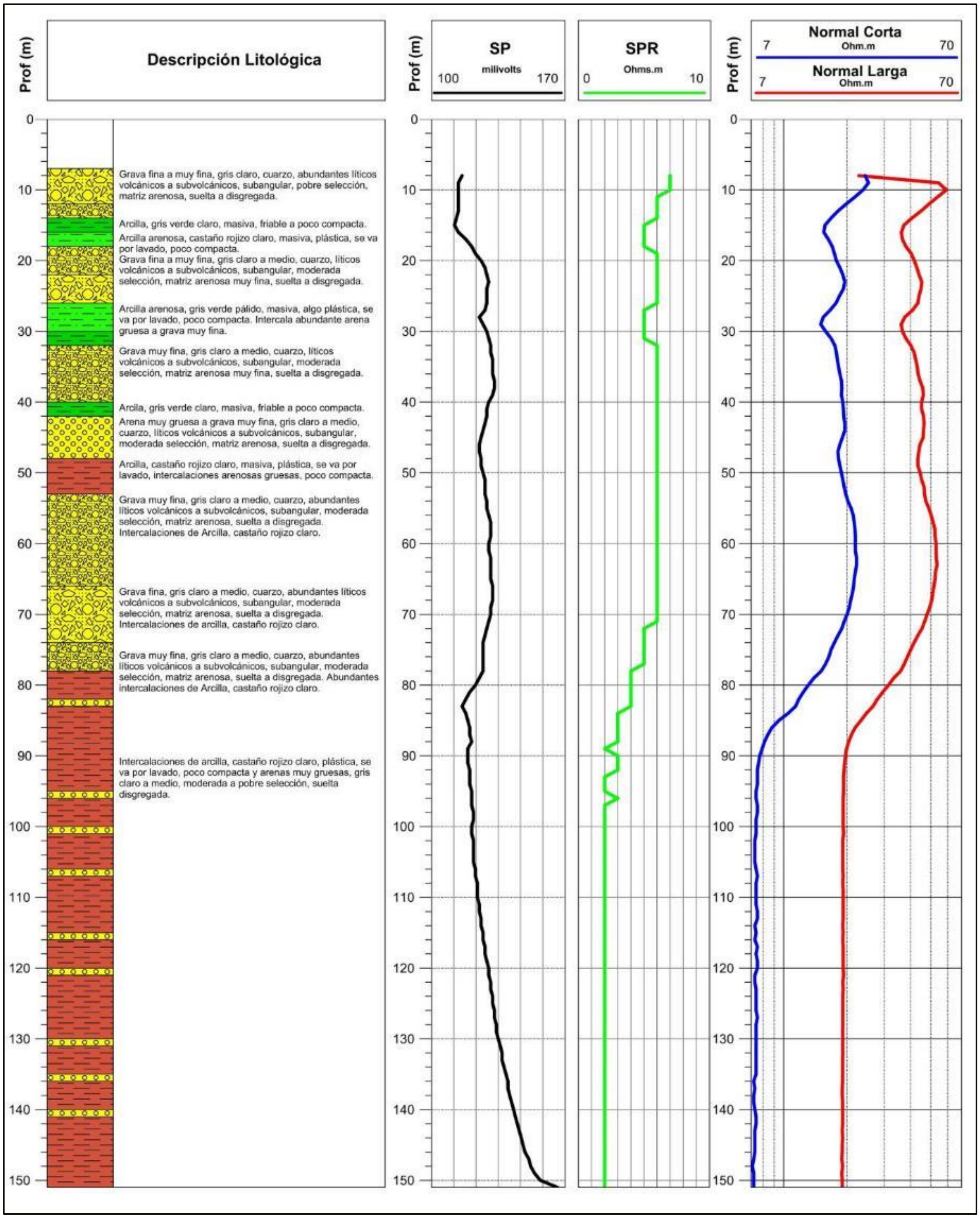
Source: Montgomery, 2022.

10.2.2.4 Freshwater Well FWWALT-02

Drilling activities for exploration well FWWALT-02 were finished on December 06, 2021, reaching the depth of 151 mbgs. Construction schematic for well FWWALT-02 is shown in Figure 10-22.

On January 20, 2022, a step-discharge test was conducted at well FWWALT-02 to evaluate drawdown at different pumping rates for determination of sustainable pumping capacity of the well for the constant-discharge test. Pumping for the step-discharge test commenced at 8:55 AM. The step-discharge test consisted of three 120-minute steps and the pre-pumping water level was at a depth of 17.65 mbmp. Average pumping rate, drawdown, and computed specific capacity for each step are summarized in Table 10-47.

Figure 10-22: Freshwater FWWALT-02 Well Diagram



Source: Conhidro, 2022f.

Table 10-47: Summary of The Step-Discharge Test at Exploration Well FWWALT-02

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
FWWALT-02	01/020/2022	1	3.3	2.56	1.3
		2	6.6	5.76	1.1
		3	12.2	11.35	1.1

A constant rate pumping test at well FWWALT-02 started on December 21, 2021 with an average flow rate of 11.7 L/s; pre-pumping water level was 17.59 mbmp. A summary of the test is given in Table 10-48. The pumping test stopped on December 23, 2021, after 48 hours; water level recovery measurements were then manually measured during the following 12 hours.

Table 10-48: Pumping Test Summary For Exploration Well FWWALT-02

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 48 Hours of Pumping (m)	Residual Drawdown After 12 Hours of Recovery (m)	Specific Capacity After 72 Hours of Pumping (L/s/m)
WFFALT-02	12/21/2021	48/12	17.59	11.7	11.02	0.14	1.06

Drawdown data were analyzed for aquifer transmissivity using the semi-logarithmic graphical method developed by Cooper and Jacob (1946) using Aqtesolv software (HydroSOLVE, 2008) and verified manually. The Theis (1935) recovery method results are generally considered to be more reliable.

A summary of computed aquifer parameters is given in Table 10-49. Analysis of the trend of groundwater level drawdown for the duration of the test indicates a transmissivity of about 240 m^2/d. Analysis of the trend of groundwater level recovery for the early period after pumping stopped indicates a transmissivity of about 360 m^2/d. A reasonable estimation of the “operative” transmissivity for well FWWALT-02 is considered to be 360 m^2/d.

Table 10-49: Summary of Computed Aquifer Parameters at Well FWWALT-02

Pumped Well ID	Average Pumping Rate (L/s)	Cooper-Jacob (1946) Drawdown Method Transmissivity (m^2/d)	Theis (1935) Recovery Method Transmissivity (m^2/d)
FWWALT-02	1.2	240	360

10.2.2.5 Freshwater Exploration Summary

A freshwater exploration program was executed in 2022 and consisted of three exploration boreholes in the northwest part of the northern concession area, and one borehole in the southwest part of the north concession. A single sample was obtained from an open hole at borehole FWWALT-02 in the southwest area and, although not considered potable, is generally considered fresh. Brine exploration well EX-ALT-08 drilled and tested in the south concession was fresh to brackish, and suggests that a freshwater source also occurs in this part of the concession. Additional exploration of the southern concession is recommended to identify a sustainable freshwater source, and to determine confirm if there is a lithium brine located at depth in this part of the Tolillar Project.

In addition, it appears that there is freshwater in the upper part of the aquifer in the far north part of the concessions in the area of WBALT-10 and -11. It is recommended that relatively shallow exploration wells be installed in this area and also northwest and west from WBALT-11 to determine the nature of the freshwater system.

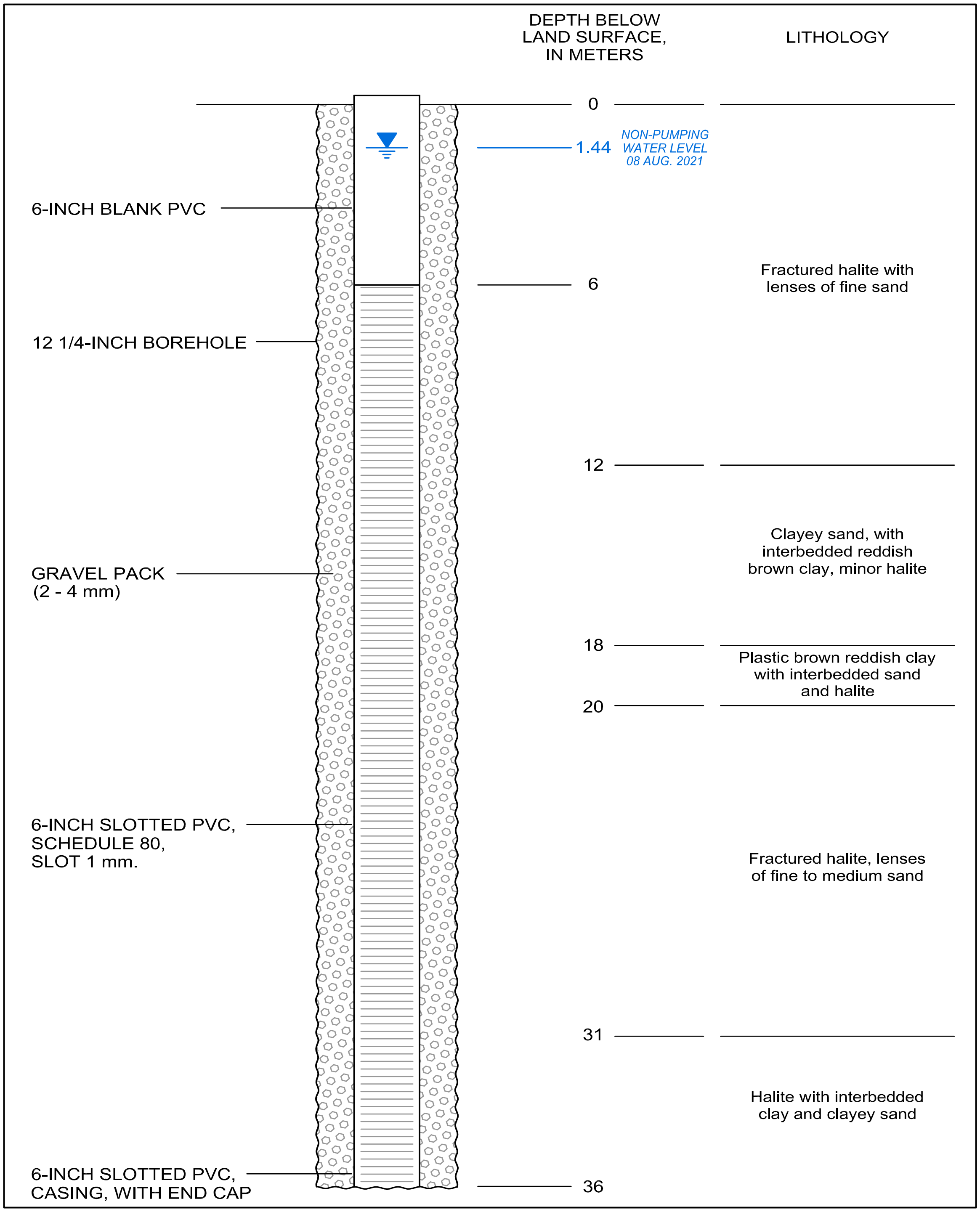
10.2.3 Piezometer Program

To date, three piezometer wells were constructed. Locations and total depths drilled for piezometer boreholes are given in Table 10-1.

10.2.3.1 Piezometer WBALT-03P

Drilling activities for well WBALT-03P started on July 28, 2021, reaching the depth of 36 mbgs on July 29, 2021. Well schematic for well WBALT-03P is shown in Figure 10-23.

Figure 10-23: Piezometer WBALT-03P Well Diagram

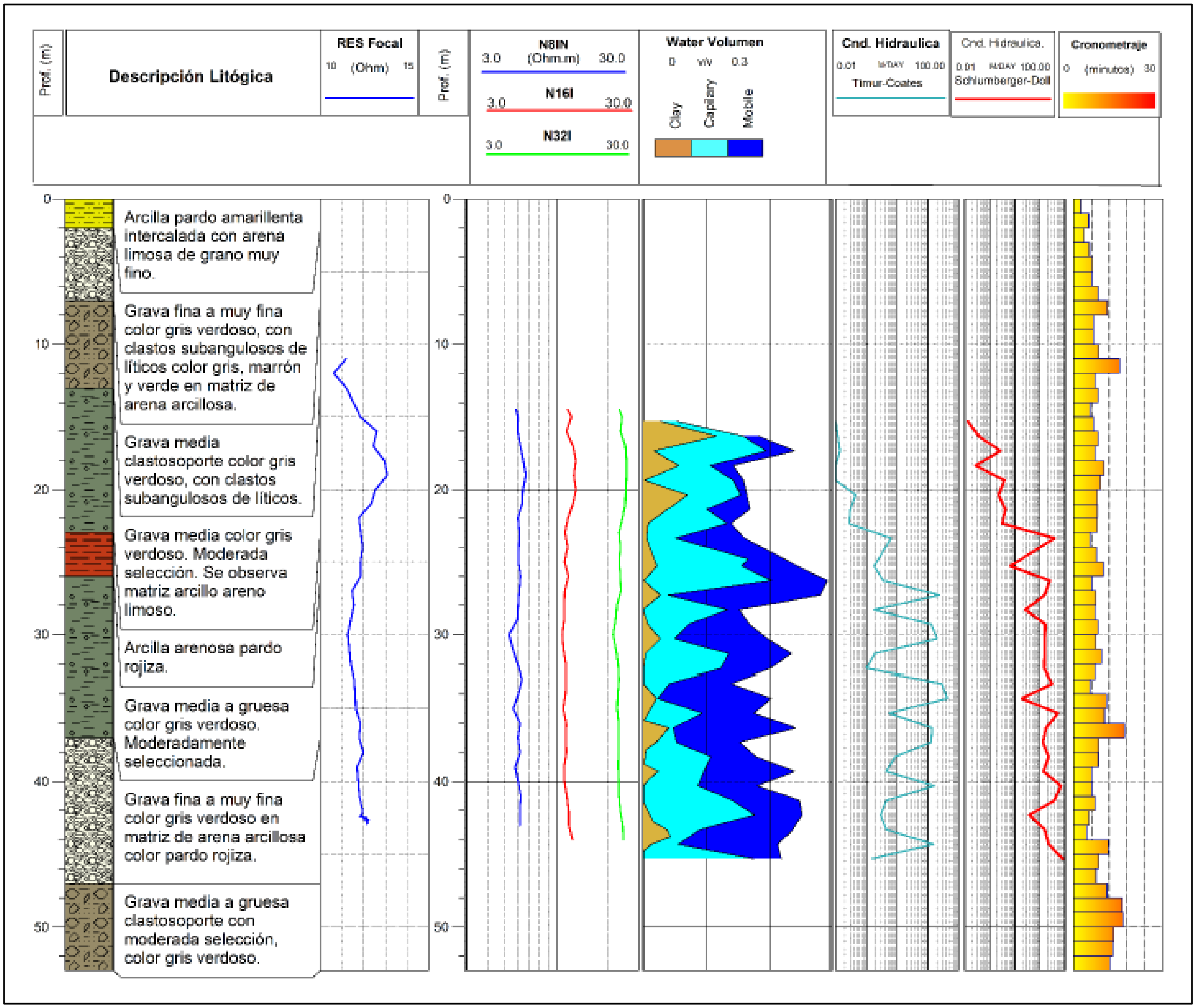


Source: Montgomery, 2022.

10.2.3.2 PzWRALT-01

The PzWRALT-01 fluctuation well was constructed to measure static level variations in the recharge zone of the FWWALT-02 well. Well schematic for well WBALT-03P is shown in Figure 10-24. Drilling activities for the PzWRALT-01 well commenced on September 16, 2022, reaching a depth of 53 mbgs on October 19, 2022. The step-discharge test consisted of three increasing and constant flow rates, and each flow rate lasted for one hour as summarized in Table 10-50. Water level recovery of the well was measured after pumping was completed.

Figure 10-24: Piezometer PzWRALT-01 Well Diagram



Source: Conhidro, 2022c.

Table 10-50: Summary of The Step-Discharge Test at PZWRALT-01 WELL

Well ID	Test Date (mm/dd/yyyy)	Step	Average Pumping Rate (L/s)	Maximum Drawdown (m)	Specific Capacity (L/s/m)
PzWRALT-1	11/01/2022	1	0.88	1.47	0.6
		2	2.21	3.73	0.59
		3	4.31	7.33	0.58

A constant rate pumping test at well PzWRALT-01 started on Nov 02, 2022 with an average flow rate of 4.92 L/s for a duration of 360 minutes for both pumping and recovery, in order to estimate the hydraulic parameters of the reservoir. The static level of the well before starting this test was 22.16 m. Results are summarized in Table 10-51.

A summary of computed aquifer parameters is given in Table 10-52.

Table 10-51: Pumping Test Summary For PZWRALT-01 WELL

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (mbgs)	Average Pumping Rate (L/s)	Drawdown After 6 Hours of Pumping (m)	Residual Drawdown After 6 Hours of Recovery (m)	Specific Capacity After 6 Hours of Pumping (L/s/m)
PzWRALT-1	11/02/2022	6/6	22.16	4.92	1.18	0	4.17

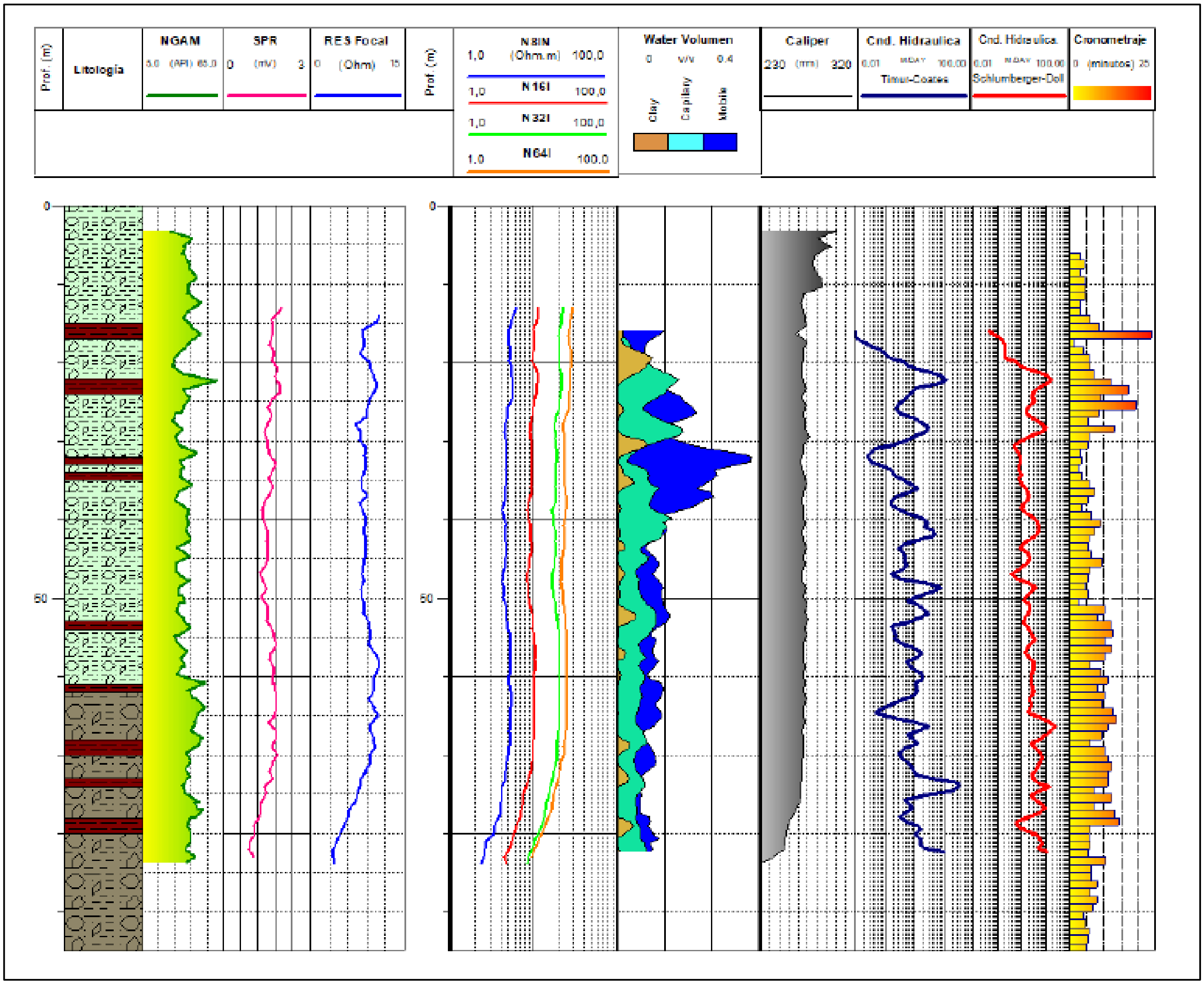
Table 10-52: Summary of Computed Aquifer Parameters at PZWRALT-01 Well

Well ID	Average Pumping Rate (L/s)	Theis (1935) Recovery Method Transmissivity (m^2/d)
PzWRALT-1	4.92	345.2

10.2.3.3 PzWRALT-02

The PzWRALT-02 piezometer well was constructed to measure static level variations in the recharge zone of the FWWALT-02 well. Well schematic for well PZWRALT-02 is shown in Figure 10-25. Drilling activities for the PzWRALT-02 well commenced on October 19, 2022, reaching a depth of 95 mbgs on October 22, 2022, from which piezometric levels were measured. Due to the well being located at a distance of 10 m from FWWALT-02, step-discharge testing was not performed. Table 10-53 shows summarized results.

Figure 10-25: Piezometer PzWRALT-02 Well Diagram



Source: Conhidro, 2022d.

A summary of computed aquifer parameters is given in Table 10-54.

Table 10-53: Pumping Test Summary For PZWRALT-02 Well

Well ID	Date Pumping Started (mm/dd/yyyy)	Pumping / Recovery Duration (h)	Pre-Pumping Water Level (meters, bls)	Average Pumping Rate (L/s)	Drawdown After 12 Hours of Pumping (m)	Residual Drawdown After 9 Hours of Recovery (m)	Specific Capacity After 12 Hours of Pumping (L/s/m)
PzWRALT-2	10/20/2022	12/9	17.59	11.73	10.98	0.17	1.07

Table 10-54: Summary of Computed Aquifer Parameters at PZWRALT-02 WELL

Pumped Well ID	Average Pumping Rate (L/s)	Theis (1935) Recovery Method Transmissivity (m^2/d)
PzWRALT-2	11.73	239.9

10.2.3.4 Piezometer Exploration Summary

Piezometer readings were taken from three wells, WBALT-03P drilled at brine well WBALT-03, and PzWRALT-01 and PzWRALT-02 drilled in the southern area of the concessions. The latter two are located within proximity to the freshwater well FWWALT-02. Borehole PzWRALT-01 is considered to be optimal for taking piezometric level measurements for any future recharge studies conducted in the area. While borehole PzWRALT-02 is also considered optimal for measurements, it is intended to be the observation well for FWWALT-02.

10.3 Pumping Test Brine Sample Results for 2020 - 2023 Field Program

Alpha Lithium has collected and received laboratory results for composite brine samples collected from wells DDHB-01, WBALT-01, -02, -03, -04, -05, -06, -07, EX-ALT-08, WBALT-09, -10, -11, -12, -13, -14, -15, and FWWALT-02 obtained during the pumping test at each well. Results are summarized in Table 10-55 through Table 10-71.

Table 10-55: Well DDHB-01 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AK46	201	1493	2146	N/A	7.43
AK47	203	1504	2194	N/A	7.41
AVERAGE	202	1498	2170	N/A	7.42

Pumping test operations conducted at pumping well DDHB-01 during the period July 25 through July 27, 2018.

Table 10-56: Well WBALT-01 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
BLCSM-0020	113	799	831	69.9	7.07
BLCSM-0021	97	815	842	69.7	8.39
BLCSM-0022	96	819	864	69.2	8.57
BLCSM-0024	96	816	805	68.6	8.51
BLCSM-0025	98	843	853	69.7	8.60
BLCSM-0026	95	813	815	66.8	8.59
BLCSM-0027	96	826	819	69.0	8.60
AVERAGE	99	819	833	69.0	8.33

Pumping test operations conducted at pumping well WBALT-01 during the period December 18 through December 20, 2020.

Table 10-57: Well WBALT-02 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
BLCSM-0048	206	2180	2550	208	10.58
BLCSM-0049	220	2220	2600	212	10.09
BLCSM-0050	209	1890	2250	209	9.04
BLCSM-0051	212	1160	1990	207	5.47
BLCSM-0052	205	1780	2080	198	8.68
AVERAGE	210	1846	2294	207	8.77

Pumping test operations conducted at pumping well WBALT-02 during the period February 18 through February 19, 2021.

Table 10-58: Well WBALT-03 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0058	212.8	1342.5	2969.5	153.5	6.33
AST_0059	220.3	1387.1	3068.6	157.1	6.30
AST_0061	212.0	1350.0	2955.8	154.4	6.37
AST_0062	218.8	1393.6	3049.0	155.2	6.37
AST_0063	221.8	1415.3	3092.9	159.1	6.38
AST_0064	228.3	1472.7	3221.7	168.9	6.45
AST_0065	211.8	1341.1	2945.3	145.2	6.33
AVERAGE	218.0	1386.0	3043.3	156.2	6.36

Pumping test operations conducted at pumping well WBALT-03 during the period September 13 through September 16, 2021.

Table 10-59: Well WBALT-04 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST-0001	202	1170	1236	103.1	5.80
AST-0002	205	1196	1298	107.0	5.84
AST-0003	199	1116	1240	100.8	5.60
AST-0004	194	1080	1132	91.6	5.58
AST-0005	197	1296	1266	100.8	6.58
AST-0006	199	1182	1221	95.6	5.95
AST-0007	191	1108	1070	84.6	5.80
AST-0008	192	1218	1115	87.8	6.35
AVERAGE	197	1171	1197	96.5	5.94

Pumping test operations conducted at pumping well WBALT-04 during the period April 27 through April 30, 2021.

Table 10-60: Well WBALT-05 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
BLCSM-0060	344	2710	3090	256	7.88
BLCSM-0061	362	2790	3150	256	7.71
BLCSM-0062	354	2730	3550	258	7.71
BLCSM-0063	351	2850	3250	252	8.12
BLCSM-0064	351	2790	3090	253	7.95
BLCSM-0065	346	2900	3410	259	8.38
AVERAGE	351	2795	3257	256	7.96

Pumping test operations conducted at pumping well WBALT-05 during the period March 27 through March 28, 2021.

Table 10-61: Well WBALT-06 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST-0106	262.0	324.0	2336	188.0	1.23
AST-0107	270.0	328.0	2381	199.0	1.22
AST-0108	259.0	350.0	2368.0	202.0	1.35
AST-0109	249.0	314.0	2319.0	191.0	1.26
AST-0111D	252.0	---	2366.6	191.8	---
AST-0112	244.9	---	2283.3	193.4	---
AST-0113	249.2	---	2327.6	196.2	---
AST-0114	247.6	---	2284.3	192.0	---
AST-0115	253.6	---	2359.7	195.0	---
AVERAGE	249.5	---	2324.3	193.7	---

--- Data considered unreliable
D Duplicate sample

Pumping test operations conducted at pumping well WBALT-06 during the period January 26 through January 28, 2022.

Table 10-62: Well WBALT-07 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0081	323.0	1611.0	2424.0	215.0	4.99
AST_0082	313.0	---	3253.0	216.0	0.00
AST_0083	339.0	1649.0	2520.0	215.0	4.87
AST_0084	365.0	1792.0	2707.0	231.0	4.91
AST-0085	351.9	1745.4	2634.1	224.4	4.96
AST-0086	343.8	1684.3	2534.9	221.5	4.90
AST-0088	351.0	1721.0	2645.9	221.0	4.90
AST-0089	340.2	1675.2	2533.5	215.3	4.92
AST-0091	340.2	1662.0	2530.5	216.3	4.89

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST-0092	343.0	1679.5	2560.4	215.2	4.90
AVERAGE	343.0	1701.0	2657.6	219.0	4.91

Pumping test operations conducted at pumping well WBALT-07 during the period October 17 through October 20, 2021.

Table 10-63: Well EX-ALT-08 Brine Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST-0098	10.3	46.3	65.1	<10	4.50
AST-0099	<10	31.4	37.3	<10	N/A
AVERAGE	N/A	38.9	51.2	N/A	N/A

Pumping test operations conducted at pumping well Ex-ALT-08 during the period December 12 through December 16, 2021. The chemical signature of the groundwater at this location suggests that it may be a potential location for a fresh or brackish water exploration program.

Table 10-64: Well WBALT-09 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0428	219	1579	2246	168	7.21
AST_0429	202	1443	2118	155	7.14
AST_0431	226	1626	2271	173	7.19
AST_0432	205	1450	2119	159	7.07
AST_0433	256	1790	2393	191	6.99
AST_0434	234	1626	2300	176	6.95
AST_0435	232	1628	2267	177	7.02
AST_0436	251	1737	2362	188	6.92
AST_0438	246	1691	2384	187	6.87
AST_0439	253	1750	2365	189	6.92
AST_0441	179	1232	2102	140	6.88
AVERAGE	228	1596	2266	173	7.02

Pumping test operations conducted at pumping well WBALT-09 during the period March 12 through March 15, 2022.

Table 10-65: Well WBALT-10 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST319	65	724	557	42	11.14
AST321	64	729	555	41	11.39
AST322	65	734	555	42	11.29
AST323	64	725	549	42	11.33
AST324	65	726	557	42	11.17

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST325	64	725	563	42	11.33
AST326	65	724	552	42	11.14
AST327 D	65	725	555	41	11.15
AST328	66	734	556	42	11.12
AST329	66	735	553	41	11.14
AST331	66	730	544	41	11.06
AST332	66	732	532	41	11.09
AST333	65	729	556	41	11.22
AST334	66	733	569	42	11.11
AST335	65	732	551	42	11.26
AVERAGE	65	729	554	42	11.20

D Duplicate sample

Pumping test operations conducted at pumping well WBALT-10 during the period July 6 through July 10, 2022.

Table 10-66: Well WBALT-11 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST391	127	1418	1470	123	11.17
AST392	125	1359	1451	120	10.87
AST393	124	1325	1470	119	10.69
AST394	121	1312	1446	118	10.84
AST395	123	1322	1467	119	10.75
AST396	122	1310	1466	118	10.74
AST398	124	1332	1471	121	10.74
AST399	123	1319	1439	120	10.72
AST401	125	1328	1488	120	10.62
AST402	125	1329	1487	120	10.63
AST404	118	1297	1455	117	10.99
AST405	129	1408	1488	121	10.91
AST406	129	1400	1477	120	10.85
AST408	128	1324	1491	117	10.34
AVERAGE	125	1342	1469	120	10.78

Pumping test operations conducted at pumping well WBALT-11 during the period August 13 through 20, 2022.

Table 10-67: Well WBALT-12 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0584	163	984	2120	160	6.04
AST_0585	164	980	2132	162	5.98
AST_0586	164	969	2153	162	5.91
AST_0588	156	992	1928	135	6.36
AST_0589	163	1051	1872	130	6.45
AST_0593	186	1284	1726	115	6.90
AST_0594	186	1276	1722	115	6.86
AST_0595	185	1285	1708	114	6.95
AVERAGE	171	1103	1920	137	6.43

Pumping test operations conducted at pumping well WBALT-12 during the period April 2 through April 8, 2022.

Table 10-68: Well WBALT-13 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST-302	265	2236	2596	220	8.44
AST-303	177	1557	1760	152	8.80
AST-304	171	1531	1739	151	8.95
AST-305	171	1520	1736	151	8.89
AST-306	159	1433	1612	141	9.01
AST-308	156	1410	1649	141	9.04
AST-309	157	1418	1596	141	9.03
AST-311	156	1411	1577	140	9.04
AST-312	153	1389	1574	137	9.08
AST-313	156	1394	1567	138	8.94
AVERAGE	172	1530	1741	151	8.92

Pumping test operations conducted at pumping well WBALT-13 during the period July 9 through 12, 2022.

Table 10-69: Well WBALT-14 Brine Sample Results Obtained During Pumping Tests

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0566	292	1744	3062	233	5.97
AST_0567 D	295	1749	3069	236	5.93
AST_0568	283	1686	2787	205	5.96
AST_0569	292	1713	3057	230	5.87
AST_0571	296	1734	3109	236	5.86
AST_0572	269	1568	2217	167	5.83
AST_0573	296	1727	2965	236	5.83
AST_0574	298	1718	2970	233	5.77

Sample ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST_0575	293	1731	2966	234	5.91
AST_0576	296	1725	2957	234	5.83
AST_0577 D	296	1725	2970	231	5.83
AST_0578	296	1723	2967	232	5.82
AST_0579	297	1728	2972	233	5.82
AST_0581	298	1727	2998	234	5.80
AST_0582	295	1735	2972	232	5.88
AST_0583	296	1730	3016	234	5.84
AVERAGE	293	1716	2941	228	5.86

D Duplicate sample

Pumping test operations conducted at pumping well WBALT-14 during the period April 8 through April 12, 2023.

Table 10-70: Well WBALT-15 Brine Sample Results Obtained During Pumping Tests

SAMPLE ID	Li (mg/L)	Mg (mg/L)	K (mg/L)	B (mg/L)	Mg/Li
AST411	316	1475	3072	264	4.92
AST412	342	1650	3159	267	5.16
AST413	342	1776	3215	271	5.21
AST414	334	1786	3216	267	5.32
AST415	341	1786	3213	270	5.35
AST416	339	1634	3164	266	5.17
AST417 D	334	1793	3212	265	5.24
AST418	341	1806	3184	268	5.28
AST419	334	1800	3183	266	5.39
AST421	329	1798	3183	265	5.27
AST422	332	1786	3162	266	5.27
AST_0423	300	1795	3174	263	5.37
AST_0424	320	1802	3212	260	5.28
AST_0425	341	1764	3146	268	5.28
AST_0426	336	1801	3201	271	5.47
AST_0427 D	334	1801	3172	268	5.42
AVERAGE	332	1753	3179	267	5.28

D Duplicate sample

Pumping test operations conducted at pumping well WBALT-15 during the period October 25 through November 1, 2023.

Table 10-71: Well FWWALT-02 Brine Sample Results Obtained During Pumping Tests

Sample ID	Date (mm-yyyy)	Li (mg/L)	Na (mg/L)	K (mg/L)	Cl (mg/L)	Total Dissolved Solids (mg/L)
AST-0243	06-2022	0.56	869.44	10.49	544.7	1442

Pumping conducted at pumping well FWWALT-02 during June 2022.

10.3.1 Brine Sampling Using Hydrasleeve System

Depth-specific brine samples using Hydrasleeve HS-2 disposable samplers were collected from wells DDHB-01, WBALT-01, -02, -04, 05, and WBALT-03P in May 2021.

Results are summarized in Table 10-72 to Table 10-74.

Table 10-72: Collected from Select Wells

Well ID	Sample ID	Depth of Sample (m)	Li (mg/L)	K (mg/L)
WBALT-01	AST-0025	8	39	440
WBALT-01	AST-0026	38	64	652
WBALT-01	AST-0027 D	38	63	627
WBALT-02	AST-0028	50	192	2192
WBALT-02	AST-0029	80	236	2543
WBALT-02	AST-0031	110	197	2201
WBALT-02	AST-0032	124	184	2323
WBALT-04	AST-0033	15	97	1231
WBALT-04	AST-0034	45	105	1251
WBALT-04	AST-0035	75	182	1820
WBALT-05	AST-0036	177	295	3017
WBALT-05	AST-0037 D	177	280	2847
WBALT-05	AST-0038	205	288	2882
WBALT-05	AST-0039	235	301	3025
WBALT-05	AST-0041	265	58	774
WBALT-05	AST-0042	298	298	3048
WBALT-05	AST-0043	328	304	3056
DDHB-01	AST-0044	54	293	2962
DDHB-01	AST-0045	80	107	1395
DDHB-01	AST-0046	112	72	912
DDHB-01	AST-0047 D	112	81	1007
WBALT-03P	AST-0048	32	12	366

D Duplicate sample

Hydrasleeve sampling was conducted during May 2021 on exploration wells drilled in years 2018 to 2021.

Table 10-73: Lithium and Potassium Results From Hydrasleeve Brine Sampling

Exploration Well Identifier	Total Depth (m)	Number of Brine Samples Collected and Analyzed	Average Lithium Content of Brine Samples (mg/L)	Median Lithium Content of Brine Samples (mg/L)	Lithium Content Standard Deviation (mg/L)	Average Potassium Content of Brine Samples (mg/L)	Median Potassium Content of Brine Samples (mg/L)	Potassium Content Standard Deviation (mg/L)
WBALT-01	43.0	3+D	51	63.1	130.4	546	627.2	116.1
WBALT-02	130.0	4	102	194.6	112.0	2315	2262.4	163.3
WBALT-03P	32.0	1	12	---	---	366	---	---
WBALT-04	80.0	3	128	105.1	243.0	1434	1251.1	334.5
WBALT-05	352.0	6+D	261	295.4	739.7	2664	3017.3	837.7
DDHB-01	208.3	4+D	138	93.6	888.2	1569	1201.4	951.9
TOTAL	813.3	21	-	-	-	-	-	-

+D Includes duplicate sample

Table 10-74: Magnesium/Lithium and Lithium/Sulfate Ratios Calculated From Hydrasleeve Brine Sampling

Exploration Well Identifier	Total Depth (m)	Number of Brine Samples Collected and Analyzed	Average Mg/Li Ratio of Brine Samples	Median Mg/Li Ratio of Brine Samples	Mg/Li ratio Standard Deviation	Average SO4/Li Ratio of Brine Samples	Median SO4/Li Ratio of Brine Samples	SO_4/Li Ratio Standard Deviation
WBALT-01	43.0	3+D	12	11.3	0.75	102	91.4	19.4
WBALT-02	130.0	4	10	10.0	0.62	75	82.9	17.2
WBALT-03P	32.0	1	18	---	---	371	---	---
WBALT-04	80.0	3	11	11.1	1.76	77	77.5	5.2
WBALT-05	352.0	6+D	9	8.9	1.07	67	56.6	20.8
DDHB-01	208.3	4+D	10	9.9	0.83	85	90.8	18.9
TOTAL	813.3	21	-	-	-	-	-	-

+D Includes duplicate sample

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 Overview

The following section applies to the initial and second surface sampling programs conducted by Argañaraz & Associates, and also to the subsequent exploration drilling and testing program conducted by Alpha Lithium. Brine samples were obtained for laboratory analyses. Additionally, Montgomery staff conducted several confirmatory tests to evaluate the brine chemistry. During the pumping tests, composite brine samples were obtained from several wells.

After the samples were sealed on site, they were stored at the Argañaraz & Associates (operations manager for one of the vendors) office in Salta, and then selected samples were shipped to the laboratories for analysis. Original samples not sent to the laboratory, and duplicate brine samples are stored at the Argañaraz & Associates office in Salta. Recent samples obtained by Montgomery were stored in Salta with Montgomery staff.

11.2 Brine Sampling Methodology

Four methods were used to obtain brine samples along the exploration programs conducted. Brine samples were used to support the reliability of the depth-specific samples included analyses of the following:

- Bailed samples from shallow trenches, and shallow pits-boreholes,
- Bailed and pumped sampling at well DDHB-01,
- Brine samples obtained near the end of the pumping tests in the exploration wells, and
- Brine samples obtained using depth-specific Hydrasleeve sampling bags.

11.2.1 Shallow Surface Sample Collection And Preparation

A surface brine sampling program covering the Tolillar Project properties was conducted during 2012, 2014, and 2015. Samples were obtained manually from shallow, hand-dug pits, trenches, and from shallow boreholes. A total of 26 brine samples (not including duplicate samples) were collected; lithological descriptions of the aquifer material in the upper part of the Salar were prepared. The brine samples were collected by means of plastic bottles and bailers. Once at the surface, the brine in the bailer was poured into a clean, 1-liter, plastic bottle. The bottles were labeled and with sample information documented. Sample containers were transported to the assay laboratory by the project geologists.

11.2.2 Brine Sampling During Exploration Well Pumping Tests

Brine samples were collected during pumping tests conducted on recently-drilled WBALT exploration wells, and during the previous 2018 exploration well program. Samples were typically obtained during testing and at the end of the pumping period: brine samples were collected at approximately 12-hour intervals during pumping. The purpose of sampling was to document the chemistry of brine from pumping wells, and to document changes in chemistry, if any, during the initial pumping periods. Unlike depth-specific samples, brine samples collected during well pumping are a composite chemistry sample for the entire screened interval of the well, and are more representative of the chemistry that would be expected from that well during production pumping.

Brine samples were collected directly from the discharge line. Temperature (°C), EC, pH, and brine density were monitored during pumping. Brine samples from current pumping test program along with duplicate samples were sent to SGS

Laboratory, Salta, Argentina; brine samples from 2018 drilling and testing program were sent to Alex Stewart Laboratory ("ASA") in San Salvador de Jujuy, Argentina, which is an ISO-certified lab and independent of the Issuer.

11.2.3 Brine Sampling Using Depth-Specific Methods

During the 2018 exploration drilling and testing program a depth specific sampling was carried out at well DDHB-01 and at various wells during the 2023 exploration drilling. Methods used to collect samples included pumping from the bottom of the well and sampling with a bailer at specific depth. The purpose of sampling was to document the chemistry of brine with depth. Brine samples were also taken using a depth specific sampler (bailer), which allow sample collection at intervals of 25 - 50 meters. During the 2020 - 2022 drilling and testing programs additional sampling using a bailer was attempted. However, samples could not be taken at depth and only shallow samples were collected.

Brine samples from the 2020 - 2022 pumping test program along with duplicate samples were sent to SGS Laboratory, Salta, Argentina, and brine samples from 2018 drilling and testing program were sent to ASA on San Salvador de Jujuy, Argentina. Besides, additional analysis of one duplicate sample collected from DDHB-01, was performed by Universidad de Antofagasta laboratory in Chile. Temperature (°C), EC, pH, and brine density were monitored during sampling. The Universidad of Antofagasta laboratory is independent from Alpha Lithium, but is an unaccredited laboratory. However, the Universidad of Antofagasta laboratory is used by many groups, including SQM for the Salar de Atacama project, and is considered a reliable laboratory for lithium.

During the 2020 - 2022 exploration program, Hydrasleeve model HS-2 of 600-mL capacity sampling bags were lowered to a specific depth at selected wells. A weight was placed on the bottom of the Hydrasleeve sampler to facilitate lowering of the sample bag. Once the bag reached the desired sampling depth, the sample bag was allowed to wait 5 to 10 minutes prior to collecting the sample. For each well, samples were obtained at 30 - 40 m intervals. Once the sample bags were at ground surface, the brine was transferred to 250-mL plastic bottles for shipment to the laboratory. Electrical conductivity, temperature (°C), pH, and oxide reduction potential were measured for each sample. Brine density was measured in the field at the request of the laboratory.

11.3 Sample Preparation

The brine samples were collected and placed in clean, 1-liter, plastic bottles. The bottles were labeled and with sample information documented. Chain of custody sheets and field traffic reports were used to document the samples prior to transportation to the assay laboratory by the project geologists. Chemistry samples (brine) were not subjected to any further preparation prior to shipment to participating laboratories. After the samples were sealed on site, they were stored in a cool location, then shipped in sealed containers to the laboratories for analysis. Duplicate samples were taken and have been stored for all samples.

11.4 Sample Analyses

Alex Stewart Laboratories ("ASA") was the primary laboratory for analysis of brine samples during the 2018 and most recent 2023 exploration program and is independent of the Issuer. ASA (Jujuy, Argentina) has their main offices in Mendoza, Argentina and corporate offices in Great Britain. ASA has extensive experience analyzing lithium-bearing brines. The ASA laboratories are International Standards Organization (ISO) 9001 accredited and operate according to Alex Stewart Group international standards, consistent with ISO 17025 standards. Samples were filtered and then analyzed for metals at the ASA laboratory using the Inductively Coupled Plasma spectrometry analytical method.

For the 2020 - 2022 drilling program, brine chemistry samples were analyzed by SGS laboratories, Argentina, who have extensive experience analyzing lithium-bearing brines. SGS Laboratory is independent of the Issuer, accredited to ISO 9001 and operates according to SGS Group standards consistent with ISO 17025 methods at other laboratories.

For the independent duplicate samples collected during the 2023 current QP site visit (Section 12.0), samples were sent to AGAT Laboratories in Dartmouth, Canada. AGAT Laboratories is independent of the Issuer, accredited to ISO 9001 and operates according to requirements consistent with ISO/IEC 17025.

Based on the sample duplicate analyses, blank analyses, and lab duplicate results, the reported lithium chemistry results are considered acceptable and reliable.

11.5 Quality Control Results And Analyses

Analytical quality was monitored through the use of quality control samples, including blanks and duplicates, as well as check assays at independent laboratories. Each batch of samples submitted to the laboratory contained at least one blank and one duplicate. During the 2020 - 2022 exploration wells program, brine samples were sent for analysis at SGS Laboratory at Salta in Argentina.

11.5.1 Sample Duplicate Analyses

Sample duplicates were obtained during sample collection in the field. Table 11-1 presents original and duplicate sample analytical results and statistics for selected constituents.

Table 11-2 presents percentage of difference between original and duplicate samples for selected constituents.

Table 11-1: Results And Statistics for Duplicate (DUP) Sample Analyses. Values Are in mg/L

Statistics	Li	Dup Li	K	Dup K	Mg	Dup Mg	B	Dup B	Ca	Dup Ca	Na	Dup Na
Count =	6	6	6	6	6	6	6	6	6	6	6	6
Min =	58	59	597	595	713	714	47	50	401	390	109,000	108,000
Max =	295	280	3017	2847	2624	2481	236	222	1193	1211	126,575	122,256
Mean =	114	112	1139	1119	1165	1162	88	88	886	898	115,762	114,997

Table 11-2: Percentage Difference Between Original and Duplicate Sample Results

Well ID	Sample ID	Interval Depth (m)	Li (mg/L) %	Mg (mg/L) %	Ca (mg/L) %	K (mg/L) %	Na (mg/L) %	SO_4 (mg/L) %	Cl (mg/L) %	B (mg/L) %
WBALT-01	AST-00171	16	1.7	5.1	1.5	-0.4	2.2	-0.1	0.0	2.0
WBALT-01	BLCSM-00242	N/A	-1.3	-0.4	-0.9	1.2	0.0	-0.5	-0.6	-2.6
WBALT-01	BLCSM-00252	N/A	-2.1	-2.0	-2.7	-4.0	-0.9	0.8	0.3	-0.4
WBALT-01	AST-00263	38	-0.8	0.1	0.8	-3.7	-3.4	0.8	-0.6	5.3
WBALT-05	AST-00363	177	-5.1	-5.5	-2.7	-5.6	3.7	-1.7	0.8	-6.1
WBALT-06	AST-01062	N/A	2.8	1.2	---	1.9	0.9	0.07	-0.9	5.8
WBALT-09	AST-0166	N/A	0.9	2.9	0.9	2.6	1.1	0.4	0.1	2.2
WBALT-13	AST_3092	N/A	0.6	0.7	0.7	1.8	-1.8	---	---	1.4
DDHB-01	AST-00463	112	12.6	10.7	11.7	10.5	-4.6	0.0	0.8	14.8

1 Sample collected with bailer
2 Sample collected during pump test
3 Sample collected with Hydrasleeve

11.5.2 Blank Analyses

Samples of distilled water were submitted as part of the laboratory quality control program. With the exception of calcium and sodium, results of the blank samples showed little to no constituents in the analytical results, indicating acceptable accuracy and precision. Lithium was not detected in any of the blank samples.

11.5.3 Standard Sample Analyses

Standard samples of known lithium concentration have been used for some, but not all of the lithium projects to date in Argentina and Chile. Standard samples were not used for this Project due to the cost and difficulty of finding suitable labs to prepare these samples. Instead, Alpha Lithium relied on the laboratory certification and their own internal QA/QC processes for confirming reliability of the reported chemistry results for the brine samples.

11.6 Sample Security

All samples were labeled with permanent marker, sealed with tape, and stored at a secure site, both in the field, and in Salta, Argentina. All field samples obtained during drilling and testing that were not sent for analysis are currently being stored in the Argañaraz & Associates offices in Salta pending future submittal to a laboratory.

11.7 Conclusions

The field sampling of brines from the pumping tests was done in accordance with generally accepted industry standards. Future sampling programs should include a more rigorous QA/QC program that includes field blanks, additional duplicate samples, chain of custody documentation, formal traffic report for every sample obtained, and possible duplicate analyses by other laboratories.

