NI 43-101 Technical Report

Updated Definitive Feasibility Study for the **Authier Lithium Project**

La Motte, Québec, Canada

Prepared for:

Sayona Mining Limited

SAYONA

Effective Date: March 27, 2023

Signature Date: April 14, 2023

Prepared by the following Qualified Persons:

- Isabelle Leblanc, P.Eng. ______________________ BBA Inc.
- Luciano Piciacchia, P.Eng. ______________________ BBA Inc.
- Jarrett Quinn, P.Eng. ______________________ Synectiq Inc.
- Maxime Dupéré, P.Geo. ______________________ SGS Canada Inc.

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Date and Signature Page

This technical report is effective as of the 27th day of March 2023.

Original signed and sealed on file	April 14, 2023
Isabelle Leblanc, P.Eng. BBA Inc.	Date

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Luciano Piciacchia, P.Eng., Ph.D. BBA Inc.	Date

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CERTIFICATE OF QUALIFIED PERSON

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This certificate applies to the NI 43101 Technical Report titled "Updated Definitive Feasibility Study for the Authier Lithium Project, La Motte, Québec, Canada" (the "Technical Report"), prepared for Sayona Mining Limited, dated April 14, 2023, with an effective date of March 27, 2023.

I, Isabelle Leblanc, P.Eng., as a co-author of the Technical Report, do hereby certify that:

1. I am a currently employed as Vice-President, Mining and metals markets with the consulting firm BBA Inc., located at 2020 Robert-Bourassa Blvd. Suite 300, Montréal, QC H3A 2A5.
2. I am a graduate from the mining engineering program of École Polytechnique de Montreal in 2007. I have practiced my profession continuously since my graduation.
3. I am a member in good standing of the Order of Engineers of Québec (# 144395) and Canadian Institute of Mining, Metallurgy and Petroleum.
4. My relevant experience includes; expertise in a wide range of activities including pit optimization and design, long range mine planning, 'trade off' studies, equipment selection, Opex and Capex cost estimation, financial analysis and the preparation of NI 43-101-compliant reports.
5. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
6. I am independent of the issuer applying all the tests in Section 1.5 of NI 43-101.
7. I am author and responsible for the preparation of Chapters 2, 15, 16, 19 and Chapter 22. I am also co-author and responsible for the relevant portions of Chapters 1, 3, 21, 25, 26 and 27 of the Technical Report.
8. I have not visited the Authier Property that is the subject of the Technical Report,as it was not required for the purpose of this mandate.
9. I have had prior involvement with the property that is the subject of the Technical Report, as I participated on previous studies, the latest of which was the Revised Authier Definitive Feasibility Study, issued on November 11, 2019.
10. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared following NI 43-101 rules and regulations.
11. As at 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 the portions of the Technical Report for which I am responsible not misleading.

Signed and sealed this 14th day of April 2023.

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This certificate applies to the NI 43-101 Technical Report titled "Updated Definitive Feasibility Study for the Authier Lithium Project, La Motte, Québec, Canada" (the "Technical Report"), prepared for Sayona Mining Limited, dated April 14, 2023, with an effective date of March 27, 2023.

I, Luciano Piciacchia, P.Eng., as a co-author of the Technical Report, do hereby certify that:

1. I am an engineer and director of Earth and Infrastructure with BBA Inc. located at 2020 Robert-Bourassa Blvd. Suite 300, Montréal, QC H3A 2A5.
2. I am a graduate in mining engineering from McGill University (1981) and hold a master's degree and a PhD with a focus on soil and rock geotechnics, also from McGill University (1983 and 1988).
3. I am a member in good standing of the "*Ordre des Ingénieurs du Québec*" (# 35912).
4. My relevant experience includes over 35 years of experience in geotechnical engineering with a focus on mining. I have applied my geotechnical/civil background to mine waste management, including waste rock, tailings and water.
5. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
6. I am independent of the issuer applying all the tests in Section 1.5 of NI 43-101.
7. I am author and responsible for the preparation of Chapters 18 and 20. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 3, 25, 26 and 27 of the Technical Report.
8. I have not visited the Authier Property that is the subject of the Technical Report, as it was not required for the purpose of this mandate.
9. I have had prior involvement with the property that is the subject of the Technical Report, as I participated in previous studies, the latest of which was the Revised Authier Definitive Feasibility Study, issued on November 11, 2019.
10. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared following NI 43-101 rules and regulations.
11. As at 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 the portions of the Technical Report for which I am responsible not misleading.

Signed and sealed this 14th day of April 2023.

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Jarrett Quinn, P.Eng.

This certificate applies to the NI 43-101 Technical Report titled "Updated Definitive Feasibility Study for the Authier Lithium Project, La Motte, Québec, Canada" (the "Technical Report"), prepared for Sayona Mining Limited, dated April 14, 2023, with an effective date of March 27, 2023.

I, Jarrett Quinn, P.Eng., Ph.D., as a co-author of the Technical Report, do hereby certify that:

1. I am a currently employed as Process Director with the consulting firm Synectiq Inc., located at 890 rue Amundson, Boucherville, QC, J4B 7S3.
2. I am a graduate of McGill University (B.Eng. 2004, M.Eng. 2006, and Ph.D. 2014) in Metallurgical Engineering. I have worked as a metallurgist since 2006.
3. I am a member in good standing of the Order des Ingénieurs du Québec (# 5018119) and the Canadian Institute of Mining, Metallurgy and Petroleum.
4. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
5. I am independent of the issuer applying all the tests in Section 1.5 of NI 43-101.
6. I am author and responsible for the preparation of Chapters 4, 5, 6, 13 and 17. I am also co-author and responsible for the relevant portions of Chapters 1, 3, 25, 26 and 27 of the Technical Report.
7. I have visited the Authier Property that is the subject of the Technical Report, on several occasions between 2018 and 2022.
8. I have had prior involvement with the property that is the subject of the Technical Report, as I participated in the preparation of the JORC-compliant feasibility study (September 2018) and updated feasibility study (October 2019).
9. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared following NI 43-101 rules and regulations.
10. As at 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 the portions of the Technical Report for which I am responsible not misleading.

Signed and sealed this 14th day of April 2023.

Original signed and sealed on file

Jarrett Quinn, P.Eng. (OIQ #5018119), Ph.D.
Process Director
Synectiq Inc.

CERTIFICATE OF QUALIFIED PERSON

Maxime Dupéré, géo. (P.Geo.)

This certificate applies to the NI 43-101 Technical Report titled "Updated Definitive Feasibility Study for the Authier Lithium Project, La Motte, Québec, Canada" (the "Technical Report"), prepared for Sayona Mining Limited, dated April 14, 2023, with an effective date of March 27, 2023.

I, Maxime Dupéré, géo., as a co-author of the Technical Report, do hereby certify that:

1. I am a currently employed as a geologist with SGS Canada Inc., SGS Geological Services, with an office at 10 Boul. de la Seigneurie Est, Suite 203, Blainville Quebec Canada, J7C 3V5.
2. I am a graduate from the Université de Montréal, Québec in 1999 with a B.Sc. in geology and I have practiced my profession continuously since 2001.
3. I am a member in good standing of the Order des Géologues du Québec (# 501).
4. My relevant experience mining exploration in diamonds, gold, silver, base metals, and iron ore. I have prepared and made several mineral resource estimations for different exploration projects including lithium at different stages of exploration. I am aware of the different methods of estimation and the geostatistics applied to metallic, non-metallic and industrial mineral projects and the preparation of NI 43-101-compliant reports.
5. I have read the definition of "qualified person" set out in the NI 43-101 – Standards of Disclosure for Mineral Projects ("NI 43-101") and certify that, by reason of my education, affiliation with a professional association, and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
6. I am independent of the issuer applying all the tests in Section 1.5 of NI 43-101.
7. I am author and responsible for the preparation of Chapters 6 to 12 inclusively and Chapter 14. I am also co-author and responsible for the relevant portions of Chapters 1, 3, 25, 26 and 27 of the Technical Report.
8. I have visited the Authier Property that is the subject of the Technical Report, on November 25, 2020, as part of this current mandate.
9. I have had prior involvement with the property that is the subject of the Technical Report, as I participated in the Authier Lithium MRE with previous owner during 2012.
10. I have read NI 43-101 and the sections of the Technical Report for which I am responsible have been prepared following NI 43-101 rules and regulations.
11. As at 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 the portions of the Technical Report for which I am responsible not misleading.

Signed and sealed this 14th day of April 2023.

Original signed and sealed on file

Maxime Dupéré, géo.

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List of Abbreviations	
Abbreviation	**Description**
2SD	Two standard deviations
3D	Three dimensional
3SD	Three standard deviations
AA	Atomic absorption
AFN	Abitibiwinni First Nation
AG	Average-grade
AGAT	AGAT Laboratories Ltd.
AI	Abrasion index
ALS	ALS-Chemex / ALS Laboratory Group
ARD	Acid rock drainage
AUD	Austrian dollar
BBA	BBA Inc.
BC1	Water storage basin 1
BC2	Water storage basin 2
BFA	Bench face angle
BM	Block model
BWI	Ball mill work index
CAD	Canadian dollar
CAPEX	Capital expenditure
CDA	Canadian Dam Association
CDC	Map designated cells
CDPNQ	*Centre de Données sur le Patrimoine Naturel du Québec*
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CMT	Construction Management Team
COC	Chain of custody
COG	Cut-off grade
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COVID-19	Coronavirus disease of 2019
CRM	Centre de Recherche Minérale
CWI	Crushing work index
DCF	Discounted cash flow
DD	Diamond drilling

List of Abbreviations	
Abbreviation	**Description**
DDH	Diamond drill hole
DFS	Definitive feasibility study
DFO	Department of Fisheries and Oceans Canada
DH	Drillhole
DMS	Dense media separation
EBITDA	Earnings Before Interest, Taxes, Depreciation, and Amortization
EDF	Environmental design flood
EIA	Environmental Impact Assessment
EOY	End of year
EPCM	Engineering, Procurement and Construction Management
ESS	Energy storage systems
ESG	Environmental, social and governance
ETP	Evapotranspiration
EV	Electric vehicles
Fe	Iron
G&A	General and Administration
GER	Glen Eagle Resources
GFE	*Services Forestiers et d'Exploration GFE*
GHG	Greenhouse gas
GMR	Gross Metal Royalty
GRES UQAT	*Groupe de recherche sur l'eau souterraine de l'Université du Québec en Abitibi-Témiscamingue*
HG	High-grade
High-Li	High-grade lithium
HLS	Heavy-liquid separation
HV	Heavy vehicle
IBA	Impacts and Benefits Agreement
ICP-AES	Inductively coupled plasma – atomic emission spectrometry
ICP-MS	Inductively coupled plasma mass spectrometry
ICP-OES	Induced coupled plasma optical emission spectrometry
ID^2	Inverse distance squared
ID^3	Inverse distance cubed
IDF	Inflow design flood
IRA	Inter ramp angle
IRR	Internal rate of return

List of Abbreviations	
Abbreviation	**Description**
JORC	Joint Ore Reserves Committee
LCE	Lithium carbonate equivalent
LFP	Lithium iron phosphate
LIMS	Low-intensity magnetic separator
Li_2O	Lithium oxide
LME	London Metal Exchange
LG	Low-grade
LOM	Life of mine
Low-Li	Low-grade lithium
LSB	*Loi sur la sécurité des barrage* (The Dam Safety Law applied in Québec)
LV	Light vehicle
Max	Maximum
MDDELCC	*Ministère du Développement Durable, de l'Environnement et de la Lutte contre les Changements Climatiques*
MDMER	Metal and Diamond Mining Effluent Regulations
MELCC	*Ministère de l'Environnement, et Lutte contre les changements climatiques* (now MELCCFP)
MELCCFP	*Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs* (formerly MELCC)
MENR	Ministry of Energy and Natural Resources (now MRNE)
MFFP	*Ministère des Forêts, de la Faune et des Parcs*
MIA	Mine industrial area
Min	Minimum
MMER	Metal and Diamond Mining Effluent Regulation
MOU	Memorandum of understanding
MPSO	Mine plan schedule optimizer
MRE	Mineral Resource Estimate
MRNF	*Ministère des Ressources naturelles et des Forêts* (formerly MERN)
NAD	North American Datum
NAL	North American Lithium
NCF	Net cash flow
NI	National Instrument
NN	Nearest neighbour
NPV	Net present value
NS	Not significant
NSR	Net smelter return

List of Abbreviations	
Abbreviation	**Description**
OB	Overburden
OBVAJ	*Organisme de bassin versant Abitibi-Jamésie*
OBVT	*Organisme de bassin versant du Témiscamingue*
OK	Ordinary kriging
OPEX	Operational expenditure
ORG	Organic material
OSA	Overall slope angle
PAH	Polycyclic aromatic hydrocarbon
PCM	Project Construction Management
PEA	Preliminary economic assessment
PMF	Probable maximum flood
PwC	PricewaterhouseCoopers
QA/QC	Quality Assurance / Quality Control
QI	Québec Inc.
QLC	Québec Lithium Corporation
Q1, Q2, etc.	First quarter, Second quarter, etc.
Raymor	Raymor Resources Ltd.
RCM	Regional county municipality
RM	Reference material
ROM	Run of mine
RQD	Rock quality designation
RSB	*Règlement sur la sécurité des barrages* (The Dam Safety Regulation applied in Québec)
RWI	Rod mill work index
SD	Standard deviation
SESAT	*Société de l'eau souterraine d'Abitibi-Témiscamingue*
SG	Specific gravity
SGS Minerals	SGS Canada Inc. Minerals Services
SGS Lakefield	SGS Minerals' laboratory in Lakefield
SOQUEM	*Société Québécoise d'Exploration Minière*
Synectiq Inc.	Synectiq
TSF	Tailings storage facility
TSS	Total suspended solids
UDFS	Updated Definitive Feasibility Study
USD	United States dollar

List of Abbreviations	
Abbreviation	**Description**
UTM	Universal Transverse Mercator
WHIMS	Wet high-intensity magnetic separation
WR	Waste rock
WRSF	Waste rock storage facility
WTP	Water treatment plant
XRD	X-ray diffraction

Units of Measurement	
Unit	**Description**
°C	Degrees Celsius
°F	Degrees Fahrenheit
µm	micrometre / micron
µS	microsecond
A	ampere
cfm	cubic feet per minute
cm	centimetre
d	day (24 hours)
deg. or °	angular degree
dia	diameter
G	giga (billion)
g	gram
g/t	grams per tonne
h or hr	hour (60 minutes)
ha	hectare
hp	horsepower
Hz	hertz
in.	inch
k	kilo (thousand)
kg	kilogram
km	kilometre
km^2	square kilometre
kV	kilovolt
kVA	kilovolt-amperes
kW	kilowatt
kWh	kilowatt hour
L	litre
L/s	litres per second
LV	low voltage
M	mega (million); molar
m	metre
m^3	cubic metre
m^3/s	cubic metres per second
m^3/h	cubic metres per hour
mm	millimetre

Units of Measurement	
Unit	**Description**
mpd	metres per day
Mt	million tonne
Mtpy	milled tonnage per year
MV	medium voltage
MVA	megavolt ampere
MW	megawatt
oz	troy ounce (31.1035g)
ppm	parts per million
psi	pound per square inch
s	second
sm^3	standard cubic metre
t	tonne (metric ton)
tpd	tonne per day
tph	tonne per hour
tpy	tonnes per year
V	volt
W	watt
w/w	mass percentage of the solute in solution
wt%	weight percent
y	year (365 days)
yd	yard

1. SUMMARY

1.1. Background

BBA Inc. (BBA), a Canadian-based consulting firm, has been requested by Sayona Mining Limited (Sayona) to update the Mineral Reserve Estimate of its Authier Lithium project, located in La Motte, Québec. Based on a new Mineral Resource Estimate produced by SGS, BBA developed an Updated Definitive Feasibility Study (UDFS) and Mineral Reserve Estimate for the Authier Lithium (Authier) Project.

The Mineral Reserve Estimate has been derived and reported by BBA according to the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) reporting guidelines as used in National Instrument 43-101 standards (NI 43-101).

1.2. Property Description and Location

The Authier property is located in the Abitibi-Témiscamingue Region of the Province of Québec, approximately 45 km northwest of the city of Val-d'Or and 15 km north of the town of Rivière-Héva.

The Property is accessible by a high-quality, rural road network connecting to the main highway, Route 109, situated a few kilometres east, which links Rivière-Héva to Amos.

Route 109 connects at Rivière-Héva to Highway 117, a provincial highway that links Val-d'Or and Rouyn-Noranda (the two regional centers of the Abitibi-Témiscamingue region), to Montréal, which is the closest major city, almost 500 km to the southeast.

As of April 6, 2023, the Property consists of one block totaling 24 mineral claims covering 884 ha. The claims are located on Crown Lands in the La Motte and the Preissac Townships.

1.3. Geological Setting and Mineralization

The Authier property is located in the southeast part of the Superior Province of the Canadian Shield craton, more specifically in the Southern Volcanic Zone of the Abitibi Greenstone Belt. The spodumene-bearing pegmatites observed on the Property are genetically related to the Preissac-La Corne batholith located 40 km northeast of the city of Val-d'Or (Corfu, 1993; Boily, 1995; Mulja et al., 1995a).

The Property geology comprises intrusive units of the La Motte pluton to the north and Preissac pluton to the south, with volcano-sedimentary lithologies of the Malartic Group in the centre.

The lithium mineralization observed at the Authier project is mainly spodumene within pegmatite intrusive dykes.

The main intrusive phase observed in the pegmatite is described as a core pegmatitic zone, characterized by large centimetre-scale spodumene crystals and white feldspar minerals. The core pegmatitic zone shows internally different pegmatitic phases, characterized by different spodumene crystal lengths, ranging from coarse-grained (earlier) to fine-grained (later). The contacts between different spodumene-bearing pegmatite phases are transitional and well defined at core logging scale. Higher lithium grades are correlated with higher concentrations of larger spodumene crystals. Late-mineral to post-mineral aplite phases cut earlier spodumene-bearing mineralization, causing local diminishing of lithium grade. The core zone hosts the majority of the spodumene mineralization at Authier.

The spodumene-bearing pegmatite is principally defined by one single continuous intrusion, or dyke, that contains local rafts, or xenoliths, of the amphibolitic host rock, which are a few metres thick and up to 200 m in length at shallow levels within the western zone. The main pegmatite outcrops in a small, 50 m by 20 m, area at the central-eastern sector that orients east-west and is mostly covered by up to 10 m of overburden. Based on the information gathered from the drilling, the pegmatite intrusion is more than 1,100 m in length and can be up to 60 m thick. The intrusion is generally oriented east-west, dips to the north at angles ranging between 35° and 50° and reaches depths of up to 270 m below surface in drilling to date.

A second spodumene-bearing pegmatite, not visible from the surface, was intersected by diamond hole AL-16-10 at shallow levels, between 15 m and 22 m downhole depth, approximately 400 m north of the main pegmatite. Follow-up drilling in early 2017 and 2018 outlined this new body, the Authier North pegmatite, which has a strike extension of 500 m east-west, 7 m average width, gently dipping 15 degrees to the north. The Authier North pegmatite appears at shallow levels, 15 m to 25 m vertical depth, and is open in all directions.

1.4. Drilling

A total of 19,736 m of historical drilling was completed on the Property. All the historical drilling that predates Sayona was diamond core of NQ diameter.

Sayona Québec has completed three drilling programs at the Authier Property, including:

- Phase 1 program in October/November 2016 of 18 holes, totalling 3,967 m. Following the drilling program, Sayona completed an upgrade of the resource and completed a Prefeasibility Study, dated February 2017;
- Phase 2 diamond drilling program in May 2017 of 31 holes totalling 4,117 m; and

- Phase 3 diamond drilling program in November/December 2017, which comprised seven diamond holes (PQ and HQ) for 769.5 m and the collection of five tonnes of core for pilot metallurgical testing; January / March 2018, which comprised 19 holes, NQ diameter, totalling 2,170.45 m; April 2018, involving condemnation drilling, six holes, NQ diameter, for 342.65 m.

1.5. Mineral Processing and Metallurgical Testing

Samples from the Authier deposit have been subjected to several metallurgical testwork programs (1999, 2012, 2016, 2017, and 2018).

In 1999, metallurgical testing was conducted at COREM on a 40-t mineralized pegmatite sample from the main intrusion at the Authier Property. Results showed spodumene concentrate grades ranging from 5.78% to 5.89% Li_2O with lithium recoveries ranging from 68% to 70% from a sample with head grade of 1.14% Li_2O.

Glen Eagle Resources Inc. undertook a testing program in 2012 on a 270 kg sample as part of a Preliminary Economic Assessment ("PEA") of the Project. After four stages of cleaning and passing the concentrate through a Wet High-Intensity Magnetic Separator ("WHIMS") at 15,000 gauss a concentrate grading 6.44% Li_2O was produced with 85% lithium recovery.

In 2016, Sayona completed a metallurgical testing program using drill core from 23 historical holes totalling 430 kg, representing the entire Deposit geometry (including 5% dilution). Concentrate grades varied from 5.38% to 6.05% Li_2O with a lithium recovery ranging from 71% to 79%. Results indicated that ore dilution had a negative impact on flotation performance.