In the opinion of the QP, sample preparation, security, and analytical procedures were acceptable, and the associated analytical results are acceptable for use in the updated Resource Estimate.

12 DATA VERIFICATION

12.1 Drilling and Mineral Resource Estimate

The QP for the previous Resource Estimate (Michael Rosko, QP for Montgomery, 2022) conducted the following forms of data verification:

- Visited the Tolillar Project site several times in 2018 and 2022;
- Obtained a depth-specific sample from 52 m at exploration well DDHB-01 and measured the depth to water on December 2, 2018, as 0.88 mbgs;
- Obtained a duplicate sample of the brine being pumped from WBALT-07 on April 7, 2022;
- Reviewed drill cuttings and descriptions from the older drilling program and from the ongoing program;
- Checked summary tables against original laboratory reports; and
- Checked receipt of regular field reports that document exploration progress, and occasional field inspections by Montgomery staff.

In previous Technical Reports, the previous QP indicated that data verification efforts by the QP and their staff were adequate to ensure that reported results are reliable.

Dr. Mark King, the QP for the updated Resource Estimate conducted the following forms of data verification:

- Visited the Project site and the Alpha office in Salta in March 2023;
- Obtained independent duplicate samples from WBALT-12 and WBALT-15, on March 24, 2023 (Figure 12-1; Table 12-1);
- Reviewed drill cuttings and descriptions from the previous drilling programs and from the ongoing program;
- Checked summary tables against original laboratory reports; and
- Checked receipt of regular field reports that document exploration progress.

It is the opinion of the current QP (Dr. Mark King) that the reported results for the previous and recent exploration programs are acceptable for use in the updated Resource Estimate.

The QP considers that the analytical results are acceptable for use in the updated Resource Estimate.

Figure 12-1: 2023 QP Tolillar Project Visit Duplicate Sampling

Source: GWI, 2023.

Table 12-1: Results for Independent QP Samples (2023) Versus Field Program Average

Well ID	Sample ID	Li (mg/L)	Li (mg/L) %	Mg (mg/L)	Mg (mg/L) %	K (mg/L)	K (mg/L) %	B (mg/L)	B (mg/L) %	Mg/Li
WBALT-12	Field Program AVERAGE	171	11.7%	1103	9.7%	1920	-15.1%	137	5.1%	6.43
WBALT-12	QP Sample ID	191		1210		1630		144		6.34
WBALT-15	Field Program AVERAGE	332	1.2%	1753	-4.7%	3179	-0.9%	267	8.2%	5.28
WBALT-15	QP Sample ID	336		1670		3150		289		4.97

ID Independent Duplicate sample
QP Brine samples were analyzed at AGAT Laboratories in Calgary, Canada

12.2 Mineral Processing and Metallurgical Testing

Patricio Pinto (Ausenco QP) visited the Project site on 30 March 2023 and Alpha Lithium's head office in Salta on March 31, 2023. The head office houses the laboratory where the metallurgical tests related to direct lithium extraction described in Section 13 were conducted. During the Project site visit, the start of construction of the pilot plant and the existence of the camp for the personnel were verified, while during the visit to the laboratory, Alpha Lithium's proprietary resin and the equipment used in the tests that were carried out were visualized.

The QP conducted a verification of the information provided by Alpha Lithium, finding that the data provided is reasonable and the information obtained is in accordance with industry standards.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

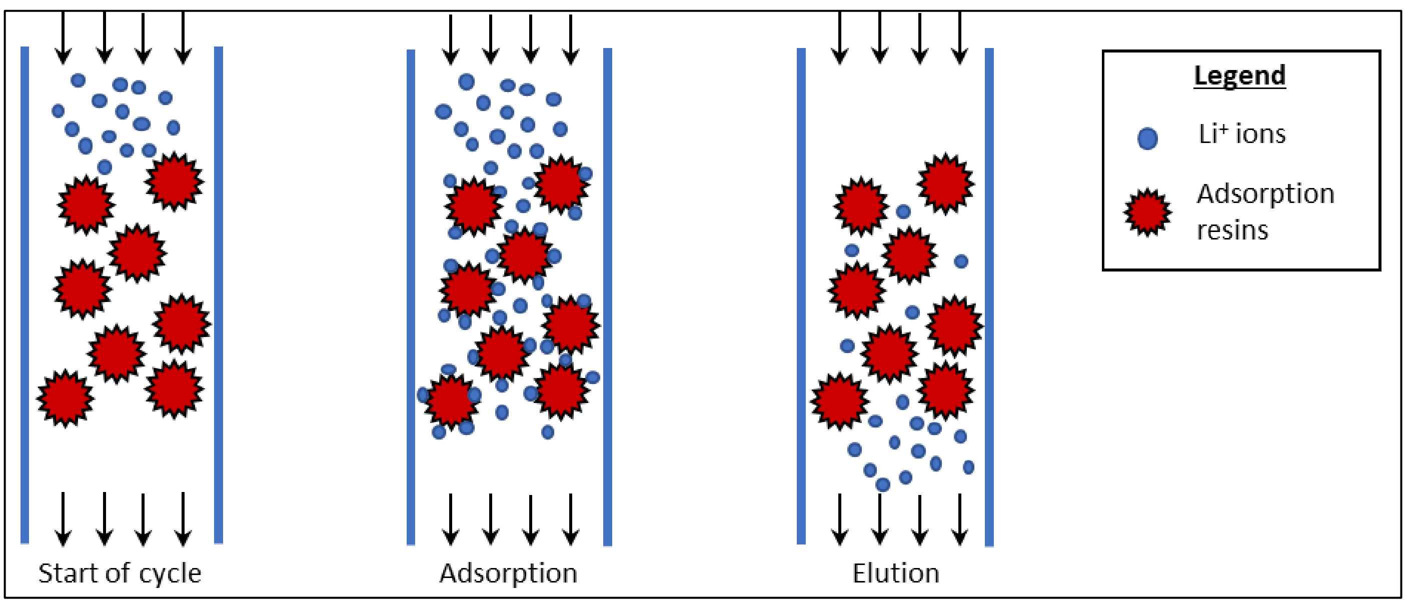
Alpha Lithium has initiated preliminary studies to design a metallurgical process for the production of lithium carbonate using brines from the Salar de Tolillar.

The process consists of capturing the lithium from raw brine by means of adsorption resins, which is then recovered together with some contaminants by washing with water. This brine is concentrated by reverse osmosis to finally continue the lithium precipitation process by adding sodium carbonate.

Lithium adsorption tests have been done with adsorption resins proprietary to Alpha Lithium. The mechanism of lithium adsorption occurs during contact between brine and resins where Li^+ ions are adsorbed on permanently negatively charged binding sites on the surface of the resin. These binding sites are produced by unbalanced charges resulting from substitutions of aluminum ions (Al^{+3}) in the crystalline structure of aluminates. The adsorption mechanism is a process involving physical (physisorption) and chemical (chemisorption) attraction between the ions dissolved in the brine and the solid adsorbent material.

Since adsorption is a process that occurs on the resin surface, the subsequent release and capture of the adsorbed Li^+ ions is easily carried out. This stage, called desorption (elution), consists of circulating a stream of water through the adsorbent resin, capturing the Li^+ ions from the resin, forming an aqueous solution (eluate) and a dilute lithium solution with some contaminants (depleted brine). Figure 13-1 shows schematically the stages of the lithium adsorption process using resins.

Figure 13-1: Direct Extraction Operation with Adsorption Resins



Source: Ausenco, 2023.

13.1 Metallurgical Testwork

The tests performed (Table 13-1) correspond to the direct lithium extraction stage and were carried out in Alpha Lithium´s laboratory in two occasions, one in July 2020 and the other in May 2022 (Alpha Lithium Argentina S.A., 2022a). Both tests were performed using the same sample taken from a specific part of the Tolillar Salar that has a lithium concentration of 198 mg/L.

Table 13-1: Metallurgical Testwork Summary Table

Year	Laboratory/Location	Testwork performed
2020	Alpha Lithium´s Laboratory, Salta, Argentina	Direct lithium extraction with resins (adsorption and elution stages)
2022	Alpha Lithium´s Laboratory, Salta, Argentina	Direct lithium extraction with resins (adsorption and elution stages)

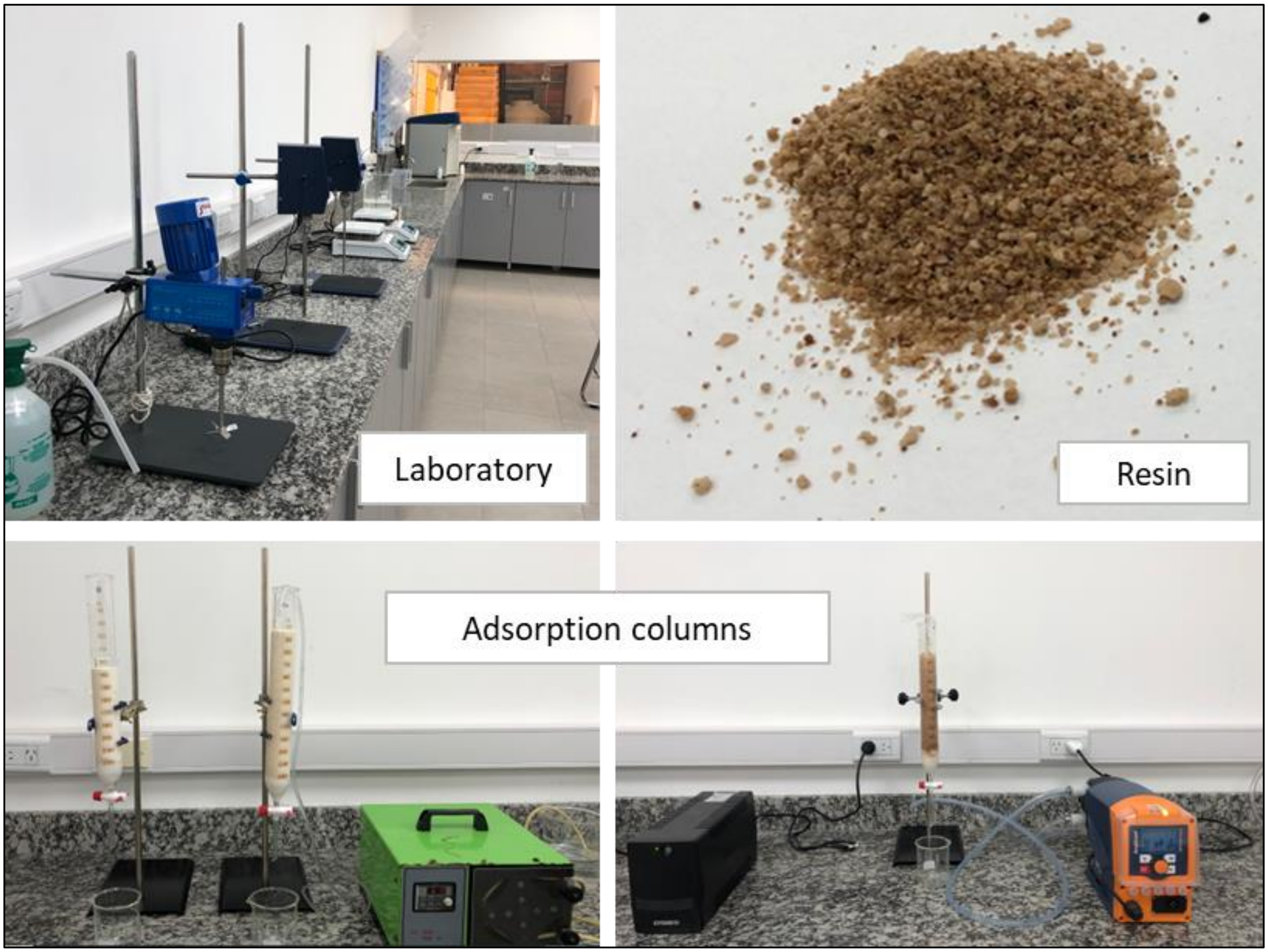
The spot sample used can be considered as a starting point for the laboratory tests, but it is not defined as representative of the property since based on the available information detailed in Section 16 the average plant feed concentration is 314 mg/L of lithium. It is important to note that there is a high variability with respect to lithium concentration in the different polygons in which the Tolillar Salar is subdivided, so it is to be expected that spot samples will have very different lithium concentrations among them, but this variability is managed by mixing brines in different flow proportions, thus obtaining a more homogeneous and constant concentration feed to the plant during the first six years of the plant.

The direct lithium extraction tests consisted of bringing aluminate-based adsorption resin from Alpha Lithium's property into contact with brine from the Salar de Tolillar using a 1,000 mL burette filled with 800 mL of resin. The tests consisted of a first stage, which involves circulating the salt brine through a fixed bed of adsorbent resin in the burette (adsorption), followed by a second stage of washing with water (elution). The procedure is described below:

- Fluid is circulated through the peristaltic pump to the burette generating a supernatant that ensures complete submersion of the adsorbent material. This procedure is first carried out for the brine in the adsorption stage, enabling the adsorption of Li+ ions, leaving an excess of approximately 20 mL on the resin, to ensure that there are no air bubbles in the resin bed.
- The operating flow rate of the pump is regulated according to the established parameters, and it is verified that the flow velocities at the inlet and outlet are equal.
- A certain volume of sample is taken, and the lithium content is analyzed using a lithium analyzer "Turbospec e400". This test is carried out continuously, so the beakers must be changed between samplings. This step is repeated until the lithium concentration stabilizes again at the starting value.
- Once the lithium concentration has stabilized, the sequence is repeated using water to release the lithium retained in the resin.
- The data obtained for the adsorption and elution steps are collected and tabulated using the "Turbospec e400" chemistry analyzer.

Figure 13-2 shows the Alpha Lithium laboratory located in the Province of Salta where the described tests were carried out, the resin used, and the burette loaded with resin before and after brine pumping.

Figure 13-2: Implementation of Equipment and Instruments for Direct Resin Extraction Test



Source: Ausenco, 2023 (photos from the site visit).

13.1.1 Direct Resin Extraction Test, July 2020

For the direct brine lithium extraction test carried out in July 2020 (Alpha Lithium Argentina S.A., 2020), the implements and consumables listed below were used.

- Implements
  - 1000 mL burette;
  - Metal lab support stand;
  - Peristaltic pump;
  - 250 mL beaker; and
  - Chemical analyzer "Turbospec e400".

- Consumables
  - Brine from Salar de Tolillar (198 mg/L Li);
  - Elution water (130 mg/L Li); and
  - Adsorbent material (aluminate-based resin).

13.1.1.1 Adsorption stage

The parameters considered in the adsorption stage are shown in Table 13-2.

Table 13-2: Parameters of the Lithium Adsorption Stage Test

Parameter	Value	Unit
Lithium concentration	198	mg/L
pH	7.0	-
Burette size	1,000	mL
Resin bed volume (BV)	800	mL
Design flow	3.0	BV/h
Inlet volumetric flow	2,400	mL/h
Outlet volumetric flow	2,400	mL/h
Operating temperature	24.0	°C
Total brine volume	25,000	mL
Sample volume	1.0	mL

Table 13-3 and Table 13-4 present the information of the samples taken during the adsorption stage indicating the bed volume and the lithium concentration of each sample.

Table 13-3: Results of the Adsorption Stage Samples - Part 1 of 2

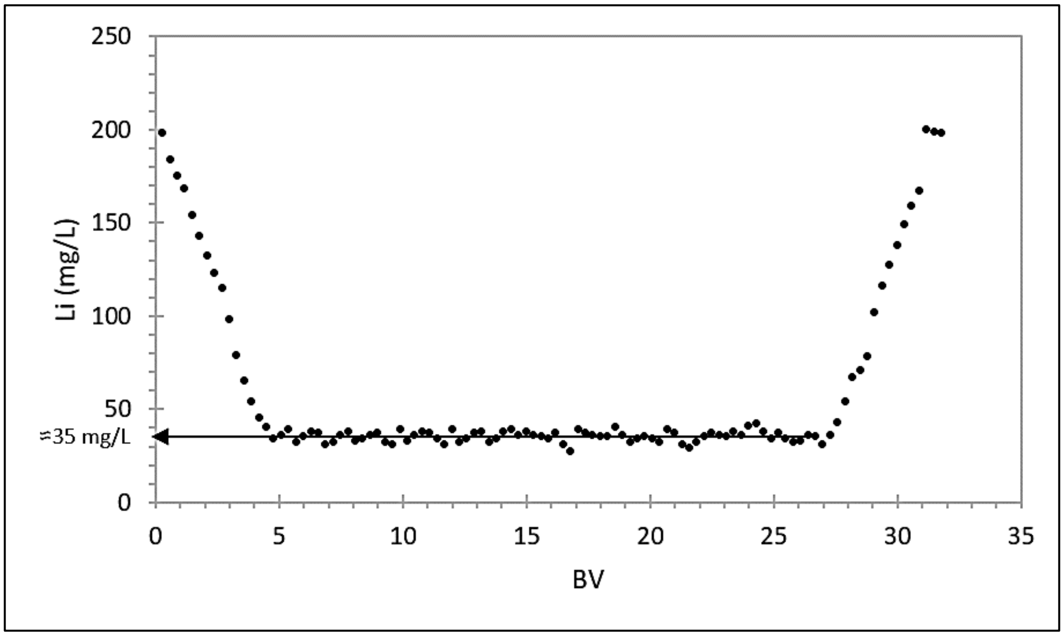
BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
0.3	198	3.6	65	6.9	31	10.2	33	13.5	32
0.6	184	3.9	54	7.2	32	10.5	36	13.8	34
0.9	175	4.2	45	7.5	36	10.8	38	14.1	38
1.2	168	4.5	40	7.8	38	11.1	37	14.4	39
1.5	154	4.8	34	8.1	33	11.4	34	14.7	36
1.8	143	5.1	36	8.4	34	11.7	31	15.0	38
2.1	132	5.4	39	8.7	36	12.0	39	15.3	36
2.4	123	5.7	32	9.0	37	12.3	32	15.6	35
2.7	115	6.0	35	9.3	32	12.6	34	15.9	34
3.0	98	6.3	38	9.6	31	12.9	37	16.2	37
3.3	79	6.6	37	9.9	39	13.2	38	16.5	31

Table 13-4: Results of the Adsorption Stage Samples - Part 2 of 2

BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
16.8	27	19.8	35	22.8	36	25.8	32	28.8	78
17.1	39	20.1	34	23.1	35	26.1	33	29.1	102
17.4	37	20.4	32	23.4	38	26.4	36	29.4	116
17.7	36	20.7	39	23.7	36	26.7	35	29.7	127
18.0	35	21.0	37	24.0	41	27.0	31	30.0	138
18.3	35	21.3	31	24.3	42	27.3	36	30.3	149
18.6	40	21.6	29	24.6	38	27.6	43	30.6	159
18.9	36	21.9	32	24.9	34	27.9	54	30.9	167
19.2	32	22.2	35	25.2	37	28.2	67	31.2	200
19.5	34	22.5	37	25.5	34	28.5	71	31.5	199

The information in the two tables above is illustrated in the graph in Figure 13-3, which shows an average concentration of around 35 mg/L of lithium.

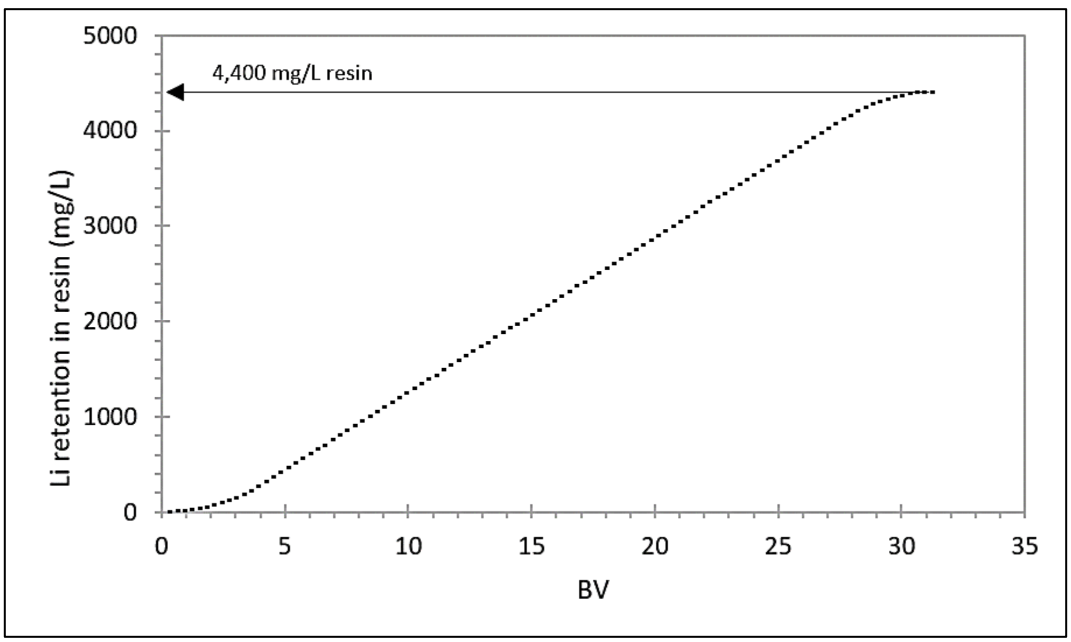
Figure 13-3: Results of Lithium Concentration in The Adsorption Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

Figure 13-4 shows the concentration of lithium retained in the resin, reaching a maximum concentration of 4,400 mg/L of retained lithium.

Figure 13-4: Results of Lithium Retention on Resin in the Adsorption Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

13.1.1.2 Elution stage

The elution step is carried out with an aqueous solution of lithium chloride with a concentration of 130 mg/L of lithium. The parameters considered in this stage are shown in Table 13-5.

Table 13-5: Parameters of The Elution Stage Test

Parameter	Value	Unit
Lithium concentration in elution solution	130	mg/L
pH	7.0	-
Burette size	1,000	mL
Resin bed volume (BV)	800	mL
Design flow	3.0	BV/h
Inlet volumetric flow	2,400	mL/h
Outlet volumetric flow	2,400	mL/h
Operating temperature	24.0	°C
Total eluent volume	2,200	mL
Sample volume	1.0	mL

Table 13-6 and Table 13-7 present the information of the samples taken during the elution stage indicating the bed volume and the lithium concentration of each sample.

Table 13-6: Results of The Elution Stage Samples - Part 1 of 2

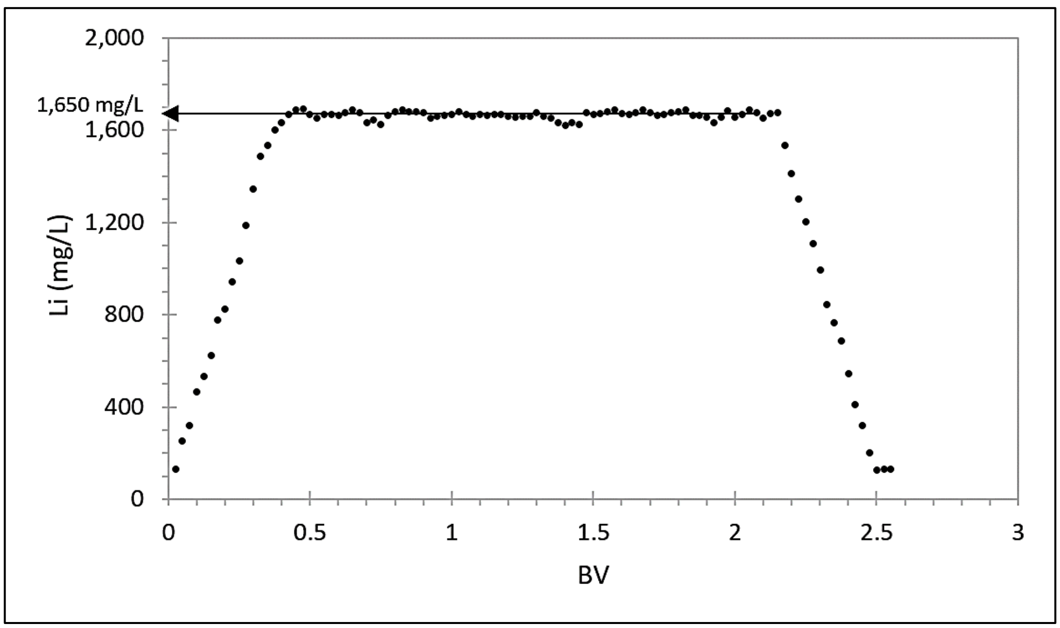
BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
0.03	130	0.28	1,189	0.53	1,654	0.78	1,666	1.03	1,679
0.05	251	0.30	1,345	0.55	1,669	0.80	1,681	1.05	1,670
0.08	321	0.33	1,489	0.58	1,670	0.83	1,689	1.08	1,662
0.10	467	0.35	1,534	0.60	1,665	0.85	1,682	1.10	1,669
0.13	532	0.38	1,600	0.63	1,678	0.88	1,679	1.13	1,664
0.15	623	0.40	1,634	0.65	1,689	0.90	1,678	1.15	1,667
0.18	776	0.43	1,667	0.68	1,678	0.93	1,654	1.18	1,669
0.20	823	0.45	1,689	0.70	1,632	0.95	1,662	1.20	1,660
0.23	945	0.48	1,691	0.73	1,645	0.98	1,664	1.23	1,657
0.25	1,034	0.50	1,667	0.75	1,627	1.00	1,669	1.25	1,661

Table 13-7: Results of The Elution Stage Samples - Part 2 of 2

BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
1.28	1,662	1.53	1,672	1.78	1,678	2.03	1,667	2.28	1,109
1.30	1,676	1.55	1,679	1.80	1,682	2.05	1,689	2.30	996
1.33	1,662	1.58	1,688	1.83	1,687	2.08	1,675	2.33	845
1.35	1,654	1.60	1,671	1.85	1,665	2.10	1,654	2.35	765
1.38	1,632	1.63	1,667	1.88	1,664	2.13	1,674	2.38	687
1.40	1,623	1.65	1,678	1.90	1,657	2.15	1,676	2.40	543
1.43	1,634	1.68	1,689	1.93	1,634	2.18	1,534	2.43	412
1.45	1,627	1.70	1,678	1.95	1,656	2.20	1,412	2.45	321
1.48	1,678	1.73	1,665	1.98	1,686	2.23	1,302	2.48	201
1.50	1,667	1.75	1,669	2.00	1,658	2.25	1,205	2.50	128

The information in the two tables above is illustrated in the graph in Figure 13-5, which shows an average concentration of around 1,650 mg/L of lithium.

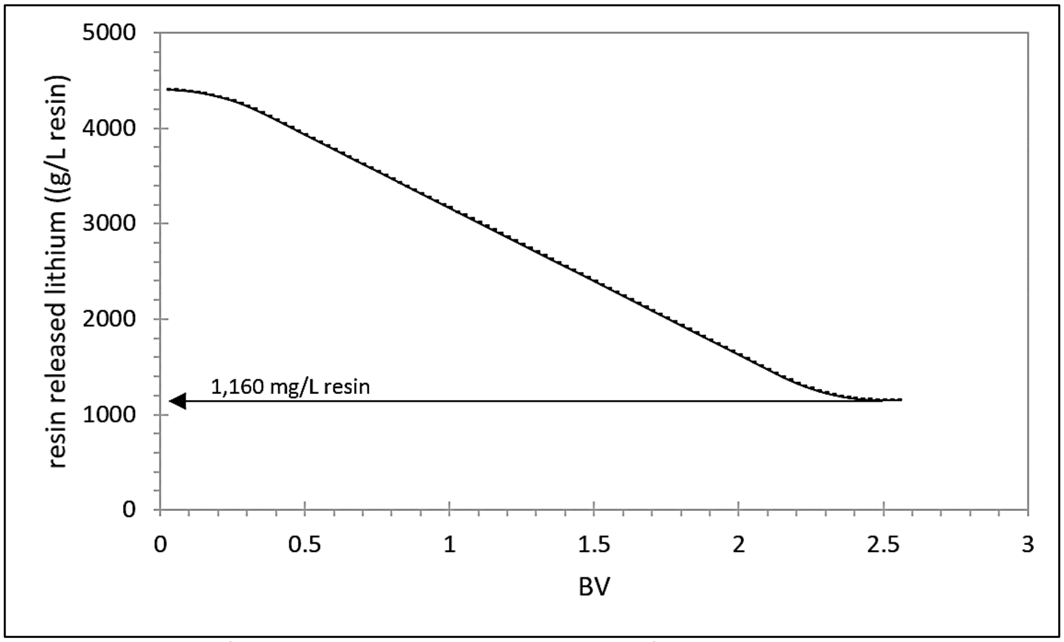
Figure 13-5: Results of Lithium Concentration In The Elution Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

Figure 13-6 shows the concentration of lithium retained in the resin, reaching a value of 1,160 mg/L of retained lithium.

Figure 13-6: Results of Lithium Retention on Resin in The Elution Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

13.1.2 Direct Resin Extraction Test, May 2022

For the direct brine lithium extraction test carried out in May 2022 (Alpha Lithium Argentina S.A., 2022b), the implements and consumables listed below were used.

- Implements
  - 1000 mL burette;
  - Metal lab support stand;
  - Peristaltic pump;
  - 250 mL beaker; and
  - Chemical analyzer "Turbospec e400".
- Consumables
  - Brine from the Salar de Tolillar (198 mg/L Li);
  - Elution water (130 mg/L Li); and
  - Adsorbent material (aluminate-based resin).

13.1.2.1 Adsorption stage

The parameters considered in the adsorption stage are the same for the tests carried out in July 2020 and May 2022, these are shown in Table 13-2.

Table 13-8 and Table 13-9 present the information of the samples taken during the adsorption stage indicating the bed volume and the lithium concentration of each sample.

Table 13-8: Results of The Adsorption Stage Samples - Part 1 of 2

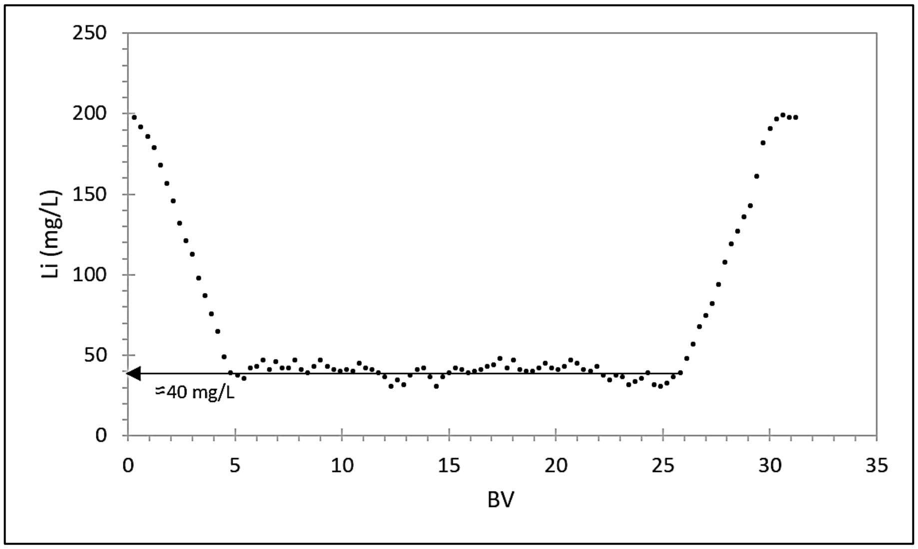
BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
0.3	198	3.6	87	6.9	46	10.2	41	13.5	41
0.6	192	3.9	76	7.2	42	10.5	40	13.8	42
0.9	186	4.2	65	7.5	42	10.8	45	14.1	37
1.2	179	4.5	49	7.8	47	11.1	42	14.4	31
1.5	168	4.8	39	8.1	41	11.4	41	14.7	37
1.8	157	5.1	38	8.4	39	11.7	39	15.0	39
2.1	146	5.4	36	8.7	43	12.0	37	15.3	42
2.4	132	5.7	42	9.0	47	12.3	31	15.6	41
2.7	121	6.0	43	9.3	43	12.6	35	15.9	39
3.0	113	6.3	47	9.6	41	12.9	32	16.2	40
3.3	98	6.6	41	9.9	40	13.2	38	16.5	41

Table 13-9: Results of The Adsorption Stage Samples - Part 2 of 2

BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
16.8	43	19.8	42	22.8	38	25.8	39	28.8	136
17.1	44	20.1	41	23.1	37	26.1	48	29.1	143
17.4	48	20.4	43	23.4	32	26.4	57	29.4	161
17.7	42	20.7	47	23.7	34	26.7	68	29.7	182
18.0	47	21.0	45	24.0	36	27.0	75	30.0	191
18.3	41	21.3	41	24.3	39	27.3	82	30.3	197
18.6	40	21.6	40	24.6	32	27.6	94	30.6	199
18.9	40	21.9	43	24.9	31	27.9	108	30.9	198
19.2	42	22.2	38	25.2	33	28.2	119	31.2	198
19.5	45	22.5	35	25.5	37	28.5	127	-	-

The information in the two tables above is illustrated in the graph in Figure 13-7, which shows an average concentration of around 40 mg/L of lithium.

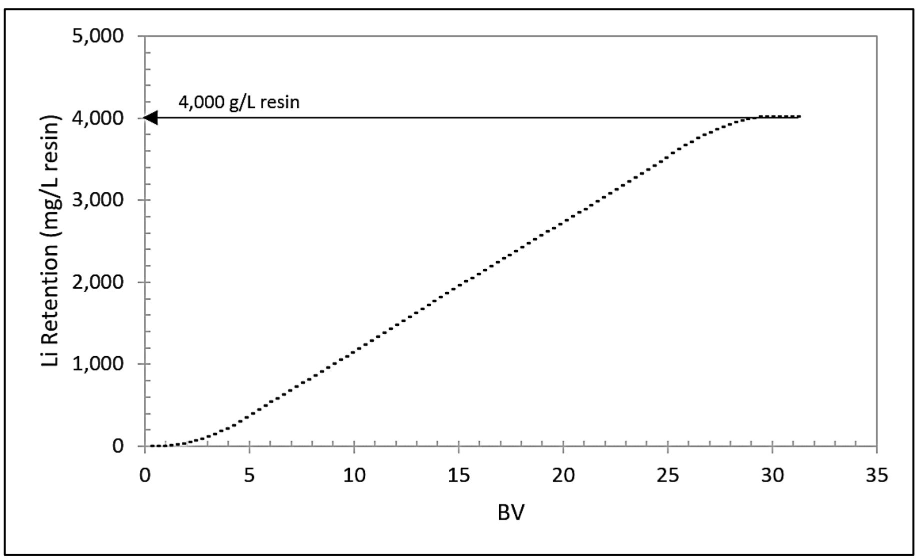
Figure 13-7: Results of Lithium Concentration in The Adsorption Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

Figure 13-8 shows the concentration of lithium retained in the resin, reaching a maximum concentration of 4,000 mg/L of retained lithium.

Figure 13-8: Results of Lithium Retention on Resin in The Adsorption Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

13.1.2.2 Elution stage

The elution stage is carried out with an aqueous solution of lithium chloride with a concentration of 130 mg/L of lithium. The parameters considered in the elution stage are the same for the tests performed in July 2020 and May 2022, these are shown in Table 13-5.

Table 13-10 and Table 13-11 present the information of the samples taken during the elution stage indicating the bed volume and the lithium concentration of each sample.

Table 13-10: Results of the Elution Stage Samples - Part 1 of 2

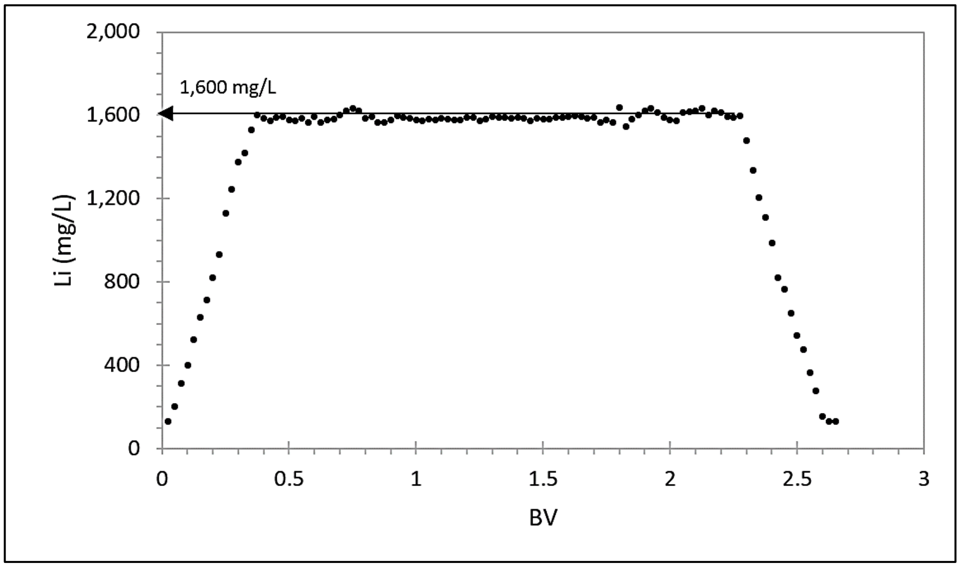
BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
0.03	130	0.30	1,376	0.58	1,567	0.85	1,565	1.13	1,582
0.05	204	0.33	1,421	0.60	1,593	0.88	1,568	1.15	1,578
0.08	312	0.35	1,532	0.63	1,567	0.90	1,578	1.18	1,580
0.10	401	0.38	1,602	0.65	1,580	0.93	1,599	1.20	1,591
0.13	523	0.40	1,587	0.68	1,582	0.95	1,590	1.23	1,590
0.15	631	0.43	1,576	0.70	1,603	0.98	1,586	1.25	1,576
0.18	712	0.45	1,589	0.73	1,621	1.00	1,579	1.28	1,583
0.20	823	0.48	1,593	0.75	1,634	1.03	1,576	1.30	1,593
0.23	934	0.50	1,578	0.78	1,621	1.05	1,581	1.33	1,591
0.25	1,132	0.53	1,576	0.80	1,587	1.08	1,579	1.35	1,590
0.28	1,245	0.55	1,587	0.83	1,596	1.10	1,587	1.38	1,587

Table 13-11: Results of The Elution Stage Samples - Part 2 of 2

BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)	BV	Li (mg/L)
1.40	1,592	1.65	1,593	1.90	1,623	2.15	1,602	2.40	987
1.43	1,586	1.68	1,586	1.93	1,634	2.18	1,623	2.43	821
1.45	1,576	1.70	1,589	1.95	1,612	2.20	1,612	2.45	767
1.48	1,586	1.73	1,567	1.98	1,590	2.23	1,594	2.48	652
1.50	1,581	1.75	1,578	2.00	1,578	2.25	1,591	2.50	543
1.53	1,583	1.78	1,567	2.03	1,576	2.28	1,599	2.53	478
1.55	1,589	1.80	1,638	2.05	1,612	2.30	1,478	2.55	364
1.58	1,592	1.83	1,546	2.08	1,618	2.33	1,335	2.58	276
1.60	1,593	1.85	1,582	2.10	1,621	2.35	1,204	2.60	156
1.63	1,598	1.88	1,604	2.13	1,634	2.38	1,109	2.63	130

The information in the two tables above is illustrated in the graph in Figure 13-9, which shows an average concentration of around 1,650 mg/L of lithium.

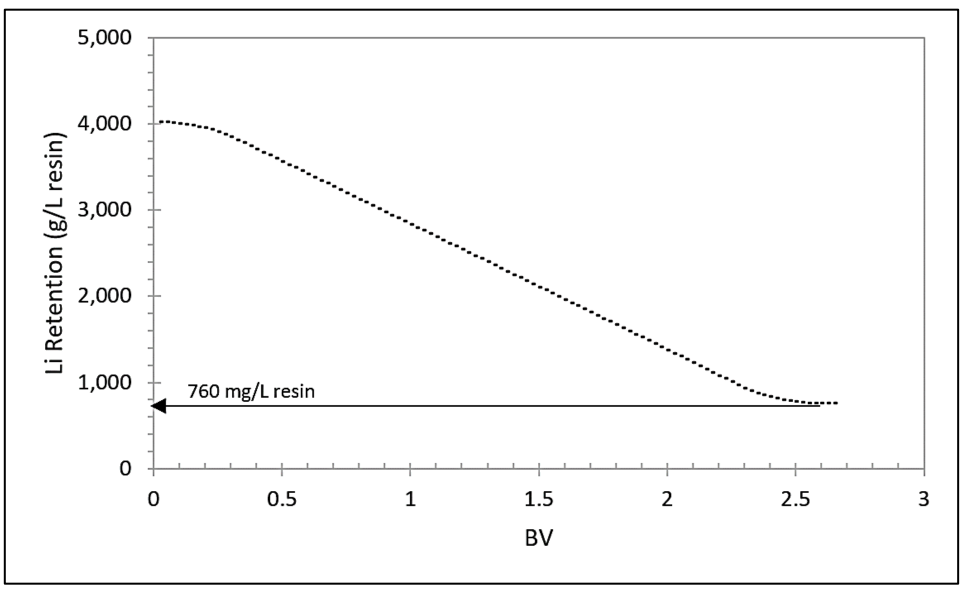
Figure 13-9: Results of Lithium Concentration in The Elution Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

Figure 13-10 shows the concentration of lithium retained in the resin, reaching a value of 760 mg/L of retained lithium.

Figure 13-10: Results of Lithium Retention on Resin in The Elution Stage



Source: Ausenco, 2023 (supported by data provided by Alpha Lithium).

13.2 Chemical Analysis from SGS Laboratory

Table 13-12 shows the results of the three chemical analyses performed by the SGS Laboratory, located in Salta. One analysis was carried out on the raw brine sample used and the other two on the eluate sample obtained from each of the direct extraction tests carried out in July 2020 (SGS Argentina S.A., 2020) and May 2022 (SGS Argentina S.A., 2022).

Table 13-12: Results of Chemical Analysis of Raw Brine and Eluates

Element Analyzed	Unit	Raw brine	Eluate - July 2020	Eluate - May 2022
Chloride	mg/L	171,599	15,590	9,783
Barium	mg/L	<10	<10	<10
Boron	mg/L	125	16	<10
Calcium	mg/L	540	163	15
Strontium	mg/L	14.7	<10	<10
Iron	mg/L	<10	<10	<10
Lithium	mg/L	198	1,960	1,594
Magnesium	mg/L	1,260	40	40
Manganese	mg/L	<10	<10	<10
Sodium	mg/L	109,000	4,070	3,043
Potassium	mg/L	1,740	122	151
Zinc	mg/L	<10	<10	<10
Sulphate	mg/L	12,558	383	111

The eluate obtained in the test carried out in July 2020 provides an average lithium concentration of 1,650 mg/L according to the chemical analyzer "Turbospec e400" (Figure 13-5), while the SGS chemical analysis reports 1,960 mg/L, which is 18% higher. With respect to the test carried out in May 2022, the results for lithium in the eluate measured with the "Turbospec e400" analyzer and by SGS are similar, 1,600 mg/L (Figure 13-9) and 1,594 mg/L respectively.

It is important to note that the SGS results show that the drag of impurities such as boron, magnesium and calcium are quite low which significantly favours the removal processes of these pollutants downstream.

13.3 Pilot Plant and Camp

Alpha Lithium is continuing with laboratory investigation to obtain a lithium-specific adsorption resin, the preliminary results of which were shown in this section of the report.

In parallel, a pilot plant is being built at the Salar property, where it is planned to test different adsorption resins, including Alpha Lithium's own developed resin. This pilot plant will allow verification of the variables and parameters that will validate the proposed design to produce 25,000 t/a of battery grade lithium carbonate.

As of the date of the report, the progress of the construction of the pilot plant and the camp is shown in Figure 13-11 and Figure 13-12 respectively.

Figure 13-11: Photographic Record of Pilot Plant Construction

Source: Ausenco, 2023 (photos from site visit and also provided by Alpha Lithium).

Figure 13-12: Photographic Record of The Camp

Source: Ausenco, 2023 (photos provided by Alpha Lithium).

13.4 Comments on Mineral Processing and Metallurgical Testing

The developed direct lithium extraction (DLE) tests for the Tolillar brine using self-developed resins show that it is feasible to consider this technology for extracting lithium from the raw brine.

Table 13-13 shows the parameters and some test results, which are discussed below.

Table 13-13: Summary of Test Parameters and Results

Parameter	Unit	July 2020 Test	May 2022 Test
Initial brine lithium concentration	mg/L	198	198
Depleted brine lithium concentration	mg/L	35	40
Eluate lithium concentration	mg/L	1,650	1,600
Direct Lithium Extraction	%	71	65
Resin lithium saturation concentration	mg/L resin	4,400	4,000
Lithium retention in resin	mg/L resin	1,160	760
Recovery lithium from resin	%	74	81
Ratio between wash solution and brine feed	%	8.0	17
Global recover of lithium	%	53	53

The data provided by the tests indicate that for a brine containing 198 mg/L of lithium, a depleted brine with a lithium concentration in the range of 35 mg/L to 40 mg/L and an eluate with a lithium concentration in the range of 1,600 mg/L to 1,650 mg/L will be obtained.

Regarding direct lithium extraction, the calculated values indicate an extraction of 65% to 71%, which needs to be improved and is part of the research that is still under development. While the resin saturation concentration in lithium shows values of 4,000 mg/L of resin to 4,400 mg/L of resin, the recovery of lithium from the resins is 74% to 81%, which also needs to be improved and is therefore under study.

To recover the lithium from the resin in the first test the elution was with water equivalent to 8% feed flow, while in the second test it changes to 17%. The results obtained improve from 74% to 81% recovery of lithium from the resin, although this variable is still under study, the results are encouraging and in progress.

In summary, the adsorption resin used is in the development stage and the extraction and recovery parameters need to be improved, considering that the resins currently on the market have extraction values of around 90% and lithium recovery values of around 100%.

The available test information does not allow to elucidate with certainty the characterization of the final product, therefore the presence of deleterious elements and/or impurities that affect the quality of the product, such as calcium, magnesium and boron, is unknown, therefore the commercial impact that could be related to the presence of these elements requires verify their existence through laboratory tests.

Since the results delivered by the tests correspond to only one stage of the process, DLE, the development of the design will use benchmark data pending the development of Alpha Lithium's own resin to reach competitive values. Due to the existence of uncertainty related to the existing benchmark information in the market regarding the lithium recovery rate in different processing plants, it is acceptable to consider that this efficiency moves in a range of 74% to 81%. For the development of the economic model the average of the mentioned range will be used, equivalent to 77%, considered as a conservative value.

It is important to note that the Alpha Lithium laboratory where the above tests were carried out is not a certified independent laboratory, and at the date of this report no information is available to validate or certify the quality of the work performed in this laboratory. However, this condition is not determinant for the development of the design, as benchmark data can and will be used while waiting for further development of Alpha Lithium's own resin and for information to certify the quality of the laboratory tests to be available.

14 MINERAL RESOURCE ESTIMATES

14.1 Method Overview

NI 43-101 defines a mineral resource as that portion of the mineral inventory that has reasonable prospects for economic extraction. An updated Mineral Resource Estimate was developed for the Tolillar Project using a polygon domain methodology, incorporating recent drilling and sampling results. The methods were generally similar to the previous Resource (Montgomery, 2022), with the differences noted in Section 14.2. Technical oversight of the Resource Estimate was provided by the QP, working with Alpha and GWI specialists. The QP considers the input data and the results to be valid and appropriate for an Indicated and Inferred Mineral Resource Estimate.

The estimation steps are summarized as follows:

- A domain was delineated for the entire Resource Zone (Section 14.3), and sub-domains were delineated for individual polygons, including Indicated and Inferred Zones (Sections 14.4 and 14.5).
- Drainable porosity was assigned to each lithology unit in each polygon, based on borehole logging and previously published porosity values of similar lithologies (Section 14.6).
- Lithium and potassium brine concentrations were assigned to each polygon, based on sampling results (Section 14.7).
- Estimation parameters were compiled in a spreadsheet, for calculation of the Resource (Section 14.8).

14.2 Differences from Previous Estimate

The methodology of the updated Resource differs from that of the previous estimate in the following ways:

- Eleven additional boreholes were available to inform the updated Resource Estimate, for a total of 21.
- The footprint of the updated Resource zone is approximately 11% larger. The total polygon (and Resource) area increased from 90.58 to 102.0 km^2.
- Lithology profiles for each hole were reconstructed for the updated Resource. Since drainable porosity was assigned based on lithology, this resulted in some change to drainable porosity values and distribution.
- Additional drainable porosity information sources were compiled for the updated Resource.

Relative changes in the Resource are summarized in Section 14.8.

14.3 Resource Domain

The surface footprint of the Resource domain was based on either: interpreted salar boundaries, deposit characteristics, surface geophysics, or concession boundaries (Figure 14-1), as follows:

The western limits of the domain were defined by the concession boundaries, with support from geophysical results showing the subsurface presence of brine extending to the boundary.

In the eastern and central zone, the limits of the domain were defined by the interpreted outer boundaries of the salar, supported by geophysical results.

The northeast and northwest limits were defined by an estimate of brine extent, supported by geophysical results.

The southern limits were defined by concession boundaries, with support from geophysical results showing the subsurface presence of brine extending to the boundaries.

14.4 Polygon Assignment

Polygons were defined around 17 boreholes in the Resource domain, as shown in Figure 14-1 and Table 14-1. The total polygon (and Resource domain) area used for the Resource Estimate is 102.0 km^2. Polygons were delineated based on the following criteria:

Outer boundaries of the polygons were defined by the Resource domain, as described in the previous section.

Inner boundaries separating polygon blocks were equidistant between boreholes.

Each polygon enclosed a single exploration well that contributed to the estimate.

In some cases, there were additional boreholes located in the polygon, in addition to the primary borehole. These additional boreholes included DDH-01, DDH-02, and DDH-03. They contributed to the lithology and depth information compiled for the polygon, but they were not used for brine concentrations.

14.5 Mineral Resource Zones

Indicated and Inferred Resource Zones were based on borehole drilling results and VES geophysics (Section 9). The top of the Indicated Zone at a given borehole (and associated polygon) was defined as the static brine level. The bottom was defined as either bedrock (if confirmed in the borehole) or the bottom of the hole (if bedrock was not confirmed). Polygon details are provided in Table 14-2.

Inferred Zones were defined for polygons in which the given borehole did not encounter bedrock. For these boreholes, the top of the Inferred Zone was defined as the final depth of the borehole. The bottom of the zone was defined as the interpreted top of bedrock, based on nearby boreholes and/or geophysical data. For example, borehole WBALT-02 reached 127 mbgs and did not intersect bedrock. Using the confirmed bedrock depth from nearby (<1 km) borehole WBALT-05 at 352 mbgs, basement was interpreted to be similar in WBALT-02. Therefore, an Inferred Resource Zone thickness for WBALT-02 is calculated to be 352 m – 127 m = 225 m. Boreholes used to interpret bedrock for Inferred Resources are listed in Table 14-3.

For reference, the resource category domains estimated for the Tolillar Project were compared against the brine deposit borehole density guidelines suggested by Houston et al. (2011). According to their definition, Tolillar would be conservatively classified as an immature (clastic-dominant) salar, which would suggest the following Resource zone criteria:

- Maximum borehole density for Measured category is 6.25 km^2/borehole;
- Maximum borehole density for Indicated category is 25 km^2/borehole; and
- Maximum borehole density for Inferred category is 49 to 100 km^2/borehole.

Although a direct comparison of the Tolillar Resource to these criteria is limited by the variable depths to which the resource categories extend in each of the Tolillar polygons, the following is noted:

- The density of ALL primary polygon boreholes (17) across the entire Tolillar Resource domain (102.0 km^2) is representative of the Indicated Resource. This density is approximately 6 km^2/borehole and does not consider the additional four boreholes in the Resource domain (Table 14-2). The borehole density is well below the Houston et al. criteria for Indicated Resources and is numerically within the criteria for Measured Resources. However, the QP considers that discrete-level brine and porosity sampling is required, to achieve conversion to Measured.
- The boreholes that proceed to basement across the entire Tolillar Resource domain (six) are representative of the Inferred Resource. The density associated with these boreholes is approximately 17 km^2/borehole, which is well below the density criteria for Inferred Resources posited by Houston et al. 2011 (49 to 100 km^2/borehole).

Table 14-1: Comparison of Boreholes Contributing to the Previous and Updated Resource Estimates

Well ID	Type	Type of Information used to inform Previous Resource, 2022		Type of Information used to inform Updated Resource	
		Lithology	Brine Chemistry	Lithology	Brine Chemistry
DDHB-01	rotary	✓	✓	✓	✓
WBALT-02	rotary	✓	✓	✓	✓
WBALT-03	rotary	✓	✓	✓	✓
WBALT-04	rotary	✓	✓	✓	✓
WBALT-05	rotary	✓	✓	✓	✓
WBALT-06	rotary	✓	✓	✓	✓
WBALT-07	rotary	✓	✓	✓	✓
WBALT-09	rotary	✓	✓	✓	✓
WBALT-10	rotary	✓	✓	✓	✓
WBALT-11	rotary	✓	✓	✓	✓
WBALT-12	rotary	✓	-	✓	✓
WBALT-13	rotary	✓	-	✓	✓
WBALT-14	rotary	-	-	✓	✓
WBALT-15	rotary	-	-	✓	✓
WBALT-16	rotary	-	-	✓	✓
WBALT-17	rotary	-	-	✓	✓
DDH-01	diamond	-	-	✓	-
DDH-02	diamond	-	-	✓	-
DDH-03	diamond	-	-	✓	-
WBALT-03P	piezometer	✓	-	✓	-
FWBALT-02	rotary	-	-	✓	✓
TOTAL INCLUDED	13	10	21	17	

✓ = included
- = not included

Table 14-2: Polygon Thickness and Average Grade

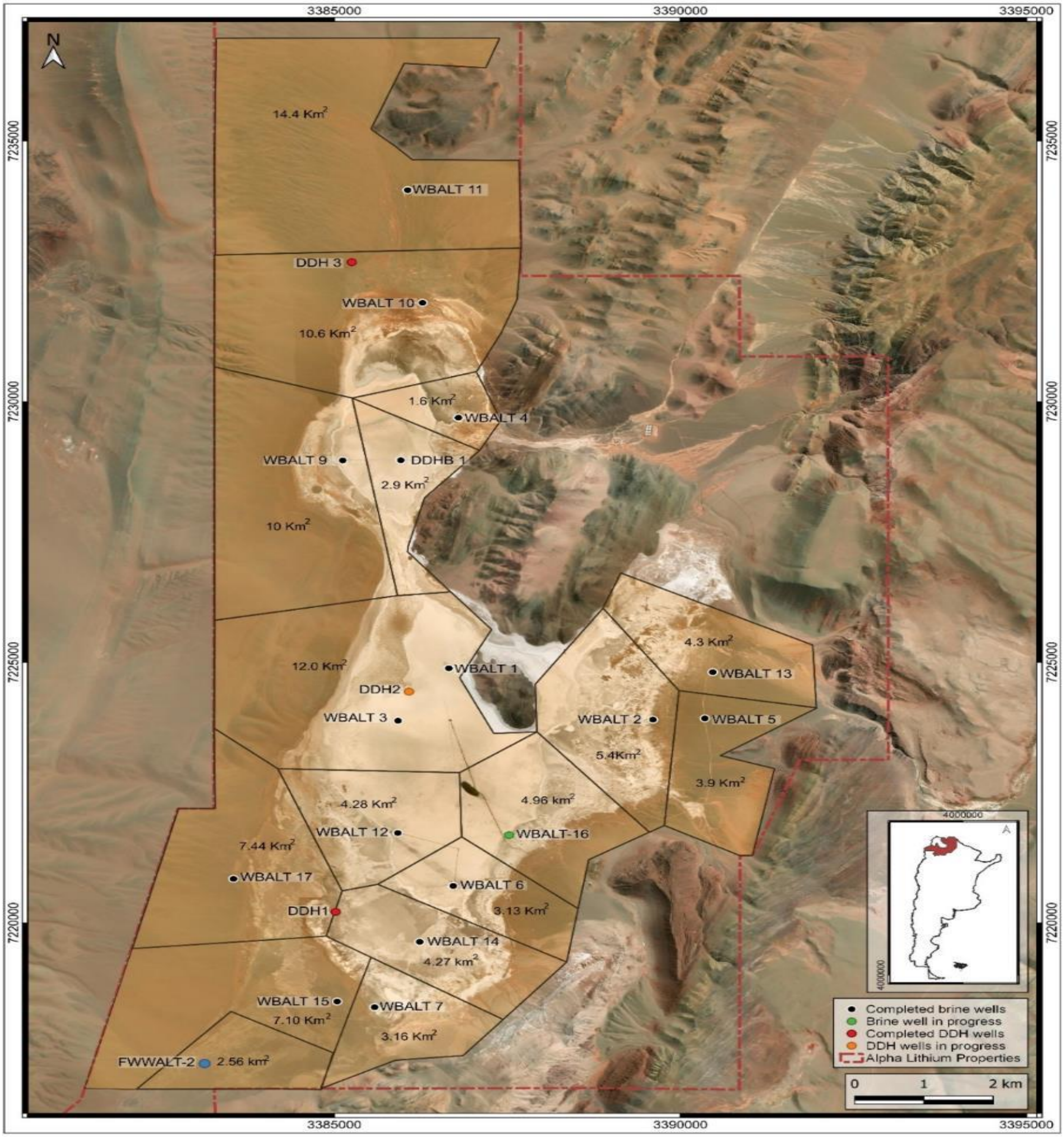
Well ID	Area (km²)	INDICATED				INFERRED			
		From (mbgs)+	To (mbgs)	Thickness (m)	Avg Li (mg/L)	From (mbgs)	To (mbgs)	Thickness (m)	Avg Li (mg/L)
DDHB-01	2.90	3	208	205	202	N/A	N/A	N/A	N/A
WBALT-02	5.40	3.5	127	123.5	210	127	352.0*	225	351
WBALT-03	12.00	1.8	120	118.2	218	120	191.0*	71	218
WBALT-04	1.60	1.7	77	75.3	197	77	208.4*	131.4	197
WBALT-05	3.90	26	352	326	351	N/A	N/A	N/A	N/A
WBALT-06	3.13	4.1	237.5	233.4	254	237.5	393.0*	155.5	254
WBALT-07	3.16	4.5	352	347.5	343	352	393.0*	41	343
WBALT-09	10.00	6.5	109	102.5	216	N/A	N/A	N/A	N/A
		109	325	216	232				
WBALT-10	10.60	3.4	N/A	N/A	N/A	3.4	90	86.6	61
						90	402	312	125
WBALT-11	14.40	57.5	108	50.5	61	400	518.0*	118	125
		108	400	292	125				
WBALT-12	4.28	4.1	101	96.9	186	361	393.0*	32	164
		101	198	97	160				
		198	361	163	164				
WBALT-13	4.30	16	269	253	172	269	318	49	172
WBALT-14	4.27	4	280	276	293	N/A	N/A	N/A	N/A
WBALT-15	7.10	9	363	354	332	363	393.0*	30	332
WBALT-16	4.96	6	158	152	285	158	271	113	285
WBALT-17	7.44	10	353	343	290	353	393.0*	40	290
FWWALT-02	2.56	N/A	N/A	N/A	N/A	80	363.0*	283	332
TOTAL	**102.00**								

+Static water level
*Interpreted bedrock depth, extrapolated from nearby boreholes
N/A = not applicable.

Table 14-3: Boreholes Used to Interpret Bedrock, for Inferred Resource Thickness

Well ID	Borehole used for Depth Interpretation
WBALT-02	WBALT-05
WBALT-03	DDH-02
WBALT-04	DDHB-01
WBALT-06	DDH-01
WBALT-07	DDH-01
WBALT-11	DDH-03
WBALT-12	DDH-01
WBALT-15	DDH-01
WBALT-17	DDH-01
FWWALT-02	WBALT-15

Figure 14-1: Plan View of The Resource Domain and Polygons



Source: GWI, 2023.
Note: The area coloured in red shows the Province of Salta relative to Argentina, where the Tolillar Salar is located.

14.6 Assignment of Drainable Porosity Values

Drainable porosity values are reported as a fraction of total rock volume. Best estimates were assigned to every lithological unit in each borehole on a qualitative basis, using the following information sources:

- Sanders (1998);
- Salar del Hombre Muerto (Montgomery, 2021);
- Pozuelos and Pastos Grandes Salars (GDH Group Engineering, 2019); and
- Cauchari Salar (FloSolutions, 2019).

Lithology profiles for each borehole were reconstructed for the updated Resource based on lithological type, grain size, grain shape, grain roundness, as well as on borehole geophysics including resistivity, gamma, and BMR logs available for most of the boreholes. Representative porosity values were assessed and assigned for each unique earth material type within each borehole.

14.7 Brine Characterization

14.7.1 Sample Data

Brine sampling methods are provided in Section 9 and QA/QC procedures are provided in Section 11.5. A total of 150 borehole brine samples were used in the Resource Estimate (Table 14-4), including:

- One hundred and two (102) composite brine samples (including four duplicates) collected during pumping tests;
- Thirty-three (33) step test samples (including two duplicates); and
- Fifteen (15) depth-specific samples, collected with Hydrasleeve HS-2 disposable samplers.

The QP considers that the lithium sampling results are acceptable for use in the updated Resource Estimate.

14.7.2 Assignment of Grade Values

Grade values assigned to the boreholes are summarized in Table 14-5. For the Indicated category, assigned grade is generally based on a single average of all the samples collected from a given well. The assigned grade for the Inferred category extends beyond the bottom of the given borehole and is assigned based on the nearest deeper well. Exceptions are as follows:

- WBALT-09: Depth-specific sampling showed a trend of higher lithium grades at depth. Consequently, depth-specific samples were used to assign an upper and lower grade.
- WBALT-10: A pumping test at this well showed an average grade below 100 mg/L Li, which was considered to be related to the capture of lower grade brine (due to freshwater dilution) in the upper part of the well screen. Consequently, a low-grade shallow zone and higher-grade deep zone was assigned to this well, based on surface geophysics and sampling results from the nearest wells (WBALT-09 and WBALT-11). The entire WBALT-10 Resource polygon was categorized as Inferred, due to this interpretative assignment.
- WBALT-11: A low grade shallow zone was also assigned to this well. Although pumping test samples showed an overall higher grade than WBALT-10, depth-specific (Hydrasleeve) sampling showed some lower values in the shallow zone.

- WBALT-12: This well is constructed with a telescopic design that allowed pump testing of the entire well, and also of three depth discrete intervals. Results from the discrete interval tests were used to assign three different lithium grades along the borehole.
- FWWBALT-02: This well was drilled to a depth of 151.0 m near the southern boundary of the Resource Zone, to explore for a potential shallow source of industrial water. The VES survey results for this area indicated shallow freshwater on top of deeper brine. The shallow freshwater was confirmed by sampling of the well. A deeper brine zone was assigned below 80 m depth based on VES results, with grades based on nearby well WBALT-15. The Resource associated with the FWWBALT-02 polygon was categorized as Inferred, due to this interpretive assignment.

Table 14-4: Summary of Brine Samples

Well ID	Sample Type	No. of Samples	Total Samples
DDHB-01	pumping test	2	2
WBALT-02	pumping test	5	5
WBALT-03	pumping test	7	7
WBALT-04	pumping test	4	8
	step test	4	
WBALT-05	pumping test	2	6
	step test	4	
WBALT-06	pumping test	5	9
	step test	4	
WBALT-07	pumping test	6	9
	step test	3	
WBALT-09	depth specific	11	11
WBALT-10	depth specific	4	4
WBALT-11	pumping test	10	14
	step test	4	
WBALT-12	pumping test	8	8
WBALT-13	pumping test	10	10
WBALT-14	pumping test	11	16
	step test	5	
WBALT-15	pumping test	11	16
	step test	5	
WBALT-16	pumping test	10	14
	step test	4	
WBALT-17	pumping test	11	11
		TOTAL	**150**

Table 14-5: Lithium Grades Used in The Resource Estimate

Well ID	Area (km^2)	INDICATED				INFERRED			
		From (mbgs)+	To (mbgs)	Thickness (m)	Avg Li (mg/L)	From (mbgs)	To (mbgs)	Thickness (m)	Avg Li (mg/L)
DDHB-01	2.90	3	208	205	202	N/A	N/A	N/A	N/A
WBALT-02	5.40	3.5	127	123.5	210	127	352.0*	225	351
WBALT-03	12.00	1.8	120	118.2	218	120	191.0*	71	218
WBALT-04	1.60	1.7	77	75.3	197	77	208.4*	131.4	197
WBALT-05	3.90	26	352	326	351	N/A	N/A	N/A	N/A
WBALT-06	3.13	4.1	237.5	233.4	254	237.5	393.0*	155.5	254
WBALT-07	3.16	4.5	352	347.5	343	352	393.0*	41	343
WBALT-09	10.00	6.5	109	102.5	216	N/A	N/A	N/A	N/A
		109	325	216	232				
WBALT-10	10.60	3.4	N/A	N/A	N/A	3.4	90	86.6	61
						90	402	312	125
WBALT-11	14.40	57.5	108	50.5	61	400	518.0*	118	125
		108	400	292	125				
WBALT-12	4.28	4.1	101	96.9	186	361	393.0*	32	164
		101	198	97	160				
		198	361	163	164				
WBALT-13	4.30	16	269	253	172	269	318	49	172
WBALT-14	4.27	4	280	276	293	N/A	N/A	N/A	N/A
WBALT-15	7.10	9	363	354	332	363	393.0*	30	332
WBALT-16	4.96	6	158	152	285	158	271	113	285
WBALT-17	7.44	10	353	343	290	353	393.0*	40	290
FWWALT-02	2.56	N/A	N/A	N/A	N/A	80	363.0*	283	332
	102.00								

+Static water level
*Interpreted bedrock depth, extrapolated from nearby boreholes
N/A = Not Applicable

14.8 Mineral Resource Estimate

NI 43-101 defines a mineral resource as that portion of the mineral inventory that has reasonable prospects for economic extraction. The updated Resource was calculated according to the following steps:

1 Brine volume was calculated for each geological unit in each polygon:

Brine Volume (m^3) = Unit thickness (m) × D. Porosity ×Area (km^2)×1,000,000 (m^2)/(km^2)

Where:

Unit Thickness (m) = derived from drilling information,

D. Porosity (fraction) = Drainable Porosity value assigned to each unit, and

Area (km^2) = Area of the polygon in which the unit is located.

2 In-situ lithium mass was calculated for each geological unit in each polygon:

Li mass (tonnes) = Brine volume (m^3) ×Grade (mg/L) ×1e^{-9} (tonnes/mg) ×1000 (L)/(m^3)

Where:

Grade (mg/L) = lithium grade values from laboratory analyses.

3 Brine volume and lithium mass was summed for each polygon, with separate tracking for Indicated and Inferred Resources.

4 Brine volume and lithium mass in all polygons was summed for the entire Resource zone.

5 Lithium mass was expressed as LCE, through multiplication by 5.3228.

A cutoff grade of 100 mg/L was assigned to the Resource Estimate, based on the research of Alpha Lithium on reasonable grades for application of Direct Lithium Extraction (DLE) mineral processing methods. Additional verification of this cutoff will be required for subsequent estimation of Measured Resources and for Reserves.

A summary of the updated Resource Estimate is provided in Table 14-6. The presentation of Mineral Resources in this Report conforms with NI 43-101 and CIM Standards. As defined under these standards, Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

Table 14-6: Summary of The Updated Mineral Resource Estimate. Mineral Resource Estimate Relative to a 100 Mg/L Lithium Grade Cut-Off (Effective Date: August 8, 2023)

Resource Category	Updated Resource Estimate		Change from Previous Estimate	
	Indicated	Inferred	Indicated	Inferred
Brine Volume (m^3)	2,940,766,000	1,453,640,300	+1,293,066,000	+313,117,300
Avg. Li (mg/L)	232	180	-10	-11
In-situ Li (tonnes)	681,000	262,000	+283,000	+44,000
LCE (tonnes)	3,626,000	1,393,000	+1,507,000	+235,000
Avg. porosity	0.124	0.149	+0.025	+0.039
Avg. K (mg/L)	2361	1919	+10	-281
In-situ K (tonnes)	6,942,000	2,790,000	+3,069,000	+280,000
KCl (tonnes)	13,237,000	5,320,000	+5,850,000	+534,000

LCE: Lithium Carbonate Equivalent, calculated as in-situ lithium multiplied by the equivalency factor (5.3228).
KCl: Potassium Chloride (potash) Equivalent, calculated as in-situ potassium multiplied by the equivalency factor (1.91).
Product and sums not exact, due to rounding.

The additional exploration work conducted since the last Resource Estimate has further improved the understanding of the basin. The Indicated and Inferred Resource estimates will likely change as more information becomes available. Additional recommended activities (Section 26) are intended to:

- further increase the Resource;
- upgrade parts of the Resource (from Inferred to Indicated and from Indicated to Measured); and
- Collect hydrogeology information (e.g., permeability, hydraulic boundary conditions, brine chemistry boundary conditions) that would contribute to estimation of Reserves.

The QP considers that additional exploration zones with potential to increase the Resource occur primarily at depth, either:

- within the deep salar in-fill materials in the central (deeper) zones of the salar, or
- within potentially permeable basement rock immediately underlying the in-fill materials.

The wells that have been drilled into basement to date provide some indication that this material may be permeable at some locations. Further, it is reasonable to expect that dense brine would invade any drainable porosity within these materials.

15 MINERAL RESERVE ESTIMATES

This section is not relevant to this report.

16 MINING METHODS

16.1 General Description

The production process in the Tolillar Salar will operate through brine extraction wells.

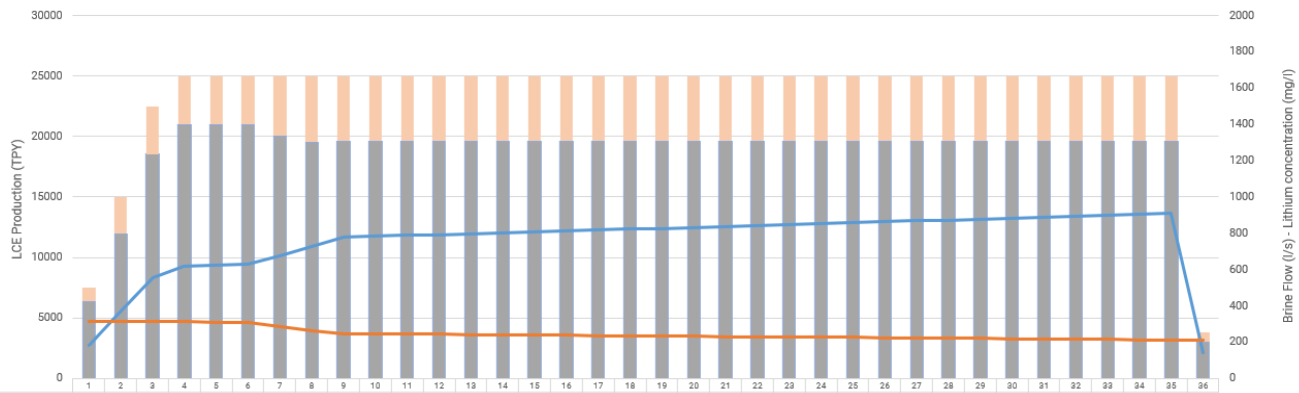
Results of the pumping tests performed in the salar indicate that brine extraction from the salar will take place by installing and operating a conventional brine production wellfield. Brine from the individual production wells will be fed into two collection/transfer ponds located in the central part of the salar, from where it will be boosted through a principal pipeline directly to the process plant located in the northernmost part of the concession.

The considerations taken into account for production plan estimation are the following:

- The maximum extractable brine will be 30% of the brine volume declared in the resource estimation section (Section 14), as a percentage determined based on the QP's experience and Houston *et al.* (2011).
- The plant's efficiency is estimated to range from 74% to 80%, with an average value of 77% used for calculation purposes.
- Annual dilution factors for the lithium concentration have been defined according to the QP's experience, following three scenarios: resource polygon entirely or almost entirely in the salar area (0.3% decline annually); resource polygon partially in the salar and in detrital deposits (0.6% decline annually); and resource polygon entirely or almost entirely in detrital deposits in the salar margins (1.0% decline annually).
- A production ramp-up, which consists of 30% of the annual LCE production target (25,000 t/y) in Year 1, followed by 60% in year 2, 90% in Year 3, and 100% from Year 4 onwards.

Based on the brine volumes and lithium concentrations estimated for the Tolillar Salar (Section 14), a maximum operating lifespan of 35.1 years has been estimated for an LCE production of 25,000 t/y, as shown in Figure 16-1. In general terms, it requires an average annual brine feed rate of 776 L/s (or 67,037 m^3/d), considering an average lithium concentration of 247 mg/L. More specifically, three production periods can be distinguished in Figure 16-1. The first period, from Year 1 to Year 6, involves the extraction of brine from most of the resource polygons with the highest average lithium concentration, to ensure the recovery of the investment during the time range; in this stage, lithium concentration is maintained at 314 mg/L from Year 1 to Year 3 and then decreases gradually to 308 mg/L in Year 6, while the brine flow increases from 185 L/s in Year 1 to 629 L/s in Year 6. The second period, involving Year 7 and Year 8, comprises the gradual incorporation of the remaining resource polygons, which means an increase in brine extraction, while at the same time a decrease in lithium concentration. Finally, during the third period, from Year 9 onwards, a relatively stable brine extraction rate and lithium concentration are maintained, with average values of 843 L/s and 230 mg/L, respectively.

Figure 16-1: Production estimation.



Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
LCE Production (TPY) - Inferred	1125	3050	3965	3980	3980	3980	4960	5450	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377
LCE Production (TPY) - Indicated	6375	11950	18535	21020	21020	21020	20040	19550	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623
Total brine flow (l/s)	185	370	554	620	624	629	677	729	779	784	788	793	798	803	807	812	817	822
Weighted Li Concentration (mg/l)	314	314	314	312	310	308	286	265	248	247	245	244	242	241	240	238	237	235

Year	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
LCE Production (TPY) - Inferred	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	5377	835
LCE Production (TPY) - Indicated	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	19623	3006
Total brine flow (l/s)	827	832	837	842	847	852	858	863	868	873	879	884	889	895	900	906	911	141
Weighted Li Concentration (mg/l)	234	232	231	230	228	227	226	224	223	221	220	219	217	216	215	214	212	210

Year

Source: Ausenco, 2023.

16.2 Wellfield Layout

Results of the Tolillar Salar pumping tests indicate that pumping rates of individual future brine production wells will range between 4 L/s and 25 L/s. It is important to note that pumping test results are not available to date for polygons WBALT-12 and WBALT-14 to -17, so specific capacity values for those polygons have been interpolated from available data in neighbouring polygons. The pumping rates for the mentioned polygons are preliminary and should be updated in a subsequent stage of the project. According to the current estimation, in the first period (Year 1 to 6) approximately 40 wells are required to be drilled, and then at the end of the project's lifespan, around 108 production wells will have been constructed. It should be noted that each well has a unique productivity and it is not possible to be certain of the flows a well will produce until it has been installed and pump tested. Consequently, some future wells will produce more and others less than predicted at this initial evaluation stage of the project.

According to the maximum bedrock depth estimated for the polygons considered in the production plan, a maximum depth of 393 m is expected for future brine production wells, with shallower depths in areas where the basement level is closer to the surface. In general terms, brine capture zones should primarily focus on sand and gravel units, with the possibility of extraction from evaporite layers (depending on their specific yield), while avoiding clay-dominated strata. Future wellfield layout design needs to be optimized to minimize dilution from water inflows from the sides of the basin.

The brine production wells will be completed with 8 to 10-inch diameter casing, with the possibility of using telescopic casing, which will be evaluated at a later stage. Stainless steel is considered as casing material, equipped with 380 V submersible pumping equipment. Permanent power will be delivered to the wellfield area through electric generators connected to each production well.

16.3 Hydrogeological Considerations

16.3.1 Freshwater Interaction

The Tolillar Salar is relatively narrow, and surrounded by areas of gravels, containing brackish water. Brackish water generally overlies brine around the margins of salars, with the system in a natural equilibrium prior to brine extraction. As brine is extracted from the salar lateral recharge occurs, and over time this is expected to result in lower lithium concentrations extracted at wells, as less concentrated brine migrates towards the wells. Pumping from the salar is likely to influence the interaction between brackish water and brine around the salar margins. Consequently, pumping wells should be constructed to minimise the amount of brine extracted from the upper level of the salar and to take advantage of natural confining layers to minimise the effects of pumping.

A network of monitoring wells is recommended to be installed around the margins of the salar, to monitor the brackish water to brine interface, with wells located based on information available from geophysical surveys.

16.3.2 Infiltration Ponds

Infiltration of brine with a high TDS concentration is strongly influenced by the precipitation of salts, as the TDS concentration increases due to evaporation from the brine. Precipitated salts tend to heal the base of the infiltration area, significantly reducing the infiltration rate. On site and modelling studies of infiltration are required to evaluate what volumes of brine could be infiltrated, without causing surface flooding and runoff. It is recommended that spent brine reinjection is also evaluated, including field trials to assess potential reinjection rates. Drilling would be required to the bedrock depth in the infiltration ponds area, to establish the sedimentary units present throughout that part of the basin and where an optimum location for reinjection would be located, minimising risk of dilution of the naturally occurring resource.

16.4 Cut-off Grade

The cut-off grade for economic extraction is considered to be 100 mg/L. Therefore, lower grade resource polygons WBALT-10 and -11 were not considered part of resource extraction, as their concentrations are close to 100 mg/l and they contain significant areas of gravel expected to host brackish water, which could lead to accelerated dilution of the pumped brine grade, to values below the cut-off grade.

16.4.1 Grade Control and Production Monitoring

Once in the operational period, brine sampling and measurement of brine and water levels for each well should be done weekly, increasing to monthly after the first year. Ongoing weekly to monthly monitoring of monitoring wells around the margins of the salar also needs to be considered. Further control should include yearly video inspections and well maintenance. Finally, a calibrated groundwater model for the brine and surrounding brackish water needs to be developed to simulate brine extraction, as well as brine disposal by infiltration or reinjection.

17 RECOVERY METHODS

17.1 Overview

The process defined for the Project (Figure 17-1) consists of six main stages, the first one corresponds to brine collection from different wells at a single common point (operational center), which consists in a pond located in the geographical center of the different wells, minimizing transport costs. From the operational center the brine is sent to two ponds used for storage and located near the chemical plant. This brine is subsequently sent to the feed tank of the process.

The second stage corresponds to the lithium concentration process, which is compounded by two substages: direct extraction by means of resin adsorption technology and high pressure reverse osmosis. Direct extraction generates a stream of lithium rich eluent with some contaminant elements and other stream of depleted brine which is discarded. The eluent continues to the second substage of concentration by means of high pressure reverse osmosis technology which permits to concentrate the lithium in the brine to around 6,000 mg/L - 7,000 mg/L. The impurities concentration also occurs in this stage.

The third stage corresponds to the elimination of bivalent elements such as calcium and magnesium by means of a chemical reaction through sodium hydroxide and sodium carbonate, generating insoluble residues that later are separated and discarded. The brine free of these elements continues to the following stage of carbonation.

The fourth stage corresponds to the precipitation of lithium carbonate by chemical reaction, which is obtained by dosing sodium carbonate. The reaction product is sent to a solid-liquid separation where a crude product and a strong centrate are obtained. The crude product is sent to the drying process if a technical grade product is required or to the refining process if a battery grade product is required. The strong centrate is sent to a neutralization process where sulfuric acid is used as neutralizer taking place a chemical reaction where carbon dioxide is liberated as a gas and generating a solution of neutral lithium sulphate which is sent back to the second stage of direct extraction to recuperate residual lithium.

The fifth stage of the process corresponds to the refining (purification) which consists in solubilize the lithium by a chemical reaction with carbon dioxide, transforming the insoluble lithium carbonate in highly solvable lithium bicarbonate, leaving the insoluble in solid phase, allowing its removal by filtration. The lithium bicarbonate rich brine is heated producing the liberation of carbon dioxide, precipitating once again the lithium carbonate but with higher purity.

In the sixth stage, the generated product in the fifth stage, which corresponds to battery grade lithium carbonate, is dried, micronized and finally packaged.

General process basis of design is shown in Table 17-1.

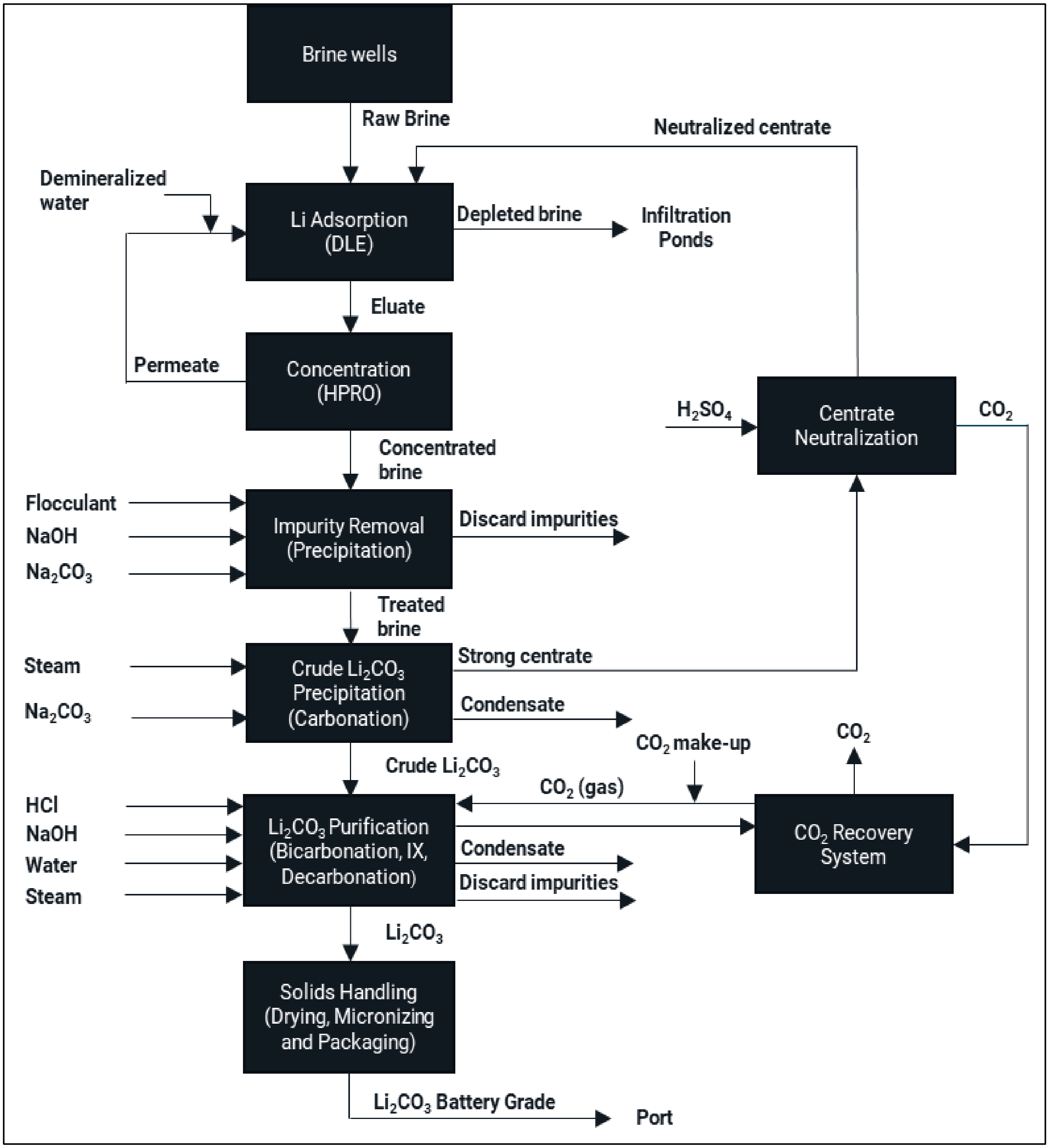
Table 17-1: General Process Basis of Design

Parameter	Units	Value
Plant availability	%	85
Operational Hours		
Days in a year	d	365
Annual hours	h/a	8,760
Operating hours	h/a	7,446
Maintenance plant stop	weeks	2
General Design Factor		
Plant	-	1.20
Reagents	-	1.20
Services (steam, water, others)	-	1.20
Equipment Isolation		
Maximum permitted temperature	°C	45

17.2 Process Flow Sheet

Figure 17-1 shows a block diagram with a general process description and flow directions.

Figure 17-1: Process Block Diagram



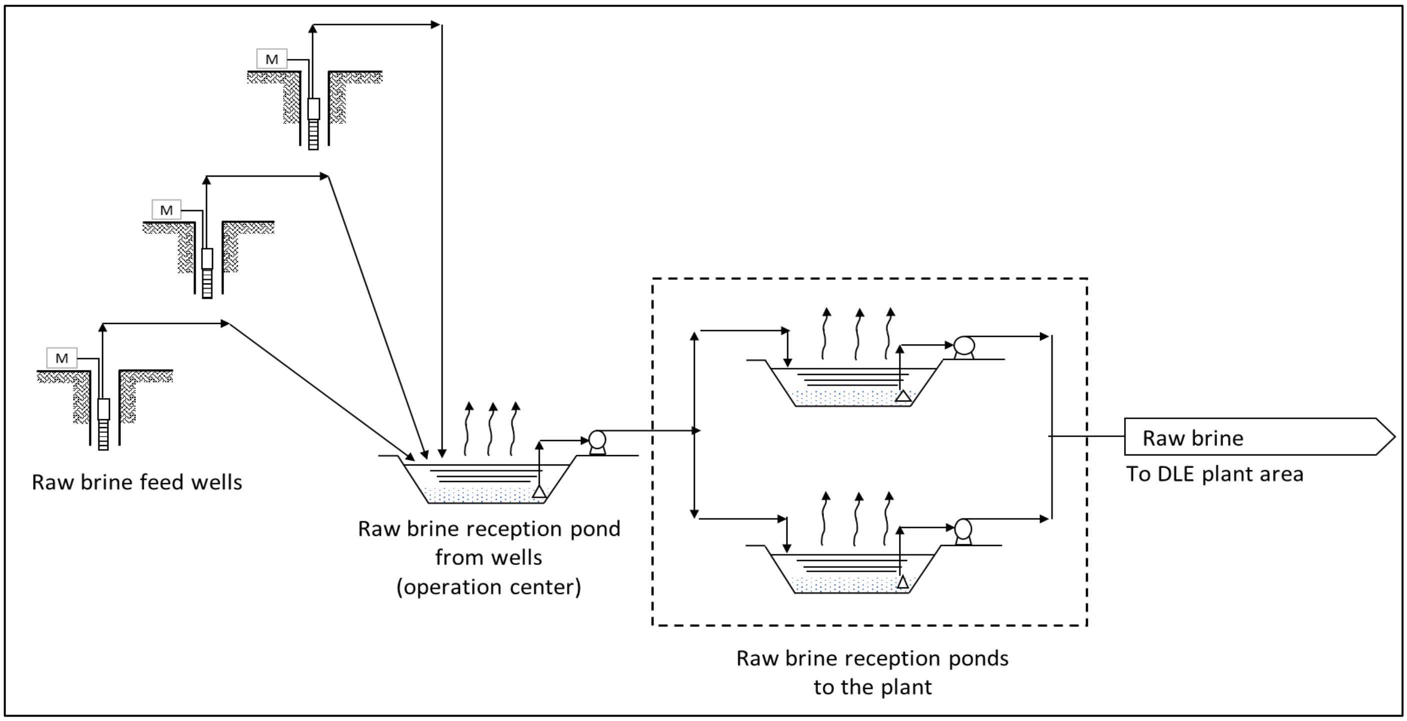
Source: Ausenco, 2023.

17.3 Plant Design

17.3.1 Brine Extraction Wells

The brine extraction well area is shown in Figure 17-2. The raw brine from all the wells is collected in a common reception pond (operation center) within the Salar. The brine is subsequently sent to the reception ponds located next to the plant. These ponds feed the tank located in the DLE Plant area which provides brine for the production process.

Figure 17-2: Brine Extraction Wells Area



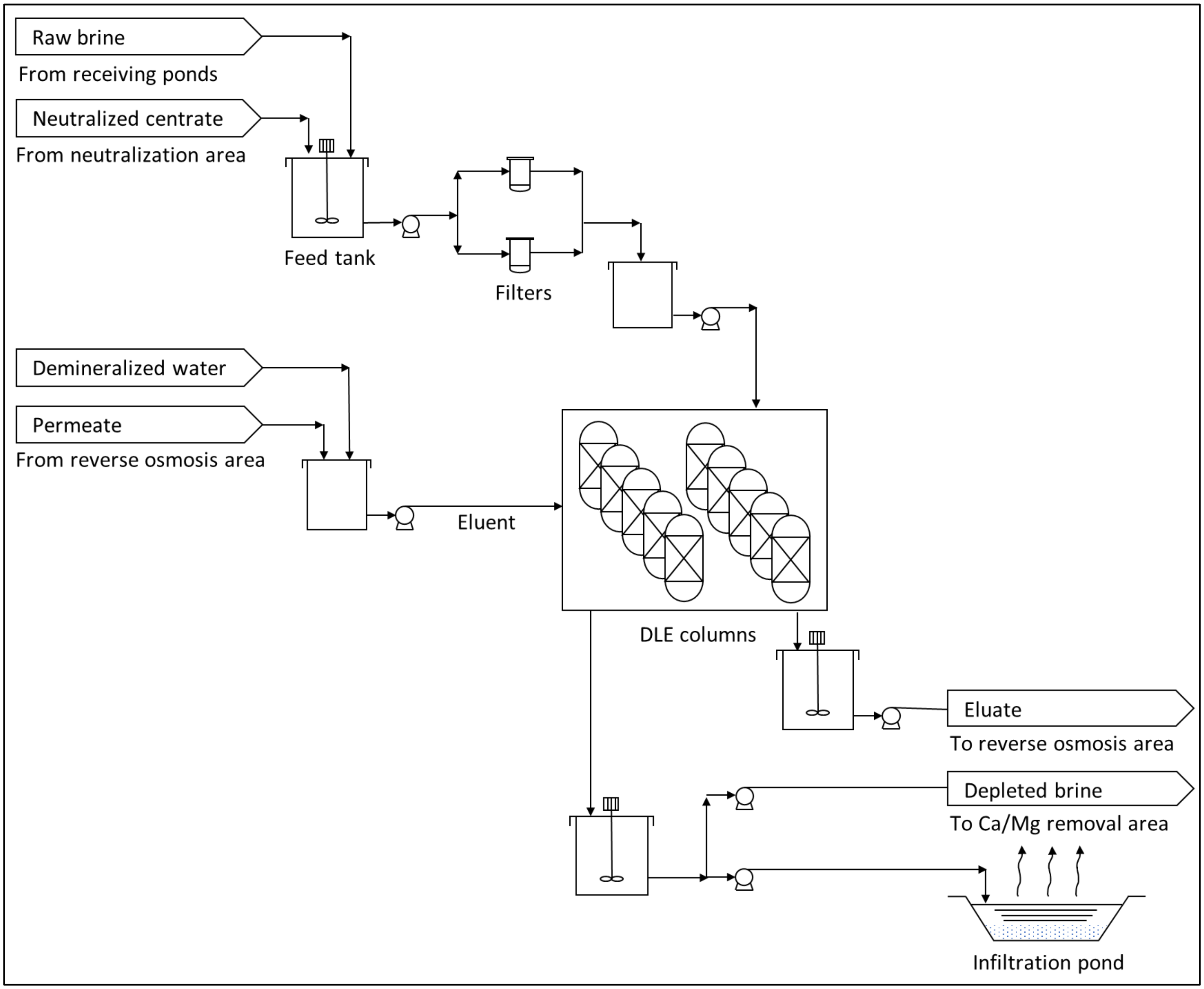
Source: Ausenco, 2023.

17.3.2 DLE Plant Area

The direct lithium extraction (DLE) plant area (Figure 17-3) aims to extract as much lithium as possible from the raw brine using resins as a highly selective adsorbent. The solution coming from the feed tank to the plant is filtered to avoid the dragging of solids that would affect the adsorption resins. The filtered solution is sent to the DLE columns, where it is contacted with specific lithium adsorption resins producing two streams:

- Depleted brine: Corresponds to brine without the lithium ions that were adsorbed by the resins (this is mostly water) which in turn is divided into two, one part is sent to repulp the residual solid from the calcium and magnesium removal process and the other remaining fraction is sent directly to evaporation-infiltration ponds.
- Eluate: Corresponds to the lithium rich solution obtained from the elution of the resins through the use of an eluent composed of water recovered from reverse osmosis (permeate) and demineralized water. This eluate is sent to the reverse osmosis process.

Figure 17-3: DLE Plant Area

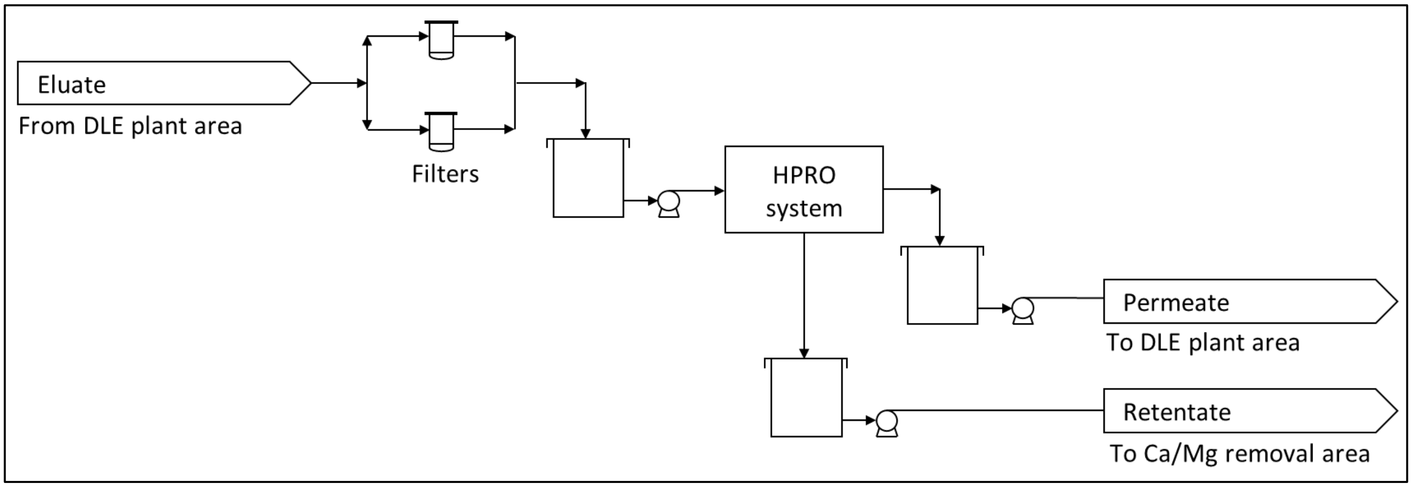


Source: Ausenco, 2023.

17.3.3 Reverse Osmosis

The reverse osmosis area (Figure 17-4) is intended to concentrate the lithium in the brine coming from the DLE columns and recover water by means of membranes. The eluate from the DLE Plant is filtered to avoid the dragging of solids that could affects the functioning of the membranes of the high pressure reverse osmosis (HPRO) system. Two output streams are produced in the HPRO, a permeate that is recirculated to the elution stage of the DLE Plant area, and a retentate (concentrated lithium brine) that is sent to the chemical plant.

Figure 17-4: Reverse Osmosis



Source: Ausenco, 2023.