In 2017, two representative samples were prepared and flotation testing was undertaken to examine the impact of the presence of dilution and the use of site water. Testwork demonstrated the ability to produce concentrate grading 6.0% Li_2O with lithium recovery greater than 80%.

A pilot plant testwork program was undertaken in 2018 at SGS Canada Inc. as part of the feasibility study. The aim of the testwork was to confirm the spodumene concentration flowsheet, operational parameters, efficiencies, and reagent consumptions. Roughly 5 t of drill core was used to prepare two composite samples representing: 1) years 0-5, and 2) years 5+ of operation. Testwork included batch and locked-cycle tests and continuous piloting.

In late 2018, an optimization batch testwork program was undertaken at SGS. Testing was performed using sub-samples from the two pilot plant composites. Tests examined the effect of spodumene conditioning, and spodumene collector optimization.

1.6. Mineral Resource Estimate

The Mineral Resource Estimate ("MRE"), with an effective date of October 6, 2021, is shown in Table 1-1. The Mineral Resources of Authier Lithium are reported using an open-pit mining perspective.

To define the Mineral Resources of Authier lithium, SGS created and used an optimized pit shell, that was done in the Whittle software, which corresponds to the ultimate pit shell in the present study at a revenue factor of 1. The final Mineral Resources include the resource blocks located within the optimized pit shell, below the overburden/bedrock interface and above the cut-off grade of 0.55% Li2O established by Sayona and BBA.

The Mineral Resources at Authier Lithium are classified into Measured, Indicated and Inferred categories. The Mineral Resource classification follows the CIM definitions and guidelines and is based on the density of analytical information, the grade variability and spatial continuity of mineralization.

Table 1-1: Authier Lithium Deposit in pit Mineral Resource Estimate

Cut-Off Grade (Li_2O %)	Category	Tonnage* (t)	Average Grade (% Li_2O)
0.55	Measured	6,042,000	0.98
	Indicated	8,098,000	1.03
	Measured + Indicated	**14,140,000**	**1.01**
	Inferred	2,996,000	1.00

Notes:

1. The Mineral Resource estimate has been estimated using the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") Definitions Standards for Mineral Resource and Mineral Reserve in accordance with National Instrument 43-101 – Standards of Disclosure for Mineral Projects. Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. Inferred Mineral Resources are exclusive of the Measured and Indicated Resources.
2. Bulk density of 2.71 t/m³ is used.
3. Effective date October 6, 2021.
4. Only block centroids had to be inside the pit to be considered.
5. Pit used: Authier20210821_977.dxf

* Rounded to the nearest thousand.

The mineral resource estimates for the Authier deposit includes Authier Main and Authier North pegmatites. Block model grade interpolation was conducted on composited analytical data. No capping was applied on the composite analytical data. Inverse Distance Squared ("ID2") restricted to a geologically controlled wireframe model was used to Interpolate Li_2O (%) grades into a block model.

A block size of 3 m (NE-SW) by 3 m (NW-SE) by 3 m (vertical) was selected for the resource block model of the Authier Project based on drillhole spacing, width and general geometry of mineralization, but primarily by the selected SMU from the feasibility study.

For the Measured resource category, the search ellipsoid was 50 m (strike) by 50 m (dip) by 25 m with a minimum of seven composites in at least three different drillholes (maximum of two composites per hole) An ellipse fill factor of 55% was applied to the Measured category i.e., that only 55% of the blocks were tagged as Measured within the search ellipse. For the Indicated category, the search ellipsoid was twice the size of the Measured category ellipsoid using the same composite selection criteria. An ellipse fill factor of 55% was applied to the Indicated category. All remaining blocks were considered to be in the Inferred category.

1.7. Mining

The Project LOM plan and subsequent Mineral Reserve estimate are based on an ore selling price of 120 CAD/t. A memorandum of understanding ("MOU") was developed between the Authier operation and NAL operation, in which NAL agrees to buy 100% of the Authier ore material at a selling price of 120 CAD/t, delivered to the NAL ore pad area. The effective date of the Mineral Reserve estimate is March 27, 2023.

Development of the LOM plan included pit optimization, pit design, mine scheduling and the application of modifying factors to the Measured and Indicated portion of the in-situ Mineral Resource. Tonnages and grades are reported as ROM feed at the NAL crusher and account for mining dilution, geological losses and operational mining loss factors.

Multiple mining phases were developed for the Updated Definitive Feasibility Study ("UDFS"). The LOM was developed based on a range of constraints and results in a mine life of 22 years. A summary of the LOM is shown in Table 1-2.

Table 1-2: Authier Lithium life-of-mine plan

Physicals	Unit	Pre-Prod	LOM									
		2025	2025	2026	2027	2028	2029	2030	2031-2035	2036-2040	2040-2046	Total
Total Moved	**(kt)**	**395**	**1,350**	**2,415**	**2,427**	**3,035**	**6,521**	**6,517**	**32,636**	**26,891**	**8,643**	**90,829**
Total Expit	**(kt)**	**395**	**1,089**	**1,883**	**1,893**	**2,494**	**5,983**	**5,979**	**29,986**	**24,245**	**5,656**	**79,604**
Expit Waste Rock	(kt)	138	466	1,289	1,019	447	4,363	4,303	26,730	21,600	2,668	63,023
Expit Overburden	(kt)	257	362	61	341	1,508	1,082	1,138	607	0	0	5,356
Expit Ore to Ore Rehandling Area	(kt)	0	261	533	534	540	538	538	540	2,647	2,631	11,225
Expit Ore to Ore Rehandling Area	(% Li_2O)	0.000	0.973	0.939	0.944	0.920	0.851	0.904	0.928	0.966	1.042	0.964
Rehandling	(kt)	0	261	533	534	540	538	538	2,649	2,645	2,987	11,225
Stripping Ratio	(t_{waste}:t_{RoM})	0.00	1.00	2.00	3.00	4.00	5.00	6.00	10.32	8.17	0.89	6.09

Table 1-3 summarizes the Proven and Probable Mineral Reserve estimate for the Project.

Table 1-3: Authier Lithium Project Mineral Reserve estimate

Ore Reserves Category	Tonnage (Mt)	Grade % Li_2O	Contaminant % Fe	Contained Li_2O* (kt)
Open Pit				
Proven Mineral Reserve	6.2	0.93	0.92	57.6
Probable Mineral Reserve	5.1	1.00	0.98	50.7
Total Mineral Reserve	**11.2**	**0.96**	**0.95**	**108.3**

*Metallurgical recovery not applied

Notes:

1. Mineral Reserves are measured as dry tonnes at the crusher above a diluted cut-off grade of 0.55% Li_2O.
2. Mineral Reserves result from a positive pre-tax financial analysis based on an ore selling price of 120 CAD/t and an exchange rate of USD0.75:CAD1.00. The selected optimized pit shell is based on a revenue factor of 0.86 applied to a base case selling price of USD850/t of spodumene concentrate.
3. The reference point of the Mineral Reserves is the NAL crusher feed.
4. In-situ Mineral Resources are converted to Mineral Reserves based on pit optimization, pit design, mine scheduling and the application of modifying factors, all of which supports a positive LOM cash flow model. According to CIM Definition Standards on Mineral Resources and Reserves, Inferred Resources cannot be converted to Mineral Reserves.
5. The Mineral Reserves estimate for the Project have been estimated by Ms. Isabelle Leblanc, P.Eng. OIQ #144395, a Qualified Person as defined by NI 43-101.
6. The Mineral Reserve estimate is valid as of March 27, 2023.
7. Totals may not add up due to rounding for significant figures.

1.8. Recovery Methods

The current Project considers mining Authier ore for shipment to the North American Lithium ("NAL") concentrator for processing. There is a memorandum of understanding that the NAL operation will purchase the Authier ore; therefore, no details on the recovery methods are provided in this Report.

For details on the recovery methods of the NAL mill, refer to the report entitled "Definitive Feasibility Study Report for the North American Lithium Project" with an effective date of March 27, 2023 (BBA, 2023).

1.9. Waste Dumps and Tailings

During the lifespan of the open-pit mine, a total of 27.39 Mm^3 of waste rocks and 2.71 Mm^3 of overburden material and 0.86 Mm^3 of organic material will be generated for a total of 30.96 Mm^3.

Results of the geochemical characterization of waste rock concluded:

- Waste rock is not acid generating material;
- A good amount of waste rock could be considered metal leaching;
- Waste rock will not be considered as high-risk level mining waste.

Groundwater protection measures will have to be applied at the foundation of the waste rock stockpile. Based on the available geotechnical and hydrogeological investigation information, the current design assumes that a geomembrane impervious structure is required.

Overburden and organic material will be used during construction and closure of the Waste Rock Storage Facility ("WRSF"). The designed concepts allow management and storage of all Authier waste materials within the same footprint. The WRSF has a footprint of approximately 75 ha, and a maximum height of ±83 m. The average height is about 72 m.

Given that the ore will be processed at North American Lithium ("NAL"), the site no longer requires a tailings storage facility.

1.10. Project Infrastructure

The project infrastructure includes Run of mine ("ROM") and loadout pad, administrative building, dry room, lay down area for mining contractor equipment shop, Waste Rock Storage Facility, mine wastewater treatment plant, site access roads, mine hauling and service roads, mine water management infrastructure, electrical distribution facilities, fuel and explosive storage and communication systems (see Figure 1-1).

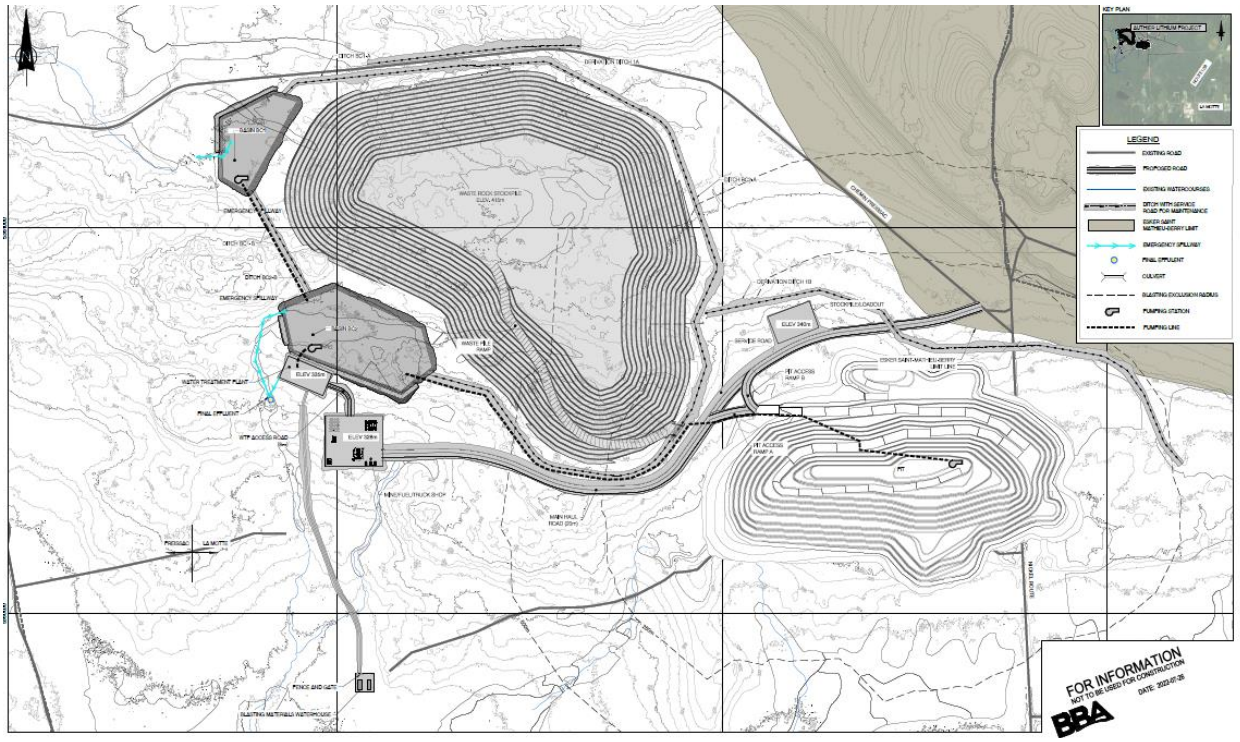


Figure 1-1: Site Layout

1.11. Market Analysis and Offtake Agreements

The prices for spodumene concentrate and lithium chemicals are expected to remain high relative to historic prices, driven by the requirement of carbonate and hydroxide transformation plants, fuelled mainly by the demand for lithium from batteries used in EVs. A memorandum of understanding ("MOU") was developed between the Authier operation and NAL operation, in which NAL agrees to buy 100% of the Authier ore material at a selling price of 120 CAD/t, delivered to the NAL ore pad area (Li_2O content of 0.80% to 1.15%).

1.12. Environmental Studies

Environmental baseline studies including literature review, field works and laboratory analysis were conducted in 2012, and from 2017 to 2022.

- Soils quality studies were carried out in 2017, 2018 and 2019;
- Hydrogeological study started in December 2016 and currently includes the installation of 27 observation wells (piezometers), groundwater sampling campaigns, the achievement of variable head permeability tests and tracer profile testing as well as groundwater level surveys;
- From 2017 to 2022, 14 to 27 wells were sampled for underground water quality. Samples collected were analyzed for a variety of parameters including metals, nutrients, major anions and cations, volatile compounds, polycyclic aromatic hydrocarbons and C_{10}-C_{50} petroleum hydrocarbons;
- Surface water was sampled in 2017, 2018 and 2019. Sampling of the surface water was conducted in five locations, i.e., four stations in the core study area and one outside the extended study area, along the mainstream draining the core study area. Some exceedances of criteria for protection of aquatic life were observed for aluminum, iron, copper, manganese, lead and nickel;
- Sedimentation characterization was carried out in 2018 and 2019. Some exceedances of sediments quality criteria were observed for arsenic and chromium;
- Wetlands were characterized in 2017, 2018 and 2019. Bogs and swamps are the main wetland classes characterized during the field surveys. Only a few bogs were located near the Project area. These bogs did not reveal any major particularities. Some low ecological value wetlands are located inside the limit of the open-pit and the waste rock dump areas;
- Field inventory for snakes, salamanders and anurans was carried out in 2017 and 2018. Bird surveys were conducted in 2017 and 2019. A bat inventory was completed in 2017. Finally, a small mammal and rodent inventory was conducted in 2017;
- Fish and fish habitats surveys were carried out in 2017 and 2019 on nine streams;
- Air emission modelling has been conducted in 2022;
- A noise modelling for the mining site was carried out in 2019 and updated in 2022. A noise modelling has also been produced in 2022 for the ore transportation to the NAL site.

The southern part of the St-Mathieu-Berry Esker is enclosed into the area of influence of the mine. However, this part of the esker is not connected to the main part of the esker which is being tapped by the drinking facilities of the city of Amos and also by the Eska water bottling society. Both portions of the esker are separated by a bedrock lump.

In the esker, the groundwater generally flows towards the north, except in the Project area where it is heading south and southeast and to the Harricana River watershed. The southern portion of the esker, located in the Project area, is in a different watershed than the remainder of the esker. However, because it is located at a lower altitude than the esker and isolated from it by a bedrock, the Authier Project will not threaten, in any way and under any circumstances, the water quality of this esker.

1.13. Decarbonization Plan

A preliminary GHG emission level assessment over the life of the Authier Project showed that nearly 80% of the Project's GHG emissions came from mining operations as well as ore transportation. In order to reduce its environmental impact by reducing its GHG emissions, the Project's decarbonization plan will address primarily those two emission factors.

It will focus on two initial approaches:

1. Deploying innovative technologies to reduce GHG emissions produced by vehicles.
2. Compensating for difficult-to-reduce emissions by investing in GHG offsets.

Because a complete reduction of the Authier Project's GHG emission can not be foreseen with the current technology maturity, compensation investments will be considered in the decarbonization plan.There are two compensation efforts that will be evaluated:

- Indirect compensation: Purchasing carbon credits from accredited/recognized organizations, with an emphasis on Québec based organizations; Invest in a local GHG reduction initiative. Direct compensation: Restoring natural habitats, such as wetland, impacted by previous mining activities or other with a high sequestration potential; Creating and running a tree planting program with a focus on the Abitibi region.

For Sayona, the decarbonization plan will be an opportunity for unifying venture for its team, its suppliers and its stakeholders going forward.

1.14. Permitting

The global certificate of authorization frames the environmental component of the Project, in respect to the Regulation respecting the environmental assessment and review of certain projects (CQLR, cQ2, r23.1). The projects listed in Schedule 1 are subject to the environmental impact assessment and review procedure under the Environment Quality Act (article 31.1). Therefore, Schedule 1 includes the establishment of a mine whose maximum daily capacity is equal to or greater than 2,000 metric tons.

The mining lease is required to extract ore under the Mining Act. The application must be accompanied by, among other things, an approved closure and rehabilitation plan and a scoping and market study on processing in Québec.

The deliverance of the mining lease is conditional on obtaining the approbation of the closure plan. According to the Quality Environmental Act a certificate of authorization is also required for construction and operation of the mine. A public consultation must also be part of the legal obligation and should last at least two months and include public open doors in the municipality where the Project is located.

1.15. Reclamation and Closure

In accordance with the Mining Act requirements, a detailed closure plan must be submitted to the MRNF. The closure plan includes the following activities:

- Rehabilitate the waste rock pile by covering slopes and flat areas with geotextiles, compacted inorganic overburden, organic overburden and vegetation;
- Remove from the site all surface and buried pipelines;
- Remove buildings and other structures;
- Rehabilitate and secure the open-pit;
- Reclaim any civil engineering works;
- Remove machinery, equipment and storage tanks; and,
- Complete any other work necessary for final rehabilitation and closure.

1.16. Transport and Logistic

Authier Lithium ore will be transported to the North American Lithium ("NAL") site for processing. As such, all ore mined from the pit will be temporarily stockpiled on an ore rehandling area situated to the north of the pit. The ore will then be loaded onto highway transport trucks for transport to the NAL site. Ore transportation will only occur during the day, only on weekdays (i.e., Monday to Friday).

1.17. Capital and Operating Cost Estimates

The following tables summarize the capital, sustaining capital and operating costs resulting from the UDFS work.

The capital cost estimate prepared for this study meets AACE Class 3 criteria, usually prepared to establish a preliminary capital cost forecast and assess the economic viability of the Project. This allows management, and / or the Project sponsor, to obtain authorization for funds for the Project's next stages. As such, this estimate forms the initial control estimate against which subsequent phases will be measured and monitored.

There are two significant changes to the capital cost estimate with respect to the previous study:

1. There is no longer a concentrator at the Authier site; and
2. The waste piles and water management infrastructure require a geomembrane under their bases due to the metal leaching potential of the waste rock material.

Table 1-4 summarizes the initial capital cost estimate, Table 1-5 summarizes the sustaining capital cost estimate, and Table 1-6 summarizes the operating cost estimate.

Table 1-4: Project initial capital cost detailed summary

Item	Total (M CAD)
Mining	**5.71**
Preproduction Mining	3.39
Owner Equipment and Mine Services	2.32
Infrastructure	**59.67**
Waste Stockpile and Water Management	38.45
Electrical Work	0.72
On-site Roads	2.17
Access Road	0.56
Owner's Costs	2.10
EPCM Services	6.29
Commissioning	0.24
Overhead	0.19
Other	1.17
Contingency	7.78
Wetland Compensation	**1.50**
Wetland Compensation	1.50
Royalty Buyback	**1.00**
1 claim	1.00
Reclamation Deposit	**6.95**
Reclamation Deposit	6.95
Total	**74.84**

Table 1-5: Sustaining Capital Cost Estimate Summary

Year	LOM (M CAD)
Mining	3.76
Infrastructure	70.64
Sustaining Capital Costs	**74.40**

Table 1-6: Summary LOM Operating Cost Estimate Summary

Cost Area	LOM (M CAD)	Unit (CAD/t Ore)	Unit (USD/t Ore)
Mining Operation and Site Maintenance	540.56	48.16	36.60
Water Treatment Management	58.73	5.23	3.98
General and Administration	20.97	1.87	1.42
Reclamation Bond Insurance Payment	7.65	0.68	0.52
Total On-site Costs	**627.92**	**55.94**	**42.51**
Ore Transport and Logistics Costs	223.36	19.90	15.12
Total Operating Costs	**851.28**	**75.84**	**57.64**
Royalty Deductions	29.33	2.61	1.99
First Nation Royalties	23.57	2.10	1.60
Total Operating Cost + Royalties	**904.18**	**80.55**	**61.22**

1.18. Economic Analysis

The economic assessment of the Project was carried out using a discounted cash flow ("DCF") approach on a pre-tax and after-tax basis, based on the procurement contract between Authier Lithium and North American Lithium ("NAL"). No provision was made for the effects of inflation as real prices and costs were used in the financial projections. Current Canadian tax regulations were applied to assess the corporate tax liabilities, while the most recent provincial regulations were applied to assess the Québec mining tax liabilities.

The key outcomes of the economic evaluation for 100% of the project, before financing costs, are presented in Table 1-7.