17.3.4 Chemical Plant

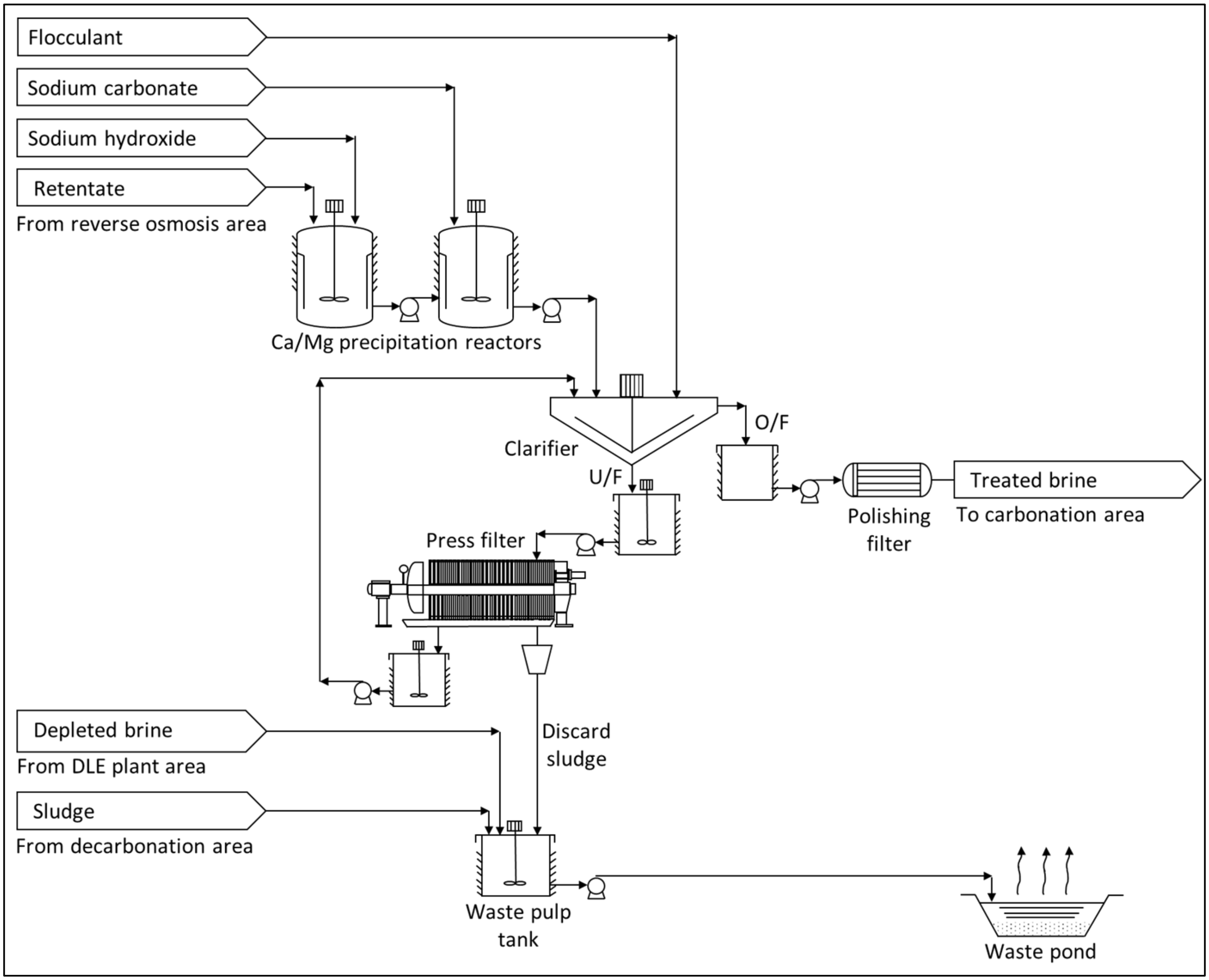
The chemical plant is divided into three stages: Ca/Mg removal, carbonation and neutralization. In the first stage, shown on Figure 17-5, the retentate (concentrated brine) from the reverse osmosis is put in contact with reagents such as sodium hydroxide (NaOH) and sodium carbonate (Na_2CO_3) to generate two insoluble products such as magnesium hydroxide and calcium carbonate, according to the following reactions:

$$2NaOH + Mg^{+2} \leftrightarrow Mg(OH)_2 + 2Na^{+}$$

$$Na_2CO_3 + \ Ca^{+2} \leftrightarrow CaCO_3 + 2Na^{+}$$

The generated pulp is fed to a clarifier where flocculant is added to promote solid-liquid separation. An underflow (U/F) is obtained from the clarifier, which is sent to a press filter that produces a discard sludge that is sent to the waste pulp tank and a filtrate that is recirculated to the clarifier. The overflow (O/F) from the clarifier is filtered and then sent to the carbonation process.

Figure 17-5: Chemical Plant: Ca/Mg Removal



Source: Ausenco, 2023.

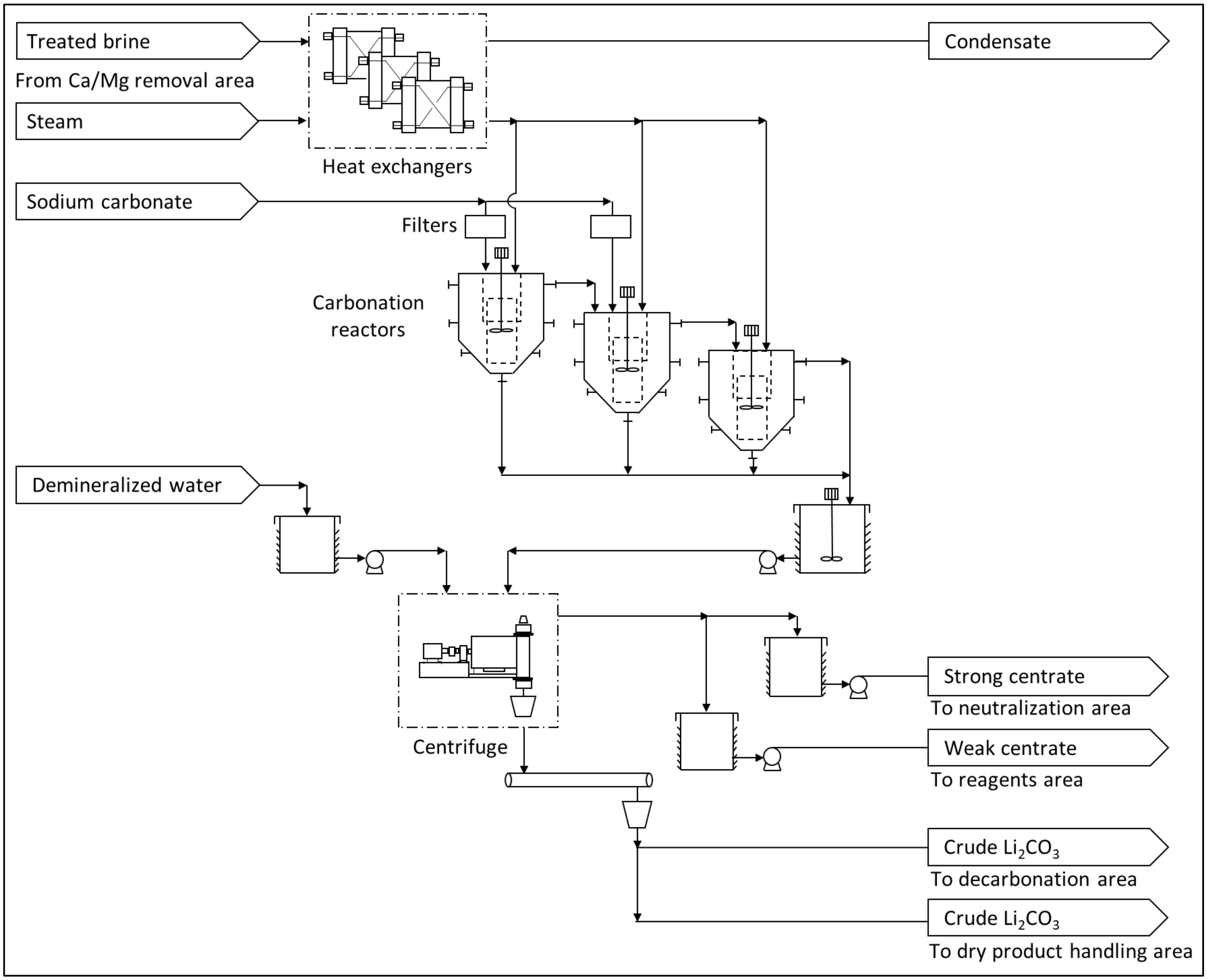
Figure 17-6 shows carbonation stage where treated brine from previous stage is sent to heat exchangers to increase its temperature and is then mixed with a sodium carbonate solution in reactors, where the carbonation reaction takes place, generating highly insoluble lithium carbonate as a product, according to the following reaction:

$$Na_2CO_3 + 2Li^{+2} \leftrightarrow Li_2CO_3 + 2Na^{+}$$

The pulp produced is centrifuged, obtaining a liquid solution (strong centrate) generated at a first squeeze that is sent to the neutralization stage and a solid product of technical grade (crude Li_2CO_3) that is transported to the bicarbonation zone to continue with the refining process and thus obtain battery grade lithium carbonate. Hot demineralized water is added to the centrifuge for cake washing, a second squeeze is performed which generates another liquid solution (weak centrate) that is used for reagent preparation.

Depending on the plant production campaign the crude Li_2CO_3 could be sent to the dry product handling area to obtain technical grade lithium carbonate which is stored in a stockpile for further transportation to its final destination.

Figure 17-6: Chemical Plant: Carbonation

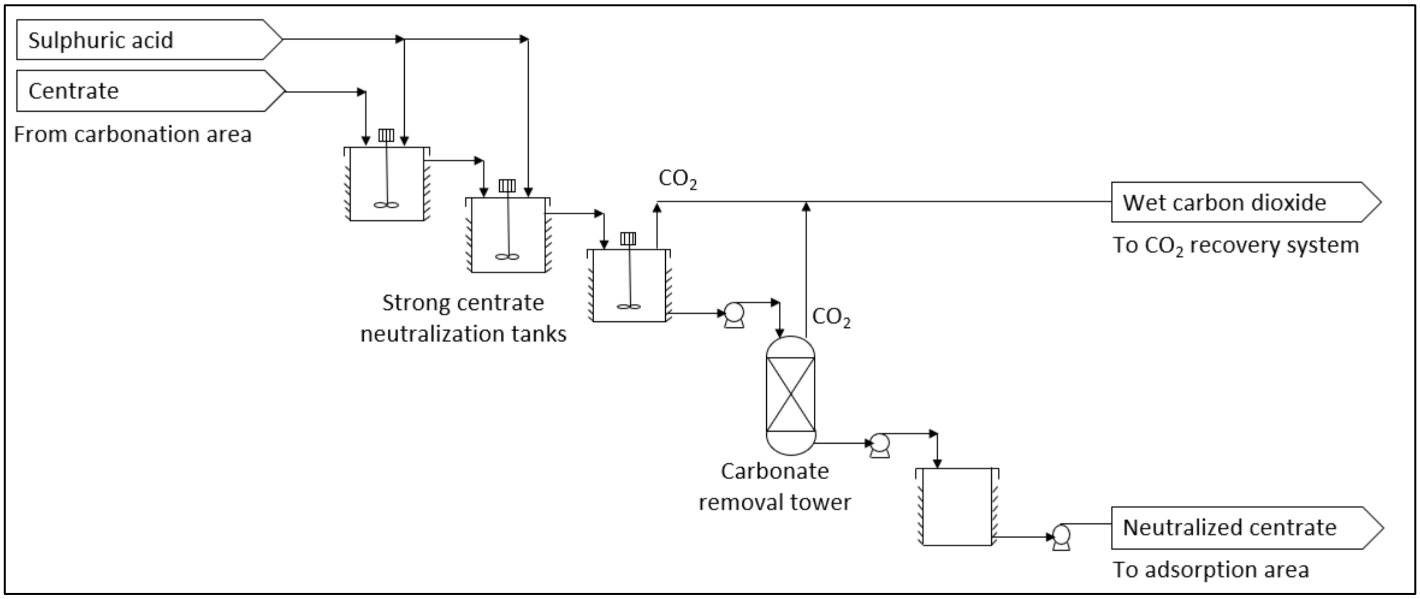


Source: Ausenco, 2023.

Figure 17-7 represents the third stage of the chemical plant, neutralization, the strong centrate (weak lithium solution) produced by carbonation enters a series of stirred tank reactors where sulfuric acid is added to adjust the pH to less than 4.5, eliminating carbonates. The reaction product is recirculated to the feed tank in the DLE Plant area. The reaction that takes place is shown below.

$$Li_2CO_3 + H_2SO_4 \leftrightarrow Li_2SO_4 + CO_2 + H_2O$$

Figure 17-7: Chemical Plant: Neutralization



Source: Ausenco, 2023.

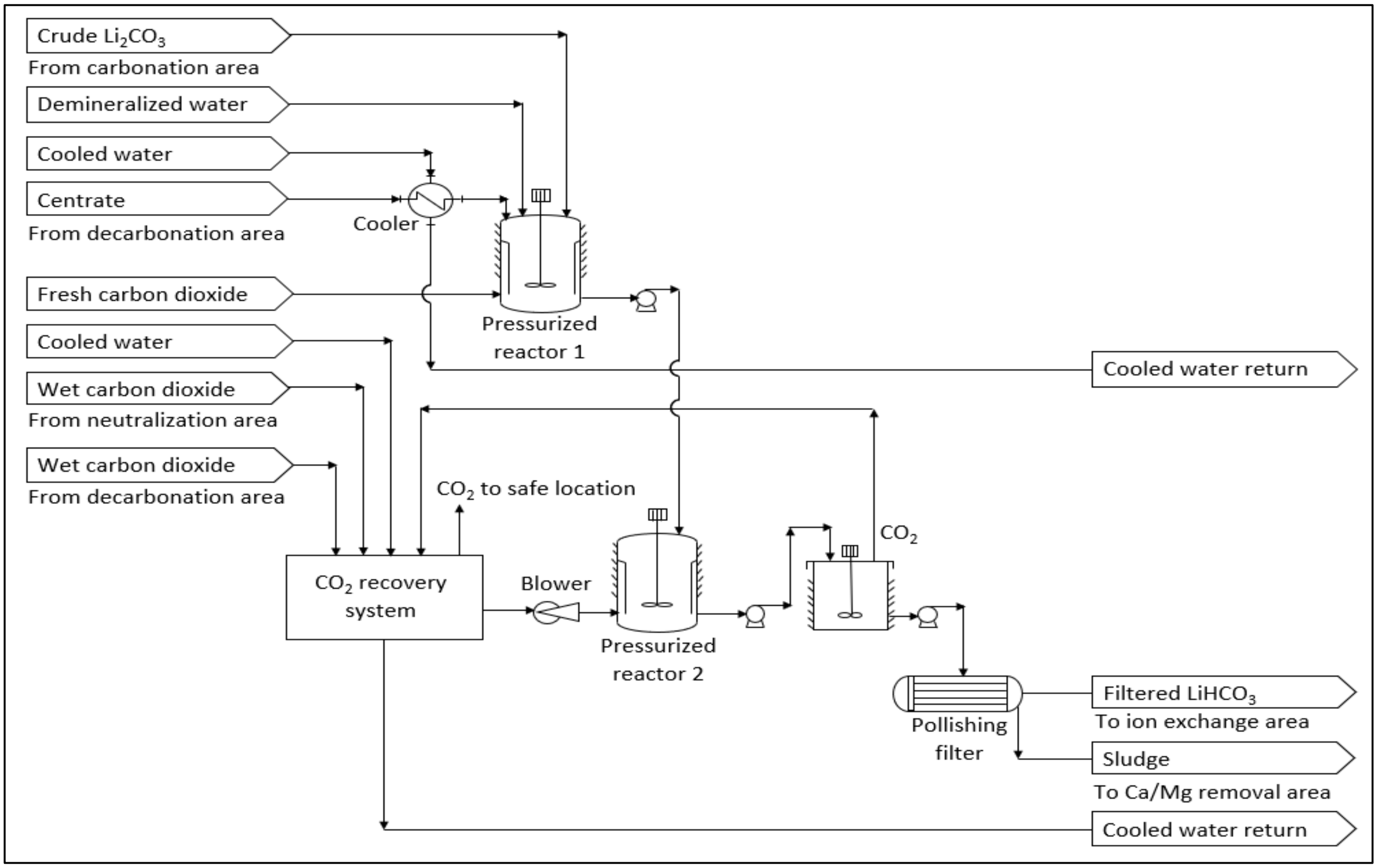
17.3.5 Purification

The purification area is divided into three stages: bicarbonation, ion exchange, and decarbonation. In the first stage, represented in Figure 17-8, the crude lithium carbonate (Li_2CO_3) is introduced into pressurized reactors where it is mixed with circulating centrate and carbon dioxide. The carbon dioxide reacts with lithium carbonate producing highly soluble lithium bicarbonate according to the reaction shown below.

$$Li_2CO_3 + CO_2 + H_2O \leftrightarrow 2LiHCO_3$$

From the bicarbonation reaction, insoluble solids are generated that accompany the product and remain in a solid phase, allowing them to be discarded of by filtration. The sludge produced is sent to the waste pulp tank in the Ca/Mg removal area.

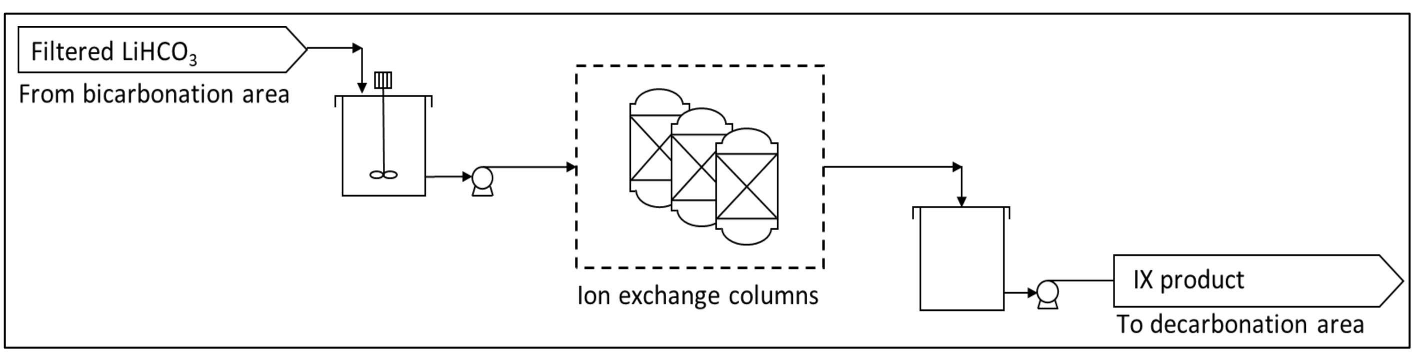
Figure 17-8: Purification: Bicarbonation



Source: Ausenco, 2023.

In the ion exchange process (Figure 17-9) the solids free solution (filtered $LiHCO_3$) is put in contact with ion exchange resins to eliminate traces of calcium, magnesium and boron. The brine free of these contaminants continues to the decarbonation process.

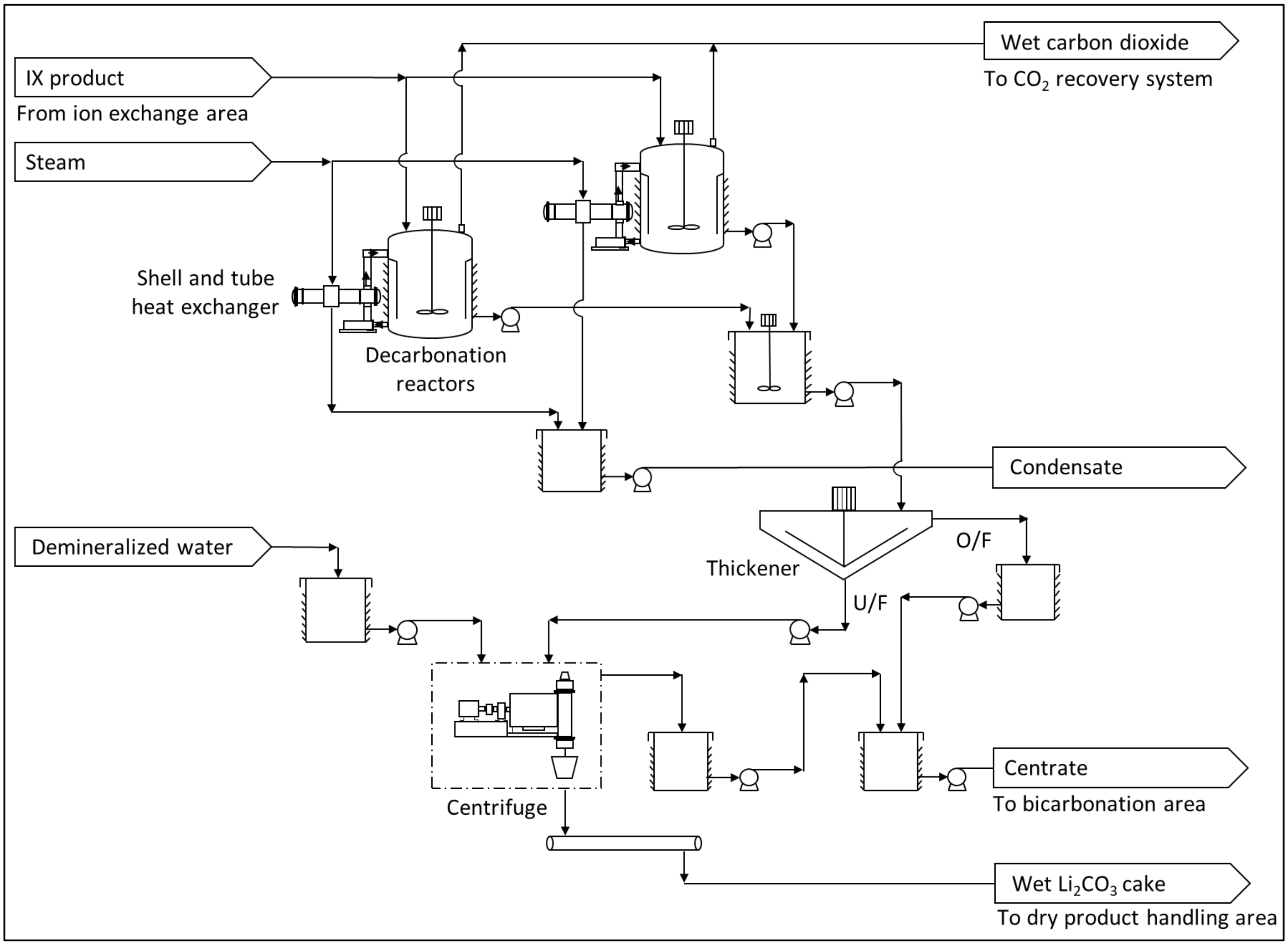
Figure 17-9: Purification: Ion Exchange



Source: Ausenco, 2023.

The decarbonation process, presented in Figure 17-10, consists in a second lithium precipitation, which is done in crystallizing reactors increasing the temperature with steam. The obtained pulp is sent to a thickener where the overflow (O/F) is recirculated to the bicarbonation stage and the underflow (U/F) is sent to a solid-liquid separation stage, where the liquid joins the overflow and the solid continues to the drying stage in the dry product handling area. Additionally, hot demineralized water is used for cake washing producing part of the centrate that is sent to bicarbonation area.

Figure 17-10: Purification: Decarbonation

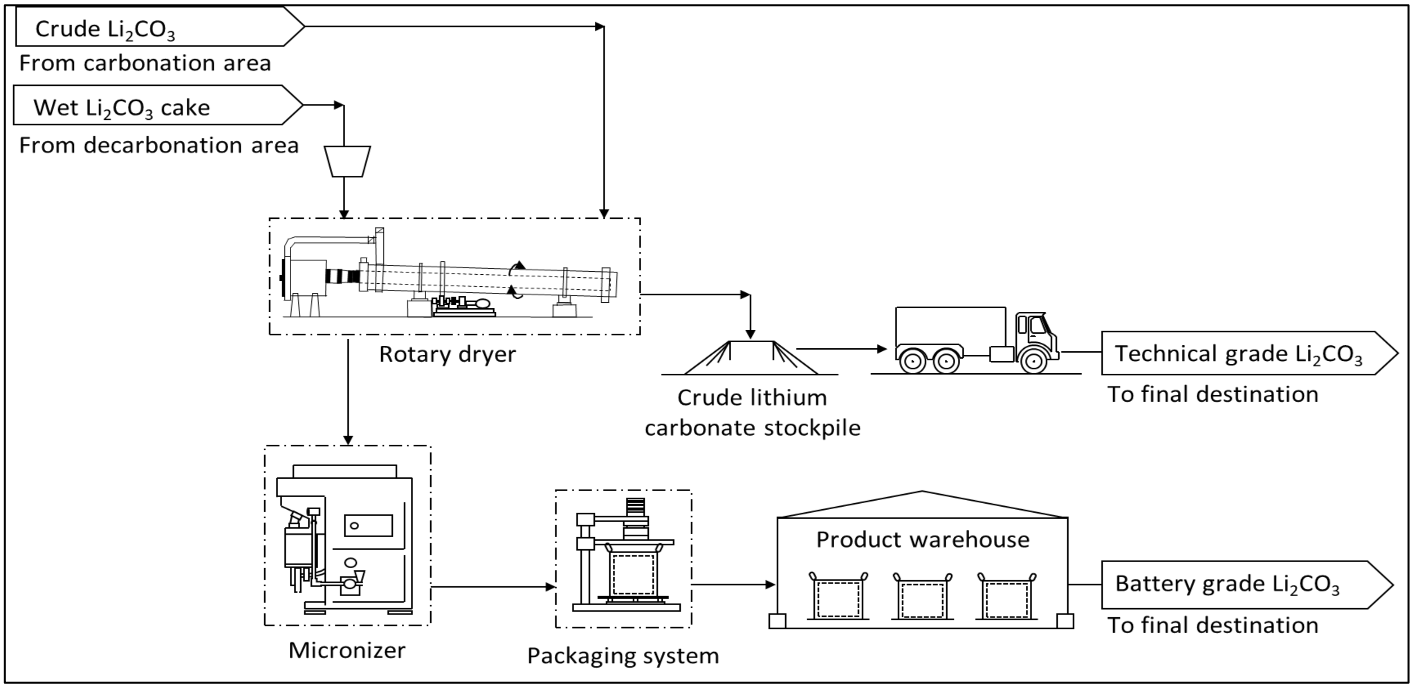


Source: Ausenco, 2023.

17.3.6 Dry Product Handling

Figure 17-11 shows the process for the dry product handling area. The lithium carbonate obtained in the purification stage is sent to a rotary dryer and then to a micronizer where the product size is reduced to industry battery grade requirements. Finally, the fine lithium carbonate is packaged and stored in the product warehouse.

Figure 17-11: **Dry Product Handling**



Source: Ausenco, 2023.

17.4 Parameters and mass balance results

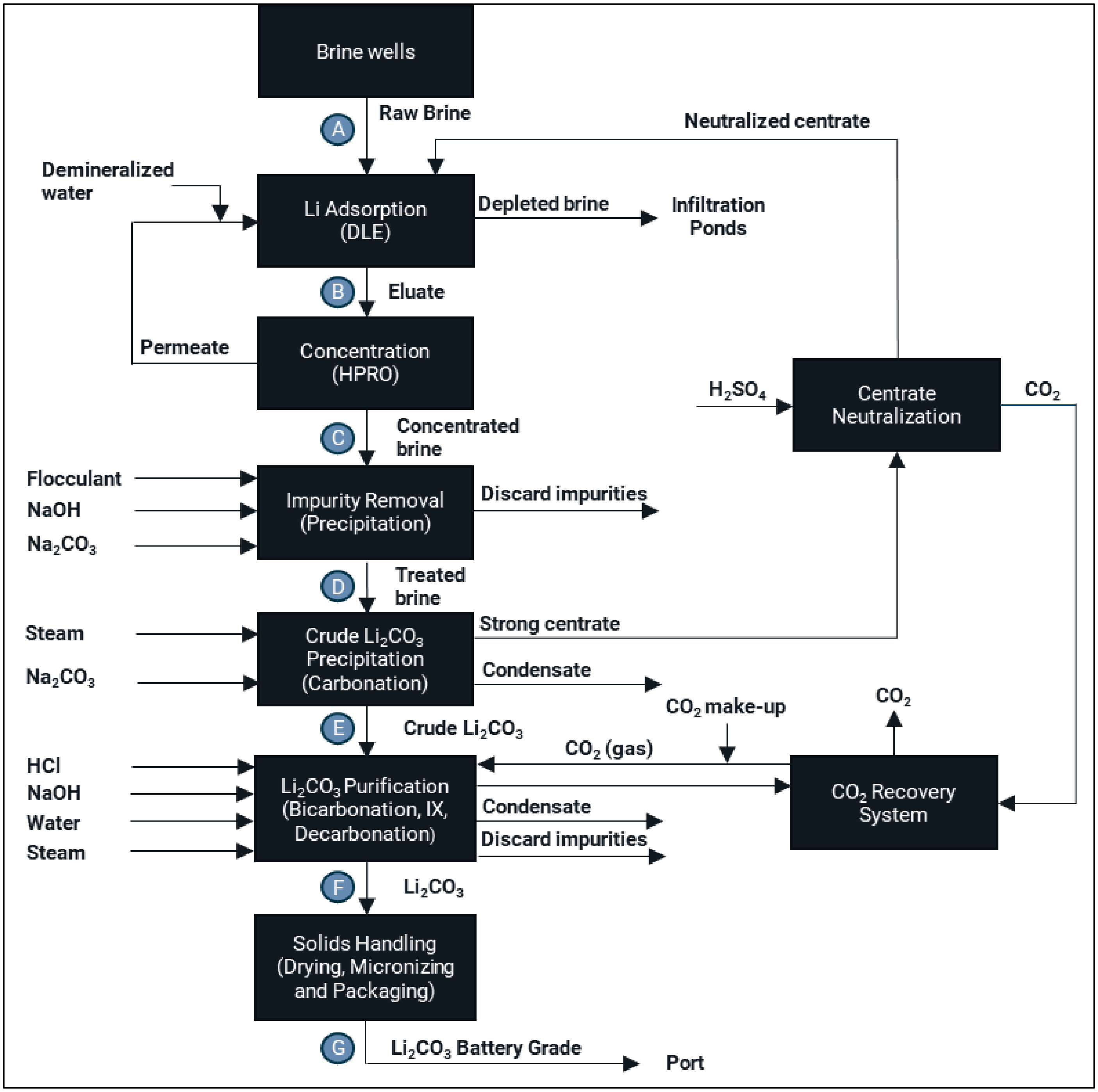
The mass balance presented in Table 17-2 highlights the main process streams indicated with letters in the block diagram shown in Figure 17-12. This theoretical balance was created based on benchmark data of Ausenco, therefore it will need to be validated with laboratory test, pilot plant tests results and information from vendors. Currently, a pilot plant is under construction in the Salar, which will allow to corroborate the theorical mass balance.

Table 17-2: **Mass Balance Process Summary**

Stream name	Code	Flow rate		Composition mg/L or (% w/w)			
		t/a	m³/a	Li^+	Mg^{+2}	Ca^{+2}	B
Tolillar raw brine	A	-	18,897,948	314	1,636	389	223
Eluate	B	-	14,698,404	469	62.5	26.0	46.1
Concentrated brine	C	-	923,304	7,198	839	394	295
Treated brine	D	-	930,750	7,099	4.14	11.7	291
Crude Li_2CO_3	E	34,922	-	(14.0)	(0.00552)	(0.0184)	(0.00148)
Li_2CO_3 from purification	F	34,326	-	(14.1)	-	-	-
Final product (Li_2CO_3 B.G.)	G	25,838	-	(18.7)	-	-	-

The production obtained in the mass balance is 25,838 t/a of battery-grade lithium carbonate, with an overall yield of 81%.

Figure 17-12: Block Diagram for Mass Balance



Source: Ausenco, 2023.

17.5 Product/Materials Handling

A fraction of the depleted brine produced in DLE Plant is pumped to evaporation-infiltration ponds, located nearby of the production plant area.

The waste pulp generated after the mixing of depleted brine and filter press sludge discard is sent to the waste pond, where liquid is evaporated.

Reject water from water treatment plant is usually used to floors wash or roads maintenance.

Depending on plant campaign technical grade lithium carbonate or battery grade lithium carbonate is produced. In case of technical grade, the product is collected in a stockpile to further be charged in trucks until its destination while battery grade lithium carbonate is packed in maxi sacks of one tonne and storage in the product warehouse until to be transported to its final destination.

17.6 Energy, Water and Process Materials Requirements

17.6.1 Reagents

The reagents required in the lithium carbonate production process are indicated in Table 17-3.

Table 17-3: Reagents Consumptions Rates

Reagent	Chemical Formula	Annual Consumption (t/a)
Sodium carbonate (soda ash)	Na_2CO_3	61,536
Sodium hydroxide (caustic soda)	NaOH	2,899
Hydrochloric acid	HCl	21,366
Sulfuric acid	H_2SO_4	142
Carbon dioxide	CO_2	9,358
Flocculant	-	0.190

The procedures of how these reagents are used and prepared are listed below.

17.6.1.1 Sodium Carbonate

Sodium carbonate or soda ash is used in the process to reduce the calcium content and to produce lithium carbonate, the latter operation being the most important in consumption terms. Sodium carbonate preparation is carried out in a plant with agitated tank that dissolves it using weak centrate from centrifugation process and demineralized water. This tank handles an excessive sodium carbonate amount, ensuring a saturated solution at operating temperature. Once the solution is prepared, it is pumped to the sodium carbonate storage tank and then sent to the sectors where it is used.

17.6.1.2 Sodium Hydroxide

Sodium hydroxide or caustic soda is received in the plant as a solid contained in bags. Sodium hydroxide is prepared by dissolving it with filtered water in an agitated tank. Once the solution is prepared, it is sent to the sodium hydroxide storage tank and then distributed.

For elution of the ion exchange columns the sodium hydroxide is additional diluted with demineralized water in an agitated tank to be used.

17.6.1.3 Hydrochloric Acid

The hydrochloric acid is transported in a tanker truck and fed into a HCl storage tank; it is then pumped to dilute hydrochloric acid tank where it is diluted with demineralized water in an agitated tank prior to be distributed to consumers.

The hydrochloric acid is needed for the ion exchangers elution operation. The solution used is sent to the waste acid tank and after is pumped to the adsorption feed tank.

17.6.1.4 Sulfuric Acid

The sulfuric acid is transported in a tanker truck and fed into a storage tank; it is then pumped to strong centrate neutralization tanks.

17.6.1.5 Carbon Dioxide

Carbon dioxide (CO_2) is used in purification area in order to obtain a battery-grade impurity-free product.

17.6.1.6 Flocculant

The solution preparation takes place when the flocculant is introduced into a silo, which feeds the flocculant mixing tank. The tank is also fed with filtered water. Once the flocculant solution is prepared, it is pumped into another tank that distributes it to the brine treatment clarifier in the chemical plant area.

17.6.2 Utilities

17.6.2.1 Water

The total projected raw water requirement for the Project based on the process plant design carried out is 578 m^3/h. This flow is of raw water obtained directly from freshwater wells and contemplates the requirement of both treated and demineralized water. Treated water is required in several stages in the production process of battery grade lithium carbonate, mainly in the DLE elution but also in the preparation of soda ash solution, dilution of caustic soda and hydrochloric acid, in the ion exchange operation and in the repulsion of crude lithium carbonate before purification. Demineralized water is obtained from a treatment plant that uses reverse osmosis to obtain the required water quality with the purpose of preventing contaminants from entering the process.

17.6.2.2 Steam

Steam is generated in boilers and is required to heat the brine entering the carbonation area and in the decarbonation process to recuperate the carbon dioxide used in the bicarbonation of lithium.

17.6.2.3 Air

Air is needed in the process plant primarily for several purposes. One is for the supply of air lines in all areas of the plant and other one for supplying air to all instrumentation that requires it in the process.

Atmospheric air is passed through air compressors, air dryers, air filters, and then process air receivers, which distribute air to the instruments, plant hose station, and process plant plate filters.

17.6.2.4 Power

Liquefied gas is used to provide energy to the different areas of the Project. Gas is supplied by the Argentinian national company YPF. For further details of power supply and energy requirements refer to Section 18.6.

17.6.2.5 Fire System

Part of the freshwater taken from the wells is fed into a tank of the fire system, from there it is pumped and distributed to cover fire emergencies in the plant.

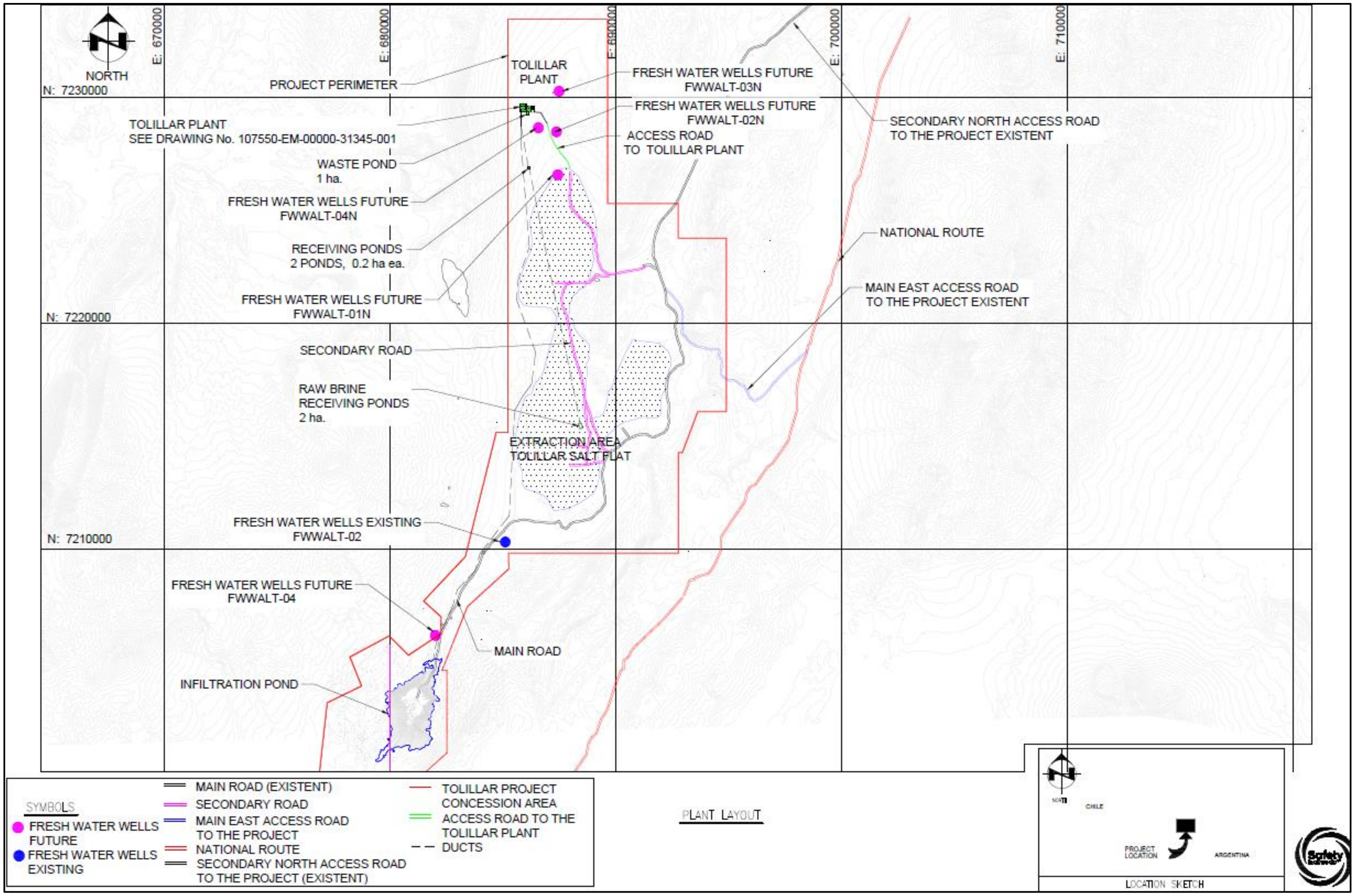
18 PROJECT INFRASTRUCTURE

18.1 Introduction

The infrastructure present for the Tolillar Project will consist mainly of civil works, site facilities/buildings, water, gas, electricity, and steam generation infrastructure.

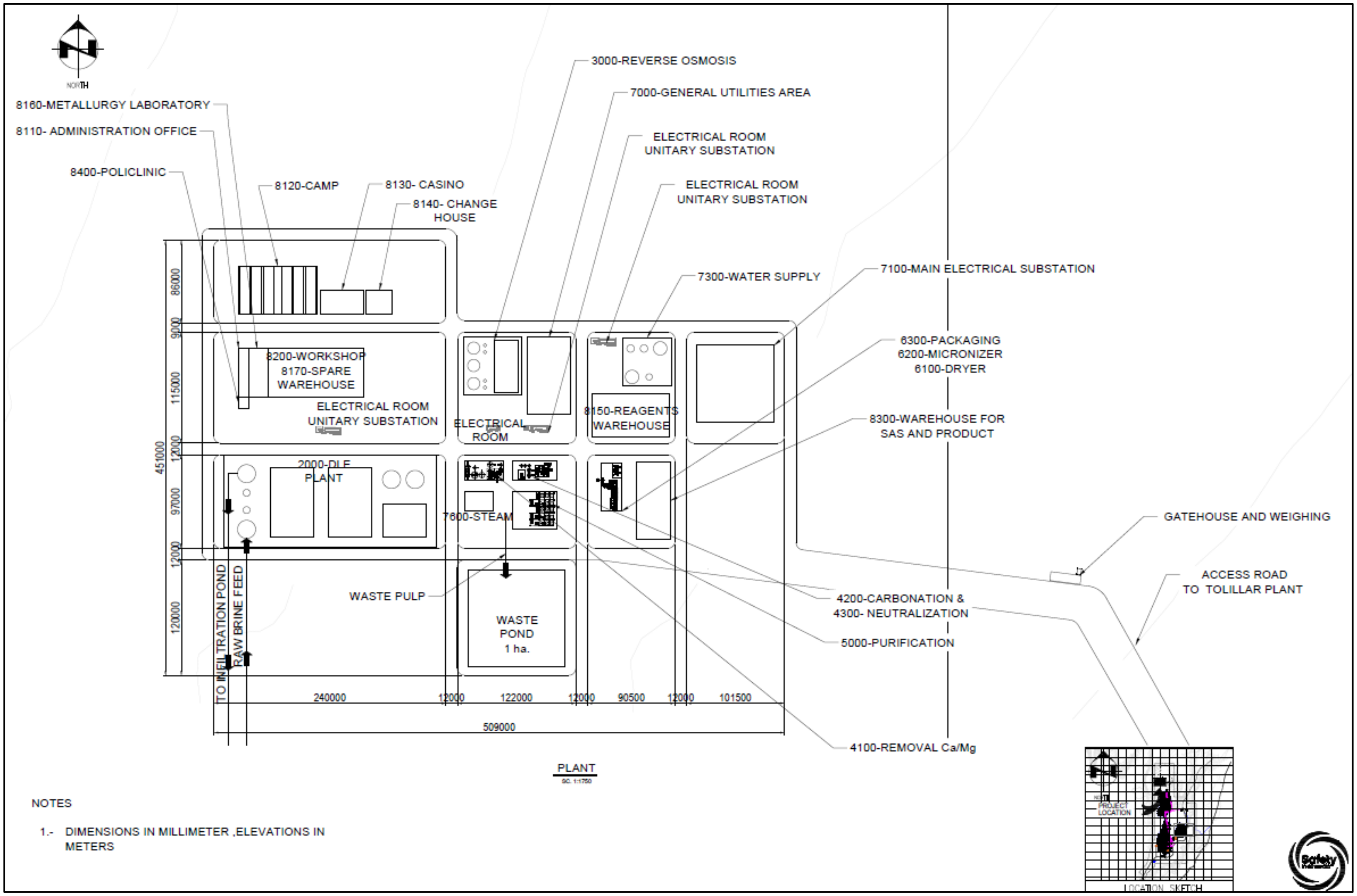
- Roads and Logistics;
- Project facilities/buildings include:
  - Well Field;
  - Raw Brine Pipeline
  - DLE Plant;
  - Reverse Osmosis;
  - Chemical Plant;
  - Purification;
  - Dry Product Handling;
  - Air and Steam;
  - Administration Office, Dining room, Change House, Policlinic and First aid;
  - Laboratory Maintenance, Workshop and Warehouses.
- Ponds:
  - Raw brine receiving pond;
  - Receiving ponds;
  - Depleted brine infiltration pond;
  - Waste pond.
- Power Supply;
- Accommodations;
- Water Supply;
- Power and Electrical; and
- Fuel.

Figure 18-1: Plot Plant Layout



Source: Ausenco, 2023.

Figure 18-2: Plant Layout



Source: Ausenco, 2023.

18.2 Road and Logistics

The Salar de Tolillar is in the department of Los Andes, Province of Salta, approximately 370 km from the city of Salta. It is accessed by National Route No. 51 which, from Salta Capital, heads west until it reaches the town of San Antonio de Los Cobres, after traveling about 160 km. From here it continues for about 60 km to Puesto Cauchari, where Provincial Route No. 27 begins and heads south, until it reaches the town of Salar de Pocitos, after traveling about 50 km. From this last place, you continue along Provincial Route No. 17, heading south. The first of the accesses is located at about 60 km following this route and 20 km of internal road to reach the project site (North access road). An alternative access is about 80 km along Provincial Route 17 plus 10 km of internal road (East access road).

The town of San Antonio de Los Cobres has a paved road to get from Salta Capital by the RN 51, except for some short stretches, with a very good trafficability in general, except for the rainy seasons when the water coming down from the mountains cuts the traffic for some hours.

This route connects the Province of Salta with the neighboring country of Chile through the Sico Pass located at 4,092 masl. Passing San Antonio de Los Cobres the asphalt ends, and the RN 51 continues a dirt road. In general, the road is passable except for days of heavy rains (in summer) or heavy snowfalls (in winter) which generate the cut of this. Also, after San Antonio the road and tourist signage are poor.

About 10 km south of SAC, RN 51 joins RP 129 which connects with the town of Santa Rosa de los Pastos Grandes. At Cauchari/Olacapato, RN 51 joins RP 27 connecting with the town of Estación Salar de Pocitos.

As for the railroad lines, the Belgrano Cargas connects Salta Capital with SAC through the C 14 branch line.

The C-14 Branch is a very important corridor of the country's railroad line. It is one of the most complex in the world and its importance lies in the fact that it is a key piece of the bioceanic corridor that links Salta to the Chilean port of Antofagasta and from there to access the Asian markets. This railway network crosses the Lerna Valley, entering through the Quebrada del Toro, in the Puna, to connect to the west with Chile at the international border of Socompa. On this route, the FFCC Belgrano passes through the following stations: Salar de Pocitos, Tolar Grande, Taca Taca, Vega de Arizaro, Caipe, Choculaqui, Quebrada del Agua and Socompa.

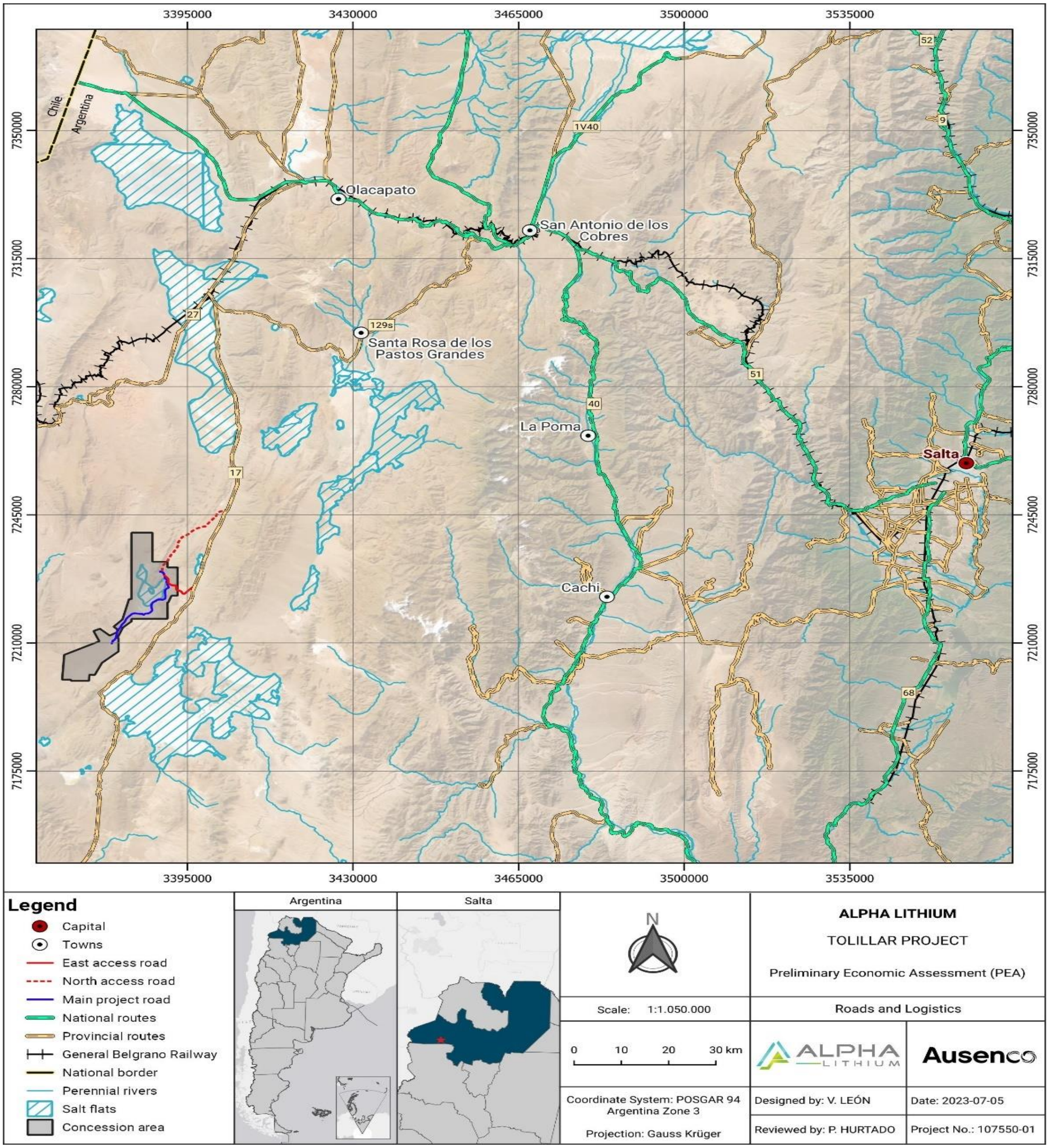
The nearest port is the port of Antofagasta, 628 km by land, in the Republic of Chile. The port has the capacity to handle vessels up to 50,000 tons. Antofagasta has a deep port (10m) with crane facilities and full berthing berths from 175 to 220 m, with holds for containers of up to 70 t. The Antofagasta port is already utilized by other operations in the region to import soda ash and export lithium carbonate to Asia via the Pacific Ocean. The alternative is the port of Buenos Aires, 1,734 km away by land, which is the main container port in Argentina, concentrating approximately 90% of the country's container movement. It is where port operations are carried out, as well as the handling of overseas and coastal vessels.

Martín Miguel de Guemes International Airport (FAA: SLA - IATA: SLA - ICAO: SASA), commonly known as El Aybal Airport, 338 km away by land, is an airport located 7 km southwest of the center of the city of Salta, capital of the province of the same name, in the Argentine Republic. The airport is located next to NR 51, Kilometer 5 and its coordinates are latitude 24° 50' 40" S and longitude 65°28'43 "W. The airport has two asphalted runways, one main runway of 3,000 m and the other of 2,400 m.

Gobernador Horacio Guzmán International Airport, 443 km by land, (FAA: JUJ - IATA: JUJ - ICAO: SASJ), is an airport located 33 km southeast of the center of the city of San Salvador de Jujuy, in the town of Perico in the department of El Carmen in the province of Jujuy. The airport has a 2950 m paved runway. It currently operates domestic routes to the city of Cordoba and Buenos Aires with narrow-body aircraft.

The Loa Airport, about 459 km by land, is located 6 km southeast of the city of Calama in Chile. It is part of the primary airport network of the Republic of Chile. The airport has a 2,889 m paved runway. Figure 18-3 shows an overview of the Project's roads and logistics.

Figure 18-3: Roads and Logistics Tolillar Project.



Source: Ausenco, 2023

18.3 Built Infrastructure

18.3.1 On – Site

18.3.1.1 Wellfield

Wellfield is described in Section 16.2 in the present report.

18.3.1.2 DLE Plant

The DLE Plant has two main structures, the one containing the adsorption and elution columns with an area of 3,000 m^2 (60 m wide, 50 m long and 8 m high) and consisting of two floors, industrial metal structure, concrete floor, and metal wall each.

18.3.1.3 Reverse Osmosis

The reverse osmosis plant has an area of 1,500 m^2 (30 m wide, 50 m long and 5 m high), one floor, industrial metallic structure, concrete floor, metallic wall with a warehouse type distribution.

18.3.1.4 Chemical Plant

The chemical plant has two main structures, the Ca/Mg removal plant with an area of 800 m^2 (40 m wide, 20 m long and 30 m high) and the carbonation and neutralization area with a surface of 900 m^2 (45 m wide, 20 m long and 30 m high), both with a metallic industrial structure, concrete floor, and metallic wall and four floors.

18.3.1.5 Purification

The purification plant has an area of 1,800 m^2 (45 m wide, 40 m long and 20 m wide) 3 floors and industrial metallic structure, concrete floor, and metal wall.

18.3.1.6 Dry Product Handling

The drying area has an area of 1,100 m^2 (22 m wide, 50 m long and 35 m high). This structure has one floor, industrial metal structure, concrete floor, and metal wall.

18.3.1.7 Air and Steam

The air supply has a structure with a surface area of 160 m^2 (8 m wide, 20 m long and 5 m high), while the steam supply has a surface area of 600 m^2 (30 m wide, 20 m long and 10 m high), both have a floor, industrial metal structure, concrete floor and metal wall distributed as a warehouse.

18.3.1.8 Administration Office, Dining room, Change House, and Policlinic for first aid.

The administration office has a capacity for 70 people with a surface area of 504 m^2 (50 m wide, 10 m long and 3 m high) and is a 1-story container-type structure.

The dining room has space for 120 people with a surface area of 1,123 m^2 (25 m wide, 45 m long and 4 m high) in a 1-story container-type structure.

The change house has space for a staff of 93 people, with a surface area of 672 m^2 (25 m wide, 27 m long and 4 m high), being a one floor container-type structure.

The first aid clinic has a capacity for 10 people and a surface of 115 m^2 (10 m wide, 12 m long and 3 m high), being a container type structure.

18.3.1.9 Laboratory, Maintenance Workshop and Warehouses

Table 18-1: Laboratory, Maintenance Workshop and Warehouses.

Infrastructure	Area (m^2)	Description
Reagents Warehouses	3,600	Industrial metal structure, concrete floor, and metal wall (warehouse type).
Metallurgy Laboratory	1,000	Industrial metal structure, concrete floor, and metal wall (warehouse type).
Spare Warehouse	5,000	Industrial metal structure, concrete floor, and metal wall (warehouse type).
Workshop of Maintenance	5,000	Industrial metal structure, concrete floor, and metal wall (warehouse type).
Warehouses for SAS and product	2,800	Industrial metal structure, concrete floor, and metal wall (warehouse type).

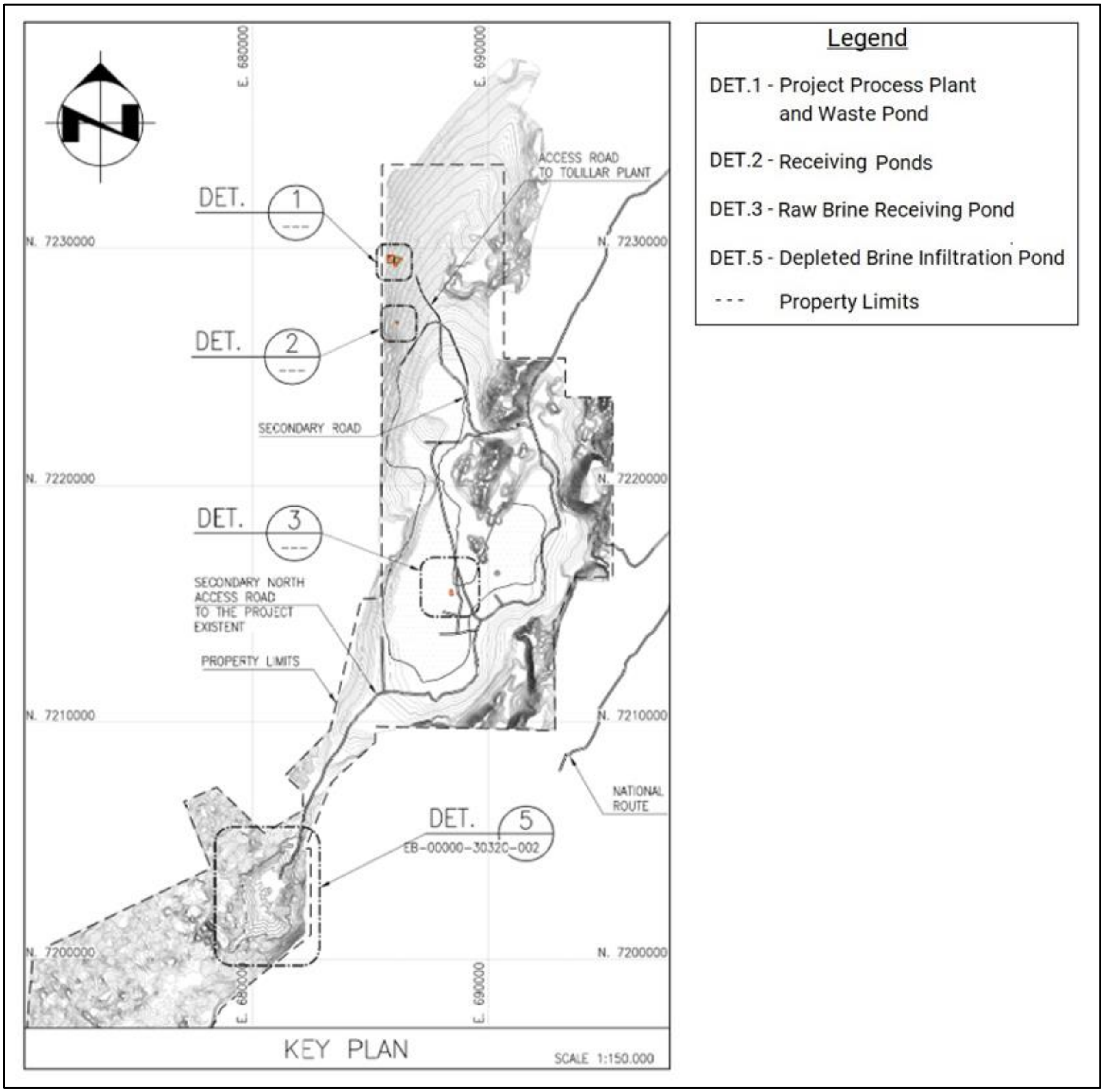
18.4 Accommodations

The camp is designed for a staff of 350 workers, with an area of 4,800 m^2 (50 m wide, 8 m long and 3 m high). It considers six buildings with two floors.

18.5 Project ponds

The Project envisages different types of ponds varying in location, function and dimensions. A pond is required to receive the raw brine from different brine extraction wells from the Salar at a common central point (Raw Brine Receiving Pond); this brine is then sent to two receiving ponds close to the plant (Receiving Ponds). The depleted brine obtained in the process requires a pond for its evaporation-infiltration (Depleted Brine Infiltration Pond); and another pond is required for disposal of the liquid waste from the process (Waste Pond). Figure 18-4 shows the preliminary location of each of these ponds framed within the property limits.

Figure 18-4: Project ponds location



Source: Ausenco, 2023.

18.5.1 Waste Pond

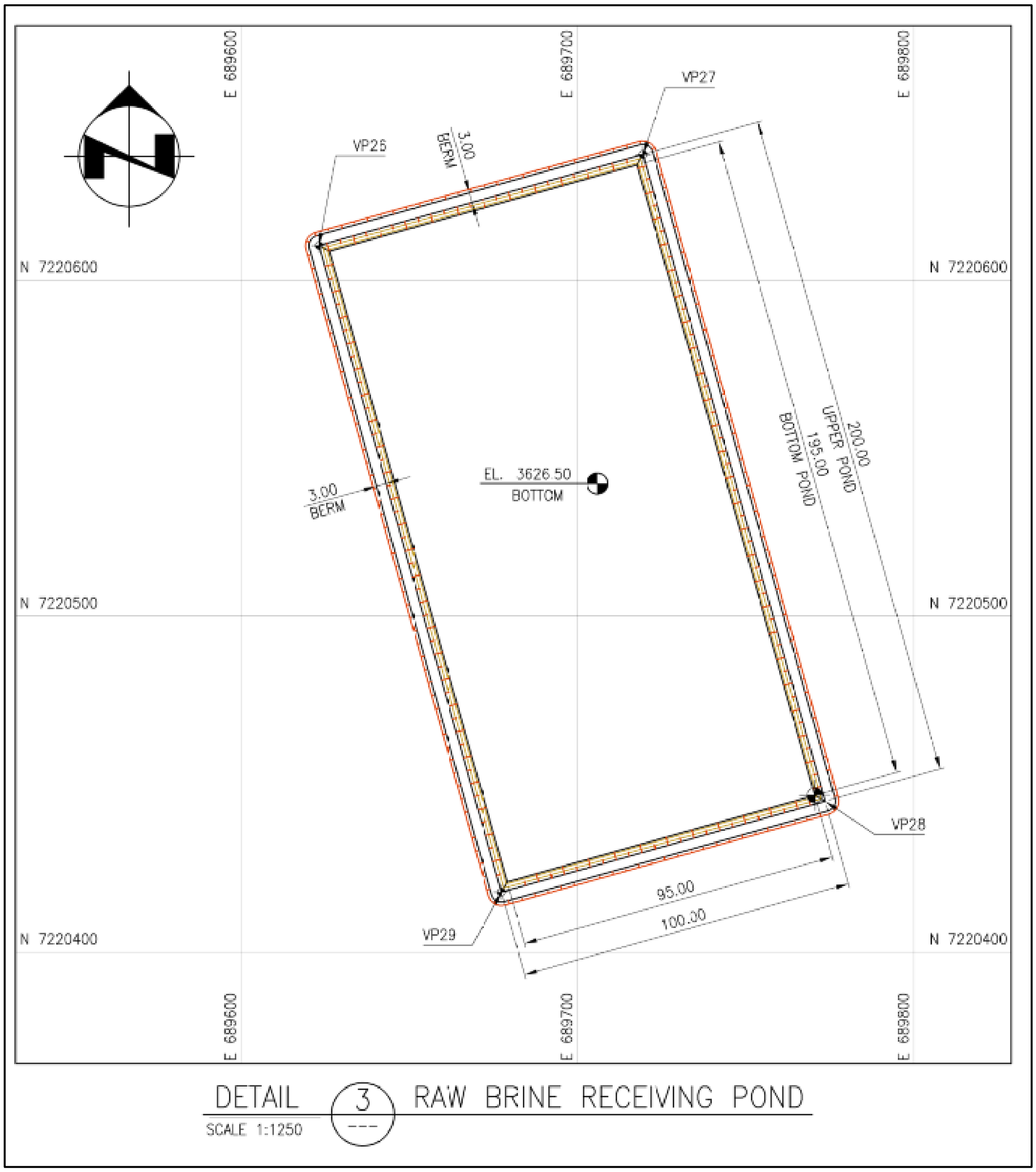
The Waste Pond is intended to evaporate the water present in the liquid waste from the plant, which is pumped from the pulp waste tank located in the chemical plant area. The preliminary area of the waste pond is 1 ha, its location is to the north of the property as shown in Figure 18-1, and its construction require to add lining to both the walls and the floor.

18.5.2 Raw Brine Receiving Pond

The Raw Brine Receiving Pond will be located south of the Tolillar Salar in the extraction area (see Figure 18-1). The bottom of this pond will have an elevation of 3,626.5 m, with a berm of 3 m, as shown in Figure 18-5. The projected area for this pond is 2 ha and for its construction it is required to add lining to both the walls and the floor.

The function of this pond is to collect the brine extracted from each of the extraction wells located within the Salar and gather it in a common central point to maintain a brine reservoir that keeps the process plant with a constant supply.

Figure 18-5: Raw Brine Receiving Pond



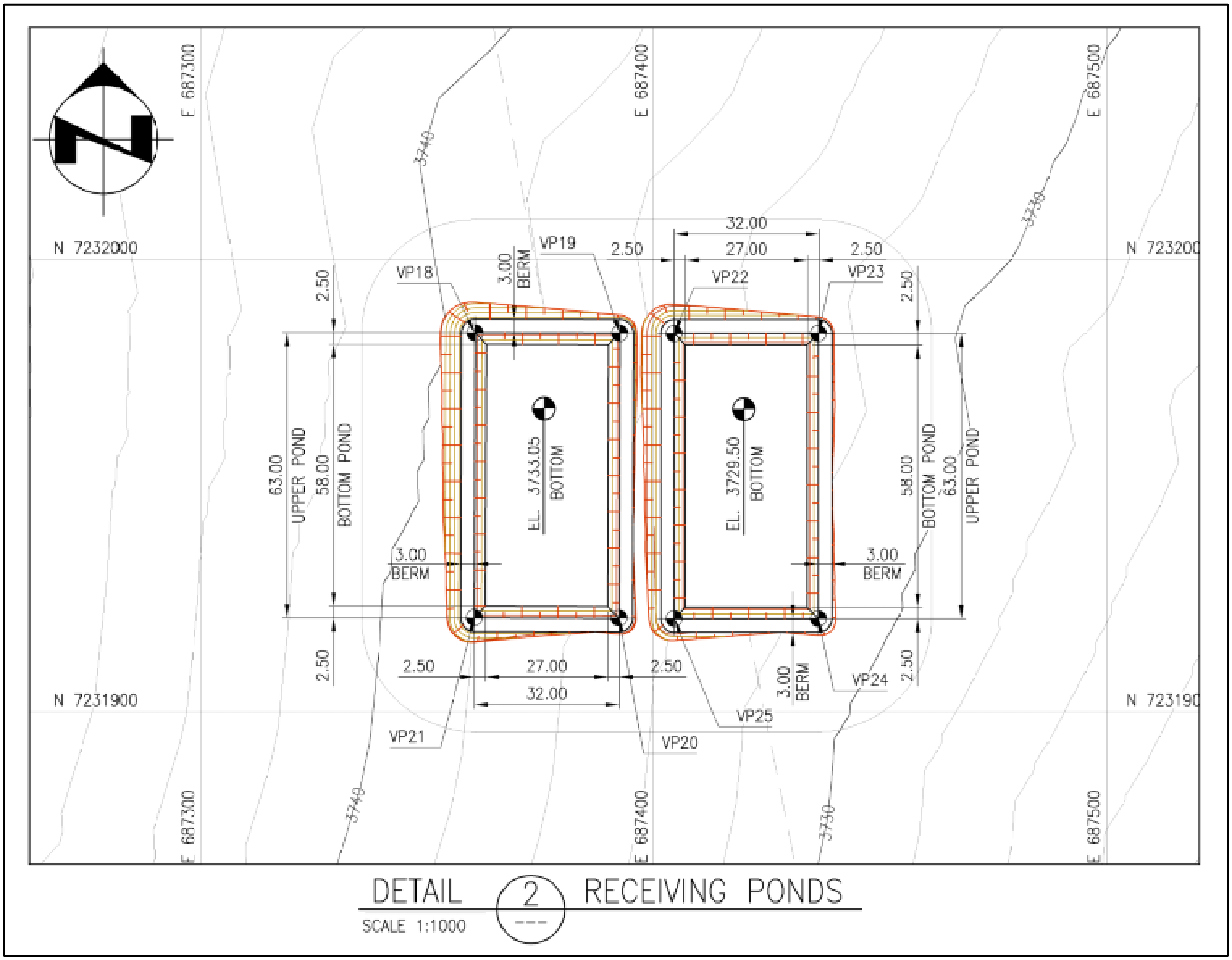
Source: Ausenco, 2023.

18.5.3 Receiving Ponds

Two Receiving Ponds will be located north of the Project in the north edge of the Salar (see Figure 18-1). The bottom of this ponds will have an elevation of 3,733.05 m and 3.729.50 m, respectively, with a berm of 3 m each, as shown in Figure 18-6. The projected area for these ponds is 0.2 ha each and for its construction it is required to add lining to both the walls and the floor.

The function of this pond is to receive the brine pumped from the Raw Brine Receiving Pond and hold it at a location close to the plant.

Figure 18-6: Receiving Ponds



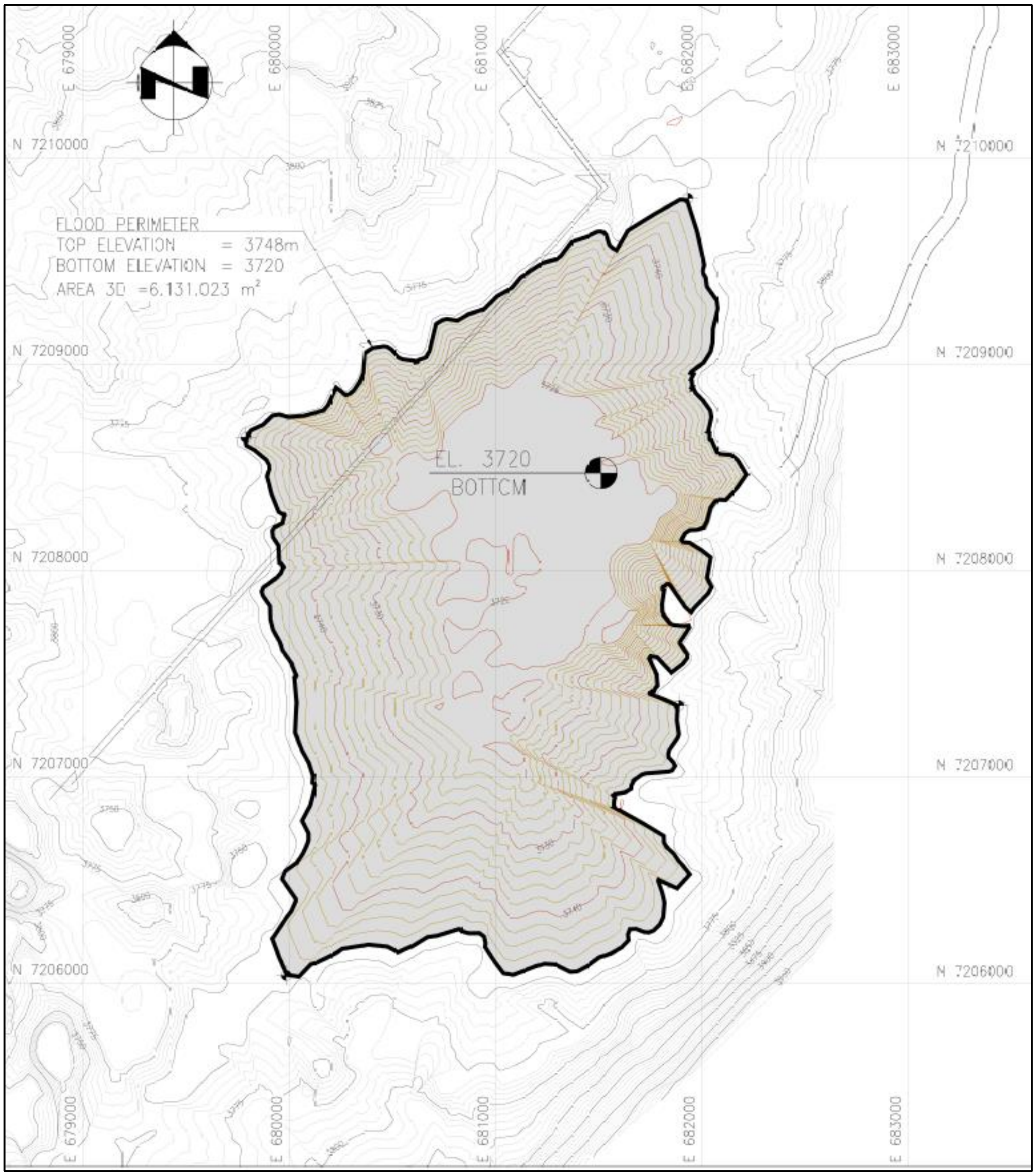
Source: Ausenco, 2023.

18.5.4 Depleted Brine Infiltration Pond

The Depleted Brine Infiltration Pond (Figure 18-7) will be located south of the Project in the sector above the projected future freshwater wells of FWWALT-5 and FWWALT3, for the post processing brine deposition zone a natural pond was selected with an area of 6,131,023 m^2 (upper elevation: 3,748.0 m - lower elevation 3,720.0 m).

Depleted brine will be pumped from the DLE Plant through a HDPE pipeline of 800 mm of diameter to the Depleted Brine Infiltration Pond as shown in Figure 18-1.

Figure 18-7: Depleted Brine Infiltration Pond



Source: Ausenco, 2023.

18.6 Power and Electrical

The main power source for the Project will be a gas-fired electricity generation plant, which in turn will be transported to the storage facility from where it will be transported and injected into the generation plant.

This gas-fired generation source will be capable of supplying approximately 34 MW of power, which responds to the sum of the electrical power requirement, equals to 13 MW, and the heat power requirement, equal to 21 MW.

The power distribution for the project will be a dedicated power supply from the medium voltage distribution switchgear in the main electrical room.

The power generation plant will use gas for its operation and will comply with the national regulations. The necessary electrical and mechanical protections will be included to ensure safe operation for the operators. This plant shall be highly efficient, shall have the possibility of being operated remotely from the operations room and shall be designed so that maintenance times are as short as possible.

The main electrical room, in which the use of GIS or AIS cubicles will be evaluated, will be prefabricated, roofed, airtight, air-conditioned, pressurized with filtered air, with panic doors. In addition, two (2) air-sealed, air-lock doors will be provided. Walls will constitute a fire barrier factor F120. Doors, windows, and gates shall be of non-combustible material. The room will have an access control system.

The primary distribution system of the project will be at a voltage to be defined, three-phase, three-wire, with a grounding system through a grounding resistor.

If necessary, reagents will be injected and harmonic distortions will be corrected by means of a capacitor bank and harmonic filter system, connected to the project's switchgear.

The following Table 18-2 and describes a summary of the energy consumption of the project in terms of active power.

Table 18-2: Summary of Energy Consumption

Mechanical Installed Power (kW)	Electrical Installed Power (kW)	Maximum Demand Power (kW)	Average Demand Power (kW)
18,663	12,446	15,249	8,461

Table 18-3: Energy Consumption by Area

Area	Name Area	Mechanical Installed Power (kW)	Electrical Installed Power (kW)	Maximum Demand Power (kW)	Average Demand Power (kW)
1000	Brine Extraction Wells	5,800	1,675	1,424	1,131
2000	DLE Plant	2,070	1,340	1,139	909
3000	Reverse Osmosis	7,623	7,202	10,971	4,856
4000	Chemical Plant	804	680	578	492
5000	Purification	924	657	559	468
6000	Dry Product Handling	200	210	178	142
7000	General Utilities	1,242	682	580	463

18.7 Fuel

The supply of LPG fuel will be done through transport trucks from an external property to the project according to the project's requirements, using relevant cargo vehicles and machinery.

18.8 Water Management

18.8.1 Site Water Balance

In 2022, a "Study of Recharge in the Salar de Tolillar" was carried out, where a first estimate of the water balance of the area was made, at a conceptual scale. This study estimated an extractable flow of 583 m^3/h in the south area of the basin, without affecting the system reserves.

A more comprehensive water balance of the basin should be developed to improve the estimation of freshwater availability. The reliability of the water balance could be enhanced based on actual measurements of evaporation.

18.8.2 Water Management Structures

The statistical data of the observations made by Ferrocarriles General Belgrano at the San Antonio de los Cobres Station and at the Meteorological Station of the Salar del Hombre Muerto indicate that almost all of the precipitation occurs in the months of December, January and February. They are less predominant in November and March. The annual variation in the volume of water that falls is very marked, so it is very possible that more than 200 mm will fall in rainy years and less than 50 mm in dry years.

The Process Plant is not situated in a ravine, so it is not anticipated to be affected by floods during the rainy season. Meteorological data is currently being gathered on-site to monitor the situation. If necessary, the water management structure will be further investigated to ensure its adequacy.

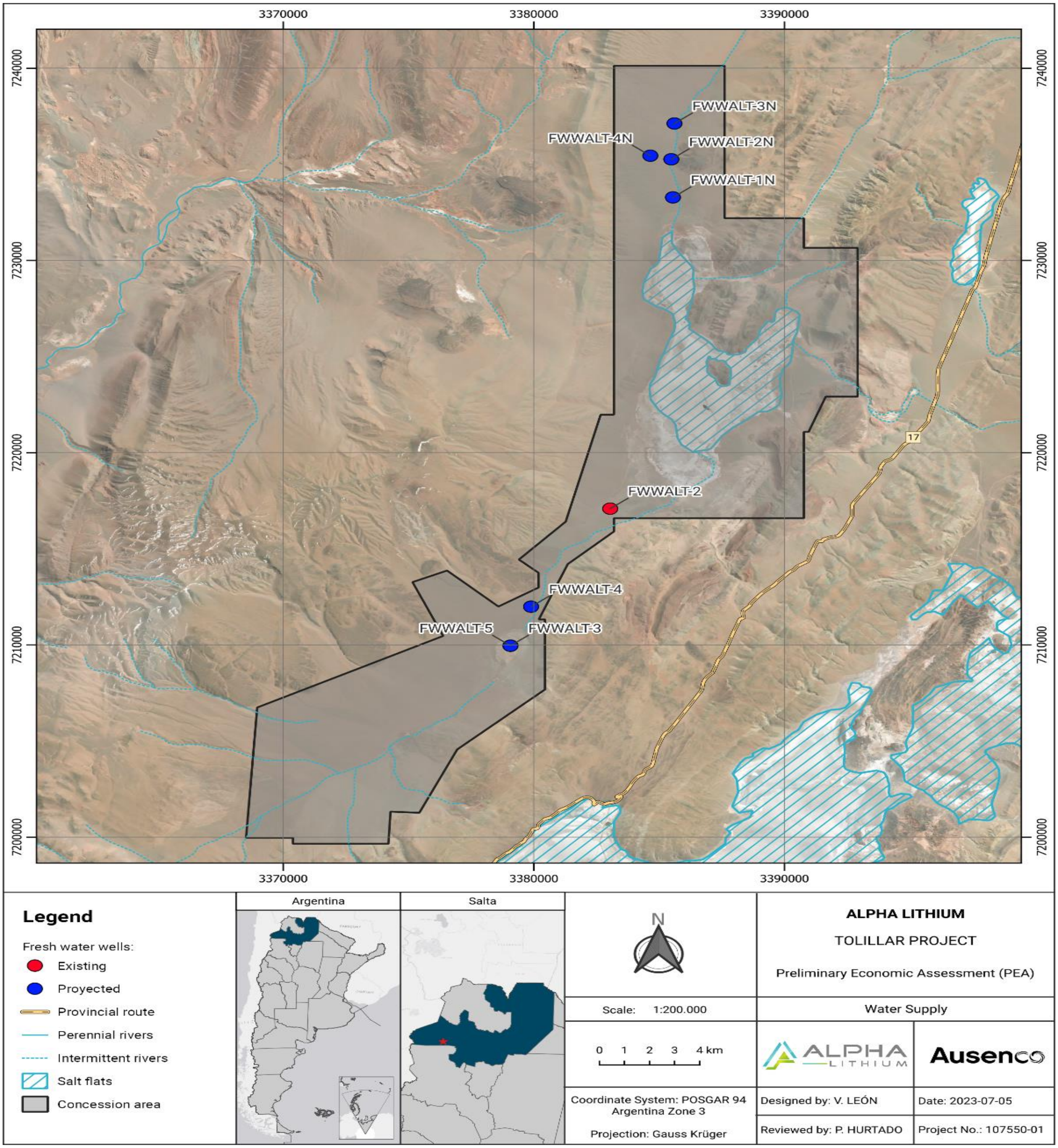
18.8.3 Water Supply

The Salar of Tolillar is in an endorheic basin at an average altitude of 3,630 m above sea level (masl), covering an area of approximately 43.8 km^2. A total of 19 wells have been drilled to date (December 2022) for brine extraction, industrial water, and static level measurements (piezometers).

Alpha Lithium carried out with the same company several freshwater exploration wells (FWWALT-02 [Conhidro Report file FWWALT-02], FWWALT-01, FWWALT-01A and FWWALT-01B) and monitoring piezometers (PzWALT1 of 45 m, and PzWALT2 of 77.75 m depth). Of the exploration wells, only FWWALT-02 could be used as a freshwater extraction well due to its hydrochemistry (chemical quality in file Analytical Report FWWALT-2) and its flow rate (75 m^3/h based on its pumping test at the end of drilling). As a result, there is a groundwater exploitation request for 40 m^3/h (attached file Water Resources Note) and a proof of its 2022 Census Record (file FWWALT-02). The rest of the documented exploration wells were abandoned due to flow and/or water quality (using the measurement of the water's electrical conductivity parameter as a reference).

There are wells planned for freshwater exploration, which correspond to the coordinates represented in the figure below.

Figure 18-8: Existing and Planned Wells Tolillar Project



Source: Ausenco, 2023.

The location being considered for the Depleted Brine Infiltration Ponds, based on the studies developed by Ausenco in 2023, has been defined in the southern area of the project; specifically over the projected wells FWWALT-3 and 5, which would lead to a re-evaluation of the projected freshwater wells for future study stages.

For water supply and water management, a series of mechanical equipment is considered, such as a water filter feed tank, pump, filter, water treatment plant package, potabilization unit package, emergency fire water tank and cooling system package.

Raw water for camp services will be extracted and will be treated in a plant using a basic process that includes a de-sanding system to precipitate suspended particles, chlorination (disinfection) with hypochlorite dispensers, storage, and distribution. This water will be used only for sanitary services (bathrooms, showers, and for washing clothes and food utensils).

Bottled water for human consumption will be brought in from the city of Salta.

18.9 Hazard Considerations

The following contingencies pose significant risks to the environment, design, operation, and project production schedule:

- seismic activity;
- fuel and/or oil spills;
- brine spill;
- fires; and
- precipitations and snow

In the event of a spill of any magnitude, the active measures to be taken to provide a quick response, and prevent the rapid dispersion of these products. In addition to protecting human life, the threatened property or population center will be protected, keeping the area suitable for investigation, and quickly restoring normal operating activities in that area.

Fires can be emergencies with dangerous consequences for the Project, causing serious loss of equipment and even human lives. The formation of brigades in each area of operation is a top priority for fire prevention and control. Fire prevention procedures include training all personnel in fire prevention measures and evacuation drills as a regular practice.

19 MARKET STUDIES AND CONTRACTS

19.1 Market Studies

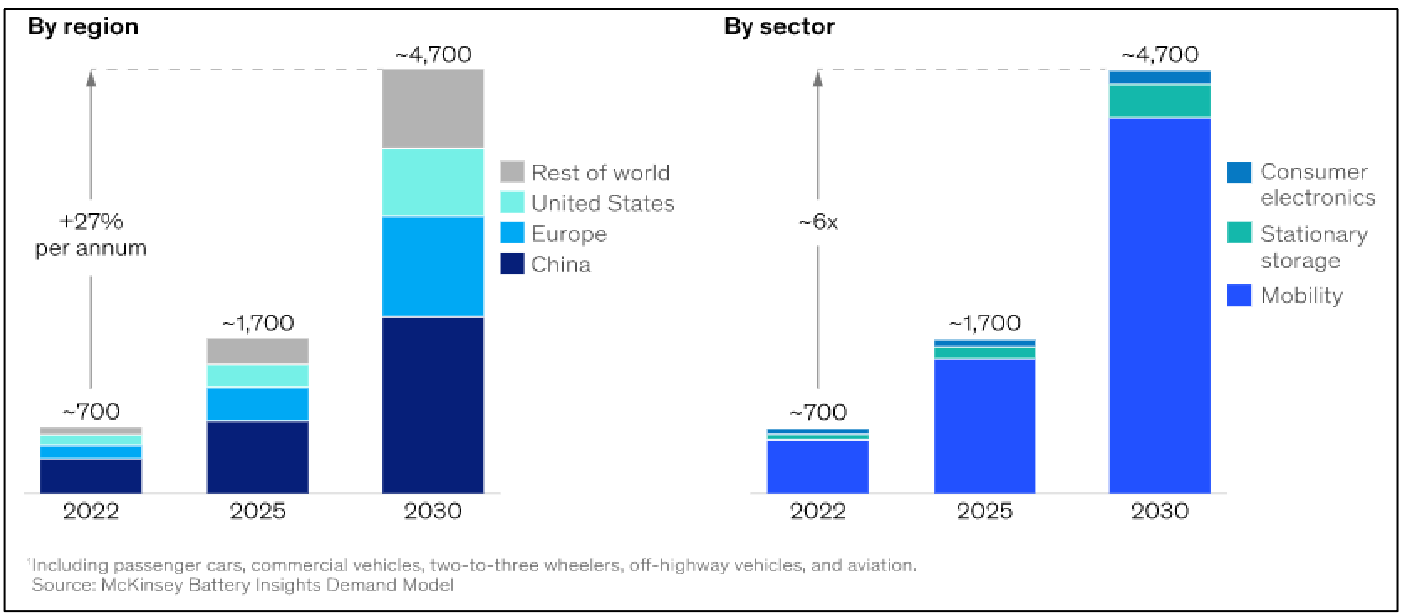
The lithium market is in a period of transformation. In 2010, global demand for lithium chemicals was less than 100 kt of lithium carbonate equivalents (LCEs) with sales spread across multiple market segments including: glass, grease, pharmaceuticals, synthetic rubber, and lithium-ion batteries; then primarily used in mobile phones and other portable electronics.

By 2020, demand had grown to over 300 kt LCE with battery-related use approximately 60% of the market primarily due to the increased demand for electric vehicles (EVs).

By 2030, demand may exceed 3,000 kt with over 90% of use related to lithium-ion batteries in both electric transportation and energy storage. Demand for traditional non battery applications will continue to grow at low single digit rates. Based on the time it takes greenfield lithium projects to be developed and come into production, it is doubtful that the supply response will be equal to demand growth for the remainder of the decade.

The consulting company McKinsey forecasts lithium-ion battery cell demand to grow from 700 gigawatt hours (GWh) in 2022 to 4,700 GWh in 2030 as shown in Figure 19-1. Each terawatt hour (1,000 GWh) requires a minimum of 800 kt of LCE.

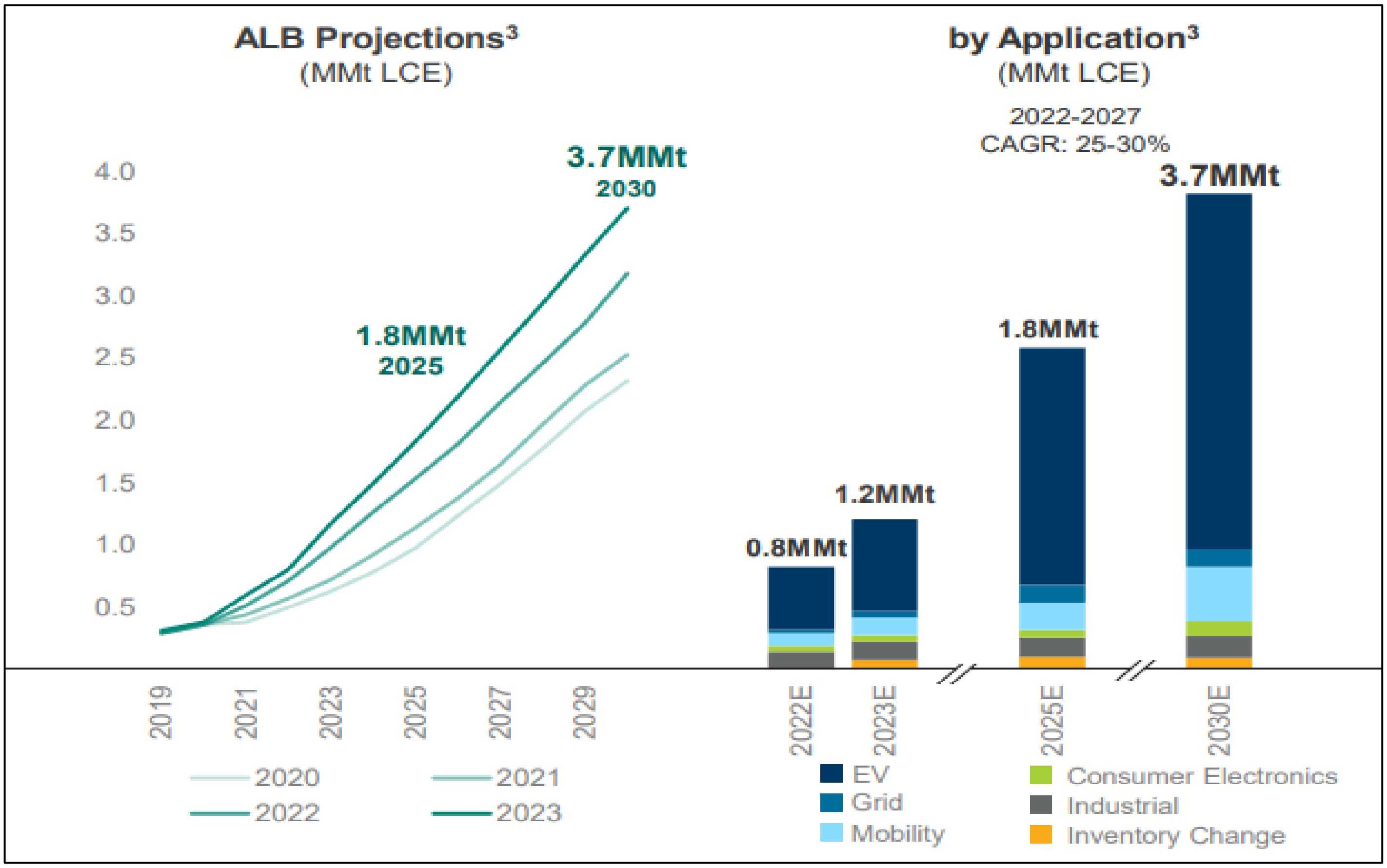
Figure 19-1: Global Li-ion Battery Cell Demand, GWh, Base Case



Source: McKinsey Battery Insights Demand Model, 2023

The world's largest lithium producer, Albemarle, forecasts a similar demand pattern for LCE shown in Figure 19-2. Note the lithium use aligns well with the GWH forecast in Figure 19-1.

Figure 19-2: Lithium Demand



Source: Albemarle Corporation Presentation, 2023

Asia will remain the largest market for lithium chemicals for the remainder of the decade. China currently has 70% of lithium-ion battery cell production capacity and will remain the largest single market for EVs into the next decade. Korea and Japan are also significant battery producers.

North America is expected to become the second-largest market for lithium chemicals over the next decade. US President Joe Biden has taken several steps to support growth of the domestic EV market.

- The American Jobs Plan proposed $174 billion of investment to support development of the US EV market.
- Providing tax credits for EVs worth up to $7,500 for a new EV and $3,750 for a used EV.
- Expanding access to charging stations with a goal of installing 500,000 new EV chargers by 2030.
- Setting an ambitious goal of 50% of 2030 US auto sales being EVs by 2030.

The European Union (EU) is supporting the growth of lithium-ion batteries through their "Green Deal" with programs like those in the US and a stated objective of making Europe the first carbon neutral continent by 2050.

Lithium-ion batteries will play a central role in the global energy transition. Ensuring adequate supply of lithium chemicals to support the growth of battery demand is becoming a global concern.

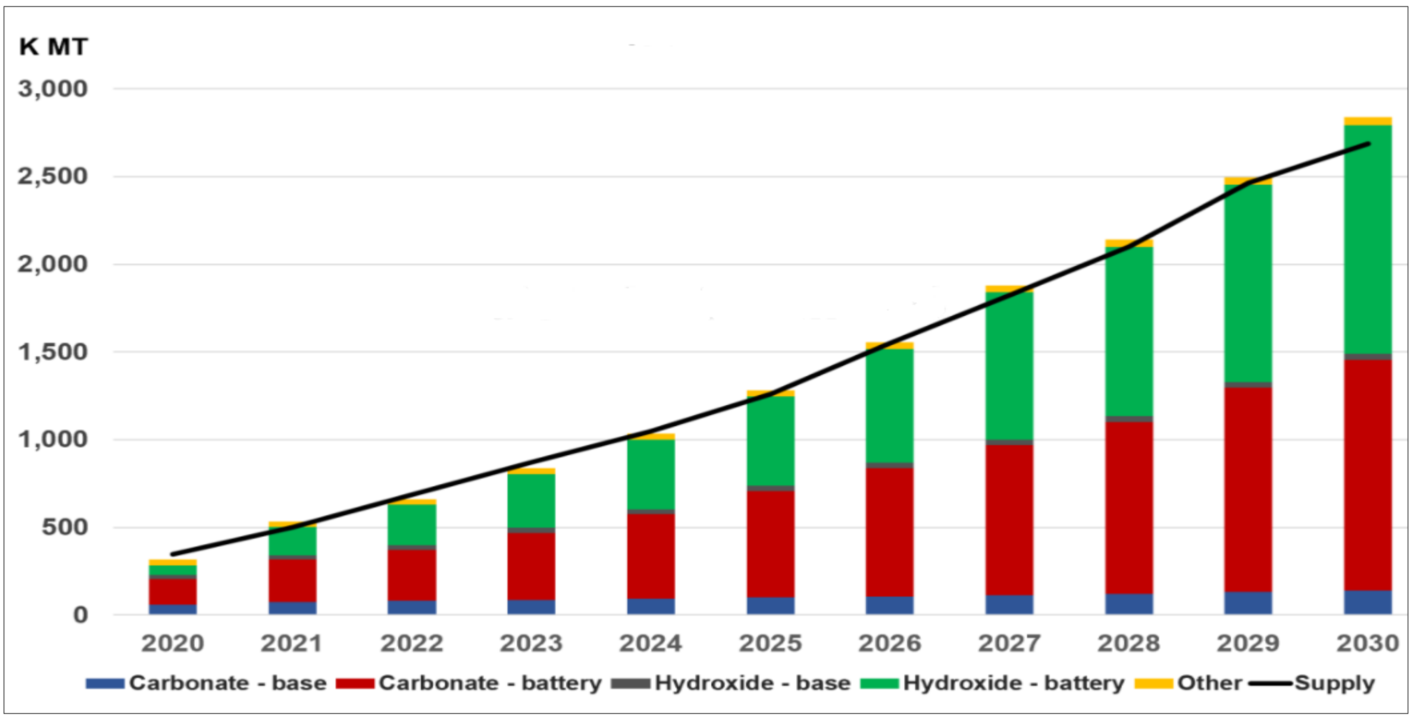
19.2 Lithium Supply and Demand

The supply of lithium chemicals is expected to be tight for the remainder of the decade and possibly longer. Due to a long and complex supply chain and rapidly growing demand, shortages of lithium chemicals can occur when the industry is operating above 90-95% of capacity. Demand is likely to exceed total supply more often than not over the next decade.

Quality requirements present another challenge as most EV batteries have rigorous qualification requirements. Lithium for use in batteries remains a specialty chemical rather than a commodity.

Advisory firm Global Lithium's supply and demand forecast is shown in Figure 19-3. Although the supply line appears in relative balance with demand in some years, the reality of the supply chain will mean a portion of consumers may have difficulty sourcing qualified product in adequate volumes creating upward price pressure.

Figure 19-3: Lithium Supply & Demand: 2020 to 2030



Source: Global Lithium LLC, 2023

The two fastest growing lithium chemicals will be battery quality hydroxide and carbonate through the remainder of this decade. These two chemicals are produced primarily from two types of resources: hard rock (spodumene) and brines although there will be production from sedimentary assets (also referred to as clay) later in this decade. Lithium chemical supply from recycling is not expected to be even 10% of supply until sometime in the 2030s.

Lithium hydroxide is primary used in longer range EV batteries requiring high nickel content while carbonate is favored in lower capacity, less expensive EV batteries, electric buses, and energy storage systems. Although it is difficult to accurately forecast the exact future mix of cathode materials and whether carbonate or hydroxide will be required; the diversity of the battery market will likely result in a continued tight market for both forms of lithium chemicals into the next decade. Figure 19-3 shows a relatively even balance of carbonate and hydroxide demand in 2030.

Lithium carbonate produced from brine sources is almost universally lower cost than the output from hard rock assets, giving brine-based sources a competitive advantage should market conditions move to an oversupply situation in the future.

Currently Western Australia is the largest global source of lithium values supplying over 40% of the total in 2022 mostly in the form of spodumene concentrate converted in China to lithium chemicals. Over the next several years, Australia will convert increasingly significant volumes of their spodumene into lithium chemicals forcing China to seek feedstock elsewhere.