Table 1-7: Financial Analysis Summary

Item	Unit	Value	Unit	Value
Mine Life	year	22	year	22
Strip Ratio	t:t	6.1	t:t	6.1
Total Mill Feed Tonnage	Mt	11.2	Mt	11.2
Revenue				
Ore Selling Price	CAD/t ore	120	USD/t ore	90
Exchange Rate			USD:CAD	0.75
Project Costs				
Open Pit Mining	CAD/t ore	48.16	USD/t ore	36.12
Water Treatment and Management	CAD/t ore	5.23	USD/t ore	3.92
General and Administration (G&A)	CAD/t ore	1.87	USD/t ore	1.40
Reclamation Bond Insurance Payment	CAD/t ore	0.67	USD/t ore	0.50
Ore transport and logistic costs	CAD/t ore	19.90	USD/t ore	14.92
Project Economics				
Gross Revenue	CAD M	1,347.0	USD M	1,010.3
Total Operating Cost Estimate	CAD M	627.9	USD M	470.9
Reclamation Bond Insurance Payment	CAD M	7.6	USD M	5.7
Transportation and Logistics Cost	CAD M	223.4	USD M	167.5
Total Capital Cost Estimate	CAD M	77.9	USD M	58.4
Total Sustaining Capital Cost Estimate	CAD M	74.4	USD M	55.8
Reclamation and Closure Costs	CAD M	41.7	USD M	31.3
Royalty Deduction	CAD M	29.0	USD M	21.7
First Nation Royalties	CAD M	27.0	USD M	20.3
Non-discounted Cash Flow (Pre-Tax)	CAD M	280.4	USD M	210.3
Discount Rate	%	8%	%	8%
PRE-TAX NPV @ 8%	**CAD M**	**58.1**	**USD M**	**43.5**
Pre-Tax Internal Rate of Return (IRR)	%	14.6%	%	14.6%

A financial sensitivity analysis was conducted on the base case after-tax cash flow NPV and IRR of the Project.

The sensitivity of the after-tax NPV was evaluated for changes in key variables and parameters such as:

- Capital costs;
- Sustaining capital costs;
- Operating costs;
- Price of ore sold to NAL.

The after-tax sensitivity analyses show that changes in the price of ore sent to NAL and the Project operating costs create the largest NPV variations.

1.19. Project Implementation and Execution

The project execution plan is conceptual in nature and will be adjusted and refined during the next phases of the Project.

Upon completion of this FS, Sayona plans to award the detailed engineering mandate with a targeted completion date of July 2024 to be executed in parallel with the certificate of authorization approval process. Construction is expected to begin soon after reception of the certificate of authorization with a target readiness for mining operations to start in March 2025.

The critical path to ore production goes through obtaining the certificate of authorization, mobilizing the mining contractor, and building the main access roads and the stockpile pads.

1.20. Risk and Opportunity

There are a number of risks and uncertainties identifiable to any new project that usually cover the mineralization, process, financial, environmental and permitting aspects. This project faces the same challenges, and an evaluation of the possible risks was undertaken. The resulting register identifies risks, impact category, the severity and probability ratings as well as potential risk mitigation measures. The following table shows the top risks of the Project.

Table 1-8: Main project risks

Risks Details			
Category	**Description**	**Rating category**	**Mitigation Measures**
Logistics	Worldwide crisis on freight forwarding	Schedule	Dedicate resources for expediting & logistics
Health & Safety	Mining traffic uses segments of roads common to ore transport and employee traffic. Berm separates the mining traffic from the others	Safety	Road to be widened and berm separating mining and other traffic. Add secondary access road to remove crossings
Operation	Start-up during wintertime	Operation	Implement temporary WTP during initial mining development
Operation	NAL will process with new ore from Authier after about six months of operation	Production	Support from external engineering staff during NAL transition to the blended ore processing
Engineering	Consultant engineers are very busy	Schedule	Frequent follow-up
Construction	Local contractors are very busy	Schedule	Reach out to provincewide contractors
Environment	Delays in obtaining mining and construction permits	Schedule	Frequent follow-up and pro-active approach of permitting authorities

1.21. Conclusion and Recommendations

The UDFS includes the recent Mineral Resources estimate (SGS 2021), a smaller overall footprint of the site, results from a number of technical optimization programs, results from the waste rock geochemical characterization, new strategy to transport ore material to NAL concentrator and realignment of revenue based on the sale of run-of-mine ore. The UDFS confirms the technical and financial viability of constructing a simple open-cut mining operation, waste rock storage facility and water treatment plant at the Authier site. The positive study demonstrates the opportunity to create substantial long-term sustainable shareholder value at a low capital cost.

Given the technical feasibility and positive economic results of the UDFS, it is recommended to continue the work necessary to support a decision to fund and develop the project.

2. INTRODUCTION

2.1. Purpose of the Technical Report

This report (the "Report") was prepared at the request of Sayona Mining Limited (ASX code: SYA; OTCQB: SYAXF) to provide an update to the Updated Definitive Feasibility Study ("UDFS", 2019) of the Authier Lithium Project (the "Project") following the Joint Ore Reserves Committee ("JORC") code. Reporting of the Mineral Reserve estimate has been carried out following the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and National Instrument NI 43-101 reporting standards. This UDFS was prepared and compiled by BBA Inc. ("BBA") and overseen by Sayona Québec, which is owned by Sayona Mining Limited (ASX:SYA, 75%) and Piedmont Lithium (ASX:PLL, 25%). BBA is an independent engineering consulting firm, headquartered in Mont Saint-Hilaire, Québec, Canada.

The main objectives of this UDFS are to:

- Complete an Ore Reserves and mine plan to support the revised strategy to transport 1,560 tpd of ore material to the North American Lithium ("NAL") concentrator facility in La Corne, Québec;
- Update the site layout to modify the design of the waste piles;
- Develop new construction and reclamation plans to account for the potential metal leachability of the waste rock material;
- Further the design related to site water management;
- Demonstrate that the Project has sufficient merit from a technical, environmental and economic standpoint to justify moving forward with the Engineering, Procurement and Construction Management ("EPCM") phase.

The purpose of this UDFS is to evaluate the potential for mining and all associated infrastructure required for development of the Project.

This UDFS is based upon developing the Project over a 22-year production period, using a conventional open-pit truck and shovel operation and transportation of ore to the NAL concentrator facility to produce a spodumene concentrate (5.4 to 5.82% Li_2O).

BBA provided engineering services for the UDFS on the Authier Lithium Project in collaboration with SGS Geostat ("SGS"), Synectiq Inc. ("Synectiq") and PricewaterouseCoopers ("PwC"). BBA performed the Mineral Reserves estimate and coordinated mining activities, associated infrastructure, and capital and operating cost estimates.

The DFS considers the concentration of the Authier ore material at Sayona's North American Lithium (NAL) concentrator. The Authier ore run-of-mine ("ROM") will be transported to the NAL site, blended with the NAL ore material and fed to the crusher. In order to get the best overview of the integrated Authier/NAL project, it is recommended to review the Definitive Feasibility Study Report for the North American Lithium Project (BBA, 2023).

2.2. Study Contributors and Report Responsibility

Table 2-1 presents the Qualified Persons (QPs) responsible for each chapter of this Report. The QPs of this Report are in good standing with the appropriate professional institutions. The companies listed are independent of NAL as defined by NI 43-101.

The QPs have supervised the preparation of this Report and take responsibility for the contents of the Report as set out in Table 2-1. Each QP has also contributed relevant figures, tables and written information for Chapters 1 (Summary), 3 (Reliance on Other Experts), 24 (Other Relevant Data and Information), 25 (Interpretation and Conclusions), 26 (Recommendations), and 27 (References).

Table 2-1:Chapters responsibility

UDFS CHAPTERS		Qualified Persons
1	Summary	All
2	Introduction	Isabelle Leblanc, P.Eng.
3	Reliance on Other Experts	All
4	Project Property Description and Location	Jarrett Quinn, P.Eng.
5	Accessibility, Climate, Local Resources, Infrastructure, and Physiography	Jarrett Quinn, P.Eng.
6	History	Maxime Dupéré, P.Geo.
7	Geological Setting and Mineralization	Maxime Dupéré, P.Geo.
8	Deposit Types	Maxime Dupéré, P.Geo.
9	Exploration	Maxime Dupéré, P.Geo.
10	Drilling	Maxime Dupéré, P.Geo.
11	Sample Preparation, Analyses and Security	Maxime Dupéré, P.Geo.
12	Data Verification	Maxime Dupéré, P.Geo.
13	Mineral Processing and Metallurgical Testing	Jarrett Quinn, P.Eng.
14	Mineral Resource Estimates	Maxime Dupéré, P.Geo.
15	Ore Reserve Estimates	Isabelle Leblanc, P.Eng.
16	Mining Methods	Isabelle Leblanc, P.Eng.
17	Recovery Methods	Jarrett Quinn, P.Eng.
18	Project Infrastructure	Luciano Piciacchia, P.Eng.
19	Market Studies and Contracts	Isabelle Leblanc, P.Eng.
20	Environmental Studies, Permitting, and Social or Community Impact	Luciano Piciacchia, P.Eng.
21	Capital and Operating Costs	Isabelle Leblanc, P.Eng. / Luciano Piciacchia, P.Eng.
22	Economic Analysis	Isabelle Leblanc, P.Eng.
23	Adjacent Properties	Jarrett Quinn, P.Eng.
24	Other Relevant Data and Information	All
25	Interpretation and Conclusions	All
26	Recommendations	All
27	References	All

2.2.1. Acknowledgement

BBA and the other study contributors would like to acknowledge the general support provided by Yves Desrosiers and Guy Laliberté from Sayona, Philippe Pourreaux and Alexandre Khanji from PwC, and the many BBA personnel who significantly contributed to the success of this mandate.

2.3. Sources of Information

The reports and documentation listed in Chapters 3 (Reliance on Other Experts) and 27 (References) were used to support the preparation of this Report. Sections from reports authored by other consultants may have been directly quoted or summarized in this Report and are so indicated, where appropriate.

The Report has been completed using the aforementioned sources of information as well as available information contained in, but not limited to, the following reports, documents, and discussions:

- Technical discussions with Sayona personnel;
- Technical information provided by Sayona personnel;
- Economic analysis provided by Philippe Pourreaux, PricewaterhouseCooper (PwC);
- Authors' personal inspections of the Property;
- Additional information from public domain sources.

2.4. Units and Currency

The following units and currency are used throughout this report:

- All units are metric, unless noted otherwise;
- All currency is in Canadian dollars (CAD or $), unless noted otherwise.

This Report includes technical information that required subsequent calculations to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and, consequently, introduce a margin of error. Where these occur, the authors consider them immaterial.

2.5. Site Visits

Many BBA employees within the Mining and Geology and Earth and Infrastructure groups visited the Authier Lithium Property between 2019 and 2023.

3. RELIANCE ON OTHER EXPERTS

The authors of the Updated Definitive Feasibility Study ("UDFS") relied upon information provided by experts who were not authors of the Report. The authors of the various sections of the Report believe that it is reasonable to rely upon these experts, based on the assertion that the experts have the necessary education, professional designation, and related experience on matters relevant to the technical report.

The authors have assumed, and relied on the fact, that all the information and existing technical documents listed in Chapter 27 (References) of this Report are accurate and complete in all material aspects. While the authors reviewed all the available information presented, we cannot guarantee its accuracy and completeness. The authors reserve the right, but will not be obligated, to revise the Report and conclusions, if additional information becomes known subsequent to the date of this Report.

The statements and opinions expressed in this document are given in good faith and in the belief that such statements and opinions are neither false, nor misleading at the date of this Report. A draft copy of the Report has been reviewed for factual errors by Sayona. Any changes made because of these reviews did not involve any alteration to the conclusions made.

The following is a list of the experts relied upon:

- **PwC:** PwC provided support for the pre-tax cashflow and post-tax financial analysis as well as sensitivity analysis.
- **Richelieu Hydrogéologie Inc.:** Richelieu Hydrogéologie was founded in 2005 to provide hydrogeological consulting services. The company specializes in numerical modeling of underground water flows around mines, quarries and sand pits, e.g., evaluation of dewatering rates for open pits, optimization of dewatering well spacing, evaluation of the impact of groundwater pumping, as well as risk assessment associated with the transport of dissolved contaminants.
- **Journeaux Assoc.:** Journeaux Assoc. is an engineering consulting firm specialized in foundations, dams, bridges, maritime ports, excavations, hydrogeology, tunnels, underground transportation systems and permafrost. They offer engineering, consulting and design services in these sectors.
- **Craler:** This firm provided the ore transportation study.
- **Services Forestiers et Exploration GFE Inc.:** GFE provided technical personnel to support the various drilling campaign and samples collection.

- **Services d'ingénierie Norinfra Inc.:** Norinfra did work on the environmental evaluation EES1 and soil characterization. Norinfra are well known in Abitibi and provide engineering services to numerous mining companies.
- **Intervia:** This firm produced the traffic study.
- **Groupe-conseil Nutshimit-Nippour:** This First Nation consulting company, a member of Groupe Desfor, contributed to environment expertise and to the landscaping architecture and related matters. Their expertise of the local Algonquin community and other First Nations particularities brings a unique and complementary expertise to this study.
- **MDAG and Lamont Inc.:** These firms are specialized in geochemistry. They have been involved in geochemical characterization and prediction of mine water quality and waste rock dump water quality.
- **CTRI:** This research institute carried out geochemical characterization studies.
- **COREM:** This research center carried out mineralogical characterization of waste samples for management optimization.
- **Consultants GCM, Del Degan, Massé et Associés Inc., SNC Lavalin, and Patricia Desgagné, anthropologist and Englobe Corporation,** also participated in the drafting of the Environmental Impact Assessment.

3.1. Mineral Claims and Surface Rights

The authors have not independently reviewed ownership of the Project area and any underlying property agreements, mineral claims, surface rights or royalties. The authors have fully relied upon, and disclaim responsibility for, information derived from Sayona. Refer to Chapter 4 (Property Description and Location) for further information on the property ownership and agreements.

4. PROPERTY DESCRIPTION AND LOCATION

4.1. Location

The Authier Property is located in the Abitibi-Témiscamingue Region of the Province of Québec, approximately 45 km northwest of the city of Val-d'Or and 15 km north of the town of Rivière-Héva. The centre of the Property is situated on NTS sheet 32D08 at about UTM 5,361,055 m N, 706,270 m E, NAD 1983.

The Property is accessible by a high-quality, rural road network connecting to the main highway, Route 109, situated a few kilometres east, which links Rivière-Héva to Amos.

Route 109 connects at Rivière-Héva to Highway 117, a provincial highway that links Val-d'Or and Rouyn-Noranda (the two regional centers of the Abitibi-Témiscamingue region), to Montréal, which is the closest major city, almost 500 km to the southeast (Figure 4-1 and Figure 4-2).

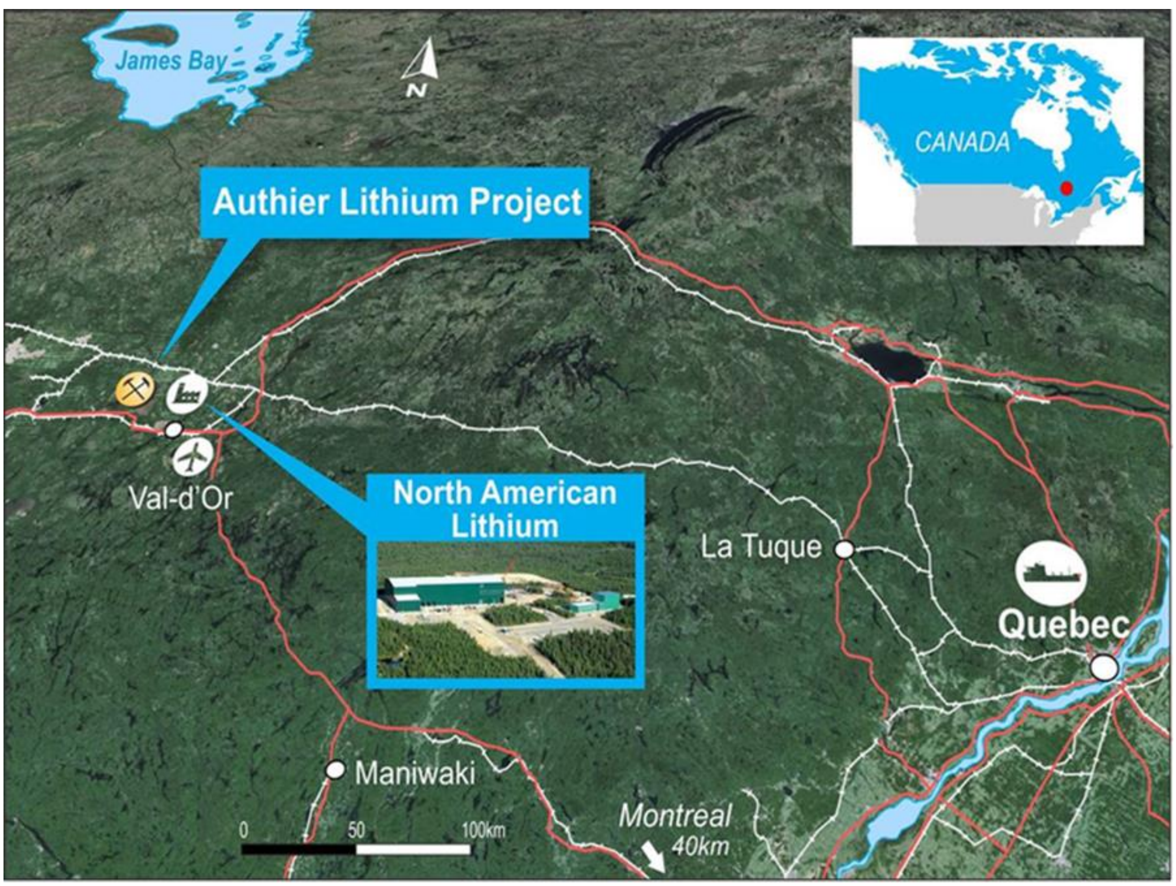


Figure 4-1: Location of the Property relative to a number of nearby regional townships

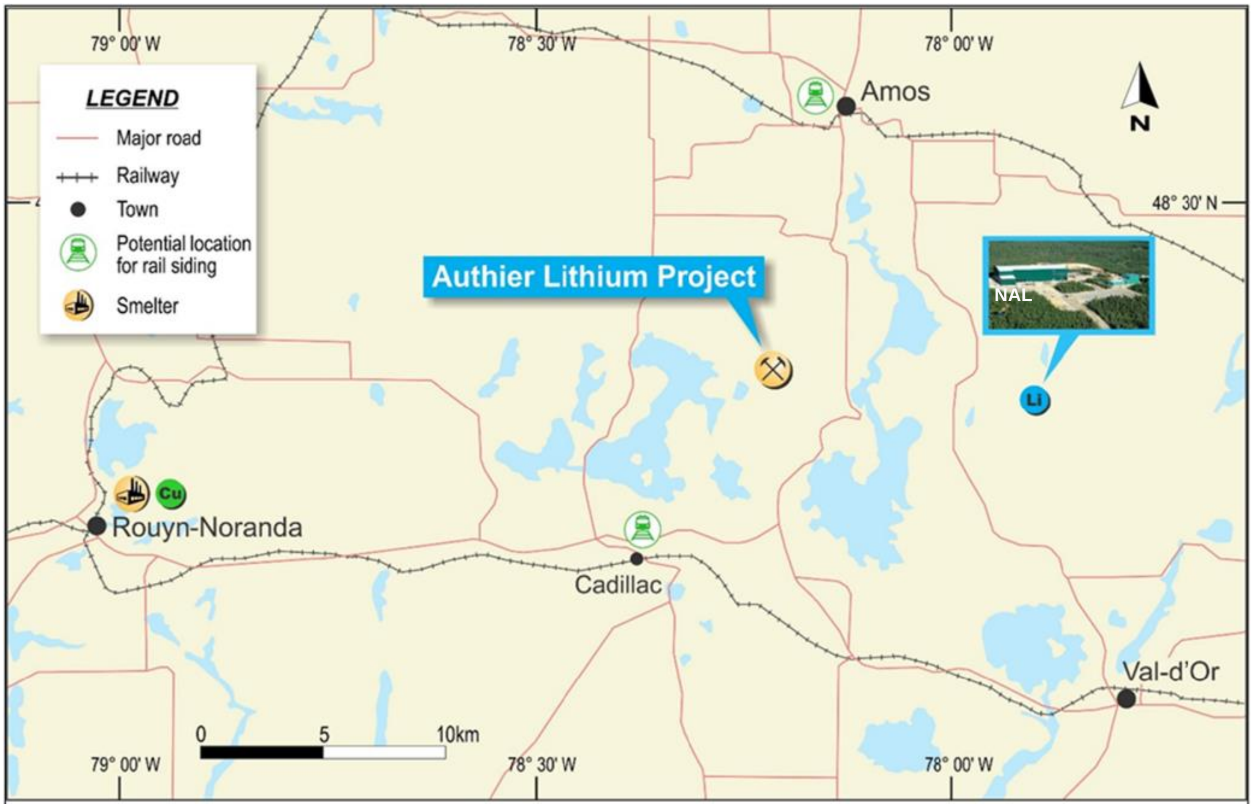


Figure 4-2: Authier proximity to nearby mining services centres

4.2. Property Ownership and Agreements

As of April 6, 2023, the Property consists of one block totaling 24 mineral claims covering 884 ha. The claims are located on Crown Lands in the La Motte and the Preissac Townships. The Property area extends 4.1 km in the east-west direction and 3.3 km in the north-south direction. All of the claims comprising the Property are map designated cells ("CDC"). Figure 4-3 shows the claims map of the Property and a detailed listing of the Authier Property claims is included in Table 4-1.