Chile is the second largest lithium producer supplying approximately 30% of LCEs globally in 2022. While China is the largest producer of lithium chemicals globally, most of the output is from imported feedstock. China is currently the third largest producer of LCEs from domestic resources. In 2022, Argentina was the fourth largest producer of lithium values globally.

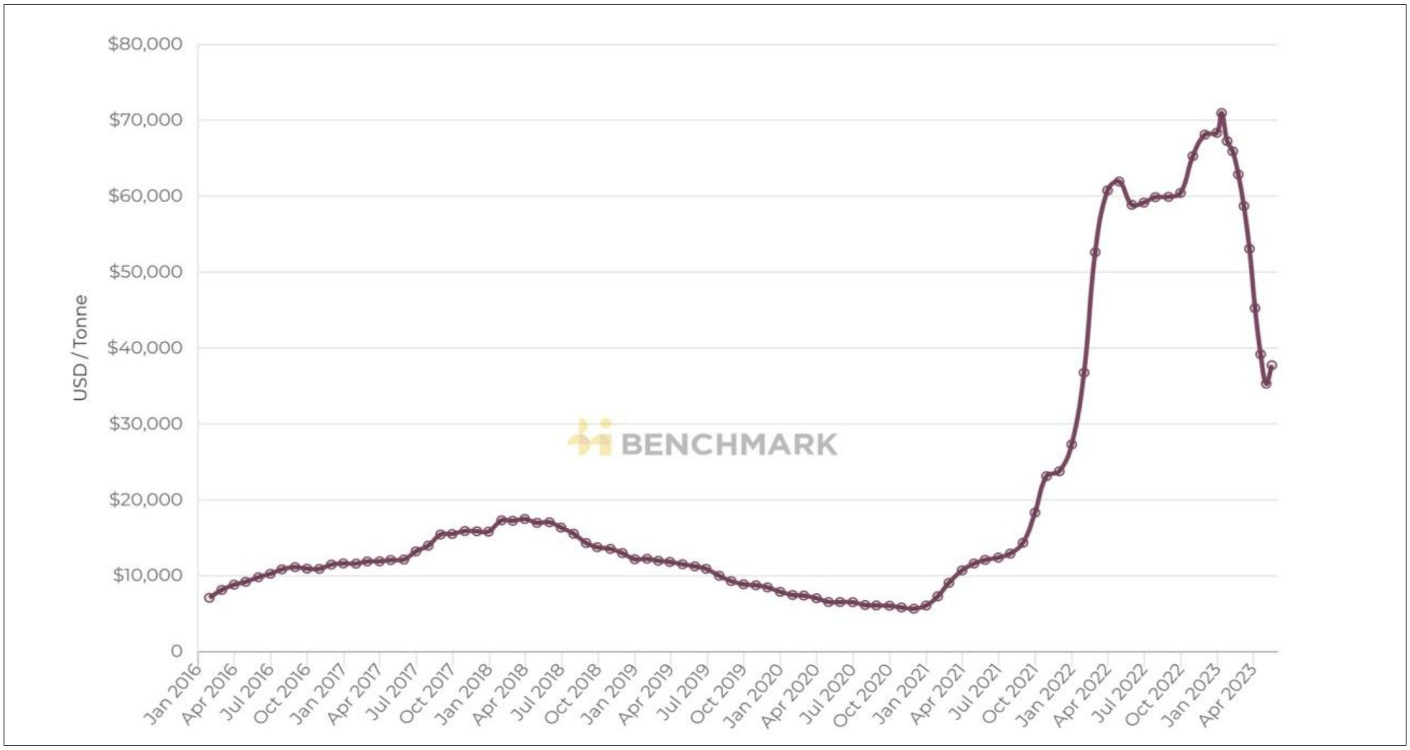
In the next five years, Argentina may move from the fourth largest producer to third position and possibly second position behind Australia by 2030 based on the number of brine projects in development. Brazil, Africa, Canada, and the US are also expected to become significant LCE producers by 2030.

Lithium chemicals are supplied in a variety of package types and sizes; however, most volumes are shipped in FIBC (flexible intermediate bulk containers) known as the “super sacks”. The most used size is 1 t; however, many battery customers request a custom volume tied to their specific batch size. Other common packages are: 500 kg super sacks, 20 or 25 kg small bags, or 100 kg fiber drums with a polyethylene liner.

19.3 Lithium Carbonate Price

Over the past few years, the price of lithium has been volatile. In 2017 the price of lithium carbonate peaked at almost $30/kg before several hard rock mines in Western Australia came online during 2018 and 2019 leading to a temporary oversupply situation where price fell below $5/kg in China and to as low as $8/kg for battery quality carbonate in Korea. In late 2020, EV growth in China and Europe moved the market back to a shortage situation. Global average price from 2016 to early 2023 by month is shown in Figure 19-4. The China spot market saw lithium carbonate price exceed $80/kg briefly before moderating. Spot pricing in China was very volatile in late 2022 through Q1 2023 while contract prices outside China remained in the $60/kg range on average through April 2023.

Figure 19-4: Global Weighted Average Lithium Carbonate Price from 2016 to Q1 2023



Source: Benchmark Mineral Intelligence, 2023

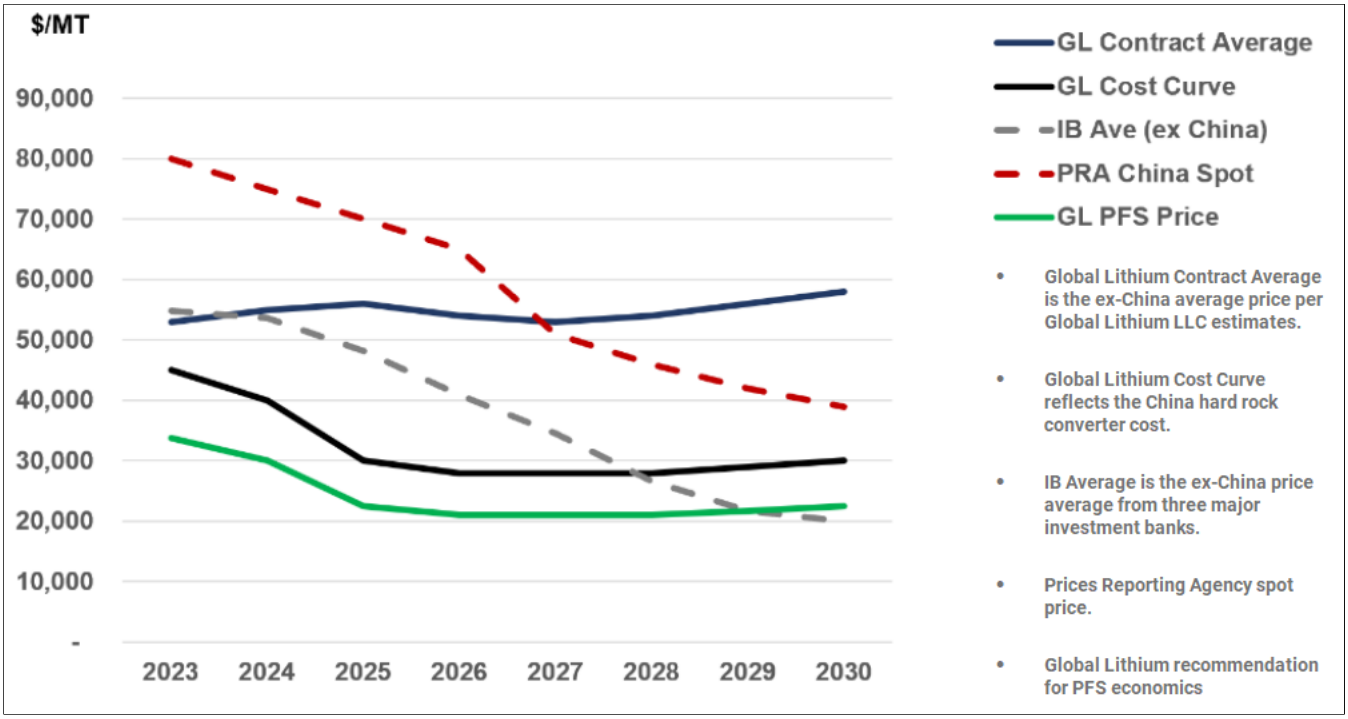
Global Lithium LLC estimates that large contract pricing will remain between $50 and $60/kg through 2030 based on the assumption that demand will exceed supply until at least the early 2030s. The price forecast in Figure 19-5 shows multiple price scenarios including an average of the price forecasts of three major investment banks, the projection of China spot price by a major Price Reporting Agency, along with what price would be if there was an oversupply situation and price dropped to the cost of high cost production.

Presently the high end of the cost curve are independent Chinese lithium chemical converters that source spodumene concentrate from offshore – mostly Australia but also to a limited extent from other countries. As long as the spodumene price remains over $2,500/t the converter cost curve will be over $25,000/t. Presently spodumene prices are much higher than $2,500/t yielding an implied cost curve price above $40,000/t. Should spodumene price drop significantly, vertically integrated lepidolite production in China will replace independent spodumene converters as the high-cost production, keeping the high end of the cost curve in the $30,000/t range.

For purposes of estimating new project future cash flows, Global Lithium recommends a very conservative approach using a price below the forecast high end of the cost curve yielding conservative project economics results leaving room for significant upside. Although Global Lithium forecasts global average prices well above the green line in Figure 19-5, using a conservative price is recommended in case of unforeseen market circumstances.

Most forecasters do not predict prices beyond 2030. Global Lithium recommends using a price of $22,500 from 2031 to 2035 and a price of $23,500 from 2036 to 2040. These prices remain below the high end of the cost curve.

Figure 19-5: BQ Lithium Price Scenarios 2023-2030



Source: Global Lithium LLC, 2023

19.4 Contracts

The company has no relevant contracts in place.

19.5 Comments on Market Studies and Contracts

The qualified person has reviewed these analyses and that the results support the assumptions in the Technical Report. Commodity prices can be volatile, and there is the potential for deviation from the forecast.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

This chapter describes the environmental, social, and permitting contexts of the Tolillar Project. The physical and biological baseline data for the Project have been collected by means of desktop studies and review of publicly available information. Specific baseline field and impact studies will need to be implemented to support future permitting requirements that will support the construction and operations phases of the project. The key premise of this Chapter is that the project is located entirely within Salta Province (refer to Chapter 4). If portions of the infrastructure are relocated outside Salta Province there may be additional regulatory requirements related to permitting and closure.

This chapter is structured as follows:

- Environmental baseline and supporting studies
- Protected areas
- Current environmental risks and monitoring programs
- Water resources, emissions, and waste
- Closure and reclamation planning
- Permitting Considerations
- Social Considerations

20.1 Environmental Considerations

Tolillar Project is located in Los Andes Department in Salta Province, Argentina (Figure 4-1), within the Puna ecoregion, which is part of the Andean Mountain Range. The Puna is defined as a highland plateau which can be found in Argentina, Chile and Bolivia, characterized by its salt flats and shallow brackish lagoons, accompanied by low shrub-steppe vegetation. Figure 4-1 shows Alpha Lithium mining concessions; within this area is Tolillar salt flat, located to the north. Southeast of the concession is the Hombre Muerto salt flat, where several other mining operations exist. The Exploration Concessions and Exploration Permits for the Project total 28,030 ha.

The Project is in its exploration phase, with roughly 20 wells currently exploring the aquifers in the Project area. The objective of the exploration phase is to characterize the salt flat, searching for areas with concentrated lithium. The Argentinian regulation requires that all mining operations submit an Environmental Impact Study (EIS) every two years, that includes a project description, the environmental components and social aspects, and presents additional information as the project progresses from exploration through to construction and operations phase. The first Environmental Impact Study for the Project was submitted in March of 2022[1], which presented preliminary information based entirely on a desktop review. Alpha Lithium indicated that fieldwork to support a number of environmental baseline studies focussed on the Project area are currently being planned and scheduled for 2023 and 2024. The results of these studies will support the next EIS to be presented in 2024 to comply with the Argentinian regulation.

[1] The Environmental Impact Study was admitted on March 3, 2022, by the Mining and Commercial Court of Record (*Juzgado de Minas y en lo Comercial de Registro*)

20.1.1 Baseline and Supporting Studies

The 2022 Environmental Impact Study presented environmental information that was bibliographic in nature and consisted of publicly available information to characterize the Project area and its surroundings; no site fieldwork has been completed to date. The 2022 document provided information about the climate, surface water and groundwater, flora and vegetation, wildlife, and protected areas, all reproduced in the sections below. The 2022 EIS did not include information for other environmental components since that information was not required by the current regulation.

Alpha Lithium have indicated that environmental baseline studies involving focussed fieldwork is currently being planned to develop more comprehensive environmental baseline and supporting studies for the EIS, which is to be presented in 2024. This new information will provide detailed data that will be used for the assessment of environmental impacts on environmental components and to make recommendations for appropriate mitigation measures and monitoring programs that will address negative impacts and provide the basis for ongoing monitoring programs.

20.1.1.1 Climate and meteorology

The Tolillar Project is in the department of Los Andes, in the Puna ecoregion, which is of an intense Andean continental type, characterized by arid conditions and average annual rainfall of 160 mm per year. The annual average temperature is 6.5°C with a large variation between maximum and minimum daily temperatures and low relative humidity typically not exceeding 25%. Conditions are often windy and dry; solar radiation is intense, especially from October to March. The high altitude influences the atmospheric pressure, which averages 410 mm Hg.

Prevailing winds blow from the west, west-northwest, and west-southwest, with an average speed of 28 km/h. Statistical data from meteorological stations located close to the Project (namely the Ferrocarriles General Belgrano at the San Antonio de los Cobres Station and the Salar del Hombre Muerto Meteorological Station), indicate that most rainfall occurs in December, January, and February, with lesser amounts during November and March. The annual variation in precipitation is very marked, with more than 200 mm of rainfall in rainy years, while less than 50 mm in dry years. Precipitation for the project area (Table 20-1) was estimated using a methodology for similar climates (Houston and Hartley, 2003) and the data from the Fénix Project, located approximately at 3.5 km from Tolillar Project (Figure 23-1).

Table 20-1: Precipitation in the Tolillar salt flat and Tolillar salt flat basin

Description	Average Altitude (masl)	Precipitation (M/a)
Tolillar salt flat	3.630	55.2
Tolillar salt flat basin	4.196	103.2

Source: Compilation based on Tolillar Salt Flat Recharge Study (*Estudio de la Recarga en Salar de Tolillar*), December 2022.

20.1.1.2 Surface water and groundwater

No permanent or temporary rivers or water channels have been identified in the Project area because rain infiltrates at the foothills to contribute to underground flows. The Project area is located in a hydraulically closed, endorheic basin, with surface water inflows during the rainy season. At the edge of the Tolillar salt flat the environment is more humid and, in rainy years, springs can be observed. The few water sources (water meadows) existing in the area are not known to be used for drinking water since there are no settlements or herding stations in the area, nor has it been observed that they are used as water for livestock.

Regarding groundwater, the phreatic level is highly variable; very close to the surface at the salt flat, between 1 and 1.57 mbgs, but increasing to 43 mbgs in other areas. In general, moving away from the edge of the salt flat the phreatic level becomes deeper.

As part of the 2022 environmental assessment, a desktop hydrological study for Tolillar salt flat estimated the recharge from precipitation using models, as referenced in Table 20-1. Based on the literature, the recharge is approximately 14% of the precipitation for locations similar to Tolillar salt flat. To better define the potential recharge, a rainfall of 82.2 mm was considered. Tolillar salt flat basin has a surface of 1,250 km^2, so the amount of water that can precipitate in the salt flat in a year is 102,750,000 m^3. Considering the 14% of potential recharge, the result is 14,385 m^3/a or 1,642 m^3/h. The hydrologic water balance and development of the hydrogeological model for the Tolillar salt flat is still in development and will be an important component in the next EIS. Refer to Section 8.1 and 18.8 for the current conceptual geologic and hydrogeologic models for the Project and surrounding areas as related to brine extraction and freshwater supply. Extensive hydrogeological testing and monitoring was conducted on 11 exploration brine wells and three freshwater exploration wells. The methodology and test results from this work are presented in Chapter 10 and will be useful for the purpose of the future environmental assessment.

20.1.1.3 Flora and Vegetation

As detailed previously, the Project is located in the Puna ecoregion. However, the Project's surrounding areas are also in the high Andean Ecoregion. In both of these ecoregions the vegetation is scarce and is often not present in widespread areas. However, their importance lies in that they serve as the main food source for many wildlife species, and are therefore the basis of the Puma ecosystem.

20.1.1.3.1 Puna Ecoregion

This zone covers most of the study area and is present between 3,400 and 4,400 masl, although in many areas it is limited to elevations below 3,900 masl altitude at which there is often a gradual transition and coexistence of floristic elements with the high Andean Ecoregion. Vast unvegetated mountainous sectors with extreme aridity can also be distinguished. The absence of vegetation in alluvial cones and low slopes is thought to be associated with the action of burrowing rodents that feed mainly on roots.

The dominant vegetation is the shrub-steppe; there are also shrubs of the genera *Fabiana, Parastrephia, Acantholippia, Senecio, Nardophyllum, Baccharis,* and *Junellia*, among others. The locals use many of these species for their medicinal properties or as firewood.

20.1.1.3.2 High Andean Ecoregion

The high Andean Ecoregion occupies the highest altitudes, above 4,400 masl. In this zone, green meadows are formed when the water accumulates in depressions, with a thin layer of saturated soils. The dominant vegetation is the herbaceous or grassy steppe of the genera *Festuca, Deyeuxia, Stipa,* and *Poa,* among others. Circular or crescent-shaped thickets, plants in cushions or plates attached to the ground are frequent, and are controlled by factors such as the accumulation of sediments or the effect of snow. All plants are highly adapted to extreme conditions and are resistant to cold and wind.

20.1.1.4 Wildlife

The fauna at the Puna and High Andean Ecoregions is varied, including mammals, carnivores, rodents, reptiles, birds, and domestic animals introduced by the community. Mules and donkeys are used as pack animals, and goats, sheep, and poultry constitute the food and economic base of the local people. Table 20-2 below shows the fauna in a conservation category in the area where the Project is located.

Table 20-2: Animals in Conservation Category in the Department of Los Andes

Class	Species	Common name		Conservation Category
		Spanish	English	
Birds	Pterocnemia pennata	Choique	Darwin's rhea	Vulnerable
Birds	Buteo puecilochorus	Aguilucho puneño	Puna hawk	Rare
Birds	Phygilus dorsalis	Comsesebo puneño	Red-backed sierra finch	Rare
Birds	Phygilus atriceps	Comesebo cabeza negra	Black-hooded sierra finch	Rare
Birds	Geositta pumensis	Caminera puneña	Puna miner	Rare
Birds	Geositta tenuirostris	Caminera picuda	Slender-billed miner	Rare
Birds	Muscisaxicola alpina	Dormilona cenicienta	Paramo ground tyrant	Rare
Birds	Muscisaxicola flavinucha	Dormilona fraile	Ochre-naped ground tyrant	Rare
Birds	Muscisaxicola frontalis	Domirlona frente negra	Black-fronted ground tyrant	Rare
Birds	Asthenes steinbachi	Canastero castaño	Steinbach's canastero	Rare
Birds	Carduelis uropigialis	Cabecita negra andino	Yellow-rumped siskin	Vulnerable
Birds	Falco peregrinus	Halcón peregrino	Peregrine falcon	Vulnerable
Mammal	Lama guanicoe	Guanaco	Guanaco	Vulnerable
Mammal	Lynchailurus colocolo	Gato del Pajonal	Pampas cat	Vulnerable
Mammal	Lagidium viscacia	Vizcacha	Southern viscacha	Vulnerable
Mammal	Vicugna vicugna	Vicuña	Vicuña	Vulnerable
Mammal	Pesudolopex culpaeus	Zorro colorado	Andean zorro	Endangered
Mammal	Akodon andinus	Ratón andino	Andean Altiplano mouse	Undetermined
Mammal	Neotomis ebriosus	Ratón ebrio	Andean swamp rat	Rare

Source: Environmental Impact Study: "Renovación Bianual Del Estudio De Impacto Ambiental Y Social E Informe De Impacto Ambiental Etapa Ensayos De Evaporación Etapa De Exploración Avanzada Proyecto Tolillar", 2022.

20.2 Protected Areas

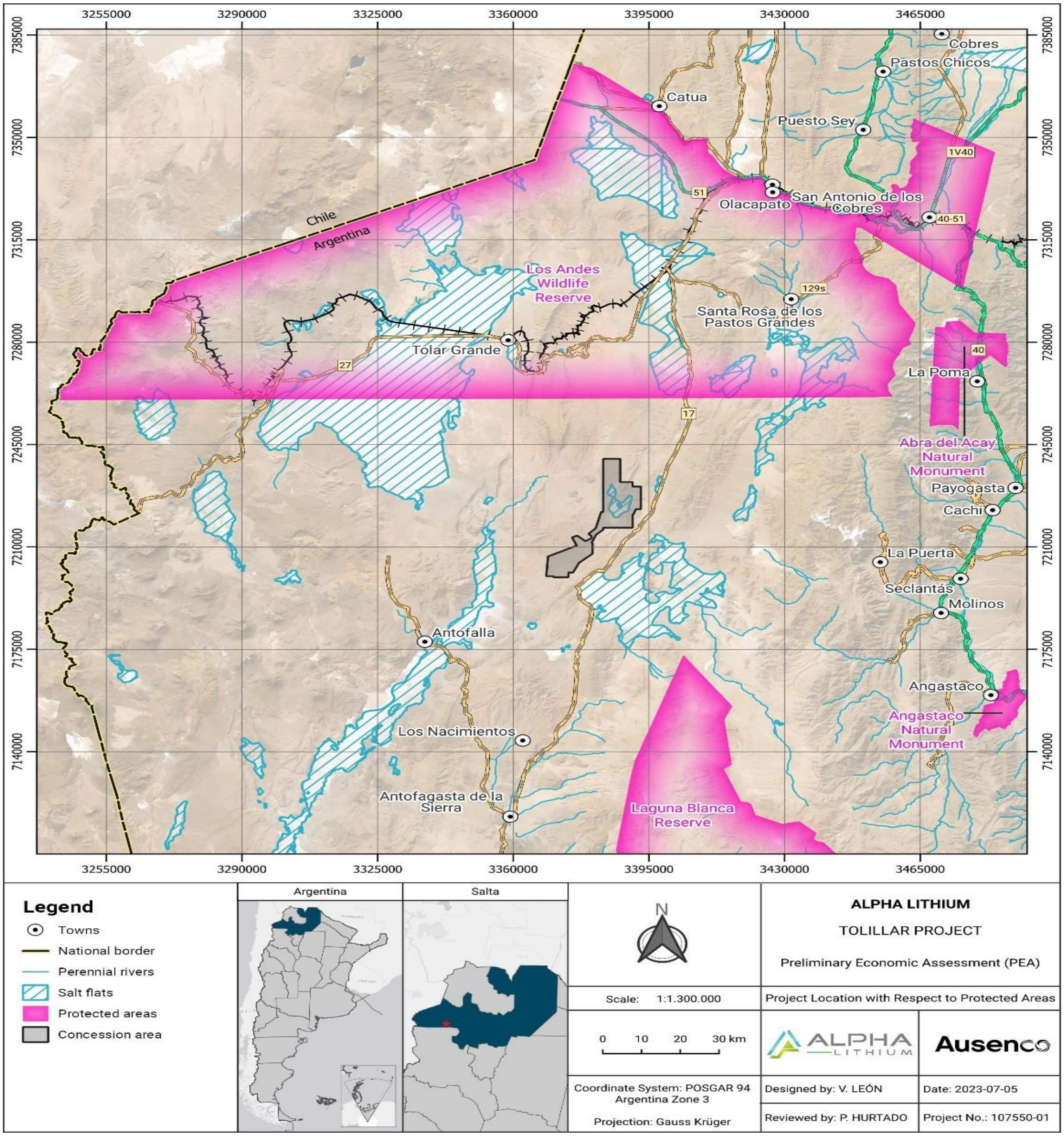
There are no protected areas within the Tolillar Project concession area. However, some protected areas are nearby, including the *Los Andes* Wildlife Reserve, *Abra del Acay* Natural Monument, *Laguna Blanca* Reserve, and *Angastaco* Natural Monument. Figure 20-1 shows their location with respect to the Project's concession area.

The nearest protected area is the *Los Andes* Wildlife Reserve, 38 km from the Project. It has an area of 1,440,000 ha and was created by Salta Province Provincial Decree No. 308 of 1980. The reserve is located on the west side of the Salta Province and occupies the entire northern section of the Los Andes Department. The reserve's objectives are to preserve the area's wildlife, especially the vicuña (*Vicugna vicugna*), the flora and soil resources, and study and apply development techniques and rational use of these natural resources. Hunting and fishing are prohibited within this area.

The Laguna Blanca Reserve, 60 km from the Project, has an area of 973,300 ha between the Belén and Antofagasta de la Sierra departments in Catamarca Province. This provincial reserve was created in 1979, and in 1982 it became part of UNESCO's Man and the Biosphere (MAB) Program, with the primary purpose of protecting the vicuña populations that were at risk of disappearing. It also protects high-altitude wetlands and the Puna and High Andean ecosystems. The

Laguna Blanca Reserve is home to a rich and varied biodiversity. The vegetation in the area consists of shrubby and grassy steppes with low vegetation cover. The fauna in the reserve include mammals such as Vicugna vicugna, a characteristic species of the area.

Figure 20-1: Protected Areas Near Tolillar Project.



Source: Ausenco, 2023

20.3 Current Environmental Risks and Monitoring Programs

Potential environmental risks and impacts for the exploration phase of the Tolillar Project were assessed in the 2022 EIS resulting in the development of environmental controls to mitigate against potential environmental effects and to establish monitoring measures to assess effectiveness of controls. For example, a major risk is the potential mixing of saltwater and freshwater aquifers in the area. Monitoring programs have been developed utilizing conductivity and physicochemical analysis to identify and monitor freshwater aquifers over time. Water level monitoring is used to measure and detect aquifer draw-down and depression from overpumping. At the time of this report, monitoring data related to potential Project impacts were unavailable for the exploration phase of the Project.

Table 20-3 lists the potential environmental risks and impacts identified at this stage of Project development, the associated control measure and monitoring indicators. Examples of types control measures include speed reduction (to control dust), equipment maintenance, use of impermeable materials in storage areas (to minimize spills), and restricting vehicle usage to existing roads and routes (to limit land disturbance).

The advancement of the Project's baseline studies and data collection to support the future EIS will also provide an improved and updated impact analysis and recommendations for control and monitoring measures.

Table 20-3: Measures and indicators for current Project impacts

Impact	Measure	Monitoring Indicator
Increased erosion risk	Respect natural slopes.	Appearance of gullies and linear erosion features
Alteration of drainage network	Do not intercept or alter drainage lines.	Modifications in runoff and water accumulation in areas where it did not naturally accumulate.
Alteration of the landscape	Limiting vehicle movement to existing roads	Number of tracks and paths.
Alteration of the soil profile	If the removed material is not used later when restoring the area, respect the order of the horizons when backfilling.	Texture and physicochemical properties
Contamination with hydrocarbons and their derivatives	Use impermeable materials with spill containment capacity where fuels, lubricants, and hazardous wastes are stored. Use metal trays in vehicles, machinery, fuel transfer pumps, and static equipment.	Hydrocarbon stains on soil. Total hydrocarbon content in soil. Mechanical verification of vehicles and machinery.
Salinization of environments outside the salt flat	Conduct monitoring to detect leaks.	Physicochemical analysis. Membrane integrity measurement
Sewage and gray water contamination.	Use of storage tanks and transport for final disposal by authorized companies.	Physicochemical and bacteriological analysis. Filling level of storage tanks
Aquifer overexploitation	Determination of aquifer depression and hydrological parameters. Pumping rates to stabilize the aquifer depression.	Static and dynamic level monitoring.
Presence of freshwater aquifers	Conductivity monitoring of each aquifer. Adequate freshwater level isolation. Including cementing and casing. Pumping rates to stabilize the aquifer depression.	Physicochemical analysis of each aquifer level.

Impact	Measure	Monitoring Indicator
Emissions of particulate matter (PM)	Reduction of traffic speed to 20 km/h. Signage.	Air quality measurements
Air pollution air with combustion gases.	Technical verification of motors for both mobile and static equipment.	Air quality measurement. Measurement of combustion gases in fixed and mobile emitters.

Source: Environmental Impact Study: "Renovación Bianual Del Estudio De Impacto Ambiental y Social e Informe de Impacto Ambiental Etapa Ensayos de Evaporación Etapa de Exploración Avanzada Proyecto Tolillar", 2022.

20.4 Water Management

Water is an essential resource for the Project, which is used for the exploration and operation processes and human consumption. The Argentinian regulation requires that the company obtains permits for the extraction of water for industrial purposes, which is a different process than acquiring water rights. More information about this permit is provided in section 20.7.3.

20.4.1 Freshwater Supply

The company will provide water for human consumption through the use of public potable water stations (known as running water centers), from which water will be transported using portable water tankers. The Project will use this system for the exploration, construction and operation stages.

Regarding process water, the project will provide the resource from the salt flat during the exploration stage. The Project should not use more than 30 m^3 of saltwater for the installation and advancement of each exploration well. During the operation phase, the project will use freshwater from seven proposed wells, located within the Project's concession area. Currently, Alpha Lithium has developed one well, with a maximum capacity of 70-75 m^3/h. The permit for this well is still in process but is expected to be approved within the coming months. Permits for the other six wells will be requested when the Project infrastructure, processes, and production capacity are finalized.

20.4.2 Surface Water, Runoff and Contact Water Management

The Project has not yet identified the need or defined any measures related to the control and management of contact water or surface runoff at the exploration phase. The EIS to be presented in 2024 will study and assess this requirement and provide designs and measures to manage surface and runoff contact water for the construction and operation phases.

20.4.3 Process Water

As indicated in section 20.4.1, during the exploration phase, the water supply is provided from the salt flat aquifer, and together with appropriate drill additives, is used to drill the brine exploration wells.

For the operational phase, extracting lithium requires freshwater, which will come from groundwater extraction wells. At the time of this report, further re-evaluation work was in progress on optimized locations for the Spent Brine Infiltration Ponds relative to the proposed freshwater wells (currently shown on Figure 18-8 as FWWALT-3, 4, and 5). It is likely that the proposed wells will be adjusted to accommodate the proposed location of the Spent Brine Infiltration Ponds. This water will be used in the DLE (direct lithium extraction) process and its subsequent stages. The process will recirculate water to minimize the use of freshwater. Saltwater extracted from the Tolillar salt flat will pass through the first process of DLE, where lithium is extracted. The residue from this process (salt water) will passively infiltrate into the infiltration pool located in the south (Figure 18-1). The quality of this saltwater and its effects on the salt flat ecosystem will be evaluated in the upcoming EIS.

20.5 Emissions and Wastes

Solid wastes will be generated during all phases of the Project. These will be classified in accordance with their nature as either recyclable, non-recyclable, or hazardous. Non-recyclable waste will be collected, properly bagged/packaged, and transported to the nearest town (San Antonio de Los Cobres), where it will be disposed of as urban solid waste. Recyclable wastes will be delivered, if possible, to non-profit organizations or to specialized facilities for this purpose. Finally, hazardous wastes will be stored in appropriate storage areas with impermeable base and containment capacity according to the volumes generated. All wastes will be transported by authorized external companies to their recycling or final disposal locations.

The 2022 EIS indicated that the exploration phase will produce minimal gaseous emissions, particulate matter, noise, and heat emissions. The Project expects that these emissions will quickly dissipate in the environment, therefore no control measures have been set, apart from speed reduction on unpaved areas.

For the next EIS, the Project will include quantification of wastes and emissions for the construction and operation phases, as required by Argentinian regulations.

20.6 Closure and Reclamation Planning

Currently, Salta Province does not have any law that requires an exclusive permit for closure and reclamation. However, the EIS process requires that a report section about closure and reclamation be included when a project is in its operation phase. In consideration of the above, the Tolillar Project has not yet provided a closure plan to the authority. This will need to be included in the 2024 EIS. Closure considerations cover the different Project phases, from exploration, to construction and operations.

20.6.1 Closure and Reclamation Plans

The Ministry of Production and Labor (*Ministerio de Producción y Trabajo*) released The Good Practice Resource Guide for Mine Closure (*Guía de Recursos de Buenas Prácticas para el Cierre de Minas*) in August 2019, providing definitions and guidance on how to define and value a closure plan. However, this guide does not provide a specific methodology or standard for this purpose.

The guide identifies seven aspects that should be addressed in the closure plan: physical stability, chemical stability, management of tailings, water management, biodiversity management, rehabilitation and restoration, and social management of closure. Moreover, the guide indicates that the project should design the closure measures and activities using a risk assessment approach.

Project facilities include infrastructure such as processing plants, a cafeteria, mine dry (changing facilities), and brine ponds for storage, distribution, and plant feeding. According to the guideline, these facilities should be dismantled at the closure phase, and the ponds must be dried. Dry ponds should be tested to assess if there are any risks to the environment. Most of the closure activities will be carried out at the end of the mine operation phase; however, it is possible that some activities will be carried out in parallel with the operation stage as concurrent, progressive reclamation. Once the closure plan has been executed, post-closure environmental monitoring will continue, before definitive closure is achieved.

The Tolillar Project will be required to take into account applicable recommendations outlined in the guide provided by the Ministry of Production and Labor, and will need to produce a detailed closure and post-closure monitoring plan that is in line with the authorities' expectations and industry best practice.

20.6.2 Closure Cost Estimates

The closure costs estimation is presented in Chapter 21. This cost will be refined further during the PFS and FS stage of the Project, since a detailed closure cost will need to meet applicable regulatory requirements, supported by feasibility level design.

The next EIS to be submitted to the environmental authority will include a closure plan that will consider the recommendations provided by the Ministry of Production and Labor and Catamarca Closure Plan regulation as described in the previous section.

20.7 Permitting Considerations

Argentina, being a federation, has a first level set of regulations corresponding to the National Law and a second level corresponding to the Provincial Law, which in this case corresponds to the Salta Province. For a mining operation, the National Law requires obtaining an environmental permit and other specific ones, such as water permits, waste generation registration, chemical precursors registration, and municipal qualification for the infrastructure. All provinces in Argentina can add requirements to the national laws in terms of the information necessary to obtain these permits. Currently, the Salta Province does not have additional specific requirements.

20.7.1 Environmental Permits

The Environmental Impact Assessment (EIS) permit is the instrument that regulates all exploration, construction, and exploitation activities of a project and must be updated every two years (Article 11 of National Law No. 24,585). The approval of the EIS generates a series of commitments and obligations, including, but not limited to, schedules, investment commitments, social obligations, environmental monitoring and audits, and safety conditions. Failure to comply with these commitments and obligations may result in penalties, fines, project suspensions and, following an administrative procedure, cancellation of the environmental permit.

The scope of the EIS will depend on the phase of the Project. The regulation has three types of scope: Prospecting, Exploration, and Operation (named as exploitation in the law). For the prospecting stage, the requirements are simple and involve general information about the environment, a project description, and a simple impact assessment. In the case of the exploration phase, the regulation requires more information about the environment; however, it is still acceptable to have only bibliographic input. It also requires measures to protect the environment, which must be based on the impact analysis results. Finally, the operation phase requires information based on fieldwork, so the impact analysis and the measures to protect the environment are very detailed in relation to the Project's potential effects.

In February 2022, an Environmental Impact Study was submitted to the provincial mining authorities to support the plans for the Project's evaporation testing and advanced exploration stages. The submission also included a description of the social and community aspects, and general information on the Project area, which was in Salta Province. The authority approved the activities through an Environmental Impact Declaration (*Declaración de Impacto Ambiental)* on December 26, 2022. As required by law, Alpha Lithium will submit a new EIS every two years to update the Project and to include required supporting baseline studies and analyses.

20.7.2 Mining Permits

As detailed in the previous section, the environmental permit is a requirement of National Law No. 24,585, which is part of the Argentinian Mining Code. Thus, the main permit for a mining operation is the Environmental Impact Study, without any other specific permits for mining activities coming from the provincial level law in the case of Salta.

20.7.3 Additional Permits and Authorizations

The additional permits required for the project area are water permits, waste generation registration, chemical precursors registration, and municipal approval for the infrastructure, which are being processed in Salta Province. Table 20-4 shows the current status of these permits. Most are currently in process, and the company expects to obtain them in the short term, although no specific dates have been indicated by the authority.

Table 20-4: Permits status for the Tolillar Project.

No.	Permit	File No.	Date of Approval	Status	Remarks
1	Water permit for industrial water	-	-	In process. The company expects to obtain the permit in the short term.	The permit in process is for the existing well.
2	Registration in the Registry of Hazardous Waste Generators	Resolution No. 000585	September 29, 2022	Approved	The permit lasts one year, the renewal will be processed during the second semester.
3	Registration in the National Register of Chemical Precursors (RNPQ)	-	-	In process. The company expects to obtain the permit in the short term.	-
4	Municipal qualification	-	-	In process. The company expects to obtain the permit in the short term.	The company had a municipal approval that is being renewed.

20.8 Social Considerations

All Provinces in Argentinian requires an EIS process that must include social aspects, which can vary depending on the phase of the project. As part of the exploration phase study, the 2022 EIS presented a general location map, described the characteristics of the surrounding communities, as well as a community relations plan and proposed activities. This document confirmed the presence of Indigenous and non-Indigenous communities in the surrounding area.

20.8.1 Indigenous Communities

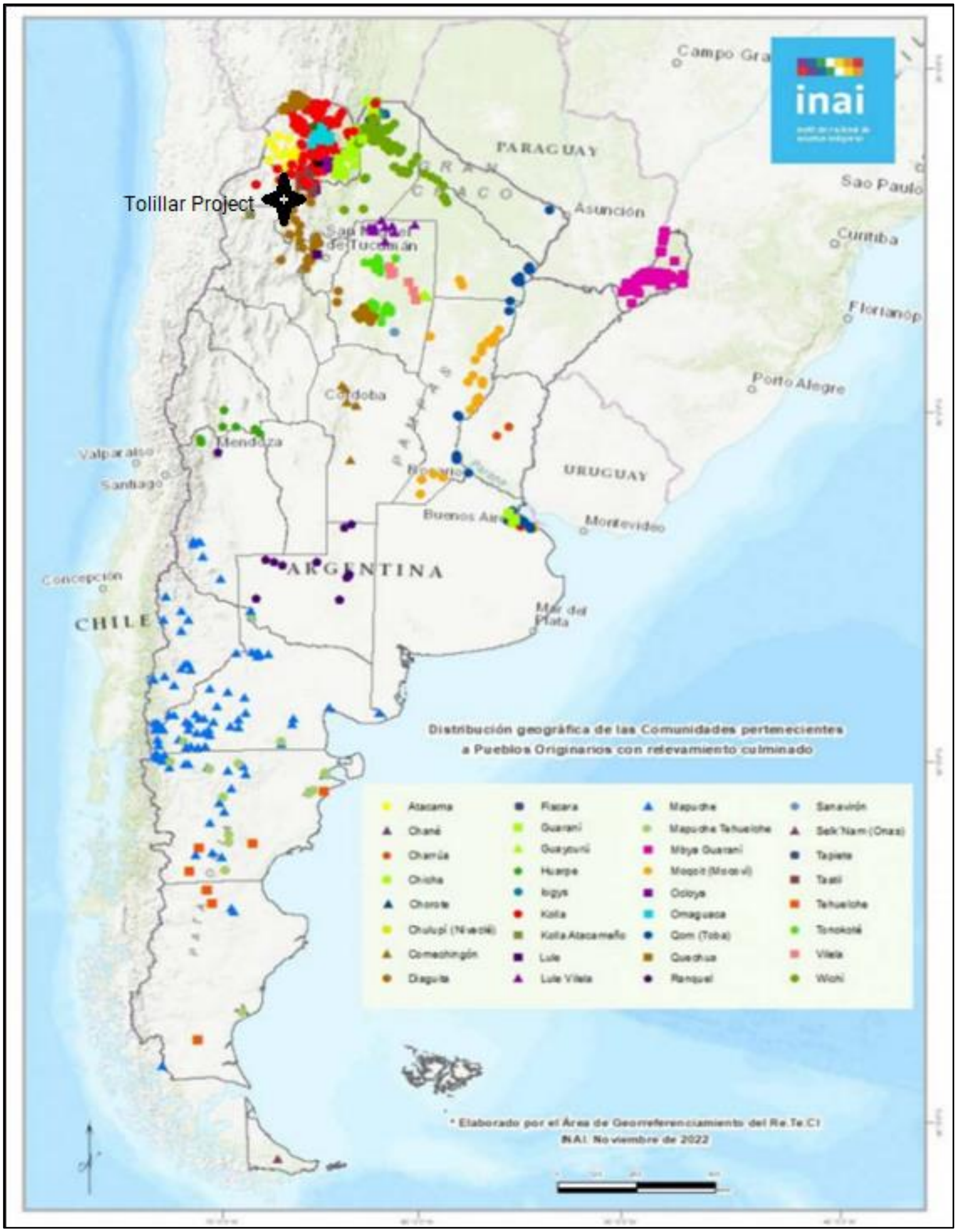
Ten Indigenous communities in the Salta Province are part of the "*Pueblo atacameño de la Cuenca de Salinas Grandes y Laguna de Guayatayoc*" (Atacama People of the Salinas Grandes Basin and Guayatayoc Lagoon). Table 20-5 below lists the seven communities that are part of the Los Andes Department, all of which are legal entities. Figure 20-2 shows the location of Indigenous communities throughout Argentina, circling the Project area and surroundings.

Table 20-5: Indigenous communities in the Los Andes Department (RIA Proyecto Tolillar, 2022)

Department	Municipality	Ethne	Name	Legal Inscription
Los Andes	Tolar Grande	Kolla	Comunidad Aborigen Kolla de Tolar Grande	Res 164/22/07/02
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Indígena Kollas Unidos	Res 336/30/12/02
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Aborigen de Hurcuro	Res 166/08/07/09
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Kolla del Salar de Pocitos	Res 278/11/09/09
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Quewar – Etnia Kolla	Res 281/11/09/09
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Andina de Santa Rosa de los Pastos Grandes	Res 573/13/07/10
Los Andes	San Antonio de Los Cobres	Kolla	Comunidad Kolla El Desierto	Res INAI 066/06/12/02

Comunidad Kolla del Salar de Pocitos is the nearest Indigenous community to the Project. The community resides in *Estación Salar de Pocitos* town, located approximately 90 km from the Project concession area. The community consists of 50 people organized into 20 families, who periodically meet in a community center.

Figure 20-2: Communities Map, Argentina

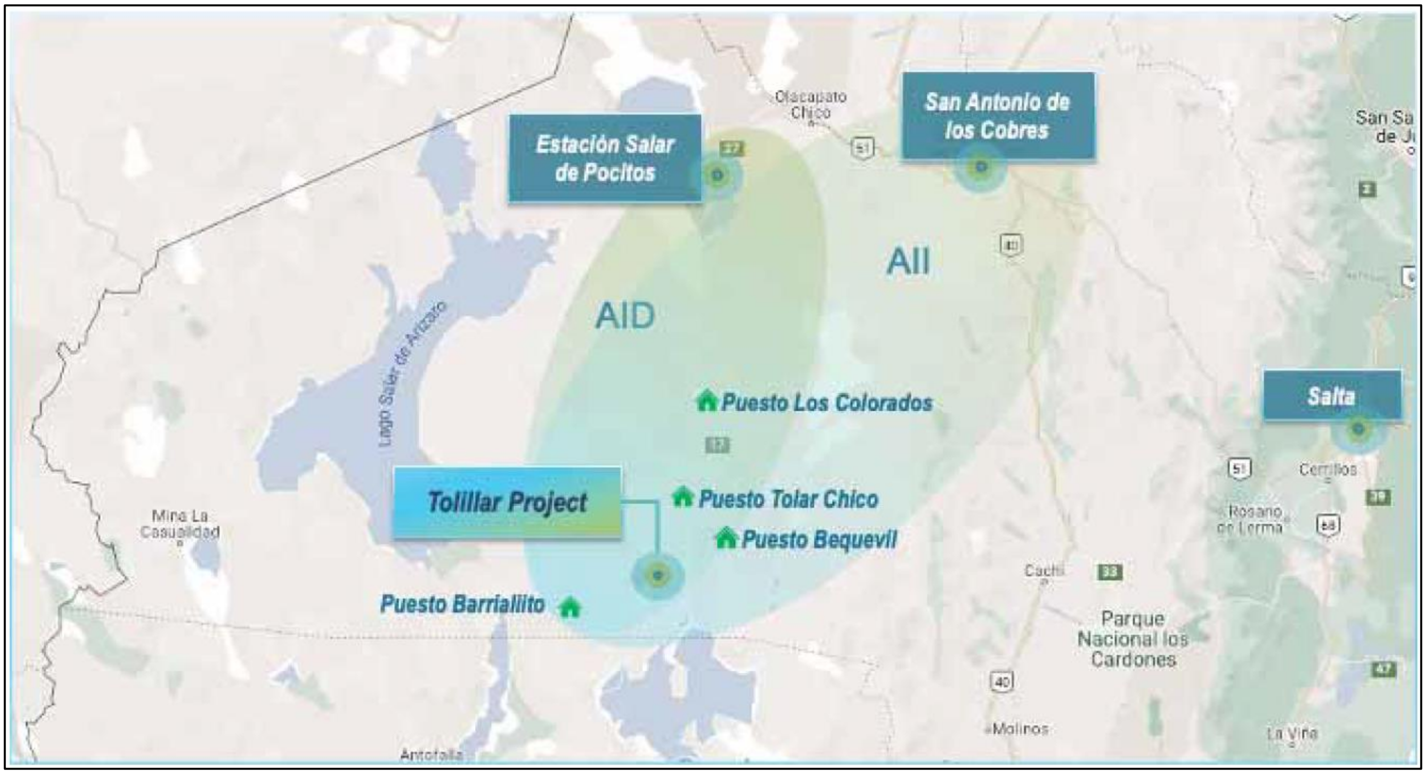


Source: “*Mapa de Pueblos originarios*” National Institute of Indigenous Affairs (INAP), 2023.

20.8.2 Non-Indigenous Communities

The two communities included in the 2022 EIA study are *Estación Salar de Pocitos*, which is nearest to the Project, and *San Antonio de Los Cobres*, where the government authorities and primary services are located.

Figure 20-3: Communities Close to Tolillar Project.



Source: Environmental Impact Study: "Renovación Bianual Del Estudio De Impacto Ambiental Y Social E Informe De Impacto Ambiental Etapa Ensayos De Evaporación Etapa De Exploración Avanzada Proyecto Tolillar", 2022.

Estación Salar de Pocitos has a total population of 76, organized into 23 families. Administratively, it is a municipal delegation that depends on the municipality of *San Antonio de Los Cobres*, which has a population of 4.763. The main route that connects *San Antonio de Los Cobres* with *Salta* (the capital city) is route RN 51, which is also the international connection to Chile. RN 51 connects with RN 27, the route to *Estación Salar de Pocitos*. RN 51 can be used throughout the year except during occasional inclement weather such as snowstorms or heavy precipitation (Figure 18-3).

Concerning social-economic dynamics, traditional economic practices such as raising camelids (llamas) and small ruminants (goats and sheep) are still practiced. It was suggested in the 2022 EIA study that there is a trend for most young people to be unwilling to continue traditional work, and to have a preference of finding employment in activities such as mining or studying in urban centers. Mining activities have been booming in the last couple of years due to new gold, lithium, and copper projects. *San Antonio de Los Cobres* also has tourism-related activities and handcrafted products.

20.8.3 Communication Plan

The social perception (through interviews) of the community to mining activity is positive, according to the Environmental Impact Report: Proyecto Tolillar, carried out in 2022, based on the perception that benefits from the Project will flow to the community. Therefore, maintaining the social license will rely on ongoing benefits to the community.

The people interviewed from the *Estación Salar de Pocitos* had historical relationships with other mining companies, and voiced complaints about historical miscommunications that led to mistrust of those companies. Alpha Lithium has been working with the community in *Estación Salar de Pocitos* as part of its communication plan to establish a mutually beneficial and respectful relationship with them. The objectives of this plan are as follows:

- To manage community perceptions by means of the dissemination of information important to the community and maintaining a clear lines of communication and a means for community members to register any concerns or complaints and receive meaningful and timely responses from the Company.
- To keep fluent communication with the community and key individuals in the region, such as authorities and government/community representatives.
- To deliver information about ongoing and proposed company activities in the region and to identify and coordinate any required social responsibility action.