Approximately 75% of the mineral resources are situated in CDC 2183455, 2194819 and 2116146, with the remainder in claims 2183454 and 2187652 (Figure 4-4).

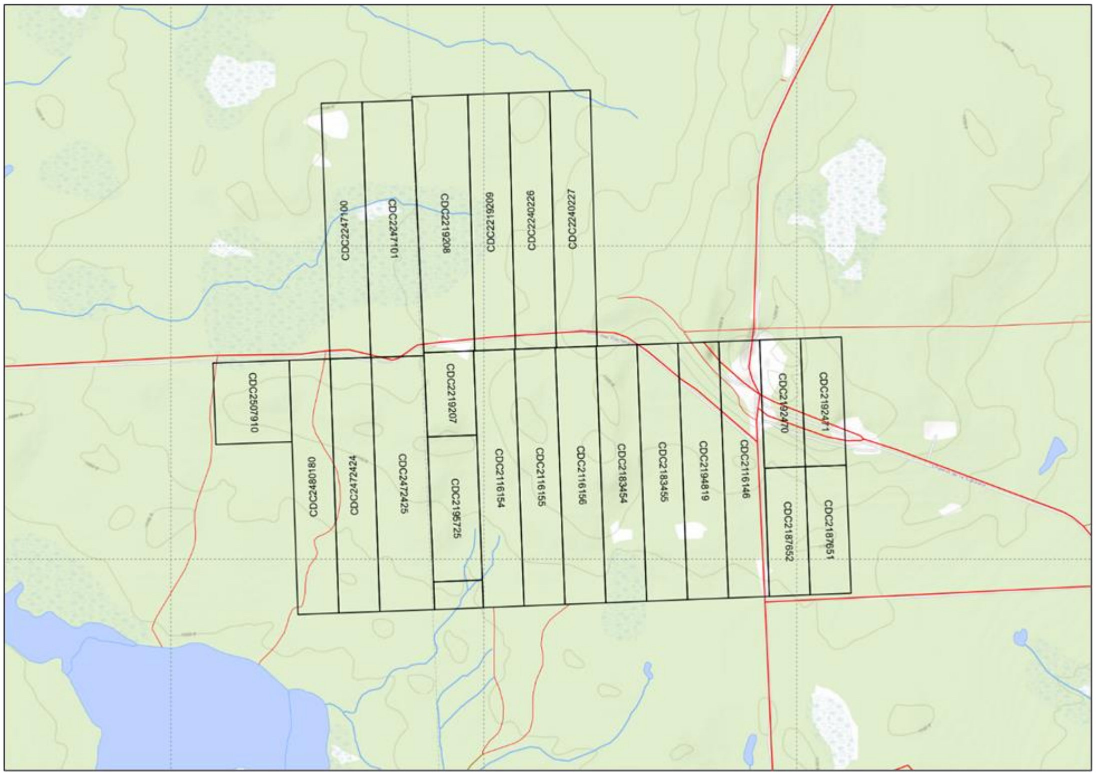


Figure 4-3: Property mining titles location map

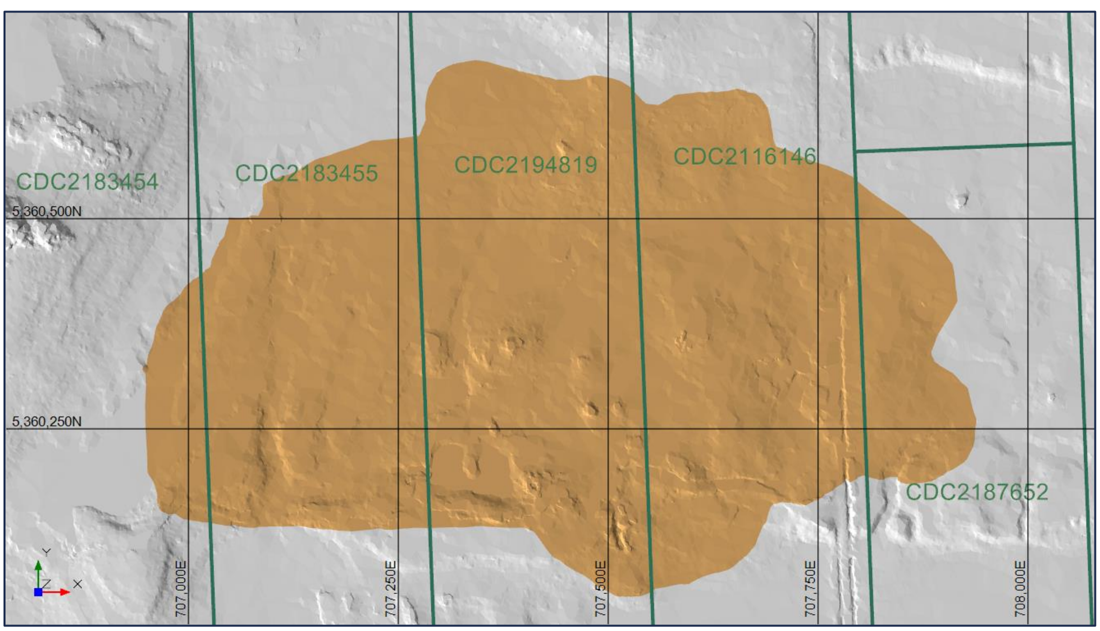


Figure 4-4: Pit relative to claim boundaries

Table 4-1: List of Authier Property claims

Claim Number		Registered holder	Status	Registration date	Expiry date	Area (ha)	Required work ($)
CDC	2116146	Sayona Québec Inc. (100%)	Active	2007/08/08	2025/08/07	43.24	$2,500
CDC	2116154	Sayona Québec Inc. (100%)	Active	2007/08/08	2026/08/07	42.88	$2,500
CDC	2116155	Sayona Québec Inc. (100 %)	Active	2007/08/08	2026/08/07	42.87	$2,500
CDC	2116156	Sayona Québec Inc. (100%)	Active	2007/08/08	2025/08/07	42.86	$2,500
CDC	2183454	Sayona Québec Inc. (100%)	Active	2007/08/08	2025/06/01	42.85	$2,500
CDC	2183455	Sayona Québec Inc. (100%)	Active	2009/06/02	2025/06/01	42.84	$2,500
CDC	2187651	Sayona Québec Inc. (100%)	Active	2009/09/02	2026/09/01	21.39	$1,000
CDC	2187652	Sayona Québec Inc. (100 %)	Active	2009/09/02	2025/09/01	21.29	$1,000
CDC	2192470	Sayona Québec Inc. (100%)	Active	2009/10/22	2025/10/21	21.08	$1,000
CDC	2192471	Sayona Québec Inc. (100%)	Active	2009/10/22	2025/10/21	21.39	$1,000
CDC	2194819	Sayona Québec Inc. (100%)	Active	2009-11-19	2025/11/18	42.82	$2,500
CDC	2195725	Sayona Québec Inc. (100%)	Active	2009/11/27	2026/11/26	29.03	$2,500
CDC	2219206	Sayona Québec Inc. (100%)	Active	2010/04/22	2025/04/21	5.51	$1,000
CDC	2219207	Sayona Québec Inc. (100%)	Active	2010/04/22	2025/04/21	17.06	$1,000
CDC	2219208	Sayona Québec Inc. (100%)	Active	2010/04/22	2025/04/21	55.96	$2,500
CDC	2219209	Sayona Québec Inc. (100%)	Active	2010/04/22	2025/04/21	42.71	$2,500
CDC	2240226	Sayona Québec Inc. (100%)	Active	2010/07/09	2025/07/08	42.71	$2,500
CDC	2240227	Sayona Québec Inc. (100%)	Active	2010/07/09	2025/07/08	42.71	$2,500
CDC	2247100	Sayona Québec Inc. (100%)	Active	2010/08/23	2025/08/22	42.75	$2,500
CDC	2247101	Sayona Québec Inc. (100%)	Active	2010/08/23	2025/08/22	53.77	$2,500
CDC	2472424	Sayona Québec Inc. (100%)	Active	2017/01/11	2026/01/10	42.50	$1,800

Claim Number		Registered holder	Status	Registration date	Expiry date	Area (ha)	Required work ($)
CDC	2472425	Sayona Québec Inc. (100%)	Active	2017/01/11	2026/01/10	55.96	$1,800
CDC	2480180	Sayona Québec Inc. (100%)	Active	2017/02/22	2026/02/21	42.51	$1,800
CDC	2507910	Sayona Québec Inc. (100%)	Active	2017/12/15	2026/12/14	25.35	$1,800
Total						**884.04**	**$48,200**

4.3. Royalty Obligations

Table 4-2 summarizes the royalties payable from the Authier project. As of April 2023, only four tenements contain ore reserves that would create royalty obligations. These are CDC 2183454, 2183455, 2194819 and 2116146.

Table 4-2: Authier project summary royalties

Tenement	Royalty	Royalty Details
2116146	2% NSR royalty payable to Jefmar Inc.	▪ The royalty payable will be based upon the Gross Value less the deductions (costs for treatment and refining, sales, brokerage, certain taxes and transportation). ▪ Gross Value is attributable to a London Metal Exchange ("LME") benchmark price (not necessarily the price actually received). ▪ The royalty enables the owner to transact (for sales or smelting) with an affiliate. However actual prices and treatment charge deductions would be substituted with an arm's-length value for the purposes of calculating the royalty. ▪ 1% of the royalty can be purchased for CAD 1.0 M.
	1.5% NSR royalty payable to RNC	▪ The royalty payable will be based upon the gross value less the deductions (costs for treatment and refining, sales, brokerage, certain taxes and transportation). ▪ No buy-back provision.
2183454 2483455	2% NSR royalty payable to 9187-1400 Québec Inc.	▪ Net Smelter Returns ("NSR") means actual proceeds received by Glen Eagle Resources ("GER") from any mint, smelter or purchaser for sale of ores, metals or concentrated products from the Property and sold after deducting: ○ Smelting, refining charges; ○ Penalties, marketing costs;
2194819	1% NSR royalty payable to 9187-1400 Québec Inc.	

Tenement	Royalty	Royalty Details
		◦ Transportation of ores, metals or concentrates from the Property to any mint, smelter or other purchaser; ◦ Insurance on all ores, metals or concentrates; and ◦ Any export or import taxes on ores, metals or concentrates in Canada or the receiving country. ▪ A 1% NSR can be repurchased on claims CDC 2183454, 2183455 and 2194819 for CAD 1,000,000 leading respectively to a 1%, 1% and 0% on CDC 2183454, 2183455 and 2194819. *Note: Prior to these claims being able to be mined, the final option consideration, due on the day on which a positive feasibility study is completed, will need to be paid to Québec Inc. ("QI"). This amount is equal to CAD500,000 plus an amount equivalent [in cash] to 1,000,000 GER share at that date. This is in addition to the royalty. This remains outstanding and the substitution of GER shares for Sayona shares has not yet been raised with QI.*
2194819	1% GMR payable to Globex Enterprises Inc.	▪ 1% Gross Metal Royalty ("GMR") to Globex. ▪ GMR is a percentage of all metals or mineral compounds including, but not limited to, lithium, lithium compounds, gold, silver, tungsten etc. produced from the Property. ▪ No costs to be included in the Globex royalty calculation. ▪ To be paid in cash or in kind at Globex's option.
2116154 **2116155** **2116156** **2187651** **2192470** **2192471** **2219206** **2219207** **2219208** **2219209** **2247100** **2247101**	2% GMR payable to Globex Enterprises Inc.	▪ 2% GMR to Globex. ▪ GMR is a percentage of all metals including, but not limited to, lithium, gold, silver, etc. produced from the Property. ▪ No costs to be included in the Globex royalty calculation. ▪ To be paid in cash or in kind at Globex's option. ▪ Globex's royalty and metals or minerals shall exclusively be the property of Globex immediately upon production.
2187652	1.5% NSR royalty payable to Canuck Exploration Inc.	▪ 1.5% of NSR payable to Canuck on any resource extracted for commercial purpose derived from the Claim with the exception of surface minerals substances. ▪ NSR is a percentage of the actual proceeds derived from any smelter or mill for the sale of all payable metals less deductions. ▪ Quarterly payments; Canuck has right to audit calculations.

4.4. Permits

In order to construct and operate the mine, Sayona will have to acquire various permits from federal and provincial authorities. Following the obtainment of the general governmental decree, specific permits will need to be obtained from the regional office of the Québec *Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs* ("MELCCFP"). Some other permits are also required by Québec *Ministère des Ressources naturelles et des Forêts* ("MRNF"). Finally, some permits will be required by federal authorities, such as the Department of Fisheries and Oceans Canada ("DFO").

As of April 2023, Sayona has not obtained any of the required permits.

4.5. Environmental Liabilities

A Phase 1 Environmental Evaluation was carried out in 2019 by Norinfra Engineering. Soil characterizations were also performed in 2019 and 2020. No sign of contamination has been observed on this greenfield site and, therefore, there are no environmental liabilities pertaining to the Property.

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

5.1. Accessibility

The Property is accessible by well-maintained secondary gravel roads that connect to Route 109, situated a few kilometres to the east; Route 109 links Rivière-Héva to Amos and continues on to Matagami. Route 109 meets Route 117 at Rivière-Héva, which is the provincial highway linking Val-d'Or and Rouyn-Noranda.

5.2. Physiography

The Property is characterized by a relatively flat topography, with the exception of the northeastern area, where gently rolling hills occur. Outcrops represent approximately 5% of the Project area.

The overburden is relatively thin and is characterized by glacial tills and clays. The land is drained westward by small creeks and local grassy swamps occur in topographic lows.

The area is generally covered by forest populated by mixed balsam, spruce and aspen trees. The Property's elevation above sea level ranges from 320 m at the lowest point to 380 m in the northeastern sector, with an average elevation of 350 m.

5.3. Climate

The region has a continental climate marked by cold, dry winters and hot, humid summers. The nearest weather monitoring station with data on climate normals, maintained by Environment Canada, is the Amos station. According to the available data collected at this weather station from 1981-2010, the coldest month is January with an average daily temperature of -17.2°C. The warmest month is July, with average daily temperature of 17.4°C. Table 5-1 shows average temperatures per month. The record low during this period was -52.8°C, and the record high was 37.2°C.

Table 5-1: Average temperatures by month

Month	Temperature (°C)
January	-17.2
February	-14.6
March	-8.1
April	1.3
May	9.2
June	14.8
July	17.4
August	15.8
September	10.8
October	4.5
November	-4.0
December	-12.4
Annual	**1.5**

The extreme temperatures measured between 1981 and 2010 were 37.2°C and -52.8°C. Temperatures are above freezing approximately 210 days per year.

Data collected shows total annual precipitation was 929 mm, with peak rainfall occurring during July (112 mm average), August (98 mm average) and September (107 mm average). Snowfall is light to moderate, with annual average of 253 cm. Snow typically accumulates from October to April, with average peak snowfall occurring in November (45 cm), December (51 cm) and January (51 cm). Peak snow depth averaged 68 cm in February. On average, the Property is frost-free for 97 days, though discontinuous permafrost exists in the area. Hours of sunlight vary from 15.5 hours at the summer solstice in June to 8.1 hours at the winter solstice in December. Table 5-2 shows the average annual precipitation with the proportions of rain and snow.

Table 5-2: Average monthly precipitation with the proportions of rain and snow

Month	Precipitation (mm)	Rain (mm)	Snow (cm)
January	56	4	51
February	36	3	33
March	50	12	38
April	65	40	25
May	87	85	2
June	94	94	0
July	112	112	0
August	98	98	0
September	107	107	1
October	87	79	8
November	79	34	45
December	59	7	51
Annual	**929**	**676**	**253**

**Numbers may not add due to rounding*

Under normal circumstances, exploration and mining operations are conducted year-round without interruption due to weather conditions.

5.4. Local Infrastructure

The Project is located in a well-developed mining region with readily available support facilities and services. The towns of Val-d'Or and Rouyn-Noranda, with populations of roughly 26,000 and 42,000, respectively, are well known for their mining history. The agricultural town of Amos, 20 km to the north, has a population of roughly 13,000.

An experienced mining workforce and other mining-related support services will come from these nearby cities.

Val-d'Or and Rouyn-Noranda have well-established hospitals, regional airports, schools, accommodation and telecommunications, which are also readily accessed from the Project site.

Québec is a major producer of electricity as well as one the largest hydropower generators in the world. Green and renewable, it is well distributed through a reliable power network. Power will be accessed 5 km to the east of the Project site via an electrical grid supplied by low-cost, hydroelectric power.

CN Rail has an extensive railway network throughout Canada. The closest rail connections to export shipping ports are located at Cadillac and Amos, 20 km to the southwest of the Property. The rail network connects to Montréal and Québec City, and to the west through the Ontario Northland Railway and North American rail system.

High- and low-pressure natural gas pipelines are located in close proximity to the Authier site, although no immediate reliance upon natural gas is anticipated.

5.5. Surface Rights

All of the claims composing the Property are situated on Crown Lands. There is no reason to believe that Sayona will not be able to secure the surface rights needed to construct the infrastructure related to a potential mining operation and waste disposal areas and other infrastructures in the mine industrial area (“MIA”).

6. PROJECT HISTORY

A series of geological surveys and geoscientific studies were conducted by the Québec Government in the Project area between 1955 and 1959, and again in 1972.

In 1956, an electrical resistivity (potential) survey was completed by Kopp Scientific Inc. in the central portion of the Property. In 1958, East-Sullivan Mines Ltd. conducted magnetic and polarization surveys, followed by six drillholes ("DH") located in the southwestern area of the Property. In 1963, Space Age Metals Corp., exploring for magmatic sulphides, completed magnetic and electromagnetic surveys in the area of the main pegmatite dyke. In 1965, Delta Mining Corp. Ltd. conducted additional magnetic surveys in the area.

From 1966 until 1969, exploration work was conducted under the direction and supervision of Mr. George H. Dumont, consulting engineer. The exploration programs, originally designed for magmatic sulphides, successfully outlined the main spodumene-bearing pegmatite on the Property. The work included magnetic and electromagnetic surveys, as well as 23 diamond drillholes ("DDH") totalling 2,611.37 m.

In 1969, the Québec Department of Natural Resources carried out a series of flotation tests on two drill core composite samples. The bulk sample was composed of split core from DH AL 14 (50 m) and DH AL-19 (38.1 m). The results confirmed that the material was amenable to concentration by flotation, producing commercial grade spodumene concentrate, assaying between 5.13% and 5.81% Li_2O with recovery ranging from 67% and 82%.

In 1978, Société Minière Louvem Inc. completed two DDH, AL-24 and Al-25, on the western extension of the pegmatite dyke for a total of 190.5 m.

In 1980, Société Québécoise d'Exploration Minière ("SOQUEM") completed six DDH (80-26 to 80-31), totalling 619.96 m in the central portion of the spodumene-bearing pegmatite. At the same time, 224 core samples from previous drilling, done between 1967 and 1980 on the pegmatite dyke, were re-assayed for Li_2O.

In 1989, the Ministre de l'énergie et des ressources, today the *Ministère des Ressources Naturelles et de la Faune* ("MRNF"), released the results of a regional metallogenic study on lithium prospects and other high technology commodities in the Abitibi-Témiscamingue region (Boily et al. 1989).

In 1991, Raymor Resources Ltd. ("Raymor") conducted small-scale metallurgical testing of pegmatite rocks mineralized in spodumene sampled on the Property. An 18.3 kg sample grading 1.66% Li_2O was tested in 1991 by the *Centre de Recherche Minérale* ("CRM"). Results of the metallurgical testing returned a concentrate grade of 6.3% Li_2O with recovery rate of 73%.

In 1993, Raymor conducted additional drilling of 33 holes for a total of 3,699.66 m with the objective of verifying the presence and detailing the geometry of the spodumene-bearing pegmatite. Raymor also conducted geological mapping and trenching and started a 30-t bulk sampling of the pegmatite dyke, which was completed in 1996.

In 1997, Raymor contracted the CRM to conduct additional metallurgical testing. The tests were conducted on two different samples weighing roughly 18 t (with an average grade of 1.32% Li_2O), and 12 t, (with an average grade of 1.10% Li_2O). Testwork results for the first sample returned a concentrate grade of 5.61% Li_2O with a recovery rate of 61% following magnetic separation. The second sample returned a final concentrate grade of 5.16% with a recovery rate of 58%.

Historical mineral resource estimates from 1994 were then revised in 1999 by Karpoff for SOQUEM and Raymor. The final historical Mineral Resources totalled 2,424,400 t at an average grade of 1.05% Li_2O, using a cut-off grade of 0.5% Li_2O. To these Mineral Resources, Karpoff defined an additional 1,580,000 t of historical resources in the Possible category, without specifying the Li_2O grade.