The *Secretaría de Minería de Salta* (Salta Mining Secretariat) organized the first meeting between the company and the community in October 2021. In this meeting, the company explained the Project and activities underway and took notes documenting any community concerns. Subsequently, the company met with the community on a monthly basis for the next three months to work on a social responsibility plan.

As of February 2022, the company has conducted several activities as part of its Corporate Social Responsibility (CSR) plan:

- National University of Salta (UNSa)- Geology thesis: Alpha Lithium cooperates with a student from the UNSa to facilitate field work for geology thesis investigations. Access to the company is promoted to advanced students of mining-related careers to provide them with professional experience with career projection.
- National Competition - Build an Electric Vehicle (EV)- Technical Secondary School N*3100 “República de la India”: Alpha Lithium provides students with materials to build a car.
- Flood Emergency in Olacapato: At Christmas, after heavy rains, a river overflowed its banks, flooding the town of Olacapato. Quickly, Alpha Lithium and other mining companies organized aid for the community, sending freshwater and materials to repair their houses. Alpha Lithium contributed by facilitating the transport of these donations and supporting the people during the incident.
- Support “Puestos”: Transhumance is a type of nomadism, a seasonal movement of livestock between places with better summer and winter pastures. The herders have a permanent home and one or a few other temporary homes. They call it “puestos.” Alpha Lithium supports the families from the puestos near Tolillar Project (Figure 20-4) through three main activities: they provide primary health care by sending an ambulance when people have an emergency; they are working to improve the accessibility and quality of the local water sources; and lastly, they have a program called "Farming Production" to enhance food production through a greenhouse developed by workers.

Figure 20-4: “Puestos Los Colorados” Close to the Tolillar Project

Source: Internal presentation: “Community Engagement and CSR Initiatives,” Alpha Lithium, 2022.

The above initiatives demonstrate the Company’s interest in building and maintaining a CSR Plan and ongoing engagement and communication with the community. However, there has been no new information available since February 2022, therefore the status of community activities since that time are currently not known.

20.9 Comments on Environmental Studies, Permitting and Social or Community Impact

Based on the above discussion, the following comments are provided:

- The 2022 EIS includes environmental data only from bibliographic sources about the Project area and its surroundings, as the Argentinian regulation does not require detailed information from field work at the exploration development stage. The next EIS, to be submitted for approval in 2024, will include detailed information about the environment including field studies that will provide a better understanding of the ecosystem and the potential project risks, esspecially, the quality of the saltwater and its effects on freshwater aquifers and the salt flat ecosystem.
- There are some key environmental gaps related to wildlife in conservation states and the sensitivity of the ecosystems within and adjacent to the Project area. Because this site-specific information is not available for the Project area, it is not currently possible to define the risk that this could pose for the future operation. Ideally, there should be an avoidance of critical wildlife habitat and ecosystems as related to critical conservation states, or if not avoidable, the potential for habitat compensation should be considered.
- The Tolillar Project is in its exploration phase, which Salta Province has authorized through the approval of the 2022 EIS. However, the Project is still processing other permits, such as water permits, chemical precursors registration, and municipal qualification for the facilities. At this stage, the Project does not appear to have any significant impediments to obtain these operating permits or the subsequent environmental ones.
- The impact assessment in the 2022 EIS resulted in minimal effects on the environment due to the small size of the operation and the current state of project development (exploration) at the time of evaluation. Nevertheless, the Project will assess the operation phase for the subsequent EIS, which can result in more complex mitigation measures.
- The 2022 EIS does not include a description of the closure phase, as it is not required by the Argentinian regulation. However, the Project should design closure measures for the next EIS in 2024, which will be a significant input to update the closure cost for the Project.

- The available data of the interactions of the Project with the local communities in the area indicates non-Indigenous and Indigenous communities are largely habituated to mining operations in the area and without apparent opposition to the Tolillar Project. The available data do not provide information that indicates Corporate Social Responsibility (CSR) activities have been ongoing since February 2022. The specific risk is losing the social license, which can occur at any stage of the Project, resulting in difficulties in obtaining permits and maintaining site activities.

Further comments regarding environmental and social aspects are included in Section 25.

21 CAPITAL AND OPERATING COSTS

The capital and operating cost estimates presented in this report provides substantiated costs that can be used to assess the preliminary economics of the Tolillar Project. The estimates are based on the development of a lithium deposit through brine extraction wells and the construction of a process plant, infrastructure, as well as indirect costs and contingency.

The following basic information pertains to the estimate of both capital and operating cost:

- Base date for these estimates is Q2 – 2023.
- All costs are expressed in United States dollars (US$), with no allowance for escalation.
- Estimate accuracy is reflective of the stage of Project development and classified as an AACE International (AACE) Class 5 Conceptual Study estimate with an expected accuracy range of -20% to -50% on the lower range, and +30% to +100% on the higher range.
- Units of measurement is metric (unless otherwise indicated).
- Sustaining capital costs are based on an estimated mine of 35 years.

21.1 Capital Costs

21.1.1 Overview

The overall capital cost estimate was developed by Ausenco. Capital cost estimate is based on preliminary mechanical and electrical equipment list, material take-off for massive earthworks, concrete and structural buildings. Other commodities quantities were factored from mechanical direct cost based on benchmark projects in the region with similar technology and region within the Ausenco database.

Unit rates and pricing were based on the Ausenco's database for similar projects in the region. The cost estimates include the initial investment and sustaining capital for a lithium concentration plant with a capacity of 25,000 t LCE/a. The capital is split into direct cost, indirect cost and contingency. The total initial capital cost is US$777 M.

Sustaining capital was based to number of wells required to continue with production over the LOM. The cumulative total LOM sustaining capital cost is US$306 M.

The Table 21-1 presents the initial capital cost summary.

Table 21-1: Summary of Capital Cost

Description	Initial Capital Cost US$M	Sustaining Capital Cost US$M	Total Capital Cost Project US$M
Mine Capital Cost	36	174	210
Plant Capital Cost	321	-	321
On-Site Infrastructure	43	-	43
Project Direct Cost	**400**	**174**	**574**
Project Indirect Cost (Including Owners)	138	61	199
Resin DLE (First Fill)	60	-	60
Total Indirect	**198**	**61**	**259**
Contingency	179	71	250
Total CAPEX	**777**	**306**	**1,082**

*Numbers may not add up due to rounding.

21.1.2 Basis of Estimate

The Capital cost estimate was developed in Q2 2023 United States dollars (US$) based on Ausenco's in-house database projects and studies as well as experience from similar operations. Due to the methodology used to develop the capital estimate and the conceptual level of engineering definition, the estimate has an accuracy of -20% to -50% on the lower range, and +30% to +100% on the higher range in accordance with the Association for the Advancement of Cost Engineering International (AACE International) guidelines for a PEA study.

Data input for the estimates has been obtained from numerous sources, including the following:

- Conceptual engineering design by Ausenco.
- Mechanical equipment cost and main electrical equipment determined from first principles and Ausenco´s database of historical projects.
- Material take-off for massive earthworks, concrete and structural buildings.
- Electrical bulks, plateworks, instrumentation, concrete and structural steel for equipment support were factored from mechanical equipment direct cost based on benchmark projects in the region with similar technology and region within the Ausenco database.

21.1.3 Mine Capital Costs

Mine capital includes wells construction and HDPE pipelines from well fields to DLE Plant. Mining initial capital is summarized in Table 21-2.

Table 21-2: Mine Capital Cost

WBS	Description	Initial Capital Cost US$M
1100	Wells	14
1200	Brine Transport	7
1300	Storage and Distribution Pond	8
1400	Plant Feeding Ponds	7
1000	**Brine Extraction Wells**	**36**

*Numbers may not add up due to rounding.

21.1.4 Process Capital Costs

Process plant initial capital is presented in Table 21-3. Direct costs include all direct and indirect labour, permanent equipment, materials, and mobile equipment associated with the physical construction of the areas.

Table 21-3: Plant Capital Cost

WBS	WBS Description	Initial Capital Cost - US$M
2000	DLE Plant	107
3000	Reverse Osmosis	68
4000	Chemical Plant	28
5000	Purification	22
6000	Dry Product Handling (Dryer, Micronizer, Packaging)	28
7000	General Utilities	68
-	**Plant Capital Cost**	**321**

Table 21-4 presents the distribution of General Utilities of capital costs (WBS 7000).

Table 21-4: General Utilities Capital Cost

WBS	WBS Description	Initial Capital Cost - US$M
7100	Power Supply	26
7200	Fuel storage and handling	0,5
7300	Water supply	30
7400	Air	2.5
7500	Reagents	5
7600	Steams	4
7000	**General Utilities**	**68**

*Numbers may not add up due to rounding.

21.1.5 On-Site Infrastructure Capital Costs

General costs include on-site infrastructure and equipment (power generators, piping general, electric grid, general, subcontractor camp, pipe rack, among others).

Table 21-5: Infrastructure Capital Costs

WBS	WBS Description	Initial Capital Cost - US$M
8110	Administration Office	2
8120	Camp	15
8130	Casino	3.5
8140	Change House	2
8150	Reagents Warehouses	6
8160	Metallurgy Laboratory	1.6
8170	Spare Warehouse	2
8170/8200	Spare Warehouse & Workshop of Maintenance	6
8300	Warehouses for SAS and product	3.5
8400	Policlinic for first aid	0.4
8900	Waste Management	1
8000	**On site - Infrastructure**	**43**

*Numbers may not add up due to rounding.

21.1.6 Sustaining Capital

Sustaining capital includes well construction which involves the installation of HDPE pipelines from wells to concentration ponds over the LOM. Sustaining capital is summarized in Table 21-6.

Table 21-6: Sustaining Capital Cost

WBS	Description	Sustaining Capital Cost (US$M) Total LOM
1100	Wells	151
1200	Brine Transport	23
	Total Direct Cost	**174**
	Project Indirect Costs	61
	Total Direct + Indirect Costs	**235**
	Contingency	71
	Total Sustaining Capital Cost	**306**

*Numbers may not add up due to rounding.

21.1.7 Indirect Project Costs

Indirect costs are those that are required during the Project delivery period to enable and support the construction activities.

In accordance with a class 5 estimate, the indirect costs of the Project were factored using references from similar projects. These percentages consider that earthworks require less indirect supervision than plant works during its execution.

Table 21-7 shows a summary of the concepts considered and the estimation basis. Factors are based on projects with similar characteristics.

Table 21-7: Indirect Project Cost

Item	Basis of Estimate	US$M
EPCM	12.00% of the direct cost plus 8.00% of direct cost items associated with Earthworks	47
Temporary Facilities	1.00% of the direct cost plus 1.00% of direct cost items associated with Earthworks	4
Third Party Services	6.00% of the direct cost plus 5.00% of direct cost items associated with Earthworks	24
Catering and Lodging	1.00% of the direct cost plus 1.00% of direct cost items associated with Earthworks	4
Freights & Logistics	4.50% of the direct cost	17
Vendor Representatives	1.50% of the direct cost	6
Spares	0.50% of the direct cost	2
Commissioning & Start-up	1.00% of the direct cost	4
Owner Costs	7.50% of the direct cost plus 5.00% of direct cost items associated with Earthworks	30
Total Project Indirect Cost		**138**

21.1.8 Resin DLE (First Fill)

First fill for the direct lithium extraction plat were estimated by first principles. Quantity was derived form the mass balance, and price from recent quotations on the Ausenco database. Total resin cost included in the initial capital is US$ 60 M.

21.1.9 Contingency

Contingency was estimated deterministically as 30% of the sum of direct and indirect costs. This percentage is in the range expected for a class 5 estimate. Initial Capex contingency for the project has been estimated at US$179 M and total contingency cost for the LOM at US$ 250 M.

The estimate contingency does not allow for the following:

- Abnormal weather conditions;
- Changes to market conditions affecting the cost of labour or materials;
- Changes of scope within the general production and operating parameters;
- Effects of industrial disputations;
- Financial modelling;
- Technical engineering refinement; and
- Estimate inaccuracy.

21.1.10 Exclusions

The following costs and scope are excluded from the capital cost estimate:

- Land acquisitions;
- Taxes not listed in the financial analysis;
- Sales taxes;
- Scope changes and Project schedule changes and the associated costs;
- Any facilities/structures not mentioned in the Project summary description;
- Costs to advance the Project from preliminary economic assessment to pre-feasibility study;
- Costs of pre-feasibility and feasibility studies;
- Geotechnical unknowns/risks;
- Financing charges and interest during the construction period;
- Any costs for demolition or decontamination for the current site;
- Escalation;
- Budgetary quotations; and
- Permitting or environmental compensation costs.

21.2 Operating Costs

21.2.1 Overview

The operating cost estimate for Tolillar Project was developed to a level of accuracy of ±30% and with a base date of Q2 2023 using Ausenco's in-house database of projects and studies and experience from similar operations. The estimate includes direct and indirect costs.

The distribution of the operating costs, shown in Table 21-8. The most relevant cost is reagents consumption (57%) followed by energy (18%). Both costs add up to US$ 96.81 M meaning 75% of the operating direct cost.

Table 21-8: Summary of Operating Cost

Description	US$M/a	US$/t Li_2CO_3
Direct Costs		
Chemical Reactive Substances and Reagents	73.40	2,936
Resin & Membrane replacement	11.73	469
Energy	23.41	936
Manpower	6.17	247
Catering and Camp Services	4.56	182
Maintenance	5.15	206
Site Vehicle Costs	0.29	11
Bus – In /Bus – Out Transportation	0.55	22
Consumables	0.63	25
Li_2CO_3 Transport to Antofagasta Port	2.88	115
Direct Cost Subtotal	**128.74**	**5,150**
Indirect Costs		
General and Administration	2.92	117
Indirect Costs Subtotal	**2.92**	**117**
Total Operating Cost	**131.66**	**5,266**

*Numbers may not add up due to rounding.

21.2.2 Basis of Estimate

Cost estimates are based on the following assumptions:

- Cost estimates are based on Q2 2023 pricing without allowances for inflation. Costs are expressed in United Sates dollars (US$).
- Production of Li_2CO_3 at 25,000 t LCE/a
- Majority of labour requirement is assumed to come from surrounding communities.
- Ausenco developed the material balance for the Ausenco's proposed design for the Tolillar Project to estimate reagent consumption.
- Equipment and materials will be purchased as new.
- Prices based on the Ausenco database and by Alpha Lithium
- Lithium feed grade for the processing plant at 314 mg Li/L

21.2.3 Operating Costs Breakdown

21.2.3.1 Chemical Reactive and Reagents

The consumption of chemical reagents was determined by mass balance for 25,000 t/a of BG lithium carbonate production.

The total reagents cost for annual consumption is US$ 73.40 M/a for Tolillar Project and its unit cost is US$2,936/t Li_2CO_3. More details are presented in Table 21-9.

Table 21-9: Chemical Reactive and Reagents

Description	Formula	t/a	US$ M/a	US$/t Li_2CO_3
Sodium carbonate (soda ash)	Na_2CO_3	61,536	47.31	1,892
Sodium hydroxide (caustic soda)	NaOH Dry	2,899	2.59	104
Sulfuric acid	H_2SO_4	21,366	10.36	414
Hydrochloric acid	HCl	142	0.118	4.71
Carbon dioxide	CO_2	9,358	6.99	280
Others			6.03	241
Total		**95,301**	**73.40**	**2,936**

*Numbers may not add up due to rounding.

21.2.3.2 Resin & Membrane replacement

Resin and membrane are considered as consumable provisions. The estimate cost for resin replacement was express as a factor of adsorption equipment with 5% plus softening IX Ca/Mg and IX B. Regarding membrane replacement, it is estimated considering the membrane lifetime.

The total resin and membrane replacement cost for annual consumption is US$11.73 M/a for Tolillar Project and its unit cost is US$469/t Li_2CO_3. More details are presented in Table 21-10.

Table 21-10: Resin & Membrane Replacement

Description	Units required per annum	US$ M/a	US$/t Li_2CO_3
Resin Replacement		**10.58**	**423**
Adsorption	1	3.13	125
Softening IX Ca/Mg	1	3.71	148
Softening IX B	1	3.75	150
Membrane Replacement		**1.15**	**46**
HP RO	476	0.48	19
UHP RO	75	0.24	10
UHP NF	78	0.28	11
Demin Water treatment plant RO	140	0.07	3
Demin Water treatment plant UF	21	0.08	3
Total		**11.73**	**469**

*Numbers may not add up due to rounding.

21.2.3.3 Energy

Energy costs consider the generation of electricity through Liquid Petroleum Gas power generation plant. Using a steam generation with a heat recovery system allows for more efficient use of fuel and significantly reduces its consumption while meeting the heat and power requirements of the plant.

The power cost is calculated from the overall plant power draw determined from the mechanical equipment list. LGP price provided by Alpha Lithium is US$1.1/kg. The total energy cost for annual consumption is US$ 23.41 M/a and US$ 936 /t Li_2CO_3.

Table 21-11: Energy Costs

Description	t/a	US$M/a	US$/t Li_2CO_3
Gas Consumption Process Plant + Camp	8,133	8.95	358
LPG Calorific Power	13,148	14.46	578
Total	**21,281**	**23.41**	**936**

*Numbers may not add up due to rounding.

21.2.3.4 Manpower

The opex calculation involves utilizing the projected amount of labor needed for a yearly production of 25,000 tonnes. The required salaries and personnel correspond to the industry standards in Argentina. A breakdown of the labor cost is shown in Table 21-12.

Table 21-12: Manpower Costs

Description	# of Employees	US$M/a	US$/t Li_2CO_3
Management	5	0.26	10
Technology & process	17	0.37	15
Wells and well field	112	1.81	73
Lithium Carbonate	48	0.80	32
Lithium Carbonate	42	0.54	22
Utilities & Maintenance	90	1.72	69
Administration	10	0.19	8
Logistics	10	0.21	8
Human Resources	4	0.14	5
HSE & Quality	5	0.13	5
Total	**343**	**6.17**	**247**

*Numbers may not add up due to rounding.

21.2.3.5 Catering and Camp Services

All costs related to lodging and food for Project staff which includes catering and camps services are shown in Table 21-13.

Table 21-13: Catering and Camp Services Costs

Description	US$M/a	US$/t Li_2CO_3
Catering	2.54	102
Cleaning and Accommodation	1.60	64
Clothes, Security, Nursing, etc	0.41	16
Total	**4.56**	**182**

*Numbers may not add up due to rounding.

21.2.3.6 Maintenance

The annual maintenance costs were derived from the total installed mechanical cost using a factor based on similar projects in the region extracted from the Ausenco database and are summarised in Table 21-14.

The annual maintenance costs were estimated at US$5.15 M/a which represent a 2.6% of the total installed mechanical costs. Considering the production of 25,000 t/a the resulting value of maintenance costs is US$ 206/t Li_2CO_3.

Table 21-14: Maintenance Costs

Area	Total Installed Mechanical Cost (US$M)	Factor (%)	US$M/a	US$/t Li_2CO_3
Brine extraction	5.17	1.0%	0.05	2.0
Lithium Adsorption	67.12	3.0%	2.01	80.4
Lithium Concentration (HPRO)	54.68	2.5%	1.37	54.8
Brine Treatment & Carbonatation	11.16	2.5%	0.28	11.2
Lithium Refining	11.66	3.0%	0.35	14.0
Product Drying	16.22	3.0%	0.49	19.6
General Utilities	30.03	2.0%	0.60	24.0
Total	**196.04**	**2.6%**	**5.15**	**206**

*Numbers may not add up due to rounding.

21.2.3.7 Site Vehicle Costs

Site vehicle cost includes diesel and maintenance and have been estimated at US$ 0.29 M/a.

21.2.3.8 Bus – In /Bus – Out Transportation

Transportation of personal from Salta to Tolillar has been estimated at US$ 0.55 M/a.

21.2.3.9 Consumables Cost

The consumables cost related to bags, water treatment, resins, and lubricants, were estimated from benchmarking from Ausenco database based on similar projects in the region for a production of 25,000 t/a, resulting in a value of US$25/t Li_2CO_3, a consumables cost of US$0.63 M/a is obtained.

21.2.3.10 Li_2CO_3 Transport to Antofagasta Port

In relation to the transportation cost of the product (Li_2CO_3), Ausenco's database cost is US$115/t Li_2CO_3. Considering a production of 25,000 t/a of lithium carbonate BG, a transportation cost of US$ 2.88 M/a is obtained.

21.2.4 Indirect Costs

21.2.4.1 General and Administration

The general and administration costs were estimate from the information obtained in the Ausenco database. This includes management compensation, environment, communications, and other expenses. The costs are shown in Table 21-15.

Table 21-15: General and Administration Cost

Description	US$ M/a	US$/t Li_2CO_3
General & Administration	2.92	117

21.3 Closure Cost

An allowance for closure cost have been assumed based on a 5% of the total capital cost of the Project and included in the economic analysis the year after the end of the operation. Further investigation will need to be required to estimate the closure cost. Total closure costs were estimated as US$54 M at the end of the LOM.

22 ECONOMIC ANALYSIS

22.1 Forward-Looking Information Cautionary Statements

The results of the economic analyses discussed in this section represent forward-looking information as the results depend on inputs that are subject to known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here.

The preliminary economic assessment is preliminary in nature, that it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

Forward-looking information includes:

- Mineral Resource estimates;
- Assumed lithium carbonate prices and exchange rates;
- The proposed mine production plan;
- Projected mining and process recovery rates;
- Sustaining costs and proposed operating costs;
- Assumptions as to closure costs; and
- Assumptions as to environmental, permitting, and social risks.

Additional risks related to forward-looking information include:

- Changes to costs of production from what is assumed;
- Unrecognized environmental risks;
- Unanticipated reclamation expenses;
- Unexpected variations in the quantity of mineralized material, grade, or recovery rates;
- Geotechnical or hydrogeological considerations being different during mining from what was assumed;
- Failure of mining methods to operate as anticipated;
- Failure of plant, equipment, or processes to operate as anticipated;
- Changes to assumptions as to the availability of electrical power, and the power rates used in the operating cost estimates and financial analysis;
- Ability to maintain the social licence to operate;
- Accidents, labor disputes, and other mining industry related risks;
- Changes to interest rates; and
- Changes to tax rates.

Calendar years used in the financial analysis are provided for conceptual purposes only. Permits still have to be obtained in support of operations, and approval for development must be granted by the Alpha Lithium's Board.

22.2 Methodologies Used

An engineering economic model was developed to estimate annual pre-tax and post-tax cash flows and sensitivities of the Project based on an 8% discount rate. It must be noted, however, that tax estimates involve many complex variables that can only be accurately calculated during operations and, as such, the after-tax results are only approximations. Sensitivity analysis were performed to assess the impact of variations in lithium carbonate, operating costs, and capital costs. The capital and operating cost estimates were developed specifically for this Project and are summarized in Section 21 of this Report. The economic analysis has been run with no inflation (constant dollar basis).

22.3 Financial Model Parameters

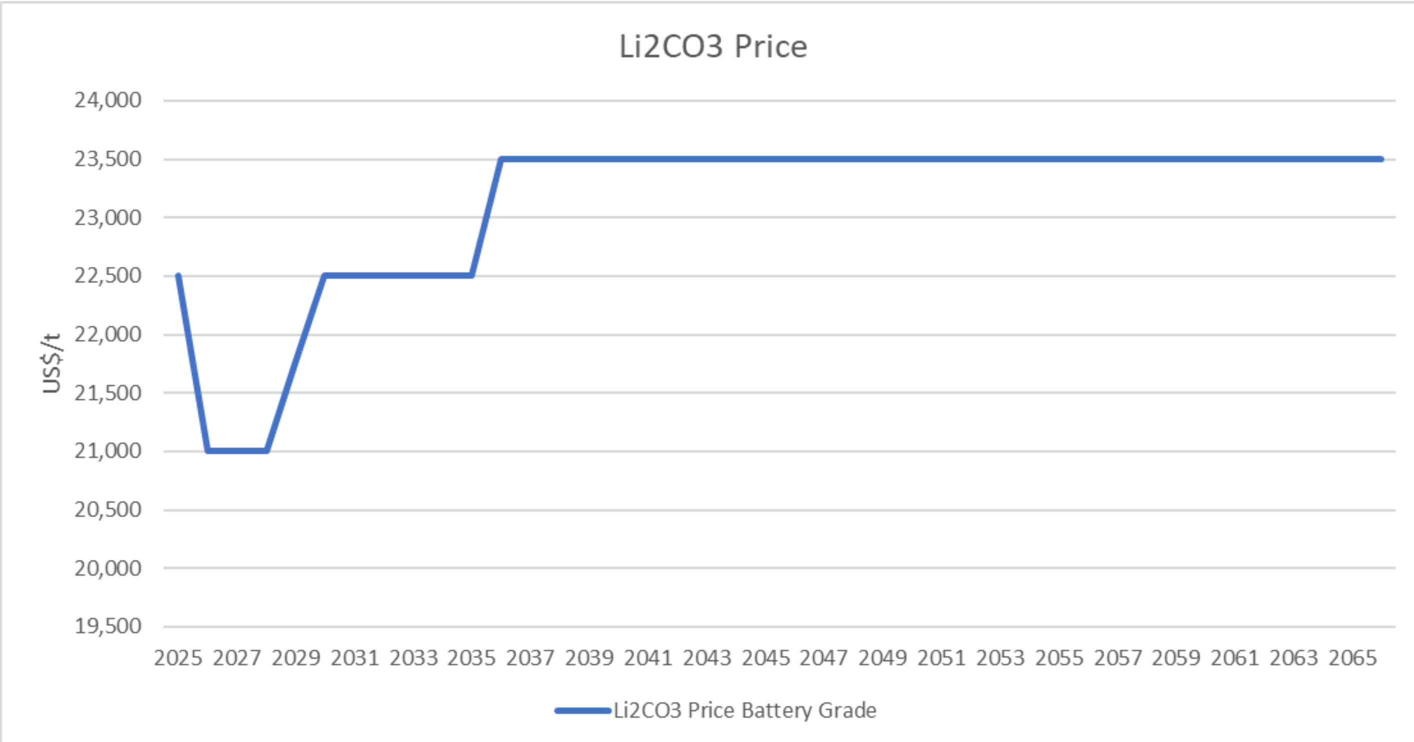
The economic analysis was performed using the following assumptions:

- Construction starts on January 01st, 2025;
- Ramp-up production start-up in 2027 and full process plant production will be achieved in 2029;
- Mine life of 35 years;
- Cost estimates in constant Q2 2023 US$;
- No price inflation or escalation factors were taken into account;
- Results are based on 100% ownership;
- Capital costs funded with 100% equity (i.e., no financing costs assumed);
- All cash flows discounted to beginning of construction January 01st, 2025;
- All lithium carbonate products are assumed sold in the same year they are produced;
- Project revenue is derived from the sale of battery-grade lithium carbonate FOB Antofagasta; and
- No binding contractual arrangements currently in place.

22.3.1 Lithium Carbonate Pricing

Battery-grade lithium carbonate prices were based on market prices obtained from Global Lithium LLC for May 31, 2023; the Global Lithium LLC as detailed in Section 19 of this Report. The forecasts used are meant to reflect the battery-grade lithium carbonate prices expectation over the life of the Project. Pricing used in the economic evaluation is shown in Figure 22-1.

Figure 22-1: Lithium Carbonate Pricing



Source: Prepared by Ausenco based on Global Lithium LLC Prices data, 2023.

22.3.2 Working Capital

A high-level estimation of working capital has been incorporated into the cash flow based on accounts receivable (30 days), inventories (30 days) and accounts payable (60 days).

22.3.3 Closure Costs

Closure costs are applied at the end of the LOM. Closure costs were estimated as US$54 M at the end of the LOM as detailed in Section 21 of this report.

22.3.4 Royalties

The economic analysis considers the fully buyback of the mining property royalties described in item 4.8 of the report. Buyback Payment of US$ 1 M for vendors A and B due in December 2023, so has not been included in the cashflow analysis model as the economic analysis starts at the beginning of construction. Buyback Payment for underlying vendors of US$ 4 M have been considered prior to the operation ramp-up.

A 3% over Net Smelter Return has been considered for the payment to the Province of Salta. Total royalty payments are estimated to be US$588 M over the LOM.

22.3.5 Export Duty

A 4.5% rate on the Revenue has been considered for the payment to the export duty fees.

Total export duty payments are estimated to be US$887 M over the LOM.

22.3.6 Taxes

The Project has been evaluated on an after-tax basis to provide an approximate value of the potential economics. The tax model was compiled by Alpha Lithium with assistance from third-party retained by Alpha Lithium. The calculations are based on the tax regime as of the date of the PEA study.

As of the effective date of this report, the Project was assumed to be subject to the following tax regime:

- The Argentinian corporate income tax system of 35% income tax.
- The total undiscounted tax payments which were estimated to be US$4,430 M over the LOM.

22.4 Economic Analysis

The economic analysis was performed assuming an 8% discount rate. Cash flows have been discounted to the beginning of the construction January 01, 2025, assuming that the Project execution decision will be made, and major project financing would be carried out at this time.

The pre-tax net present value discounted at 8% (NPV8%) is US$ 2,773 M, the internal rate of return (IRR) is 30.7%, and payback is 3.6 years. On an after-tax basis, the NPV8% is US$ 1,739 M, the IRR is 25.6%, and the payback period is 3.7 years. A summary of the Project economics is included in Table 22-1 and shown graphically in Figure 22-2. The cashflow on an annualized basis is provided in Table 22-2 to Table 22-4.

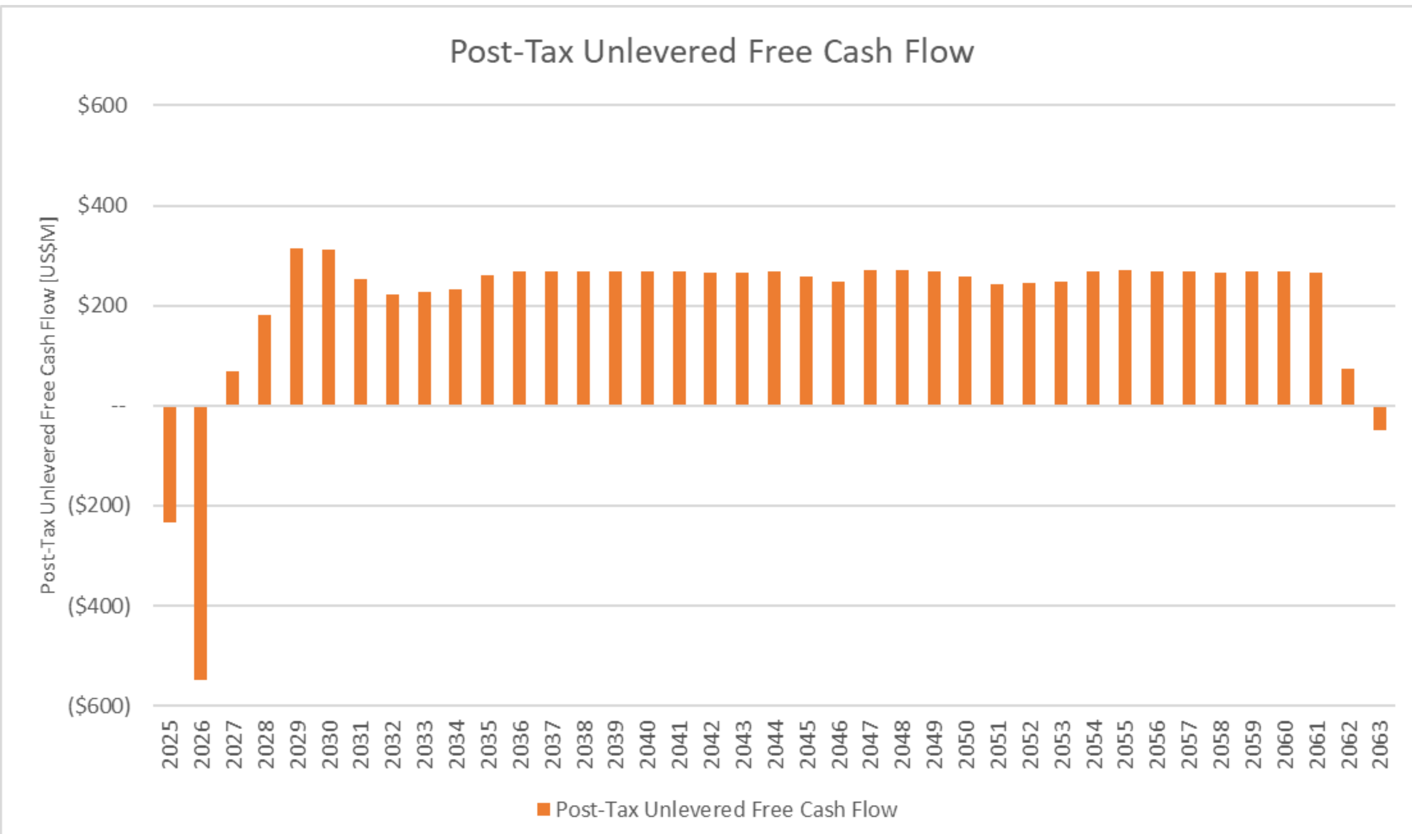
Table 22-1: Economic Analysis Summary Table

General	LOM Total/Avg.
Li_2CO_3 Price (US$/t) – Linear Avg.	$23,146
Operational Years (years)	35.2
Production – LOM	
Process Efficiency (%)	77%
LOM Li_2CO_3 Battery Grade (t/a)	24,143
Full Production Li_2CO_3 Battery Grade (t/a)	25,000
Total Payable Li_2CO_3 Battery Grade (t)	848,841
Operating Costs	
Processing Cost (US$/t Li_2CO_3)	$5,172
Transport Cost (US$/t Li_2CO_3)	$115
Total Operating Cost (Processing Cost + Transport Cost) (US$/t Li_2CO_3)	$5,287
Cash Costs (US$/t Li_2CO_3)*	$5,980
AISC (US$/t Li_2CO_3)**	$6,288
Capital Costs	
Initial Capital (US$M)	$777

Sustaining Capital (US$M)	$306
Closure Capital (US$M)	$54
Financials - Pre-Tax	
Pre-Tax NPV (8%) (US$M)	$2,773
Pre-Tax IRR (%)	30.7%
Pre-Tax Payback (years)	3.6
Financials - Post Tax	
Post-Tax NPV (8%) (US$M)	$1,739
Post-Tax IRR (%)	25.6%
Post-Tax Payback (years)	3.7

*Cash costs consist of mining costs, processing costs, G&A, transport cost and royalties. Export duty is excluded.
** AISC includes cash costs plus sustaining capital and closure cost

Figure 22-2: Post-Tax Free Cash Flow Post-Tax



Source: Ausenco, 2023.

Table 22-2 Cashflow Statement on an Annualized Basis (Year -2 to Year 11)

General	Unit	-2	-1	1	2	3	4	5	6	7	8	9	10	11
		2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
Production - Li_2CO_3 Battery Grade	t	--	--	7,500	15,000	22,500	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000
Li_2CO_3 Price Battery Grade	US$/t Li_2CO_3	$22,500	$21,000	$21,000	$21,000	$21,750	$22,500	$22,500	$22,500	$22,500	$22,500	$22,500	$23,500	$23,500
Total Revenue	US$mm	--	--	$158	$315	$489	$563	$563	$563	$563	$563	$563	$588	$588
Operating Costs	US$mm	--	--	($49)	($83)	($117)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)
Transportation	US$mm	--	--	($1)	($2)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)
Export Duty	US$mm	--	--	($7)	($14)	($22)	($25)	($25)	($25)	($25)	($25)	($25)	($26)	($26)
Royalty	US$mm	--	--	($5)	($9)	($15)	($17)	($17)	($17)	($17)	($17)	($17)	($18)	($18)
EBITDA	US$mm	--	--	$96	$207	$333	$389	$389	$389	$389	$389	$389	$412	$412
Initial Capex	US$mm	($233)	($544)	--	--	--	--	--	--	--	--	--	--	--
Sustaining Capex	US$mm	--	--	($19)	($16)	($7)	--	--	($34)	($34)	($32)	--	($2)	--
Closure Capex	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Royalty Buyback	US$mm	--	($4)	--	--	--	--	--	--	--	--	--	--	--
Change in Working Capital	US$mm	--	--	($9)	($10)	($11)	($5)	--	--	--	--	--	($2)	--
Pre-Tax Unlevered Free Cash Flow	US$mm	($233)	($548)	$68	$181	$314	$384	$389	$355	$355	$357	$389	$408	$412
Unlevered Cash Taxes	US$mm	--	--	--	--	--	($73)	($135)	($132)	($128)	($125)	($128)	($140)	($144)
Post-Tax Unlevered Free Cash Flow	US$mm	($233)	($548)	$68	$181	$314	$311	$254	$223	$227	$232	$260	$268	$268

Table 22-3: Cashflow Statement on an Annualized Basis (Year 12 to Year 24)

General	Unit	12	13	14	15	16	17	18	19	20	21	22	23	24
		2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050
Production - Li_2CO_3 Battery Grade	t	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
Li_2CO_3 Price Battery Grade	US$/t Li_2CO_3	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500
Total Revenue	US$mm	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588
Operating Costs	US$mm	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)
Transportation	US$mm	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)
Export Duty	US$mm	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)
Royalty	US$mm	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)
EBITDA	US$mm	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412
Initial Capex	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Sustaining Capex	US$mm	--	--	--	--	($2)	($2)	--	($12)	($25)	($2)	--	--	($12)
Closure Capex	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Royalty Buyback	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Change in Working Capital	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Pre-Tax Unlevered Free Cash Flow	US$mm	$412	$412	$412	$412	$410	$410	$412	$400	$387	$410	$412	$412	$400
Unlevered Cash Taxes	US$mm	($144)	($144)	($144)	($144)	($144)	($144)	($144)	($143)	($140)	($140)	($141)	($144)	($143)
Post-Tax Unlevered Free Cash Flow	US$mm	$268	$268	$268	$268	$266	$266	$268	$257	$247	$270	$271	$268	$257

Table 22-4: Cashflow Statement on an Annualized Basis (Year 25 to Year 37)

General	Unit	25	26	27	28	29	30	31	32	33	34	35	36	37
		2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063
Production - Li_2CO_3 Battery Grade	t	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	25,000	3,841	--
Li_2CO_3 Price Battery Grade	US$/t Li_2CO_3	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500	$23,500
Total Revenue	US$mm	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$588	$90	--
Operating Costs	US$mm	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($129)	($20)	--
Transportation	US$mm	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($3)	($0)	--
Export Duty	US$mm	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($26)	($4)	--
Royalty	US$mm	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($18)	($3)	--
EBITDA	US$mm	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412	$412	$63	--
Initial Capex	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Sustaining Capex	US$mm	($30)	($32)	($32)	($7)	($2)	--	--	($4)	--	--	($2)	--	--
Closure Capex	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	($54)
Royalty Buyback	US$mm	--	--	--	--	--	--	--	--	--	--	--	--	--
Change in Working Capital	US$mm	--	--	--	--	--	--	--	--	--	--	--	$32	$6
Pre-Tax Unlevered Free Cash Flow	US$mm	$382	$380	$380	$405	$410	$412	$412	$408	$412	$412	$410	$95	($48)
Unlevered Cash Taxes	US$mm	($139)	($135)	($133)	($136)	($139)	($143)	($144)	($144)	($144)	($144)	($144)	($22)	--
Post-Tax Unlevered Free Cash Flow	US$mm	$243	$245	$247	$269	$271	$269	$268	$265	$268	$268	$266	$73	($48)

22.5 Sensitivity Analysis

A sensitivity analysis was conducted on pre-tax and after-tax NPV and IRR of the Project, using the following variables: battery-grade lithium carbonate price, discount rate, initial capital costs and operating costs. Table 22-5 shows the pre-tax sensitivity analysis findings, and Table 22-6 shows the results post-tax.

Analysis revealed, as shown in Figure 22-3, Figure 22-4, and Figure 22-5, that the Project most sensitive to changes in lithium carbonate price, initial capital, and to a lesser extent, operating cost and sustaining capital.

Table 22-5: Pre-tax Sensitivity Analysis

Pre-Tax NPV Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	$3,674	$5,209	$6,743	$8,278	$9,812
5.0%	$2,432	$3,533	$4,633	$5,734	$6,834
8.0%	$1,343	$2,058	$2,773	$3,487	$4,202
10.0%	$905	$1,462	$2,019	$2,575	$3,132
12.0%	$601	$1,045	$1,490	$1,934	$2,379

Pre-Tax IRR Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	20.4%	25.8%	30.7%	35.3%	39.6%
5.0%	20.4%	25.8%	30.7%	35.3%	39.6%
8.0%	20.4%	25.8%	30.7%	35.3%	39.6%
10.0%	20.4%	25.8%	30.7%	35.3%	39.6%
12.0%	20.4%	25.8%	30.7%	35.3%	39.6%

Pre-Tax Payback Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	5.1	4.1	3.6	3.2	2.9
5.0%	5.1	4.1	3.6	3.2	2.9
8.0%	5.1	4.1	3.6	3.2	2.9
10.0%	5.1	4.1	3.6	3.2	2.9
12.0%	5.1	4.1	3.6	3.2	2.9

Pre-Tax NPV Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$1,578	$2,293	$3,008	$3,722	$4,437
(10.0%)	$1,461	$2,175	$2,890	$3,605	$4,320
--	$1,343	$2,058	$2,773	$3,487	$4,202
10.0%	$1,225	$1,940	$2,655	$3,370	$4,085
20.0%	$1,108	$1,823	$2,538	$3,252	$3,967

Pre-Tax IRR Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	22.3%	27.6%	32.4%	36.9%	41.1%
(10.0%)	21.4%	26.7%	31.6%	36.1%	40.3%
--	20.4%	25.8%	30.7%	35.3%	39.6%
10.0%	19.4%	24.9%	29.9%	34.5%	38.9%
20.0%	18.5%	24.0%	29.1%	33.7%	38.1%

Pre-Tax Payback Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	4.7	3.9	3.4	3.1	2.8
(10.0%)	4.8	4.0	3.5	3.1	2.9
--	5.1	4.1	3.6	3.2	2.9
10.0%	5.3	4.3	3.7	3.3	3.0
20.0%	5.6	4.4	3.7	3.3	3.0

Pre-Tax NPV Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$1,480	$2,195	$2,909	$3,624	$4,339
(10.0%)	$1,411	$2,126	$2,841	$3,556	$4,270
--	$1,343	$2,058	$2,773	$3,487	$4,202
10.0%	$1,275	$1,989	$2,704	$3,419	$4,134
20.0%	$1,206	$1,921	$2,636	$3,351	$4,065

Pre-Tax IRR Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	24.1%	30.3%	36.0%	41.2%	46.1%
(10.0%)	22.1%	27.8%	33.1%	38.0%	42.6%
--	20.4%	25.8%	30.7%	35.3%	39.6%
10.0%	19.0%	24.1%	28.7%	33.0%	37.1%
20.0%	17.8%	22.6%	26.9%	31.0%	34.9%

Pre-Tax Payback Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	4.4	3.6	3.2	2.8	2.6
(10.0%)	4.7	3.9	3.4	3.0	2.7
--	5.1	4.1	3.6	3.2	2.9
10.0%	5.4	4.4	3.8	3.4	3.1
20.0%	5.8	4.6	4.0	3.5	3.2

Pre-Tax NPV Sensitivity To Sustaining Capex

Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$1,364	$2,079	$2,794	$3,508	$4,223
(10.0%)	$1,353	$2,068	$2,783	$3,498	$4,213
--	$1,343	$2,058	$2,773	$3,487	$4,202
10.0%	$1,333	$2,047	$2,762	$3,477	$4,192
20.0%	$1,322	$2,037	$2,752	$3,466	$4,181

Pre-Tax IRR Sensitivity To Sustaining Capex

Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	20.6%	26.0%	31.0%	35.5%	39.8%
(10.0%)	20.5%	25.9%	30.8%	35.4%	39.7%
--	20.4%	25.8%	30.7%	35.3%	39.6%
10.0%	20.3%	25.7%	30.6%	35.2%	39.5%
20.0%	20.2%	25.6%	30.5%	35.1%	39.4%

Pre-Tax Payback Sensitivity To Sustaining Capex

Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	5.0	4.1	3.5	3.2	2.9
(10.0%)	5.0	4.1	3.6	3.2	2.9
--	5.1	4.1	3.6	3.2	2.9
10.0%	5.1	4.1	3.6	3.2	2.9
20.0%	5.1	4.2	3.6	3.2	2.9

Table 22-6: Post-tax Sensitivity Analysis

Post-Tax NPV Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	$2,347	$3,346	$4,344	$5,342	$6,340
5.0%	$1,526	$2,246	$2,962	$3,679	$4,394
8.0%	$802	$1,272	$1,739	$2,206	$2,672
10.0%	$508	$877	$1,242	$1,607	$1,970
12.0%	$303	$599	$892	$1,184	$1,475

Post-Tax IRR Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	17.1%	21.6%	25.6%	29.4%	32.9%
5.0%	17.1%	21.6%	25.6%	29.4%	32.9%
8.0%	17.1%	21.6%	25.6%	29.4%	32.9%
10.0%	17.1%	21.6%	25.6%	29.4%	32.9%
12.0%	17.1%	21.6%	25.6%	29.4%	32.9%

Post-Tax Payback Sensitivity To Discount Rate

Discount Rate	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
3.0%	5.1	4.2	3.7	3.3	3.0
5.0%	5.1	4.2	3.7	3.3	3.0
8.0%	5.1	4.2	3.7	3.3	3.0
10.0%	5.1	4.2	3.7	3.3	3.0
12.0%	5.1	4.2	3.7	3.3	3.0

Post-Tax NPV Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$957	$1,426	$1,893	$2,360	$2,825
(10.0%)	$879	$1,349	$1,816	$2,283	$2,748
--	$802	$1,272	$1,739	$2,206	$2,672
10.0%	$724	$1,195	$1,662	$2,129	$2,595
20.0%	$645	$1,117	$1,586	$2,053	$2,519

Post-Tax IRR Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	18.7%	23.0%	26.9%	30.7%	34.1%
(10.0%)	17.9%	22.3%	26.3%	30.0%	33.5%
--	17.1%	21.6%	25.6%	29.4%	32.9%
10.0%	16.3%	20.8%	24.9%	28.7%	32.3%
20.0%	15.4%	20.1%	24.2%	28.1%	31.7%

Post-Tax Payback Sensitivity To Opex

Opex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	4.8	4.0	3.5	3.1	2.9
(10.0%)	4.9	4.1	3.6	3.2	3.0
--	5.1	4.2	3.7	3.3	3.0
10.0%	5.5	4.4	3.8	3.4	3.0
20.0%	5.8	4.5	3.9	3.4	3.1

Post-Tax NPV Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$907	$1,375	$1,842	$2,307	$2,772
(10.0%)	$854	$1,324	$1,791	$2,257	$2,722
--	$802	$1,272	$1,739	$2,206	$2,672
10.0%	$748	$1,220	$1,688	$2,155	$2,622
20.0%	$695	$1,167	$1,637	$2,104	$2,571

Post-Tax IRR Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	20.1%	25.2%	29.9%	34.2%	38.2%
(10.0%)	18.5%	23.2%	27.6%	31.6%	35.3%
--	17.1%	21.6%	25.6%	29.4%	32.9%
10.0%	15.9%	20.1%	23.9%	27.5%	30.8%
20.0%	14.9%	18.8%	22.5%	25.8%	29.0%

Post-Tax Payback Sensitivity To Capex

Initial Capex	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	4.5	3.7	3.2	2.9	2.7
(10.0%)	4.8	4.0	3.5	3.1	2.9
--	5.1	4.2	3.7	3.3	3.0
10.0%	5.6	4.5	3.9	3.5	3.1
20.0%	6.0	4.8	4.0	3.7	3.3

Post-Tax NPV Sensitivity To Sustaining Capex

Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	$816	$1,287	$1,754	$2,221	$2,686
(10.0%)	$809	$1,280	$1,747	$2,214	$2,679
--	$802	$1,272	$1,739	$2,206	$2,672
10.0%	$795	$1,265	$1,732	$2,199	$2,665
20.0%	$787	$1,258	$1,725	$2,192	$2,657

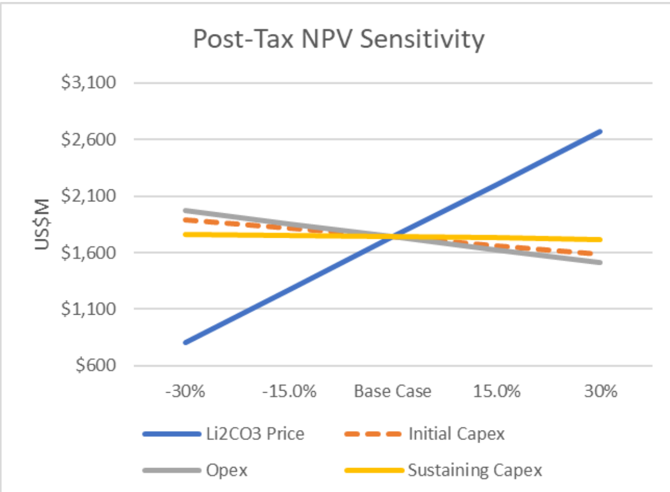
Post-Tax IRR Sensitivity To Sustaining Capex

Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	17.3%	21.7%	25.8%	29.6%	33.1%
(10.0%)	17.2%	21.7%	25.7%	29.5%	33.0%
--	17.1%	21.6%	25.6%	29.4%	32.9%
10.0%	17.0%	21.5%	25.5%	29.3%	32.8%
20.0%	16.9%	21.4%	25.4%	29.2%	32.7%

Post-Tax Payback Sensitivity To Sustaining Capex

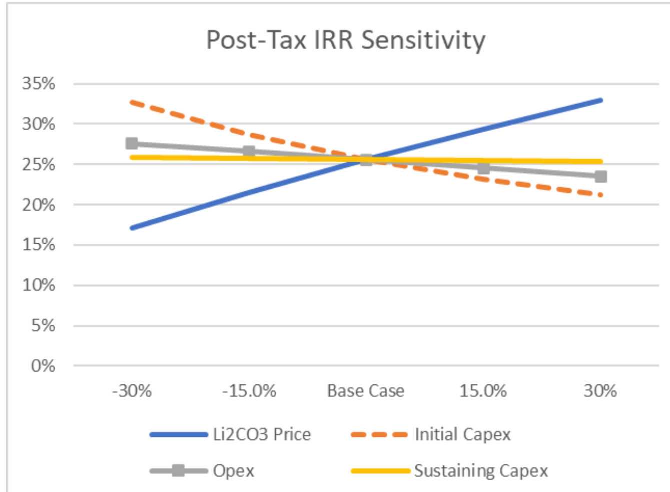
Sustaining CAPEX	Li_2CO_3 (US$/t) (30.0%)	(15.0%)	--	15.0%	30.0%
(20.0%)	5.1	4.2	3.7	3.3	3.0
(10.0%)	5.1	4.2	3.7	3.3	3.0
--	5.1	4.2	3.7	3.3	3.0
10.0%	5.2	4.2	3.7	3.3	3.0
20.0%	5.2	4.2	3.7	3.3	3.0

Figure 22-3: NPV Sensitivity Analysis Post-Tax



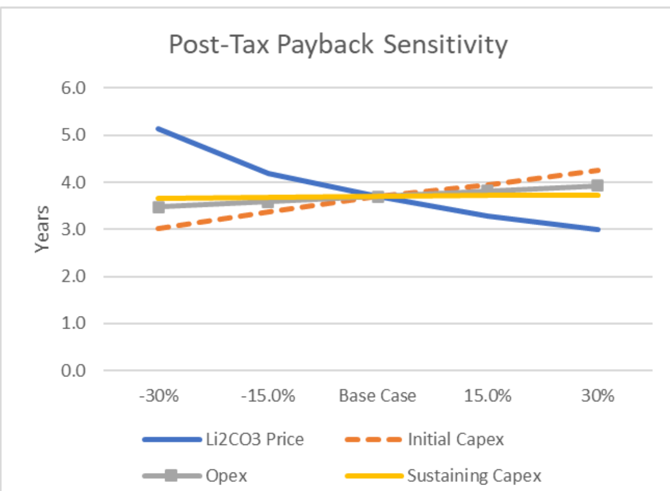
Source: Ausenco, 2023.

Figure 22-4: IRR Sensitivity Analysis Post-Tax



Source: Ausenco, 2023.

Figure 22-5: Payback Sensitivity Analysis Post-Tax

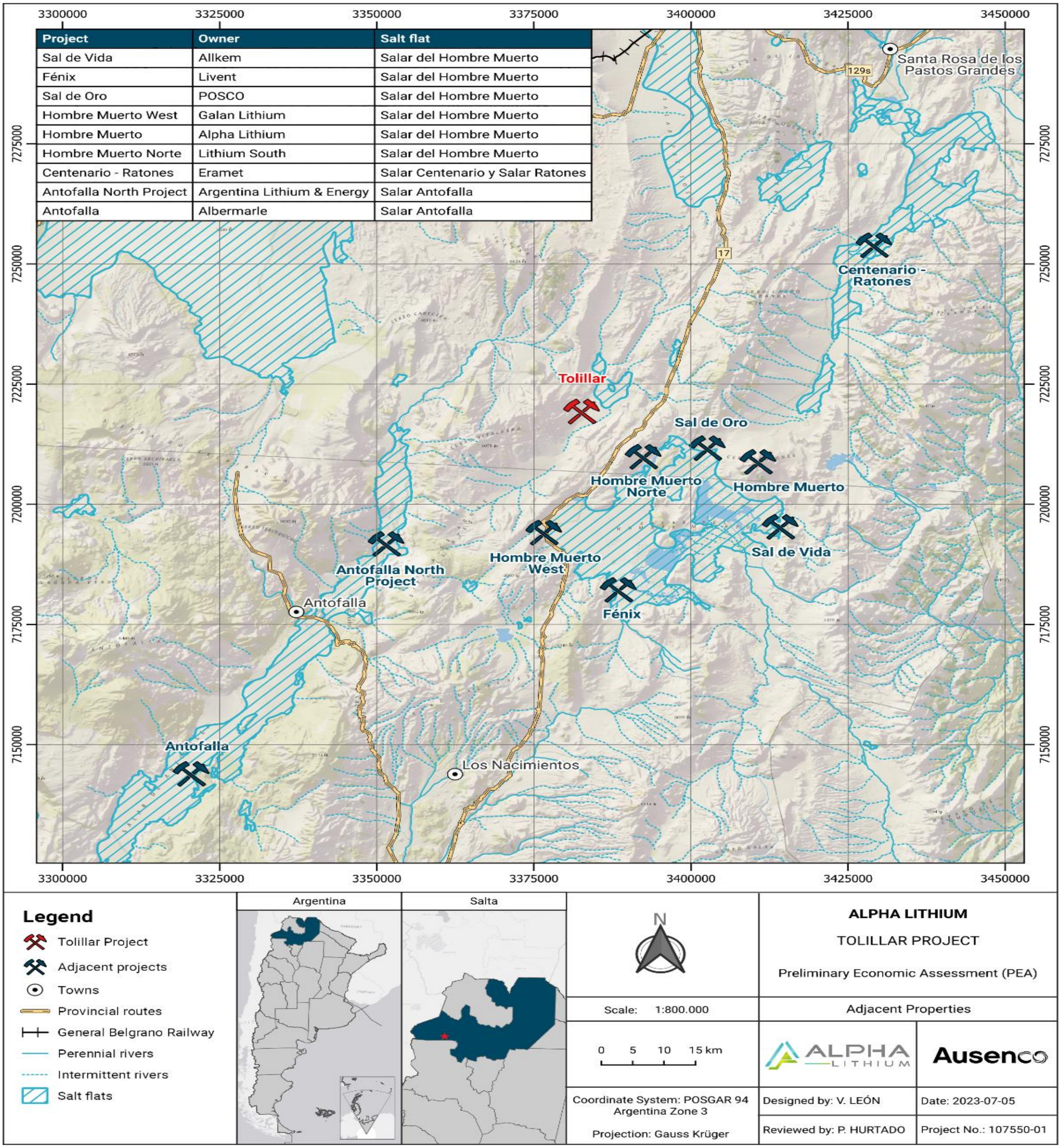


Source: Ausenco, 2023.

23 ADJACENT PROPERTIES

Physically adjacent properties to the Tolillar Project are not associated with potential lithium production. However, there are several projects in the area that have reported subsurface brines with elevated concentrations of lithium located nearby Salar de Tolillar which are shown in Figure 23-1 and described below.

Figure 23-1: Projects Near Tolillar Project



Project	Owner	Salt flat
Sal de Vida	Allkem	Salar del Hombre Muerto
Fénix	Livent	Salar del Hombre Muerto
Sal de Oro	POSCO	Salar del Hombre Muerto
Hombre Muerto West	Galan Lithium	Salar del Hombre Muerto
Hombre Muerto	Alpha Lithium	Salar del Hombre Muerto
Hombre Muerto Norte	Lithium South	Salar del Hombre Muerto
Centenario - Ratones	Eramet	Salar Centenario y Salar Ratones
Antofalla North Project	Argentina Lithium & Energy	Salar Antofalla
Antofalla	Albermarle	Salar Antofalla

Source: Ausenco, 2023

Overall, many projects occur in the vicinity of the Tolillar Project but are not hydraulically connected to the Salar de Tolillar. Therefore, even though these other more advanced projects are located nearby, they do not provide site-specific information that is relevant for the ongoing exploration in Salar de Tolillar.

The current resources and information on the adjacent properties are reported on the corporate websites and SEDAR filings of the holding companies. These data have not been verified by the authors and are not reported herein. The authors have not visited any of these adjacent properties. The information presented may not necessarily be indicative of the geology or mineralization on the Tolillar Project that is the subject of this Technical Report. The information provided in this section is simply intended to describe examples of the type and tenor of mineralization that exists in the region and may or may not be an exploration target for Tolillar Project.

Investors are cautioned that this information is taken from the publicly available sources, has not been independently verified by the Company and it is not known if it conforms to the standards of NI 43-101. Furthermore, proximity to a discovery, mine, or mineral resource, does not indicate that mineralization will occur at the Company's Project, and if mineralization does occur, that it will occur in sufficient quantity or grade that would result in an economic extraction scenario.

23.1 Sal de Vida Project - Allkem

Sal de Vida Project mine is located in the northwest section of the Salar del Hombre Muerto salt flat in the province of Catamarca, Argentina, 39 km southeast of Tolillar Project.

The Project is located 650 km from the city of Catamarca via Antofagasta de la Sierra, 390 km from the city of Salta via San Antonio de Los Cobres and approximately 1,400 km northwest of Buenos Aires, Argentina, on the Salar del Hombre Muerto.

Sal de Vida Project was previously owned by Orocobre and Galaxy Resources, but since 2021, Sal de Vida Project owner 100% is Allkem Corporate.

Allkem currently has mineral rights over 26,253 ha at Salar del Hombre Muerto, which are held under 31 mining concessions. All concessions are in good standing with all statutory annual payments (mining canon) and reporting obligation up to date.

The Resource estimate of 6.85 Mt of lithium carbonate equivalent (LCE) has an average grade of 752 ppm Li and low levels of impurities. The Reserve estimate of 1.74 Mt of LCE supports a 40-year project life for the production of high-grade lithium brines.

The Project has shown significant potential, and the company has conducted extensive exploration programs to further delineate the resources.

The Project was divided into three stages: the initial production target of 15,000 t/a in Stage 1 feasibility stage concluded on 2021, it currently is under construction; and Stage 2 and 3 remains on feasibility study at the moment setting a expansion to a 45,000 t/a brine operation with an additional 30 kt/a from Stage 2 (2023).

23.2 Fénix Project - Livent

The Fénix lithium mine is located in the western section of the Salar del Hombre Muerto salt flat in the province of Catamarca, Argentina, 40 km south of Tolillar Project It is located at an elevation of 4,000 masl, the Salar del Hombre Muerto covers an area of approximately 600 km^2.

The mining concession is owned and operated by Minera del Altiplano, a local Argentinian operating subsidiary of Philadelphia-based chemical manufacturing company Livent. The Fénix lithium mine was previously under the ownership of FMC Corporation until it was separated from it through a spin-off in March 2019.

The Fénix lithium mining concession on the Salar del Hombre Muerto was estimated to hold recoverable reserves of up to 1.2 Mt of LCE as of March 2019.

Up to date, Fénix produces 10,000 t of lithium carbonate. On mid 2021, Livent announced the start-up of its first expansion works for the second lithium carbonate production plant in the Fénix Project, this first expansion was planning to add 20,000 t LCE production capacity upon completion in two equal phases of 10,000 t each. Phase 1 of this expansion saw an addition of 10,000 t of Lithium Carbonate production capacity by Q1 2023.

The phase 2 will increase capacity by another 10,000 t by the end of 2023, at which time it will be expected the commercial production to begin. Also, phase 2 will include deployment of a mechanical evaporation unit, a significant step in delivering on our sustainability goal of reducing water use.

The Fénix Project is pursuing to reach a Lithium Carbonate production of 100,000 t by the end of 2030, so there will be a second expansion for the lithium carbonate plant by the end of 2025.

23.3 Sal de Oro Project - POSCO

The Sal de Oro Project is located in the northwestern section of the Salar del Hombre Muerto, at an elevation of 3,990 masl, 19 km southeast of Tolillar Project The mining concession is owned by POSCO, a South Korean company.

In 2017, Posco manufactured a Pilot Plant in South Korea with a capacity of production 2,500 t/a of lithium, then it was brought and installed in Argentinian Puna.

Currently, Sal de Oro is in Advanced Exploration stage, and it is expected to have a 25,000 t lithium hydroxide plant completed by the end of 2023. Moreover, a second expansion for production increasement to 20,000 t more is being planned for the following year.

23.4 Hombre Muerto West – Galan Lithium

The Hombre Muerto West (HMW) Project is part of the Hombre Muerto basin in which mining properties are owned 100% by Galan Lithium Limited, the project location is in the Geological Province of Puna, 90 km north of the town of Antofagasta de la Sierra, province of Catamarca, Argentina, it is located to the West and South of the Salar del Hombre Muerto, 30 km southwest of Tolillar Project.

The HMW Project originally comprised six exploration permits Rana de Sal (I, II and III), Pata Pila, Catalina and Deceo III covering 9,493 ha. However, in 2020, Del Condor and Pucara concessions were comprised in two additional claim blocks which covered 1,804 ha giving a total of 11,297 ha.

The mineral resource estimates undertaken by SRK were determined for lithium and potassium. Lithium is reported as lithium carbonate (Li_2CO_3) equivalent, and potassium as potassium chloride (KCl).

The total mine of life production is 40 years to produce around 800 kt LCE. The PEA 2019 assumed a Li recovery of 58.5%, hence the total initial resource to feed the project was estimated at 1.37 Mt LCE. This presents around 60% of the total resource of HMW. As a result, the Project has the potential to increase its production to 20 kt/a de Li_2CO_3 while maintaining a long mine life.

PEA was updated at the end of 2021; pilot plant operations are progressing rapidly with the successful completion of 5,000 m^2 of basin area and evaporation testing as of May 2022. A conclusive feasibility study for the development of the HMO Project was expected to be completed in the first quarter of 2023.

The study estimated a production profile of 20,000 t/a of battery grade lithium carbonate product.

23.5 Hombre Muerto – Alpha Lithium

Hombre Muerto Project is located in the northeast part of the Salar del Hombre Muerto, 28 km southeast of Tolillar Project in which mining properties are owned by Alpha Lithium and bordered by POSCO and Livent projects. Hombre Muerto is under development and exploration stage and to date it has acquired 5,000 ha, completed 56 VES points and a total of 28.5 km of VES lines and applied for several drilling licenses.

23.6 Hombre Muerto Norte - Lithium South

Hombre Muerto Norte Project is located in the north section of the Salar del Hombre Muerto, at an elevation of 4,090 masl, 14 km southeast of Tolillar Project.

The mining concession is 100% owned by Lithium South, a Canadian company. It claimed 5,687 ha and comprised nine separated mining concessions: Tramo, Alba Sabrina, Natalia Maria, Gaston Enrique, Via Monte, and Norma Edith are located on the Salar. The Sophia I, II and III claims are located north of the Salar claim blocks and were acquired for potential plant location and water sourcing. To date only the Tramo block has been explored and contains the current resource estimate and the subject of the PEA.

Preliminary results given on the preliminary economic assessment were completed on 2019 and gave a 5,000 t/a LCE, moreover, Lithium South expects to expand the proven resource with its current drilling program, due to current resource is based on only 14% of the total project area.

Currently, HMN Project feasibility study is expected to be completed 2023 based on upgraded resource size, additional project work, including permitting, environmental studies and process test work, is ongoing.

23.7 Centenario-Ratones Project - Eramine

The Centenario Ratones salt flat area is located 300 km west of the city of Salta, at 3,900 masl, 53 km northeast of Tolillar Project Centenario Ratones Project is accessed from San Antonio de Los Cobres along Provincial Route 129. Pastos Grandes is located 60 km from the Project, with a population of 100 inhabitants. Centenario Ratones control 50,000 ha of mining leases.

The property concessions are owned by the local company Eramine Sudamerica S.A. which is owned by the French conglomerate Eramet. Eramet controls 50.1% of the Project and will manage it from an operational standpoint. The Group began constructing the lithium production plant in April 2022 in partnership with Tsingshan (a Chinese steel group with 49.9% ownership).

Since the discovery of the Centenario-Ratones deposit in Argentina, geological works have increased the quantity of developed by Eramet, under real conditions at the deposit. The construction of the plant began in early 2022.

The plant commissioning is expected to be on the first quarter of 2024 with a nominal production capacity to be reached in mid 2025.The nominal production capacity in Phase 1 of 24,000 t LCE per year.

In collaboration with its partner in Phase 1, Eramet is continuing its feasibility study for a second phase of the Project, an expansion phase which will allow annual production capacity to reach a total of around 75 kt LCE.

23.8 Antofalla North Project - Argentina Lithium & Energy Corporation

The Antofalla North Project is located approximately 25 km west of Argentina's largest lithium producing operation at Salar de Hombre Muerto, 47 km southwest of Tolillar Project The mining concession is 100% owned by Argentina Lithium & Energy Corporation, member of the Grosso Group, a Canadian Group. The southern boundary of the Antofalla North Project is situated approximately 500 m north of properties controlled by global lithium producer Albemarle Inc.

The Antofalla North Project controls 15,800 ha of mining leases in the north end of the Salar de Antofalla, distributed between the adjacent provinces of Salta and Catamarca, with 100% interest in 9,080 ha and the remaining leases held under option.

During 2022, 70 line-km of Transient Electromagnetic soundings were installed to delineate brine deposits and, in 2023 it is expected to have six more diamond drill holes to continue the exploration stage.

23.9 Antofalla Project - Albemarle

The Antofalla Project is located in the center of the Salar and approximately 57 km south of the Argentina Lithium Antofalla Salar, 102 km southwest of Tolillar Project. This project is owned by Albemarle Corporation which includes both mining concessions and brine concessions.

In 2016, it reported a resource of 2.22 Mt of lithium (11.8 Mt LCE) grading 350 mg/L and 83 t of potash (KCl) grading 6,400 mg/L. It remains under development stage.

24 OTHER RELEVANT DATA AND INFORMATION

This section is not relevant to this Report.

25 INTERPRETATION AND CONCLUSIONS

25.1 Introduction

The QPs note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this Report.

25.2 Mineral Tenure, Surface Rights, Water Rights, Royalties and Agreements

The ownership of the Tolillar Project lies with Alpha Lithium Argentina S.A., a company incorporated in Salta and controlled by Alpha Lithium Corp. It is located within "The Lithium Triangle" in the Salar de Tolillar Salt Lake in the Salta province of northwest Argentina, situated approximately 170 km from Salta and about 90 km south of the town of Estación Salar de Pocitos. The Project covers approximately 28,030 ha and consists of 16 Exploitation Concessions and Exploration Permits. The mineral rights in Argentina are governed by the National Mining Code, and the provinces have the authority to grant exploration permits and exploitation concession rights. The mining authority in Salta is the Mining Court, and the mining environmental authority is the Mining Secretariat.

The property agreements for the Tolillar Project involves various parties and are subject to royalties. Alpha Lithium Argentina S.A. holds valid ownership of the concessions and permits, and some titles are awaiting granting sentences from the Mining Court. The Project is subject to a 2% NSR (Net Smelter Return) royalty to the vendors. Additionally, there are agreements with the Province of Salta's mining and energy company, Recursos Energéticos y Mineros de Salta (REMSa), for certain areas within the Project.

Alpha Lithium Corp acquired the rights and obligations of Vendor A under the agreement with REMSa. The Project's mineral tenure is maintained through filings, environmental impact reports, and the payment of fees. The concession titles are recorded and regulated by the Mining Court of Salta.

As for water rights, the only water permit currently held by Alpha Lithium is for well FWWALT-02 in Tolar Grande. This permit, registered in the census for the Secretariat of Water Resources, is specifically for industrial use and allows the extraction of groundwater at a rate of approximately 11 to 25 L/s for daily use.

25.3 Exploration, Drilling and Analytical Data Collection

Results from recent exploration activities support the concept that brine enriched in lithium occurs at the Tolillar Project in large quantities and may be favorable for production. The elevated concentrations of lithium observed in the Tolillar Project area justify continued exploration activities and resource characterization. The overall geometry of the basin continues to become better known, and will be important for development of a numerical groundwater flow model capable of conducting wellfield simulations and supporting lithium Reserve Estimates.

25.4 Mineral Resource Estimate

The updated Mineral Resource Estimates conform with National Instrument 43-101 (NI 43-101) and the Canadian Institute of Mining, Metallurgy, and Petroleum Definition Standards for Resources and Reserves (CIM Standards). The updated Resource Estimate includes:

- An estimated 3,626,000 tonnes LCE of Indicated Resources, at an average lithium grade of 232 mg/L, and
- An estimated 1,393,000 tonnes LCE of Inferred lithium Resources, at an average grade of 180 mg/L.

These Resources are estimated relative to a 100 mg/L lithium cut-off grade. It is noted that Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

The additional exploration work conducted since the last Resource Estimate has further improved the understanding of the Salar de Tolillar basin. The Indicated and Inferred Resource estimates will change as more information becomes available. Additional recommended activities (Section 26) are intended to:

- Further increase the Resource;
- Upgrade the Resource (from Inferred to Indicated and from Indicated to Measured); and
- Collect additional hydrogeology information (e.g., permeability, hydraulic boundary conditions, brine chemistry boundary conditions) that would contribute to estimation of Reserves.

25.5 Metallurgical Testwork and Recovery Plan

The proposed design considers that the brine from the Salar de Tolillar, after filtration, is sent to a direct lithium extraction (DLE) stage using specific adsorption resins for this element. The adsorption process produces two brines; one depleted in lithium that is sent to the disposal area (evaporation-infiltration ponds) and another enriched in lithium (eluate) that continues to the next stage of concentration via reverse osmosis where two streams are obtained, one of brine concentrated in lithium (retentate) that continues to the impurity removal stage and another of water (permeate) which is recirculated to the adsorption process significantly reducing the consumption of freshwater.

The concentrated brine from reverse osmosis is treated with reagents to remove calcium and magnesium and then continues to the carbonate precipitation stage where by dosing sodium carbonate in aqueous solution crude lithium carbonate (technical grade) is produced. The depleted brine product of carbonation is recycled to the adsorption process, previously neutralized with sulfuric acid.

The crude lithium carbonate continues to the refining stage, which uses carbon dioxide to solubilize the insoluble lithium carbonate and transform it into soluble lithium bicarbonate, leaving the insoluble contaminants in the solid phase, which are subsequently separated and discard. The solution free of insolubles is heated decreasing the solubility of lithium bicarbonate generating the release of carbon dioxide, which is recovered and reused, and precipitating lithium carbonate, in "battery grade" quality, which is separated and sent to the micronizing, drying and packaging process. The solution depleted in lithium bicarbonate is recycled to the carbonation system to be used again in the solubilization of crude lithium carbonate.

The parameters and assumptions made during the development of this design and the proposed process must be verified with tests in a pilot plant, especially the one related to the refining stage with carbon dioxide, whose implementation depends on the amount of impurities dragged from the adsorption stage The tests will minimize the risks of the process and confirm a design that adjusts to a capital and operating cost in order to be competitive in a highly demanding market.

25.6 Mining Methods

The production process in the Tolillar Salar will operate through a conventional brine production wellfield. A maximum operating lifespan of 35.1 years has been estimated for an LCE production of 25,000 t/y. The average annual brine feed rate is estimated at 776 L/s, and lithium concentration gradually decreases from 314 mg/L in the first year to 210 mg/L in the last year.

Pumping rates of individual future brine production wells will range between 4 L/s and 25 L/s. Therefore, approximately 40 wells are required to be drilled in the first six years, and then at the end of the project's lifespan around 108 wells will have been constructed. A maximum depth of 393 m is estimated for production wells, with brine capture zones primarily focused on sand and gravel units.

25.7 Infrastructure

The infrastructure to support the Tolillar Project during the LOM will consist of the listing of process buildings, buildings for personnel, Depleted Brine Infiltration Ponds, power supply and water supply.

The process area infrastructure includes, DLE Plant, Reverse Osmosis, Chemical Plant, Purification, Dry Product Handling, Air and Steam, Ca/Mg Removal, Workshop, Spare Warehouse, Metallurgy Warehouse, Warehouse for SAS and Product and a Gatehouse.

The personnel buildings located in the process plant area of the Project consist of administrative offices, a dining room, a change house, a polyclinic, and an estimated camp for 350 people.

The Depleted Brine Infiltration Ponds will have an area of 6,131,023 m^2 and will be in the southern zone, specifically over two projected freshwater wells, which would imply a re-evaluation of these wells in future study stages.

The main power source for the Project will be a gas-fired electricity generation plant, which in turn will be transported to the storage facility from where it will be transported and injected into the generation plant. This gas-fired generation source will be capable of supplying approximately 34 MW of power, which responds to the sum of the electrical power requirement, equals to 13 MW, and the heat power requirement, equal to 21 MW.

With respect to water supply, a study developed during 2022 estimates an extractable flow of 583 m^3/h without affecting the reservoir system. In the future, four freshwater extraction wells are planned in the northern part of the Project and three wells in the southern part of the Project, two of which would be at the location of the depleted brine infiltration pond. To date there is the FWWALT-2 well which would have a flow rate of 75 m^3/h.

Complementary infrastructure includes freshwater supply system, drinking water system, wastewater treatment system, access roads and internal roads.

25.8 Markets and Contracts

The demand for lithium in the last few decades has increased considerably, growing in the order of 300% compared to 2010 and is estimated to reach 3,000 kt by 2030, mainly related to lithium-ion batteries for electric vehicles. In an emerging market, lithium-ion batteries will play a key role in the global energy transition, so meeting the growing demand is a global concern. Demand is expected to outstrip supply in the remainder of the decade, so optimizing the complex lithium supply chain will generate added value. Among the main current and potential lithium producers are China, Chile, Australia, and Argentina. Lithium prices have been volatile in recent times and Global Lithium has recommended keeping the price estimate on the conservative side at around $22,500/t to $23,500/t.

25.9 Environmental, Permitting and Social Considerations

The Project, located in the Salta Province, has an approved EIS from the province's environmental authority and a hazardous waste generator permit to support advanced exploration. The other permits required are still in process, and the company expects to gain their approval in the short term, most likely in the course of 2023.

The current environmental data provides a general data review for the region where the Tolillar Project is located based on publicly available information. There are some key environmental gaps related to wildlife in conservation states and the fragility of the ecosystems within and adjacent to the Project area. Because this site-specific information is not available for the Project area, it is not currently possible to define the risk that this could pose for the future operation. Ideally, there should be an avoidance of critical wildlife habitat as related to critical conservation states, or if not avoidable, the potential for habitat compensation should be considered.

Potential impact to the quality and quantity of freshwater (both groundwater and seasonal surface water) is a risk to the Project that should be included in future hydrological and hydrogeological baseline studies and modelling efforts for the Project. This risk has not yet been adequately assessed for the purposes of future operations.

Local Indigenous and non-Indigenous communities are located near to the Project area. As part of the last EIS, the company reportedly developed a Community Social Responsibility (CSR) plan to engage with the communities and maintain ongoing fluent and meaningful engagement and communication. A number of activities were reported to have occurred as part of the CSR prior to February 2022. No further information since that time has been provided.

The completion of additional environmental and socio-economic baseline studies and modeling/analyses will support the further refinement of project designs to the feasibility level by means of a better understanding of environmental and community constraints. These same baseline studies will also satisfy the regulatory requirements for the subsequent EIS and other permits for the operation. Recommendations for designing and implementing environmental baseline studies are provided in Section 26.

25.10 Capital and Operating Cost Estimates

The capital and operating cost estimates presented in this PEA provide substantiated costs that can be used to assess the preliminary economics of the Tolillar Project. The estimates are based on well field, construction of a process plant, and infrastructure, as well as indirect cost, first fills, owner's costs and contingency. Estimate accuracy is reflective of the stage of project development and classified as an AACE International Class 5 Order of Magnitude/Conceptual Study estimate with a -30% to +50% accuracy.

25.11 Economic Analysis

The Tolillar Project PEA has provided a robust design and positive economics on which to further advance the Project.

The preliminary economic assessment is preliminary in nature, that it includes Inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

25.12 Risks and Opportunities

25.12.1 Risk

25.12.1.1 Mineral Resources

Estimates to date are limited to Indicated and Inferred Resources. Mineral resources that are not mineral reserves do not have demonstrated economic viability. A particular consideration (and associated risk) for evaluating the transition from Resources to Reserves at this deposit is the potential for dilution of brine during recovery pumping. The QP considers that this will be a significant criteria for any future production design.

Further, all conceptual models (including the polygon methodology used herein to estimate resources) have a degree of risk and uncertainty that should be considered when evaluating the project.

25.12.1.2 Mineral Processing and Metallurgical Testwork

The only tests performed at the date of the report correspond to direct lithium extraction using resins (DLE stage), performed with Alpha Lithium's own resins and with brine samples from the Salar de Tolillar. The risk identified is that there is insufficient information to confirm the representativeness of the sample used versus the brine that will feed the processing plant. Due to the resins are still in the study phase, the results of the adsorption tests carried out are preliminary, therefore they are not sufficient to support the proposed design.

Laboratory tests are also required to support the other unit operations that make up the design, such as reverse osmosis, removal of impurities, carbonation, and purification. As a consequence of the lack of metallurgical test data, the process design was carried out using benchmark data from the Ausenco database, thus generating the risk that the proposed design with brine from the Salar de Tolillar and the defined unit operations is the most optimal process to obtain the desired product of battery grade lithium carbonate.

25.12.1.3 Mining Methods

During brine extraction from the production wells, it is likely that a mixture between brines from different aquifers will be generated, whose chemical interaction may lead to the precipitation of salts in the wells. This could seal their slots, affecting their extraction capacity, and could also generate corrosion in the casing, which may lead to well loss in the long term, considering the extended operation time of the project (35.1 years). To account for this risk, well replacement is considered for around 75% of the total wells, considering an average life of wells of around 20 years, which is included in the project’s cost estimation.

On the other hand, pumping from the salar is likely to influence the interaction between brine and brackish water around the salar margins. This implies a risk of brine dilution, decreasing its lithium concentration as it is extracted from the production wells.

No numerical flow model has been developed to evaluate the interaction between brines or with the brackish water mentioned above, or to simulate and optimize the extraction of brine from the project, which causes uncertainty regarding the possible impact on production.

The drainable porosity values used to estimate brine volumes are based on literature values and results obtained from other projects, which generates considerable uncertainty regarding the hydrological characterization of the units in this area and resource estimation, given the importance of drainable porosity in the estimation.

Uncertainty is also identified in the vertical variation of brine chemistry, since most brine samples were collected during pumping tests, representing composite samples. Only a few depth-specific samples are available, collected using the Hydrasleeve system, which has allowed only minor resource differentiation on the basis of Lithium concentration variations with depth.

Finally, the deposition of spent brine in infiltration ponds implies a risk of salt precipitation at the base of the ponds due to evaporation, which is likely to significantly reduce the permeability and interfere with the planned infiltration.

25.12.1.4 Recovery Methods

The feed to the plant consists of a mixture of brine extracted from wells located in different parts of the Salar de Tolillar, therefore their compositions have a percentage of variability, due to this, the mixture of them can produce unforeseen crystallizations that have an impact on the final concentration of the brine mixture that feeds the plant, producing the risk of not complying with the proposed mining plan.

The proposed lithium recovery flowsheet was selected based on available benchmark data and therefore there is a risk that it may not be optimal and should be reviewed and supported by vendor testing and/or information. For example, for the direct lithium extraction stage, benchmark information was used regarding a resin that has a specific lithium retention capacity, if the retention efficiency varies this may impact the selection of the unit operations of the process modifying the proposed flowsheet.

Another risk identified is that at the date of the report the available water is not sufficient yet to meet the water requirement indicated for the proposed process, therefore availability of freshwater supply by water wells needs to be probed.

25.12.1.5 Infrastructure

In order to calculate the area of the infiltration ponds of the depleted brine, it is necessary to know the infiltration rate of the depleted brine in the specific conditions of the site. Due to lack of data, a benchmark value for the infiltration rate was used for the Project to calculate the required infiltration area, so there is a risk that there may be a difference between the rates that could have an impact on the footprint of the infiltration ponds.

There is a risk related to the lack of a water balance of the entire basin, that is needed to estimate freshwater availability. A full basin hydrogeological model and water balance should be developed In order to improve freshwater availability estimate.

25.12.1.6 Environmental, Permitting and Social Considerations

The key environmental and socio-economic risks to the Project are identified below. These risks can be mitigated and addressed by means of implementing the recommendations provided in Section 26:

- There is currently a lack of detailed information about the terrestrial environment within and adjacent to the study area. The current publicly available data for the general area indicates a locally fragile ecosystem and some wildlife species that are in a sensitive conservation state. Therefore, there is a strong potential that the Project will require measures to avoid, mitigate, or potentially compensate impacts to ecosystems from the operation.

- There is a lack of hydrological and hydrogeological baseline studies and modelling efforts for the Project that could help determine quantitative and qualitative impacts to freshwater (groundwater and seasonal surface water) arising from current and future operations. Impacts could include changes to local freshwater aquifers that could potentially affect human health and cause ecological impacts to plants and wildlife.
- The other risk is associated with the interactions of the Project with the local Indigenous and non-Indigenous communities in the area. The available data indicates non-Indigenous and Indigenous communities that are largely habituated to mining operations in the area and without apparent opposition to the Tolillar Project. The available data do not provide information that indicates CSR activities have been ongoing since February 2022. The specific risk is losing the social license, which can occur at any stage of the Project, resulting in difficulties in obtaining permits and maintaining site activities.

25.12.1.7 Market Studies and Contracts

Commodity prices can be volatile, and there is the potential for deviation from the forecast.

25.12.2 Opportunities

25.12.2.1 Mineral Resources

The QP considers that additional exploration zones with potential to increase the Resource occur primarily at depth, either:

- Within the deep salar in-fill materials in the central (deeper) zones of the salar, or
- Within potentially permeable basement rock immediately underlying the in-fill materials.

The wells that have been drilled into basement to date provide some indication that this material may be permeable at some locations. Further, it is reasonable to expect that dense brine would invade any drainable porosity within these materials.

25.12.2.2 Mineral Processing and Metallurgical Testwork

Because Alpha Lithium has its own selective lithium adsorption resin, there is an opportunity to further develop studies and laboratory tests in order to obtain better lithium capture, contaminant reduction and water requirement results than those obtained with the resins currently on the market.

25.12.2.3 Mining Methods

At a later stage, there is an opportunity to develop a numerical flow and transport model to optimize wellfield layout and to evaluate interaction with brackish water and associated dilution. To control mixing with brackish water from the margins of the salar, a wellfield layout that minimizes the brine extracted from the upper levels of the salar should be considered, along with taking advantage of the natural confining layers to reduce the effect of pumping close to the surface. Additionally, a network of monitoring wells installed on the margins of the salar would allow controlling this possible interaction.

The current scenario presents the opportunity to take advantage of upcoming drilling campaigns to take representative samples for laboratory testing of total and drainable porosity and to undertake geophysical logging of holes with a borehole magnetic resonance tool, for measurements of in-situ drainable porosity. This will allow adequate characterization of the drainable porosity of the aquifers and reduce the uncertainty in the resource estimation.

Uncertainty in vertical variations in brine chemistry can be reduced in subsequent stages of the project with depth-specific brine sampling in exploration wells using the inflatable packer system.

It is also recommended to develop brine chemistry mixing simulations in order to identify potential precipitation of salts inside lines or ponds.

Regarding infiltration ponds, on-site and numerical modeling studies are required to evaluate what volumes of brine can be infiltrated without causing surface flooding and runoff. It is also possible to consider spent brine reinjection, which involves evaluating reinjection rates and a location that minimizes the risk of dilution of the natural resource.

25.12.2.4 Recovery Methods

Since the process proposed for the Project is based on reference data, there is the possibility of modifying part of it by selecting different unit operations or modifying its components. For example, a resin with better lithium recovery could be selected for the direct lithium extraction (DLE) process, or the possibility of eliminating the purification step could be verified and by substituting some unit operations the desired battery grade product could be obtained directly from the carbonation step (first crystallization).

25.12.2.5 Infrastructure

There is an opportunity to find a more optimal location for the process plant south the Salar de Tolillar to reduce the size of raw brine pipeline and depleted brine pipeline and reduce the size of associated pumping system.

Another opportunity is to locate the purification plant near to the place of shipment of the product in order to reduce the construction, operation, storage, transport, logistic and administration costs.

Having the option of locating the infiltration ponds in the northern sector of the property also represents an opportunity because in the event that there is any impediment to locate the ponds in the place provided for that purpose, either by permits or otherwise, there is an alternative option for this purpose within the project property.

25.12.2.6 Environmental, Permitting and Social Considerations

The key identified opportunities are as follows:

- Expediting environmental and socio-economic baseline studies so that any construction and operational constraints can be identified.
- Cost savings can be realized if the environment team collaborates closely with the exploration and hydrogeological drilling teams to identify opportunities where hydrogeological and hydrological monitoring and testing to support environmental studies can be incorporated into a single program.
- Working closely with the feasibility design team to ensure that required environmental measures are identified early, adopted and integrated into the Project so that avoidance or mitigation of potential impacts can be achieved.

25.13 Conclusions

Based on the assumptions and parameters presented in this report, the PEA shows positive economics (i.e., US$1,739 M post-tax NPV (8%), 25.6% post-tax IRR and 3.7 post-tax payback). The PEA supports a decision to carry out additional studies as outlined in the recommendations.

The preliminary economic assessment is preliminary in nature, that it includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized.

26 RECOMMENDATIONS

26.1 Summary of Recommendations

The financial analysis of this PEA demonstrates positive economics. It is recommended to continue developing the project through additional studies, including a pre-feasibility study. Items required to be completed in advance of, and as inputs to, a pre-feasibility study are indicated as such in the respective sections below.

Table 26-1 summarises the proposed budget to advance the project through the pre-feasibility study stage, considering the recommendations discussed in this Section and a pre-feasibility study budget of $1,500,000.

Table 26-1: Recommendations Budget

Description	Cost Estimate (US$ M)
Exploration Program	**5.05**
Roads and drilling platforms	0.17
Environmental studies	0.04
Drilling and testing	3.20
Field monitoring and supervision	0.45
Freshwater sustainability study (including drilling)	0.80
Development of a resource block model	0.08
Reporting	0.07
Exploration Program Contingency	0.24
Mining Methods	**0.39**
Infiltration studies and modelling (For infiltration ponds)	0.04
Numerical flow and transport model brine extraction scenarios	0.03
Design of network of monitoring wells for salar margins	0.15
Brine mix evaluations	0.02
Geophysical studies	0.15
Metallurgical Testwork Program	**2.80**
Laboratory Testwork	0.80
Pilot Plant Testwork	2.00
Infrastructure Studies	**0.56**
Geotechnical and soil mechanics studies	0.30
Infiltration rate studies	0.10
Purification plant location trade-off analysis	0.14
Infiltration Pond location studies	0.02
Environmental Studies, Permitting, Social and Communities	**0.75**
Pre-feasibility Study	**1.50**
Total	**11.05**

26.2 Exploration Program

Based on the initial results of exploration to date, additional exploration activities are justified to better characterize the subsurface brine in the Project concessions. Additional drilling and testing will allow for expansion of the resource laterally throughout the entire concession area, and deeper, potentially into bedrock.

We recommend eight coreholes (drilled to a maximum of about 400 mbgs). The coreholes will include:

- Depth-specific brine sampling using an inflatable packer, and
- Laboratory analysis of core for drainable porosity values.

Additional drilling and testing will allow for improved estimation of the lithium resource and will support increasing the Indicated Resource to Measured. In addition, additional core and brine sampling will increase understanding of the hydrogeological units and allow for a more confident construction of a groundwater flow model to obtain an estimated lithium reserve.

If the results of the proposed exploration program continue to be favorable and support feasibility of a lithium extraction Project, additional studies should include the following:

- Freshwater study to identify a long-term supply for the Tolillar Project, and
- Development of a hydrogeological flow model to allow estimation of an initial reserve estimation.

26.3 Mining Methods

For further explorations stages, diamond drilling coreholes and packer tests need to be performed to characterize hydraulic conductivity. Also, laboratory testing of representative samples for total and drainable porosity should be considered to reduce uncertainty in the resource estimation, preferably in addition to profiling holes with a borehole magnetic resonance tool to measure in-situ drainable porosity. Sampling protocols for discrete sampling using packer testing have to be developed to properly describe the brine chemistry of the different units encountered.

It is recommended to use the hydrogeological flow model for the initial reserve estimation (recommended in 26.2) to simulate brine extraction in different scenarios, thus optimizing wellfield configuration. Also, it is considered that brine chemistry mixing simulations need to be developed to identify potential precipitation of salts inside pipelines or ponds.

Additionally, it is recommended to conduct new surface-based geophysical studies to determine the basement topography in greater detail. The information obtained should be interpreted in conjunction with the available stratigraphy of the diamond and rotary drilling wells.

It is recommended to consider a wellfield layout that minimizes the brine extracted from the upper levels of the salar, in order to control mixing with brackish water from the margins of the salar. Also, a network of monitoring wells should be installed on the margins of the salar to monitor this risk.

Given the possible decrease in permeability because of salt precipitation in infiltration ponds, on-site and numerical modeling studies are recommended to assess maximum volumes of infiltrated brine, thus avoiding surface flooding and runoff. Brine reinjection could also be considered, including field trials to determine potential reinjection rates. Drilling would be required to the bedrock depth, to establish the sedimentary units present throughout the salar basin and where an optimum location for reinjection would be located, minimising risk of dilution of the naturally occurring resource.

26.4 Metallurgical Testwork Program

Due to the novel nature of the proposed process technology in the direct lithium extraction and downstream unit operation to obtain battery grade lithium carbonate it is recommended to simulate the proposed process design on a laboratory scale and in the pilot plant in order to verify parameters and variables considered in the evaluation of the process recovery method.

Metallurgical recommended testwork cost are shown in Table 26-1, which includes laboratory and pilot plant testwork detailed below.

26.4.1 Laboratory recommended testwork

26.4.1.1 Direct Lithium Extraction (DLE)

- Verify the direct extraction of lithium from brine;
- Verify the drag of impurities and deleterious elements;
- Verify the composition of lithium and impurities in eluent and depleted brine;
- Verify water consumption in lithium recovery;
- Selection of the resin that maximizes lithium recovery and consumes the least amount of freshwater;
- Verify the lithium retention capacity in the resin; and
- Verify the ability to remove lithium by washing.

26.4.1.2 High Pressure Reverse Osmosis (HPRO)

- Perform reverse osmosis tests using high pressure with the eluents produced in the laboratory and verify performance, energy consumption and the composition of lithium obtained along with impurities; and
- Evaluate the possibility of using nanofiltration technology to concentrate lithium and evaluate its contribution to the process.

26.4.1.3 Impurity removal

- Verify the reduction of calcium and magnesium of the HPRO brine product;
- Verify calcium and magnesium solubility data; and
- Verify the use of ion exchange for the reduction of calcium, magnesium and boron.

26.4.1.4 Carbonation

- Verify the parameters used in process design;
- Verify the solubility of lithium once lithium carbonate has precipitated; and
- Verify if the precipitated product meets battery grade quality to avoid purification stage through carbon dioxide use.

26.4.1.5 Purification

- Verify consumption and solubility of carbon dioxide in brine at 25°C;
- Verify lithium composition once lithium carbonate has been solubilized and then precipitated at 80°C; and
- Verify carbon dioxide recovery for recycling to process.

26.4.2 Pilot Plant recommended testwork includes:

- Verify parameters, process variables along with reagent consumption;
- Select through tests the equipment technology that fits quality capital costs and operating costs;
- Verify process options that allow reducing unit operations and achieving the same quality and lower costs;
- Verify freshwater consumption required by process design;
- Verify obtaining commercial quality product; and
- Verifies proposed plant performance along with checking equipment efficiency, washing efficiency, required materiality, adequate instrumentation and waste management, as well as verifying that the proposed final disposal of depleted brine is adequate.

26.5 Infrastructure Studies

Prior to the pre-feasibility study it is recommended to perform the following investigation:

- Geotechnical and Soil Mechanics Studies
  - Identify sites for extraction of backfill material for the construction;
  - Carry out a study of the area to determine the best place for the location of the ponds, industrial plants and any other structure or infrastructure necessary for the operation of the Project;
  - Determine the bearing capacity of the soil for the different sites;
  - Recommendations for foundations;
  - Geological study of the site;
  - Schedule a geologist site visit to take a soil sample for lab analysis; and
  - Processing of soil laboratory data and geotechnical report.
- Perform a site test for infiltration rates in the potential locations to build the Infiltration Rate Studies.
- Analyze the alternative to a different location for the purification plant. Alternatives should include the location of the purification plan at site, close to Salta and a port in Argentina and Chile in order to have logistics, energy and manpower savings.
- An Infiltration Pond location study should be performed for an optimal design considering earthworks, potential impact on freshwater available at site and permitting.

26.6 Environmental Studies

The following recommendations are made with regard to the design and implementation of environmental and socio-economic baseline studies. Qualified professionals should be retained to design and oversea the implementation of each of these studies. A review of available data should be undertaken as part of the design and scoping of these studies, prior to field implementation:

- Environmental baseline field studies and analyses should be completed in the following subject areas:
  - Hydrological and Hydrogeological Water Balance: Completing a quantitative surface and groundwater monitoring and testing program for the Project area that will support a hydrogeological and water balance model. The model should provide emphasis on seasonal recharge of the freshwater aquifers within and near the Project area and the potential drawdown from ongoing freshwater extraction as planned for the operation and the determination of sustainable yields that will be protective of sensitive ecosystems and human use and health. There is potential to work closely and collaborate with the hydrogeological production teams on the above initiatives, especially in regard to developing a conceptual and numerical three dimensional groundwater model.
  - Water Quality Studies and Predictions: The groundwater and seasonal surface water (if present) of the study area should be sampled and analyzed for water quality to use for modelling and to establish a baseline that can be used as an early warning to predict the potential for freshwater – salt water mixing.
  - Air Quality: Baseline conditions for air quality should be established for near field and further afield operations.
  - Near Surface Soil Characterizations: Near surface soil textures and chemistry should be established as part of the baseline program.
  - Flora, Fauna, and sensitive ecosystems – A survey of flora and fauna throughout the Project area should be conducted with an emphasis of identifying species that are listed in conservation status and areas that can be considered sensitive ecosystems on that basis. If identified, these areas should identified as considerations in feasibility level designs.
- Additional socio-economic and cultural baseline studies should also be considered:
  - A gap analysis should be completed on current understanding of socio-economic conditions related to Indigenous and non-Indigenous communities near the site. The purpose of the gap assessment would be to identify current socio-economic information gaps related to nearby populations and community land use activities around the site and potential future conflicts. Land use activities could include local harvesting of plants, wildlife, cattle grazing, and human/agricultural water use.
  - Studies to understand how best to provide benefits to the community and consideration of establishing Impact Benefit or Cooperation agreements with nearby communities.
  - A conflict resolution procedure should be established that allows individuals in communities to lay complaints against the company and requires a prompt and meaningful response from the Company and action as warranted.
  - Ongoing engagement with the local communities should continue with regular community meetings as determined by local community needs and requests.
  - The current CSR plan should be regularly reviewed and updated based on the results of studies and feedback from the community. A system of recording community comments along with company response and feedback should be implemented.

- A qualitied archaeologist should be retained to complete a desktop study of the Project area to assess the potential for encountering and disturbing cultural artifacts. If there is a high potential for encounters, field studies should be implemented for those high potential areas and mitigation plans put in place as required.

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