Raymor concluded an agreement with SOQUEM in 1999. The group completed a prefeasibility study on the Project, including additional metallurgical testing. The metallurgical test results underlined the difficulty of generating a high quality spodumene concentrate. The economic analysis returned a negative internal rate of return (“IRR”), making the Project uneconomic at that time.

Glen Eagle Resources (“GER”) acquired the Project in 2010, and completed a number of mapping, sampling, drilling, metallurgical, and resource definition programs as well as a Preliminary Economic Study in 2012.

In November 2010, a ground magnetic survey was performed on the Authier Property. The survey was executed by Services Forestiers et d’Exploration GFE and the data was processed by MB Geosolutions at the request of Glen Eagle. The survey totalled 53.5 line-km and was done through the forest without a cut line grid. The lines were read with a GSM-19 Overhauser magnetometer, built by the company GEM of Toronto, which was used in walking mode with the locations of the readings determined by an integrated GPS.

The magnetic measurements were taken continuously along 23 traverse lines for a total of 66,027 readings at every 1.25 m. Magnetic diurnal was monitored with a base station and the magnetic readings were corrected accordingly. Figure 6-1 presents the results of this survey.

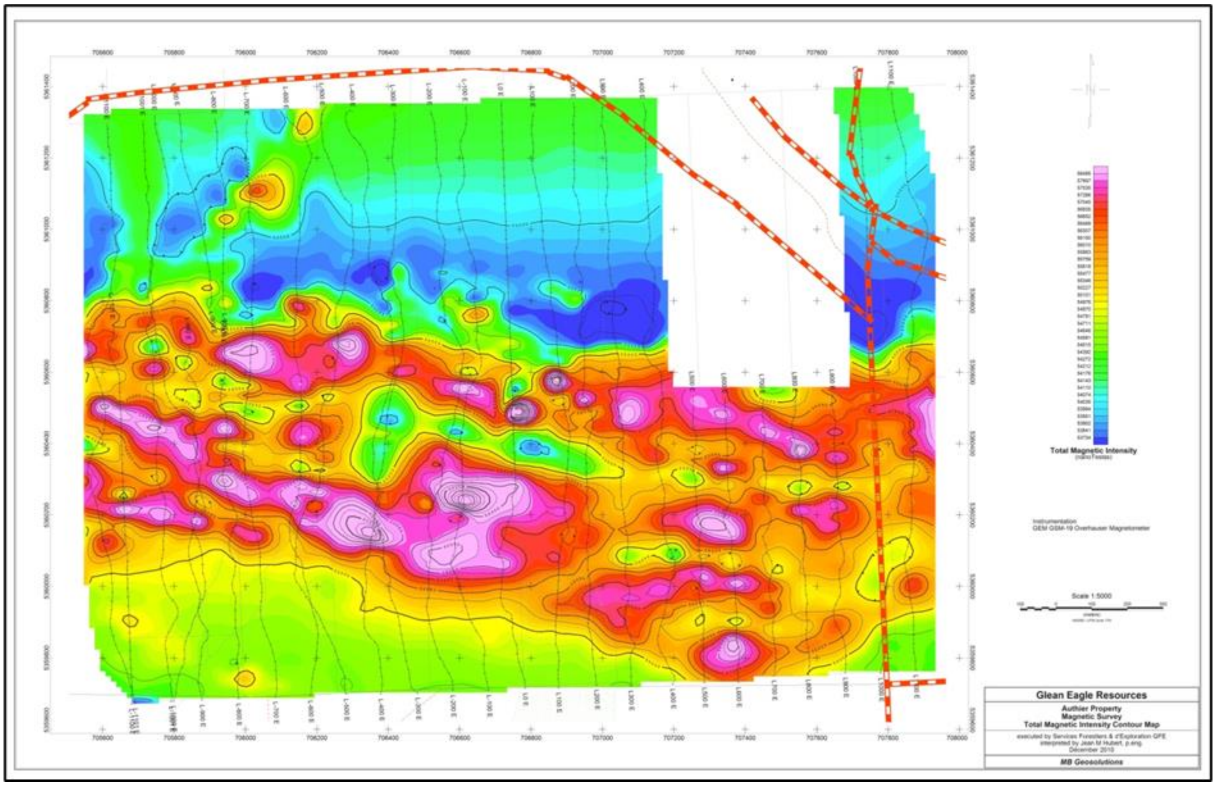


Figure 6-1: 2010 Authier Property magnetic survey

In August 2011, a geochemical survey program was completed in an effort to discover new spodumene-bearing pegmatites. Eighty-six samples were collected, mainly in the northwest sector of the Property. Four samples were collected on the main pegmatite and were analyzed for the major elements. The geochemical signature of the collected samples was compared to the signature of the main pegmatite and only a few samples were determined to have a similar signature. Three DH were drilled in the area of these samples; muscovite-bearing pegmatites were discovered with little, or no, spodumene.

From 2010 to 2012, Glen Eagle completed 8,990 m in 69 diamond, NQ diameter DH on the Authier Property; 7,959 m were drilled on the Authier Deposit; 609 m (five DDH) were drilled on the northwest and 422 m on the south-southwest sectors of the Property.

From these DH, 1,474 samples were collected for analysis, representing approximately 18% of the drill core material. The DH are generally spaced 25 m to 50 m apart, with azimuth generally south dipping (180°) and dip ranging from 45° to 70°. The mineralized drill intersection ranged from near true thickness to 85% true thickness.

The spodumene-bearing pegmatite is principally defined by one single continuous intrusion or dyke, which contains local rafts or xenoliths of the amphibolitic host rock that can be a few metres thick and up to 200 m in length.

In 2012, Glen Eagle conducted further testing on a 270 kg composite sample and achieved very attractive results, including an 88% metallurgical recovery to a 6.09% Li_2O concentrate. The results were achieved in batch flotation tests, after passing the concentrate through wet high-intensity magnetic separation ("WHIMS") and two-stage cleaning, without mica pre-flotation. Bumigème Inc. used the results of this program to design a conventional process flowsheet incorporating crushing, grinding and flotation for the Authier NI 43-101 Preliminary Economic Assessment (2013). The flowsheet contemplated the processing of 2,200 tpd of ore at 85% metallurgical recovery, producing a 6% Li_2O spodumene concentrate. This assessment suggested the technical and commercial viability of developing the Deposit and reported Mineral Resources at the time, which were a combined Measured and Indicated historical resources of 7.67 Mt at 0.96% Li_2O (Table 6-1).

Table 6-1: Glen Eagle 2013 Historical Estimate
(NI 43-101 compliant at 0.5% Li_2O cut-off)

Category	Tonnes	Grade (% Li_2O)	Contained Li_2O (t)
Measured	2,244,000	0.95	21,318
Indicated	5,431,000	0.97	52,681
Total	7,675,000	0.96	73,999
Inferred	1,552,000	0.96	14,899

Although the 2013 Glen Eagle Authier historical estimate was done according to industry's best practices following the CIM guidelines, from a block model estimated by inverse distance squared, using composited datapoints within a mineralized 3D wireframe model, the Authier Deposit estimate presented above is considered by the author as a historical estimate from a previous owner and should not be relied upon.

The author has updated the Authier Deposit resources and done additional sufficient work to classify and disclose current Mineral Resources. These current Mineral Resources are fully described in Chapter 14. The presence of the historical estimates is solely for comparison purposes.

In August 2016, Sayona completed the acquisition of the Authier Property for CAD4.0M. In September of the same year, Sayona drilled 19 DDH, for a total of 3,982 metres, prior to completion of a prefeasibility study undertaken by SGS.

From January to March 2017, 31 DDH were done, totalling 4,122 metres, drilled for definition and metallurgical testing. A prefeasibility study update was completed in December 2017 by Wave International Ltd.

From January to March 2018, 19 DDH were completed, for a total of 2,025 metres, to confirm lithium mineralization at depth. Following this program, an updated Joint Ore Reserves Committee ("JORC") Mineral Resources was produced returning 17.18 Mt at 1.01% Li_2O in the Measured and Indicated category and 3.76 Mt @ 0.98% Li_2O in the Inferred category. Towards the end of 2018, Sayona completed a seven DDH program totalling 342.5 metres for condemnation purposes. A definitive feasibility study was completed for the Project in September 2018 by BBA Inc. The Project contemplated an open-pit mine and 675,500 tpy flotation concentrator.

In October 2019, BBA Inc. produced an updated feasibility study for the Authier Project. The Project contemplated an open-pit mine and 883,000 tpy flotation concentrator.

In September 2021, 25 DDH, totalling 3,908 metres, were completed on exploration and definition targets.

7. GEOLOGICAL SETTING AND MINERALIZATION

7.1 Regional Geology

The Authier property is located in the southeast part of the Superior Province of the Canadian Shield craton, more specifically in the Southern Volcanic Zone of the Abitibi Greenstone Belt. The spodumene-bearing pegmatites observed on the Property are genetically related to the Preissac-La Corne batholith (Figure 7-1) located 40 km northeast of the city of Val-d'Or (Corfu, 1993; Boily, 1995; Mulja et al., 1995a).

The Preissac-La Corne batholith is an Archean-age syn- to post-tectonic intrusive complex that intruded along the La Pause anticline into the volcano-sedimentary units of the Malartic Composite Group. The rocks of the Malartic Group are metamorphosed to the greenschist to lower amphibolite metamorphic grade and are bounded to the north by the Manneville fault and by the Cadillac-Larder Lake fault to the south. The units comprising the Malartic Group are mafic to ultramafic metavolcanic rocks (serpentinized peridotites, amphibolitic mafic flows) and metasedimentary units (biotite schists derived from greywackes). The Preissac-La Corne batholith comprises early-stage metaluminous intrusive suites, dioritic to granodioritic in composition, and four late-stage peraluminous monzogranitic plutons: Preissac, La Corne, and La Motte and Moly Hill plutons. Late Proterozoic-age diabase dykes crosscutting all the lithologies can also be observed in the region (Boily, 1995; Mulja et al., 1995; Desrocher and Hubert, 1996).

The pegmatite dykes and other aplitic dykes and veins observed in the region are genetically derived from the late peraluminous plutons. More than one thousand intrusions of mineralized, but mostly barren, pegmatite dykes have been mapped in the vicinity of the Preissac-La Corne batholith. These intrusions cross-cut all of the units of the Malartic Group and intrusive lithologies of the batholith, with the exception of the late Proterozoic diabase dykes. The pegmatites and the aplitic intrusions occur in two distinct morphologies: tabular, generally strongly dipping dykes with sharp contacts, and irregularly shaped dykes, often comprised of mixed pegmatitic and aplitic lithologies in contact with the country rocks. The dykes can be up to hundreds of metres in length with a thickness varying from a few centimetres to tens of metres, with the majority having less than 1 m in thickness.

The pegmatites can be classified by their spatial distribution within and around the lithologies of the Preissac-La Corne batholith. The pegmatites occurring within, or in, the vicinity of the La Motte and La Corne plutons are generally mineralized in beryl and columbite-tantalite as opposed to the pegmatites observed in association with the Preissac pluton, which are mostly un-mineralized. The spodumene-bearing pegmatites almost exclusively cross-cut lithologies located outside the late stage plutons of the Preissac-La Corne Batholith and can be uniform or present internal zoning enriched in spodumene. The hydrothermal veins mineralized in molybdenite occur inside, near the edges, of the intrusives related to the Preissac and Moly Hill plutons.

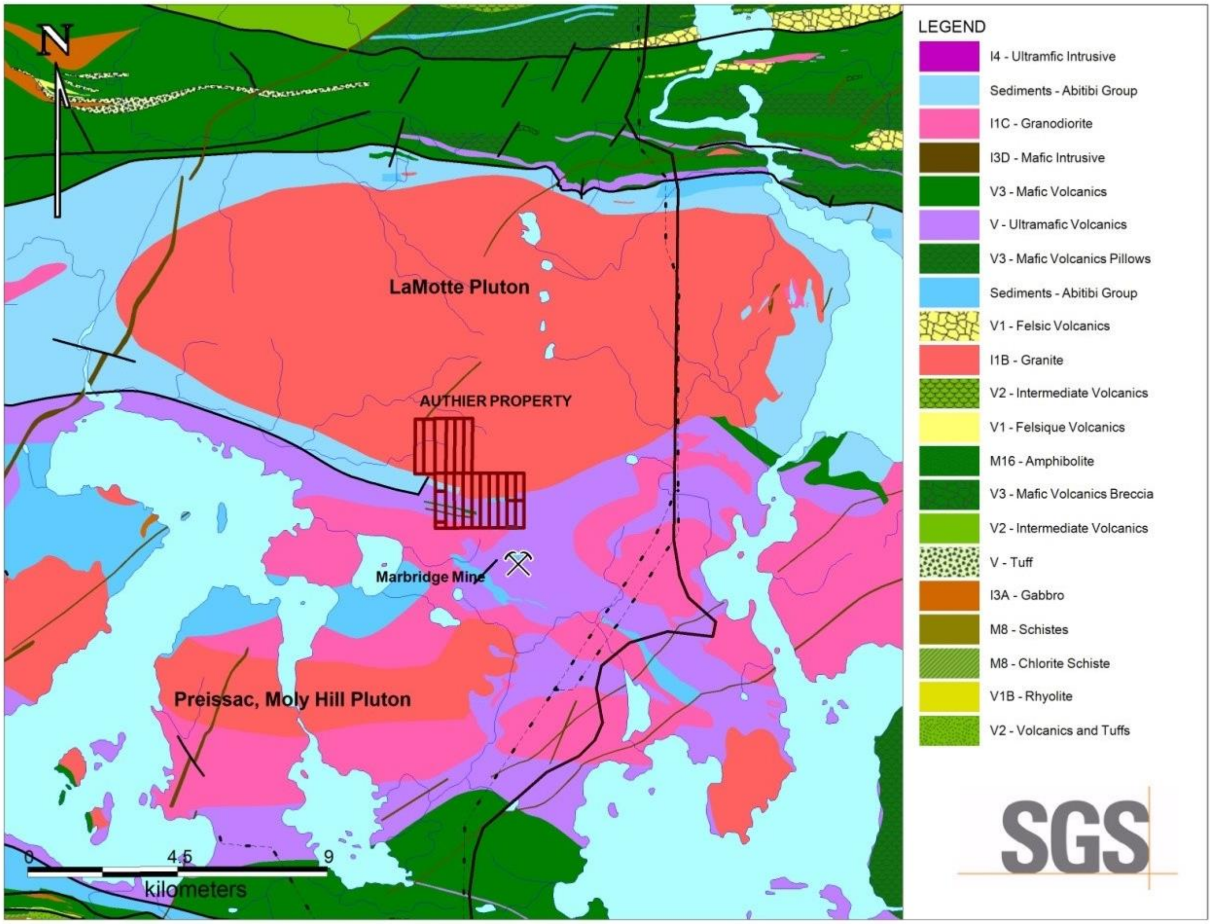


Figure 7-1: Regional geology map

7.2 Property Geology

The Property geology comprises intrusive units of the La Motte pluton to the north and Preissac pluton to the south, with volcano-sedimentary lithologies of the Malartic Group in the centre (Figure 7-2). The volcano-sedimentary stratigraphy is generally oriented east-west and ranges between 500 m and 850 m in thickness (north-south). The volcanic units comprise principally ultramafic (peridotitic) metavolcanic flows with less abundant basaltic metavolcanics. Several highly metamorphosed metasedimentary units, described as hornblende-chlorite-biotite schists, occur on the south-central portion of the Property, generally in contact with the La Motte pluton to the north (Karpoff, 1994).

The northern border of the Preissac pluton, composed of granodiorite and monzodiorite, runs east-west along the southern edge on the Property. To the north, muscovite monzogranitic units of the La Motte pluton cover the Property. Numerous small pegmatites, generally composed of quartz monzonite, are intruding the volcanic stratigraphy, including the larger Authier spodumene-bearing pegmatite, which is the focus of study.

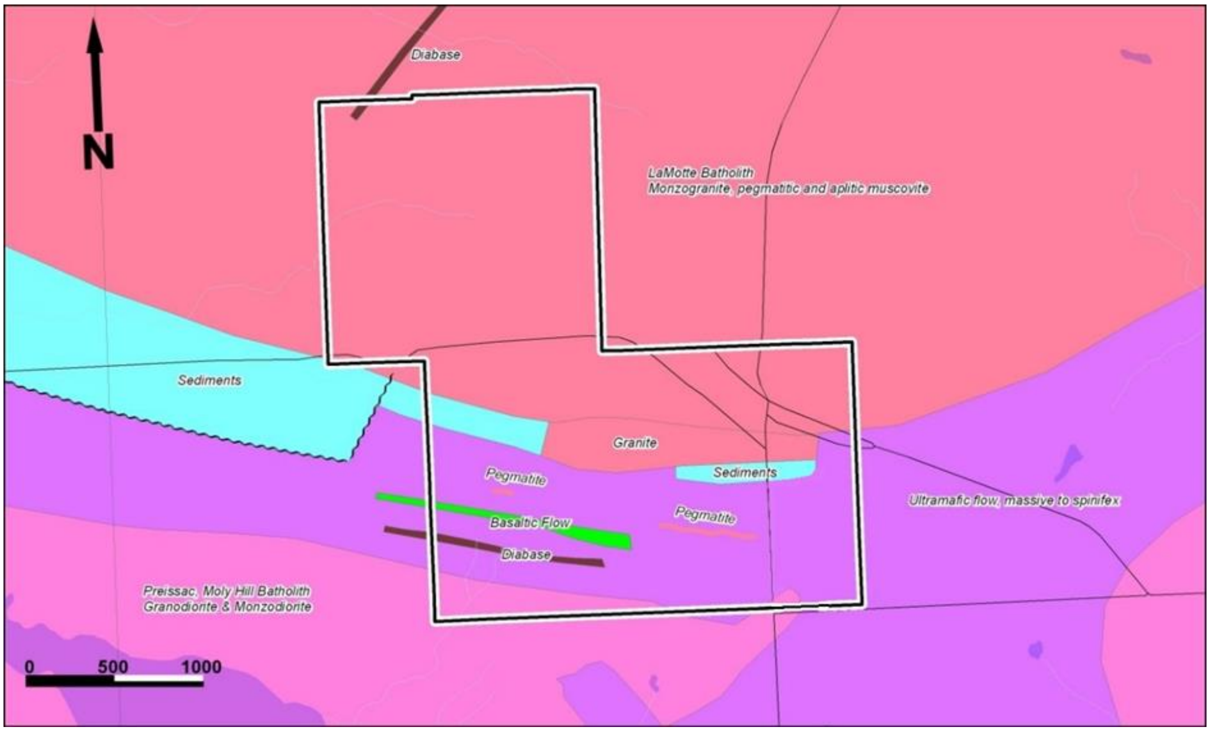


Figure 7-2: Local geological map

7.3 Mineralization

The lithium mineralization observed at the Authier project is mainly spodumene within pegmatite intrusive dykes. There are also trace amounts of beryllium, molybdenum, tantalum, niobium, cesium and rubidium.

Detailed logging of drill core suggests that the main pegmatite at Authier is composed of several internal phases related to intrusive placement and progressive cooling. The outside border of the pegmatite in contact with the host rocks has been identified as a transition zone or border zone. This transition zone is often significantly less mineralized in spodumene and is characterized by a centimetre-scale fine- to medium-grained chill margin, followed by a medium- to coarse-grained decimetre to metre-scale zone. The transition zone often includes fragments of the host rock and can also be intermixed with the material from the core zone.

The main intrusive phase observed in the pegmatite is described as a core pegmatitic zone, characterized by large centimetre-scale spodumene crystals and white feldspar minerals. The core pegmatitic zone shows internally different pegmatitic phases, characterized by different spodumene crystal lengths, ranging from coarse-grained (earlier) to fine-grained (later). The contacts between different spodumene-bearing pegmatite phases are transitional and well defined at core logging scale. Higher lithium grades are correlated with higher concentrations of larger spodumene crystals. Late-mineral to post-mineral aplite phases cut earlier spodumene-bearing mineralization, causing local diminishing of lithium grade. The core zone hosts the majority of the spodumene mineralization at Authier. Figure 7-3 is a photograph that illustrates the transition and core zones from drillhole AL-10-03.

The spodumene-bearing pegmatite is principally defined by one single continuous intrusion, or dyke, that contains local rafts, or xenoliths, of the amphibolitic host rock, which are a few metres thick and up to 200 m in length at shallow levels within the western zone. The main pegmatite outcrops in a small, 50 m by 20 m, area at the central-eastern sector that orients east-west and is mostly covered by up to 10 m of overburden. Based on the information gathered from the drilling, the pegmatite intrusion is more than 1,100 m in length and can be up to 60 m thick. The intrusion is generally oriented east-west, dips to the north at angles ranging between 35° and 50° and reaches depths of up to 270 m below surface in drilling to date.

A second spodumene-bearing pegmatite, not visible from the surface, was intersected by diamond hole AL-16-10 at shallow levels, between 15 m and 22 m downhole depth, approximately 400 m north of the main pegmatite. Follow-up drilling in early 2017 and 2018 outlined this new body, the Authier North pegmatite, which has a strike extension of 500 m east-west, 7 m average width, gently dipping 15 degrees to the north. The Authier North pegmatite appears at shallow levels, 15 m to 25 m vertical depth, and is open in all directions. Figure 7-4 is a photograph showing spodumene mineralization from the new shallow pegmatite intersected by drillhole AL 16-10.

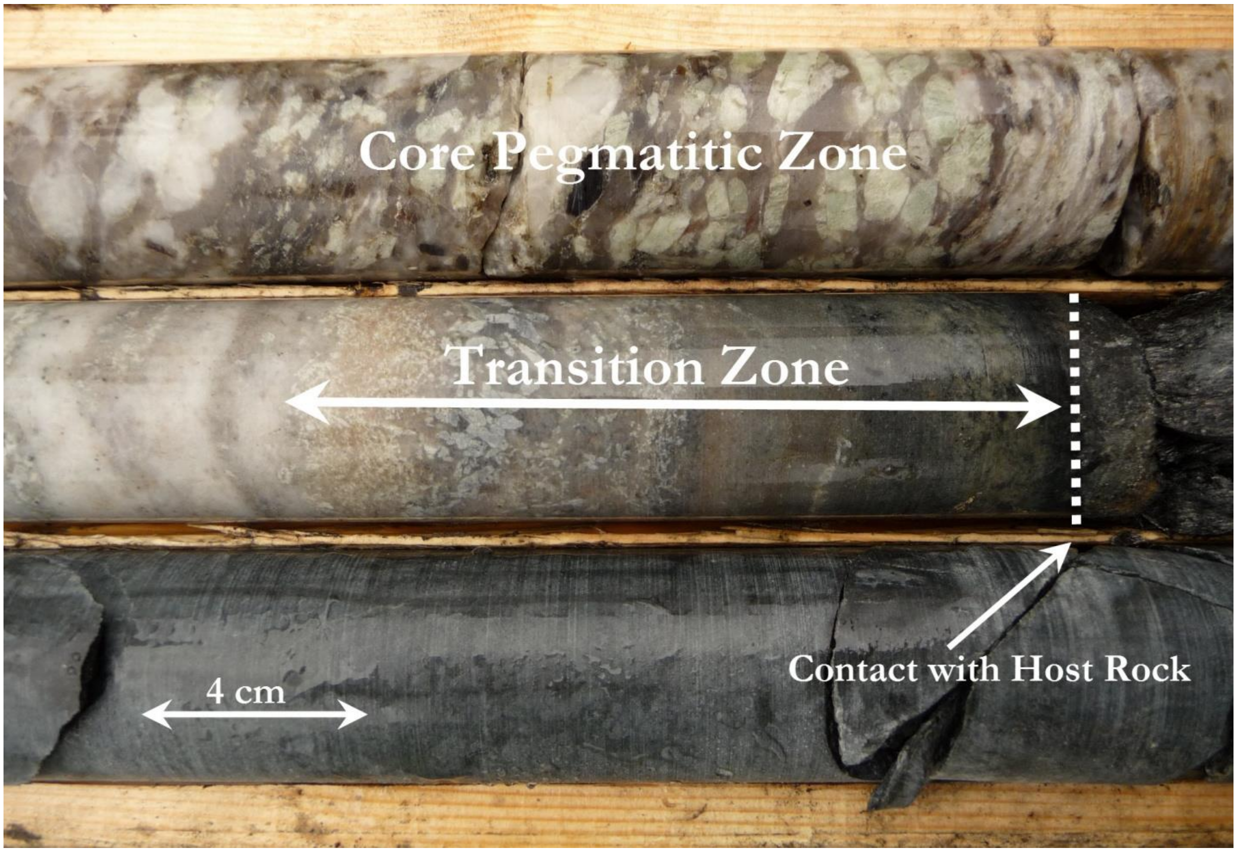


Figure 7-3: Drill core from hole AL-10-03, showing core and transition zones

Figure 7-4: Drill core from hole AL-16-10, showing spodumene mineralization in the new Authier North pegmatite

8. DEPOSIT TYPES

8.1. General

The deposit type for the lithium mineralization occurring on the Authier Property is a granitic pegmatite type, more specifically the rare-element pegmatites subtype, due to the presence of spodumene.

Rare-element pegmatites typically occur in metamorphic terrains and are commonly peripheral to larger granitic plutons which, in many cases, represent the parental granite from which the pegmatite was derived.

The late Archean pegmatites of the Superior Province are typically located along deep fault systems that, in many areas, coincide with major metamorphic and tectonic boundaries. Most pegmatites range in size from a few metres to hundreds of metres long and from centimetric-scale to several hundred metres wide, and even more for a few known cases.

Rare-element pegmatites can have complex internal structures where the internal units in complex pegmatites consist of a sequence of zones, mainly concentric, which conform roughly to the shape of the pegmatite, but differ in mineral assemblages and textures. From the margin inward, these zones consist of a border zone, a wall zone, intermediate zones and a core zone.

The border zone is generally thin and typically aplitic or fine-grained in texture. The wall zone, composed mainly of quartz-feldspar-muscovite, is wider and coarser grained than the border zone and marks the beginning of coarse crystallization characteristic of pegmatites. Intermediate zones, where present, are more complex mineralogically and contain a variety of economically important minerals such as sheet mica, beryl and spodumene.

In the intermediate zones of some pegmatites, individual crystal size can reach metres to tens of metres. The core zone consists mainly of quartz, either as solid masses or as euhedral crystals.

Rare-element pegmatites, typically associated with granitic intrusions, are distributed in zonal patterns around such intrusions. In general, the pegmatites most enriched in rare metals and volatile components are located farthest from intrusions (Figure 8-1).

Rare-element pegmatites are generally considered to form by primary crystallization from volatile-rich siliceous melt related to highly differentiated granitic magmas.

The lithology of the source rocks for these melts is a major control on the ultimate composition of subsequently formed rare-element pegmatites (Cerny, 1993; Sinclair, 1996)

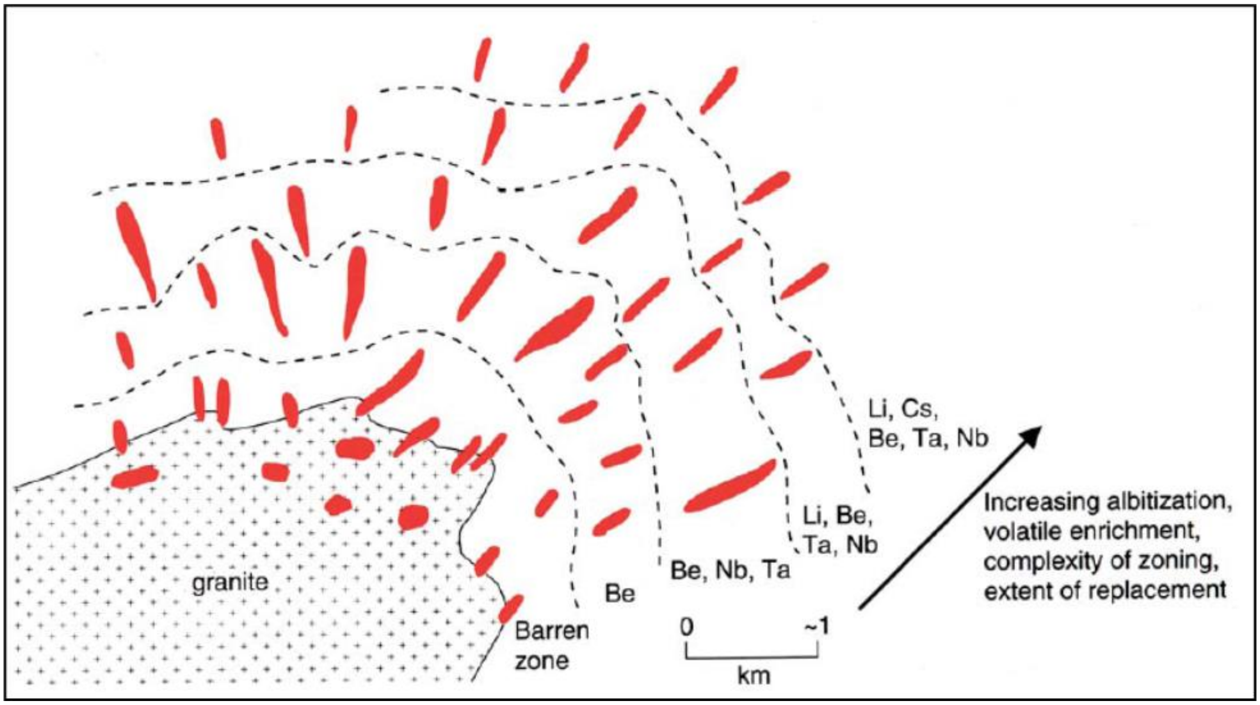


Figure 8-1: Schematic representation of regional zonation of pegmatites source (Image from Sinclair 1996 [modified from Trueman and Cerny 1982])

9. EXPLORATION

The Glen Eagle 2010-2012 diamond drilling campaign was preceded by prospecting geochemical sampling and geophysical surveys that covered the Authier Lithium Deposit targeted areas. This work confirmed the presence of several pegmatite occurrences across the Property. Drilling on the Northwest of the Property has been done on pegmatites with a similar geochemical signature to the main Authier pegmatite. A bulk sample was taken for metallurgical studies for which the results have not been received.

9.1. Geophysics

In November 2010, a ground magnetic survey was performed on the Authier Property. The survey was executed by Services Forestiers et d'Exploration GFE and the data was processed by MB Geosolutions at the request of Glen Eagle. The survey totalizes 53.5 line-km and was done through the bush without a cut line grid. The lines were read with a GSM-19 Overhauser magnetometer, built by the company GEM of Toronto. It was used in walking mode and the locations of the readings were determined by an integrated GPS (Figure 9-1).

The magnetic measurements were taken continuously along 23 traverse lines for a total of 66,027 readings at every 1.25 m. Magnetic diurnal was monitored with a base station and the magnetic readings have been corrected accordingly.

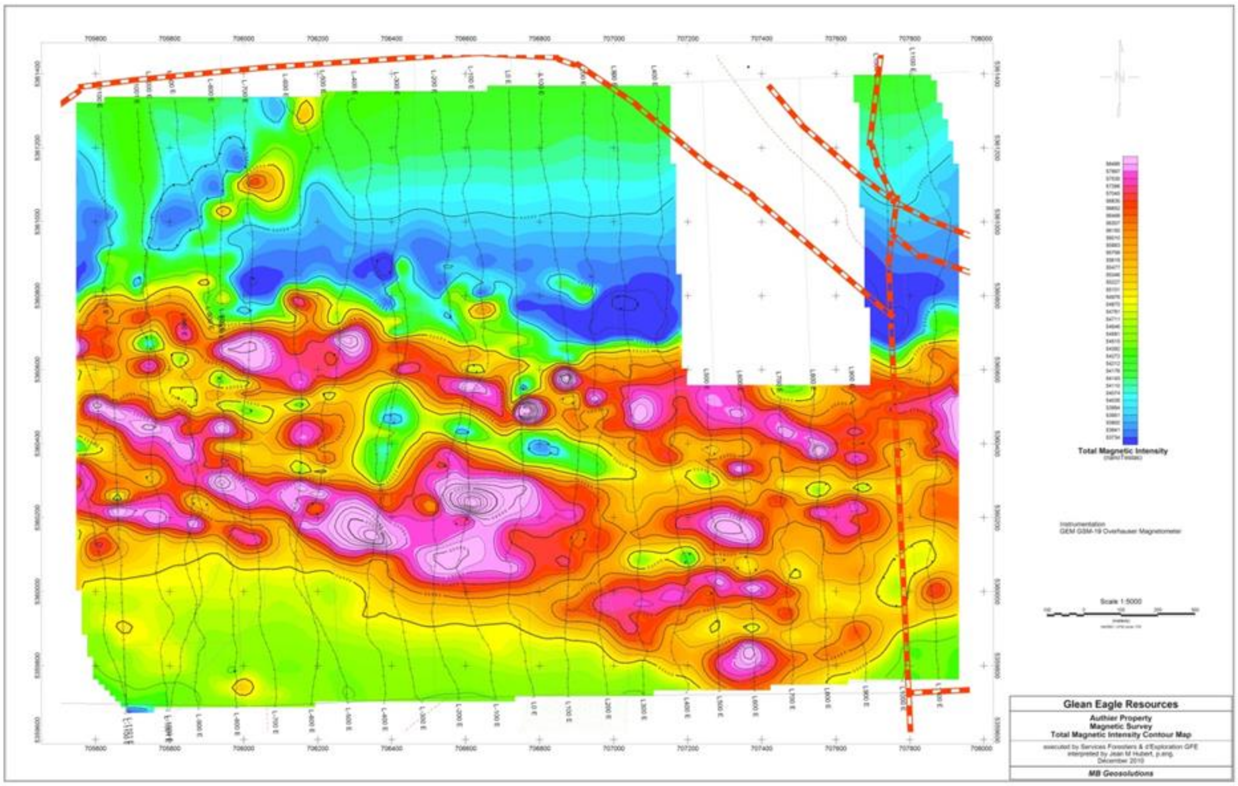


Figure 9-1: 2010 Authier Property magnetic survey

9.2. Geochemistry

In August 2011, a geochemical survey program was undertaken in an effort to discover new spodumene-bearing pegmatites. Eighty-six samples were collected mainly in the northwest part of the Property. Four samples were collected on the main pegmatite. The samples were analyzed for the major elements. The geochemical signature of the collected samples was compared to the signature of the main pegmatite and only a few samples were determined to have a similar signature. Three drillholes were drilled in the area of these samples. Muscovite-bearing pegmatites were discovered with little or no spodumene.

10. DRILLING

10.1 Historical Drilling

Several exploration companies have previously conducted drilling programs on the Authier Property, mainly the pegmatite, as described in Chapter 6 (History).

A total of 19,736 m of historical drilling was completed on the Property. Figure 10-1 shows a plan view of the historical drillholes. All the historical drilling that predates Sayona was diamond core of NQ diameter.

Table 10-1: Summary of drilling completed on the Property prior to the Sayona acquisition in 2016

Period	Drillholes Series	Number of Diamond Drillholes (DDH)	Metres Drilled
Historical	GM-XX	5	1,176
	LG-XX	12	2,437
	AL-XX	31	3,433
	R-93-XX	33	3,700
Glen Eagle Resources	AL-10-XX	18	1,905
	AL-11-XX	27	4,051
	AL-12-XX	24	3,034
Total		**150**	**19,736**

10.2 Sayona Drilling Summary

Sayona Québec has completed three drilling programs at the Authier Property, including:

- Phase 1 program in October/November 2016 of 18 holes, totalling 3,967 m. Following the drilling program, Sayona completed an upgrade of the resource and completed a Prefeasibility Study, dated February 2017;
- Phase 2 diamond drilling program in May 2017 of 31 holes totalling 4,117 m; and
- Phase 3 diamond drilling program in November/December 2017, which comprised seven diamond holes (PQ and HQ) for 769.5 m and the collection of five tonnes of core for pilot metallurgical testing; January / March 2018, which comprised 19 holes, NQ diameter, totalling 2,170.45 m; April 2018, involving condemnation drilling, six holes, NQ diameter, for 342.65 m.

The drilling performed by Sayona since acquiring the Authier Property from Glen Eagle is 81 holes for 11,367.5 m. From this database, 199 drillholes were used for the solid modelling and updated Mineral Resource Estimate (“MRE”). All holes completed by Sayona in both programs have been diamond core drillholes (“DDH”) using HQ or NQ core diameter size with a standard tube and bit. Core diameter for metallurgical drilling was done using PQ core for 680 m and HQ core for 89.5 m . Condemnation drilling was done using NQ core diameter.

Core was oriented using a Reflex ACT III tool for Phase 1 and Phase 2, whereas Phase 3 diamond core was not oriented.

The drilling programs were planned and managed by Sayona’s Qualified Person, assisted by one of Sayona’s project geologists. In addition, Sayona contracted *Services Forestiers et d’Exploration GFE* (“GFE”) for the permitting and logistic support of the drilling program. GFE provided the office, core logging and storage facilities to Sayona, which are located less than 4 km southeast from the main pegmatite dyke, near the town of La Motte.

All drill core handling was done on-site with logging and sampling processes conducted by employees and contractors of Sayona.

Drill core of HQ size was placed in wooden core boxes and collected twice a day at the drill site and then transported to the core logging facilities. The drill core was first aligned and measured by a technician or the geologist for core recovery. After a summary review of the core, it was oriented and geologically and geotechnically logged, including rock type, spodumene abundance, mica abundance, rock quality designation (“RQD”), orientation data (alpha and beta angles) for structures (faults, fractures, etc.). Point load tests (one each, 10 m average) have also been undertaken. The logging of the geological features was predominately qualitative. Parameters such as spodumene abundance are visual estimates by the logging geologist.

The observations of lithology, structure, mineralization, sample number and location were noted by the geologists and geotechnicians in hard copy and an excel spreadsheet, and then recorded in a Microsoft Access digital database. Copies of the database are stored on an external hard drive for security. Sampling intervals were defined by a geologist. Before sampling, core was photographed using a digital camera after metre marks and sample intervals have been clearly marked on the core. The core was photographed dry and wet. The core boxes were identified with the box number, hole ID, from and to using aluminum tags. The entire target mineralization type core, i.e., spodumene pegmatite, and surrounding barren host rock has been logged, sampled, and assayed.

The footwall and hanging wall barren host rock has been summary logged. Main rock units, i.e., pegmatite and host rock, are competent with average core recovery around 99%. High competence of the core tends to preclude any potential issue of sampling bias and sampling is considered representative.

Sampling intervals were determined by the geologist, marked and tagged based on observations of the lithology and mineralization. The typical sample length is 1.0 m, starting 2 m to 3 m above and below the contact of the pegmatite with the barren host rock. In general, at least two host rock samples were collected each side from the contact with the pegmatite. High- to low-grade lithium-bearing mineralization, i.e., spodumene, is visible during geological logging and sampling.

The drill core samples were split into two halves with one half-placed in a new plastic bag along with the sample tag; the other half was placed in the core box with the second sample tag for reference. The third sample tag was archived on-site. The samples were then catalogued and placed in rice bags or sealed pails for shipping. The sample shipment forms were prepared on-site with one copy inserted into one of the shipment bags and one copy kept for reference.

Full core was sent to the laboratory for PQ and NQ diameter samples taken for the metallurgical drilling program.

As with the 2017 and 2016 samples, the 2018 samples were transported on a regular basis by a courier truck contracted by Sayona, directly to the SGS facilities in Lakefield, Ontario. Sample preparation and assaying techniques are within industry standard and appropriate for this type of mineralization.

All core drilling before 2016 was NQ core diameter size only, standard tubes and bit, and not oriented.

10.3 Sayona Québec Drilling 2016

Sayona Québec completed a Phase 1 diamond drilling program at the Authier Property, including 18 holes for 3,967 m (Figure 10-1), which had the following objectives:

- Converting the Inferred Mineral Resources to be Measured and Indicated through further drilling;
- Exploring for extensions to the existing Mineral Resources and other potential mineralization within the tenement package;
- Collecting geotechnical data for incorporation in the Authier prefeasibility study; and
- Collecting additional drill core for any additional metallurgical testing that may be required to complete a definitive feasibility study.

Holes were typically drilled perpendicular to the strike of the mineralized pegmatite to provide high confidence in the grade, strike and vertical extensions of the mineralization.

The final diamond drillholes (Table 10-2) have all intersected high-grade spodumene mineralization, including:

Table 10-2: Phase 1 Sayona drillhole collar location and intercept information (downhole intersections in metres)

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-16-001	707525	5360175	330	180	-45	87	12	74	62	1.35
including							27	43	16	1.65
AL-16-002	707525	5360245	330	180	-45	111	50	99	49	1.18
including							81	98	17	1.49
AL-16-003	707600	5360500	331	180	-55	267	170	197	27	1.46
including							181	192	11	1.66
							213	223	10	1.24
including							218	221	3	1.63
AL-16-004	707525	5360430	331	180	-55	246	156	206	50	1.13
including							157	168	11	1.4
							200	205	5	1.89
AL-16-005	707500	5360520	332	180	-55	294	197	202	5	1.44
							218	243	25	1.08
including							218	232	14	1.18
AL-16-006	707650	5360210	330	180	-45	105	16	60	44	1.02
including							16	35	19	1.45
AL-16-007	707479	5360174	330	180	-45	90	3.81	44	40.19	1.27
including							13	33	20	1.47
AL-16-008	707475	5360425	330	180	-60	234	162	198	36	0.93
including							163	173	10	1.32
AL-16-009	707245	5360478	330	180	-60	249	192	230	38	1.1
including							192	215	23	1.35
AL-16-010	707500	5360580	330	180	-55	330	15	22	7	1.36
including							17	19	2	2.24
							236	241	5	1.36
							258	266	8	0.85
including							264	266	2	1.42
AL-16-011	707220	5360420	330	180	-65	204	135	181	46	1.26
including							137	161	24	1.62

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-16-012	707500	5360460	331	180	-55	240	161	208	47	1.05
including							167	194	27	1.31
AL-16-013	707175	5360478	331	180	-60	234	184	208	24	1.25
							216	224	8	0.91
AL-16-014	707600	5360440	331	180	-55	241	148	193	45	1.08
including							149	157	8	1.36
							171	189	18	1.34
							203	207	4	1.65
AL-16-015	707175	5360550	330	180	-60	279	242	262	20	1.32
including							248	259	11	1.61
AL-16-016	707400	5360425	331.47	180	-60	252	158	186	28	1.2
including							162	180	18	1.39
AL-16-017	707280	5360500	330	180	-60	240	190	235	45	1.28
including							190	213	23	1.77
AL-16-018	707318	5360465	330	170	-55	264	197	201	4	0.99
							206	213	7	0.95
							218	228	10	1.2
including							219	225	6	1.48

Note: Downhole widths are not true widths

The highlights of the 2016 drilling program include:

- Fourteen new drillholes successfully tested the deep extensions of mineralization on the main Authier pegmatite;
- Holes AL-16-01, 02, 06 and 07 successfully tested the geometry of the Authier pegmatite at shallow levels in the eastern and central sectors to upgrade the resource categories from Indicated to Measured;
- Hole AL-16-16 intersected a thick zone of spodumene mineralization in the gap zone, between eastern and western zones of the main pegmatite;
- Holes AL-16-03, 04, 05, 08, 10, 12 and 14 extended the lithium mineralization in the eastern sector of the main Authier pegmatite, beyond 200 m of vertical depth;
- In addition, hole AL-16-10 intercepted a new pegmatite at shallow levels between 15 m and 22 m downhole depth, which is not visible from the surface and located 400 m north of the main Authier pegmatite and;
- Holes AL-16-09, 11, 13, 15, 17 and 18 extended the lithium mineralization in the western sector of the main Authier pegmatite, beyond 200 m of vertical depth.

The mineralization remains open in all directions.

10.4 Sayona Québec Drilling 2017

Sayona Québec completed a Phase 2 diamond drilling program at the Authier Property, including 31 holes for 4,117 m (Figure 10-1), having the following objectives:

- Defining the mineralized boundaries and lifting the resource categories in zones in the western sector that were drilled during the 2016 drill program. The 2016 drilling program in the west zone highlighted a number of new high-grade intersections between 120 m to 220 m vertical depth, such as hole AL-16-11, which returned 46 m of 1.26% Li_2O from 135 m, including 24 m of 1.62% Li_2O from 137 m;
- Testing for mineralization in the eastern strike extension at both shallow and deeper levels at a similar vertical level to hole AL-16-14, which intercepted 45 m of 1.08% Li_2O from 148 m, including 8 m of 1.36% Li_2O from 149 m and 18 m of 1.34% Li_2O from 171 m;
- Testing for a vertical extension of the mineralization in the gap zone to follow up hole AL-16-16, which intersected 28 m of 1.20% Li_2O from 158 m, including 18 m of 1.32% Li_2O from 149 m; and
- Assessing the resource potential of the new northern pegmatite, which intersected 7 m of 1.36% Li_2O from 15 m in Sayona's 2016 drilling.

The Phase 2 diamond drillholes are detailed as follows (Table 10-3):

Table 10-3: Phase 2 Sayona drillhole collar location and intercept information (downhole intersections in metres)

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-17-01	707210	5360520	331.5	180	-60	283.0	241.8	251.5	9.7	NS
AL-17-02	707080	5360460	331.0	180	-65	253.0	165.0	197.0	32.0	1.15
including							177.0	184.0	7.0	1.44
and							186.0	192.0	6.0	1.37
AL-17-03	707000	5360500	330.0	180	-60	268.0	222.0	233.0	11.0	1.07
including							226.0	231.0	5.0	1.42
							236.0	240.0	4.0	1.0
AL-17-04	706900	5360425	335.4	180	-70	264.0	166.0	177.0	11.0	0.88
including							166.0	169.0	3.0	1.26
							214.0	225.0	11.0	1.03
including							218.0	222.0	7.0	1.26
AL-17-05	706800	5360425	344.9	180	-75	303.0	199.0	205.0	6.0	1.09
							224.0	243.0	19.0	1.26
including							224.0	233.0	9.0	1.69

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-17-06	706900	5360360	331.9	180	-55	240.0				NS
AL-17-07	706803	5360356	339.0	180	-55	246.0	210.0	211.0	1.0	0.64
							214.0	219.0	6.0	0.89
including							215.0	216.0	1.0	1.48
AL-17-08	706802	5360310	335.0	180	-45	219.0	165.0	173.0	8.0	1.07
including							167.0	170.0	3.0	1.31
AL-17-09	707500	5360630	339.2	180	-55	90.0	26.0	31.0	5.0	0.84
including							28.0	29.0	1.0	2.34
AL-17-10	707500	5360680	340.3	180	-55	78.0	20.0	21.0	1.0	0.62
AL-17-11	707450	5360615	336.9	180	-55	48.0	23.0	29.0	6.0	1.32
including							24.0	27.0	3.0	1.76
AL-17-12	707550	5360615	338.7	180	-55	72.0	27.0	32.0	5.0	0.90
including							30.0	31.0	1.0	1.71
AL-17-13	707720	5360440	332.5	180	-55	228.0	153.0	156.0	3.0	1.17
including							154.0	156.0	2.0	1.32
							163.0	189.0	26.0	1.26
including							169.0	184.0	15.0	1.42
AL-17-14	707780	5360440	332.3	180	-55	213.0	169.0	189.0	20.0	0.95
including							170.0	180.0	10.0	1.19
AL-17-15	707780	5360250	329.8	180	-55	81.0	11.0	14.0	3.0	1.02
including							12.0	13.0	1.0	1.40
AL-17-16	707700	5360210	328.6	180	-50	87.0	8.0	15.0	7.0	0.76
including							10.00	11.0	1.0	1.10
AL-17-17	707830	5360250	327.0	180	-60	57.0	22.0	23.0	1.0	1.13
AL-17-18	707400	5360610	335.8	180	-55	39.0	22.0	26.0	4.0	0.82
AL-17-19	707350	5360610	335.9	180	-55	45.0	10.73	19.0	8.27	0.88
including							10.73	15.0	4.27	1.27
AL-17-20	707450	5360680	338.4	180	-55	51.0				NS
AL-17-21	707550	5360680	341.6	180	-90	69.0				NS
AL-17-22	707400	5360525	334.06	180	-60	271.0	227.0	256.0	29.0	0.92
including							232.0	245.0	13.0	1.10
including							248.0	249.0	4.0	1.46
AL-17-23	707600	5360615	338.7	180	-55	36.0	16.0	24.0	9.0	0.82
including							21.0	24.0	3.0	1.53
AL-17-24	707323	5360628	335.9	180	-55	39.0	12.0	15.0	3.0	0.56
including							12.0	13.0	1.0	1.13
AL-17-25	707308	5360671	336.27	180	-65	42.0				NS
AL-17-26	707890	5360265	332.5	180	-65	60.0	27.0	39.0	13.0	0.73

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
including							27.0	31.0	4.0	0.95
including							37.0	39.0	2.0	1.33
AL-17-27	707890	5360345	332.5	180	-65	87.0				NS
AL-17-28	707720	5360345	331.1	180	-65	181.0				NS
AL-17-29	707935	5360341	332.5	180	-45	71.0				NS
AL-17-30	707833	5360286	332.5	180	-45	66.0	16.0	19.0	3.0	0.84
							30.0	40.0	10.0	1.04
including							30.0	33.0	3.0	1.26
including							35.0	39.0	4.0	1.16
AL-17-31	707740	5360615	332.5	180	-65	30.0				NS

Note: Downhole widths are not true widths
NS: Not Significant Results

The highlights of the 2017 drilling program include:

- Extension of the mineralization within the main pegmatite orebody by 150 m to the east, up to 300 m to the west within the deeper levels, and 200 m to the west at shallower levels and at depth in the gap zone;
- The east-west strike length of the main deposit has now been extended from 850 m to 1,100 m, with an average thickness of 25 m, ranging from 4 m to 55 m, dipping at 40 to 50 degrees to the north. The orebody remains open to the east, west and at depth; and
- Delineation of the Authier North pegmatite, which has 670 m of drilling completed in 13 holes. The northern pegmatite has a narrow and gently-dipping geometry between 10 m and 25 m vertical depth, not visible from the surface, and downhole intersections typically averaging 5 m to 8 m in width. The pegmatite remains open in all directions. Sayona Québec aims to delineate a resource at shallow levels that would be amenable to open-cut mining at a low stripping ratio.

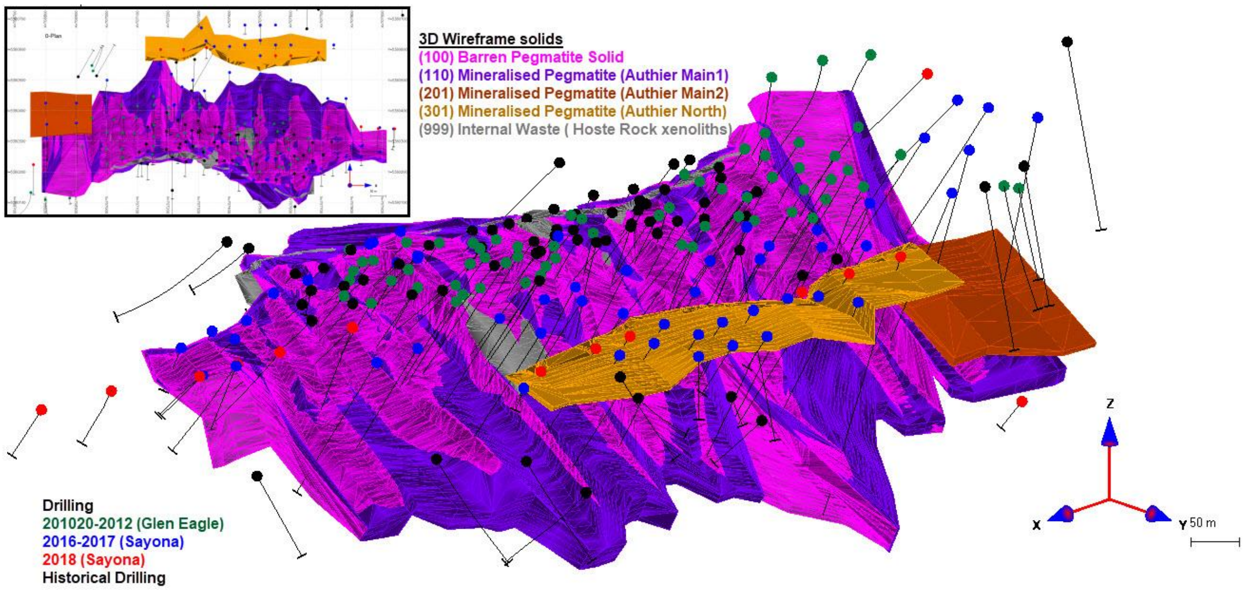


Figure 10-1: Drillhole collar location in isometric view and plan view

10.5 Drillhole Results by Sector

Western Zone

Drilling has successfully defined a 300 m western extension of the main Authier pegmatite at between 110 m and 220 m vertical depth, including:

- AL-17-02: 32 m of 1.15% Li_2O, including 7 m of 1.44% Li_2O;
- AL-17-05: 19 m of 1.26% Li_2O, including 9 m of 1.69% Li_2O; and
- AL-17-08: 8 m of 1.07 % Li_2O from 165 m, including 3 m of 1.31% Li_2O from 167 m.

AL-17-02 and AL-17-05 demonstrated similar widths and grades to those in the deeper, Phase 1 holes, which included:

- AL-16-13: 24 m of 1.25% Li_2O from 184 m and 8 m of 0.91% Li_2O from 216 m; and
- AL-16-15: 20 m of 1.32% Li_2O from 242 m, including 11 m of 1.61% Li_2O from 248 m.

The results indicate a potential western plunge of the high-grade mineralization at deeper levels within the western sector. The higher-grade mineralization below the economic open-cut pit depths could be amenable to future underground mining (Figure 10-2).

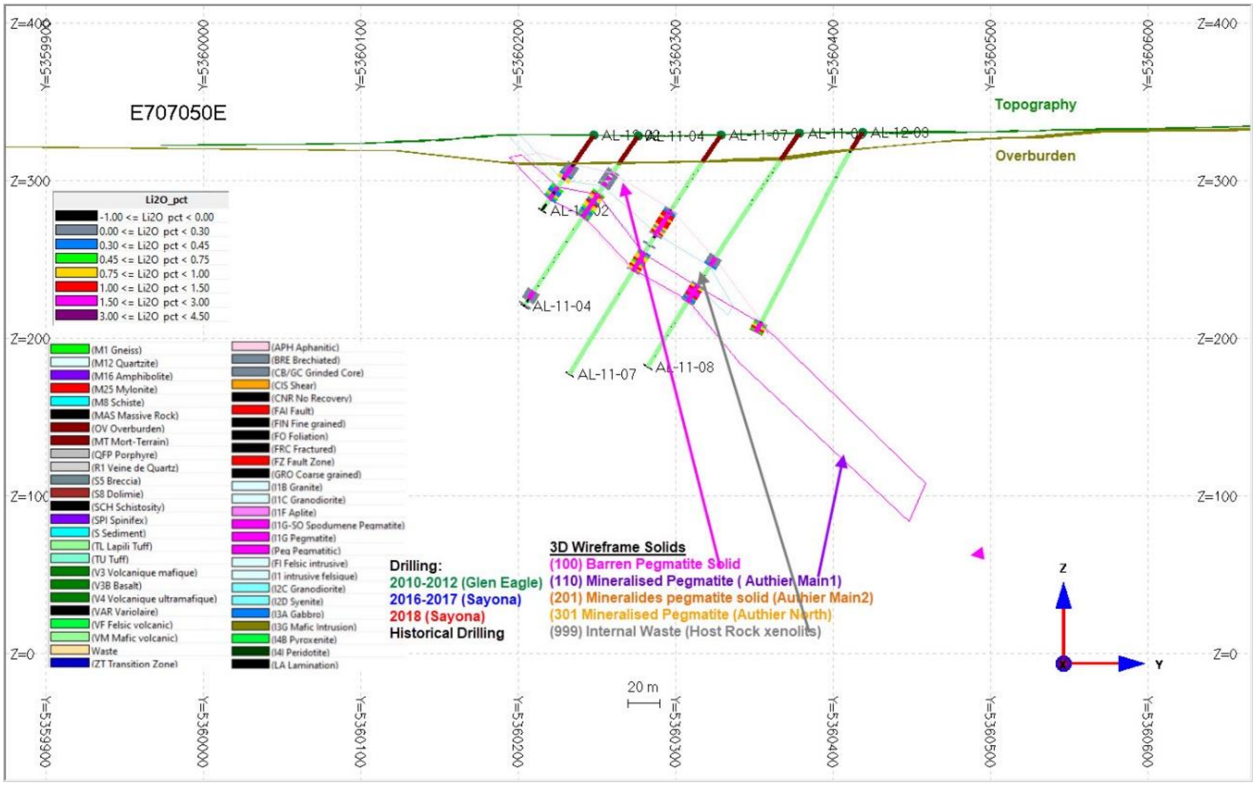


Figure 10-2: Section 707050 mE looking west, demonstrating the extension of mineralization

AL-17-01, AL-17-06 and AL-17-07 (Section 706800 m East, see Figure 10-3) have intercepted narrow zones of low-grade to barren pegmatite, which has been affected by a large north-south fault cross-cutting the mineralization in the Beaver Dam area on Section 707560 m East. The pegmatite pinches within the fault zone but shows no significant evidence of post-mineral displacement.

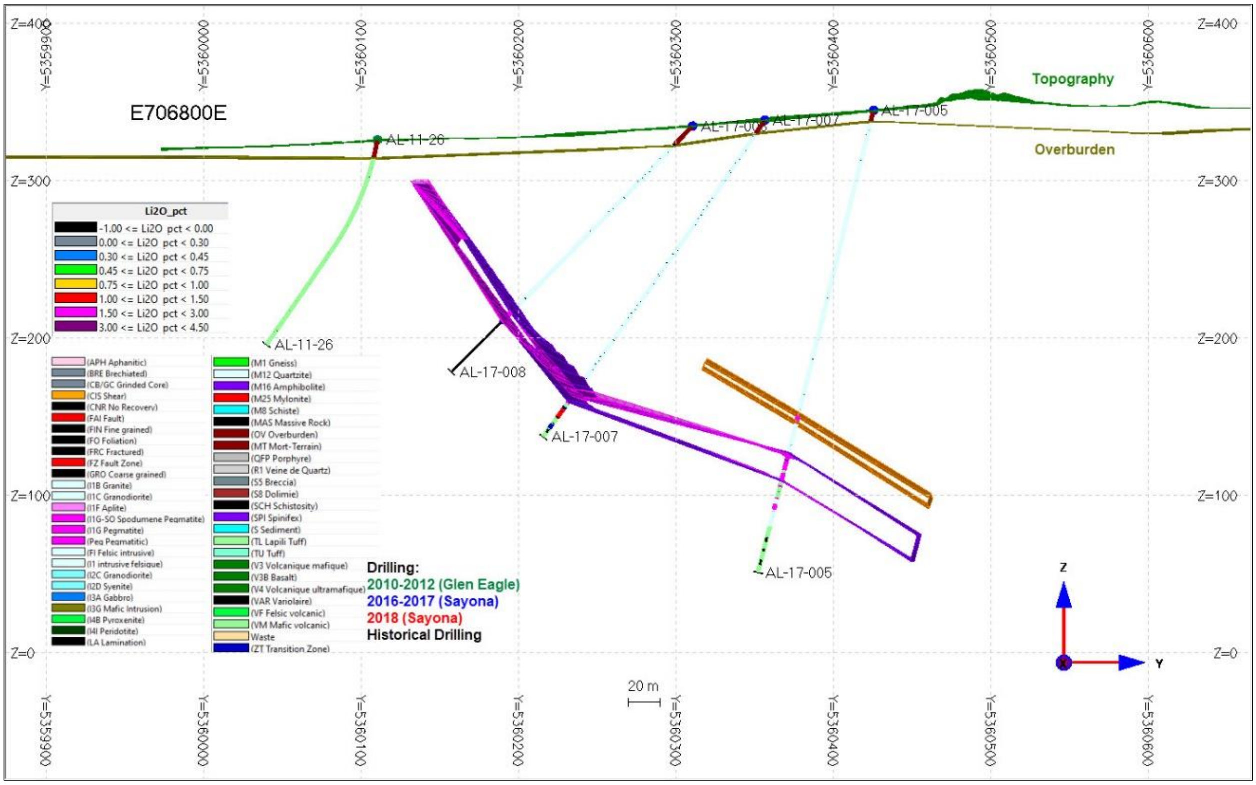


Figure 10-3: Section 706800 mE looking west, intersecting narrow zones of low grade to barren mineralization

Figure 10-4 shows the main Authier pegmatite in relation to the local magnetic geophysical image. The main orebody is strongly correlated to a deep magnetic low, which extends to the western tenement boundary. Additional drilling will be required to extend the mineralization further west.

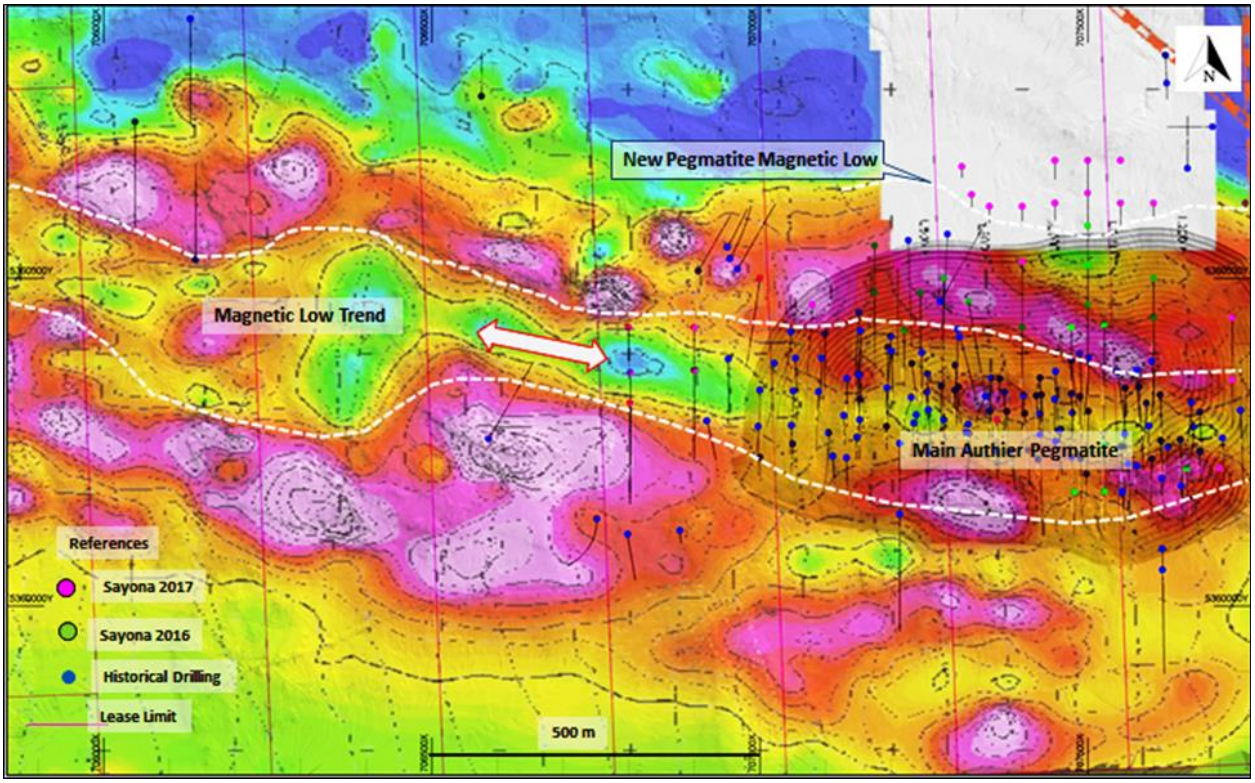


Figure 10-4: Magnetic Geophysical image and the main Authier pegmatite orebody which has been extensively drilled (right side of image)

Gap Zone

AL-17-22 intersected a thick zone of spodumene mineralization in the gap zone, 29 m of 0.92% Li_2O, confirming an 85 m down-dip extension of the exploratory Phase 1 drillhole AL-16-16, which intersected 28 m of 1.20% Li_2O from 158 m, including 18 m of 1.39% Li_2O from 162 m. AL 17-22 has confirmed an extension of the resource down to approximately 200 m in the gap zone (see Figure 10-5).

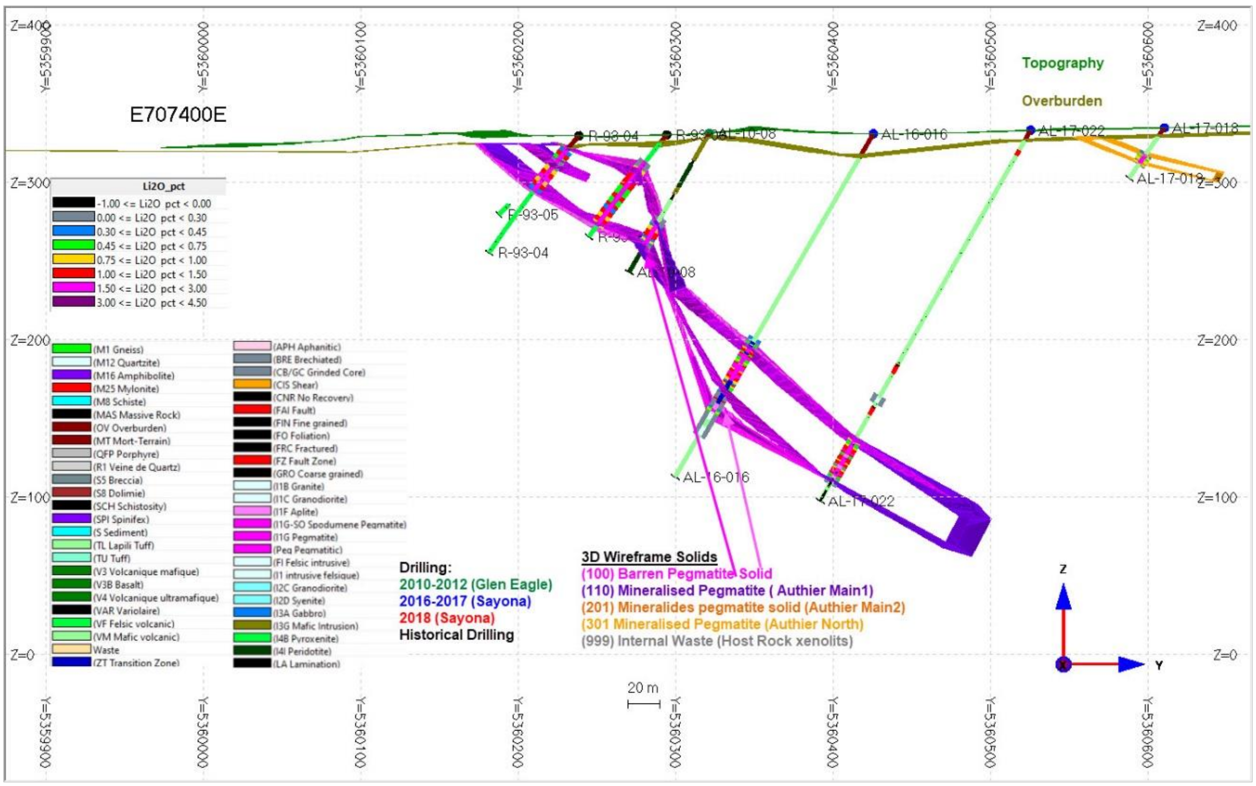


Figure 10-5: Section 707400 mE looking west (Gap Zone) showing the dip extension of mineralization

Eastern Zone Deep

Holes AL-17-13 (section 707725 m East)and AL-17-14 (section 707775 m East) in the eastern deep zone have extended mineralization 150 m to the east. Hole AL-17-13 yielded 26 m of 1.26% Li_2O from 163 m, including 15 m of 1.42% Li_2O from 169 m, and is located 120 m east of AL-16-14, which intercepted mineralized pegmatite from a vertical depth of 120 m and is expected to result in an 80 m deepening of the current pit outline.

Hole AL-17-28, a 100 m step forward from AL-17-13, intercepted low-grade pegmatite that was affected by a fault zone, which caused a local pinching of the main Authier pegmatite.

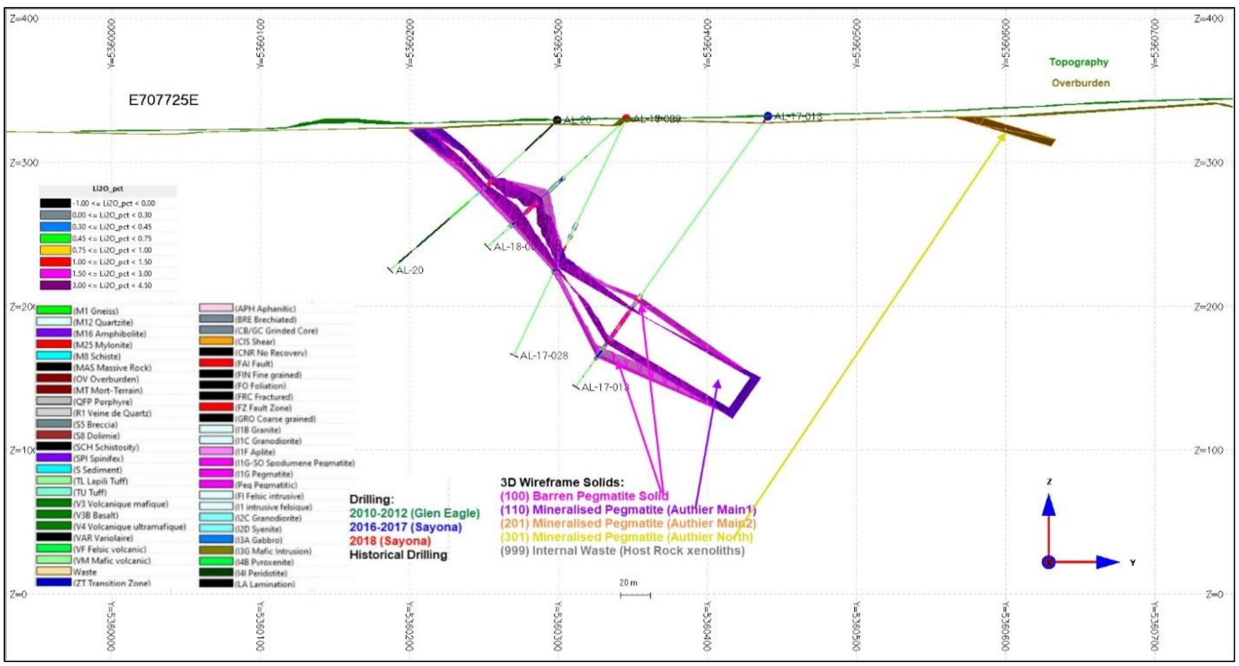


Figure 10-6: Section 707725 mE looking west

Eastern Zone Shallow

Hole AL-17-16 intercepted a narrow zone of mineralized pegmatite, 7 m of 0.76% Li_2O, within a wider zone of low-grade to barren pegmatite at shallow levels. It is interpreted that the mineralization has been pinched with respect to the wider pegmatite intercepted by the following holes:

- AL-17-30: 10 m of 1.04% Li_2O from 30 m, including 3 m of 1.26% Li_2O from 30 m; and
- AL-17-26: 13 m of 0.73% Li_2O from 27 m, including 2 m of 1.33% Li_2O from 37 m.

Hole AL-17-17 intercepted the narrow, lower portion of the eroded pegmatite, 1 m of 1.03% Li_2O, immediately below 12 m of overburden being collared 35 m south (same section) of AL-17-30.

Holes AL-17-30 and AL-17-26, separated 65 m east-west, intercepted the main pegmatite slightly deeper than AL-17-15 and AL-17-17. The narrow mineralization intercepted by AL-17-15 was extended 165 m down-dip by AL-17-14, which yielded 20 m of 0.95% Li_2O from 169 m, including 10 m of 1.19% Li_2O from 170 m, from a vertical depth of 135 m and collared 185 m north in the same section.

Holes AL-17-27 and AL-17-29, the easternmost holes, intercepted narrow barren pegmatite in fault zones. The geometry of the pegmatite at narrow levels pinch and swells, but it is considered open and further drilling is required to test the easternmost strike extent.

Northern Pegmatite

During Phase 2, drilling began to define the geometry of the new northern pegmatite, located 400 m north of the main Authier pegmatite. During the Phase 1 drilling, AL-16-10 intersected 7 m of 1.36% Li_2O from 7 m in a step-back hole targeting deeper mineralization in the main pegmatite. Drilling from the Phase 2 program has now defined additional mineralization over 300 m in strike length and the system remains open in all directions.

Such a mineralized zone was built using a reference east–west line, 35 m north of AL-16-11, in a 50 m by 50 m drilling grid. The most significant holes are:

- AL-17-11: 6 m of 1.32% Li_2O from 23 m, including 3 m of 1.76% Li_2O from 24 m;
- AL-17-12: 5 m of 0.90% Li_2O from 27 m, including 1 m of 1.71% Li_2O from 30 m;
- AL-17-19: 8.27 m of 0.88% Li_2O from 10.7 m, including 4.27 m of 1.27% Li_2O from 10.7 m; and
- AL-17-23: 8 m of 0.86% Li_2O from 16 m, including 3 m of 1.53% Li_2O from 21 m.

Fifty-metre step-back holes AL-17-10, AL-17-20, AL-17-21, AL-17-24 and AL-17-25, as well as scout hole AL-17-31, intercepted narrow and low-grade to barren pegmatite. While the grades were lower than anticipated, Sayona Québec believes the system has good potential to host further mineralization. Zones within the pegmatite occur as coarse-grained, narrow, high-grade mineralization, suggesting potential for a large feeder system at depth. Further drilling will be required to test the down-dip extensions of the pegmatite, which has only been drilled to shallow levels.

Figure 10-7: Hole AL-17-10 in the Northern Pegmatite which intersected 7 m of 1.36% Li_2O from a downhole depth of 15 m (vertical depth of 12 m), including 2 m of 2.24% Li_2O from 17 m

10.6 Sayona Québec Drilling 2018

Sayona Québec completed a Phase 3 diamond drilling program at the Authier Property, including 33 holes for 3,282.6 m (Figure 10-8) and having the following objectives:

- Converting the Inferred mineral resources to Measured and Indicated, and upgrading Ore Reserves for the DFS;
- Exploring for extensions to the existing mineral resources and other potential mineralization within the tenement package;
- Collecting geotechnical data for incorporation into the DFS and 5,000 kg of core for pilot metallurgical testing; and
- Condemnation drilling in areas planned for infrastructure.

Resource Expansion and Exploration Drilling

A total of 19 diamond core holes (NQ diameter), for 2,170 m, were completed as part of the Phase 3 drilling program.

A number of diamond drillholes have intercepted high-grade spodumene mineralization with the best intercepts including:

- AL-18-09: 25 m of 1.48% Li_2O from 79 m, including 6 m of 1.77% Li_2O from 80 m and 6 m of 1.78% Li_2O from 94 m;
- AL-18-10: 6 m of 1.26% Li_2O from 97.4 m, including 4 m of 1.52% Li_2O from 98.4 m;
- AL-18-16: 37 m of 1.03% Li_2O from 255 m, including 11 m of 1.24% Li_2O from 266 m and 3 m of 1.67% Li_2O from 281 m; and
- AL-18-17: 33 m of 1.18% Li_2O from 160 m, including 10 m of 1.25% Li_2O from 166 m and 3 m of 1.75% Li_2O from 190 m.

Drilling has successfully demonstrated depth extensions of the mineralization at the main Authier pegmatite. Infill drilling successfully targeted areas of low drilling density with the objective of upgrading the resource categories. A number of holes testing the eastern extensions of the main Authier pegmatite at shallow levels were stopped due to the presence of a fault zone but warrant further testing in a future drilling program.

A potential third deep pegmatite dyke was intercepted at a depth of 300 m and returned low-grade mineralization due to the replacement of spodumene by phengite. Further drilling will be required to test the potential of this system, especially at shallower levels.

Drilling has successfully extended the mineralization at the Authier North pegmatite from 300 m to 500 m in strike length and at depth. The system remains open in all directions. The mineralization remains open in all directions.

10.7 Drillhole Results by Sector

Main Authier Pegmatite

The following summarizes the key outcomes of the resource expansion and exploration drilling program within Phase 3 drilling:

- AL-18-01 and AL-18-02 were stopped before hitting the target due to a fault zone;
- AL-18-09, 18-04, 18-05, 18-06 and 18-07 tested the eastern extension of the main Authier pegmatite at shallow levels, intercepting narrow zones of weak lithium mineralization;

- AL-18-08 and AL-18-09 filled the gaps within the East zone of the main Authier pegmatite resource from 40 m to 70 m vertical depth. AL-18-09 yielded 25 m of 1.48% Li_2O from 79 m, including 6 m of 1.77% Li_2O from 80 m and 6 m of 1.78% Li_2O from 94 m;
- AL-18-10 intercepted a narrow lithium-mineralized zone that filled the gap of the main Authier pegmatite resource in the central part, including 6 m of 1.26% Li_2O from 97.4 m, including 4 m of 1.52% Li_2O from 98.4 m;
- AL-18-12 drilled within a NNE fault zone intercepted narrow and weak lithium anomalies in the west zone;
- AL-18-16 at the deep west zone of the main Authier pegmatite intercepted a wide deep extension of the pegmatite at a vertical depth of 235 m to 270 m, 75 m step back of hole AL-16-15 (20 m of 1.32% Li_2O from 242 m). A potential third pegmatite dyke was intercepted at a vertical depth of 300 m with 25 m downhole width, which returned no significant spodumene mineralization due the replacement of spodumene by phengite. Additionally, AL-18-16 intercepted the Authier North pegmatite with lithium mineralization at shallow levels; and
- AL-18-17, an infill hole at the East zone of the main Authier pegmatite, intercepted a wide mineralized pegmatite zone of 33 m of 1.18% Li_2O from 160 m, including 10 m of 1.25% Li_2O from 166 m and 3 m of 1.75% Li_2O from 190 m (Figure 10-8).

Sayona Québec believes that the main Authier pegmatite is still open in all directions. The geometry of the mineralized pegmatite at shallow levels in both east and west extensions seems affected by post-mineral faulting, and further drilling should be conducted at mid-to-deep levels to test along strike extension of the main pegmatite. The deep extensions of the main pegmatite are demonstrating excellent grades and widths.

Northern Pegmatite

Holes AL-18-13, AL-18-14 and AL-18-16 extended the mineralization from 250 m to 500 m in strike extension; AL-18-13, AL-18-18 and AL-18-19 were infill holes. The Authier North pegmatite is narrow, gently dipping to the north, and is still open along strike.

The resource expansion and exploration drillhole results as part of Phase 3 diamond drilling (Table 10-4) are detailed as follows:

Table 10-4: Sayona Phase 3 Metallurgical Pilot Plan drillhole collar location and intercept information (downhole intersections in metres)

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-17-32	707520	5360175	328.8	180	-45	97.5	13	78	65	1.29
including							27	48	21	1.54
AL-17-33	707520	5360240	331.0	180	-45	119.5	53	99	46	1.28
including							54	66	12	1.50
AL-17-34	707550	5360240	331.0	177	-45	96.0	56	91	35	1.09
AL-17-35	707425	5360225	330.43	177	-45	73.5	4.7	42	37.3	0.98
including							27	42	15	1.10
AL-17-36	707150	5360350	329.9	180	-52	112	67	81	14	1.47
							83	94.9	11.9	1.57
							104	112	8	1.49
AL-17-37	707218	5360418	330.0	180	-65	186	139	146	7	1.15
							151	167	16	0.54
AL-17-38	707375	5360300	330.0	180	-45	85	34	52	18	0.96
							54	60	6	1.32
							63	65	2	1.30

Note: Downhole widths are not true widths

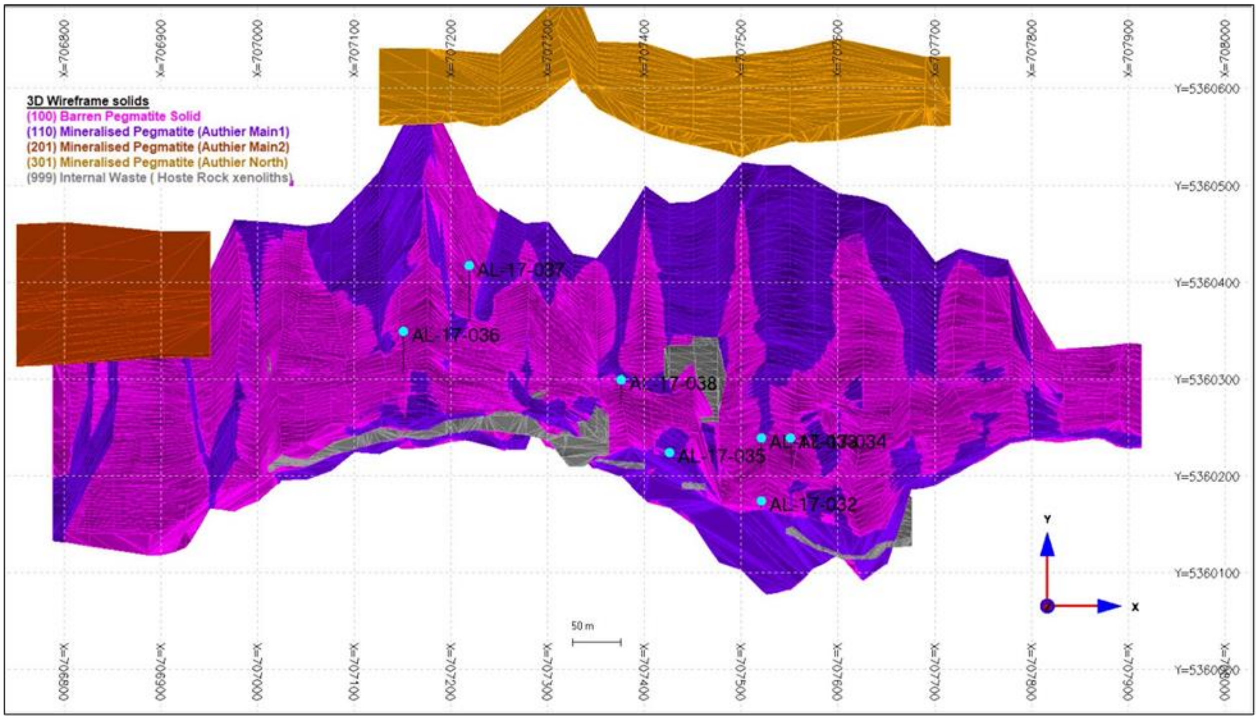


Figure 10-8: Drillhole collar location plan view, highlighting (light blue) the Metallurgical Pilot Plan drillholes completed during Phase 3 drilling at Authier Project

Condemnation Holes

In 2018, seven diamond core holes, NQ diameter for 342.65 m, were completed in the zone north of the Authier deposit to test and discard potential mineralized pegmatite within the planned infrastructure zone. The areas tested were selected based on geological mapping and sampling, close to outcropping pegmatite, which returned low-grade lithium anomalies after surface rock chip sampling or nearby historical drilling (Figure 10-9). All of the holes intercepted narrow zones of low-grade to barren pegmatite dykes at different depths. Sampling has been performed to confirm the low-grade to barren character of the pegmatites dykes and results will be made available.

The condemnation drillholes results of Phase 3 diamond drilling (Table 10-5) are detailed as follows:

Table 10-5: Sayona Phase 3 Metallurgical Pilot Plan drillhole collar location and intercept information (downhole intersections in metres)

Drillhole	East	North	RL	Azimuth	Dip	Depth	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)
AL-18-20	707348	5360950	340	180	-50	48				NS
AL-18-21	707036.7	5360304	341	180	-50	42				NS
AL-18-22	706039	5360905	341	180	-50	51				NS
AL-18-23	706115	5360890	340	180	-50	51				NS
AL-18-24	706107	5361328	342	180	-50	48.65				NS
AL-18-25	706446	5361165	341	180	-50	51				NS
AL-18-26	706450	5360970	340	180	-50	51				NS

Note: Downhole widths are not true widths

NS: Not significant results

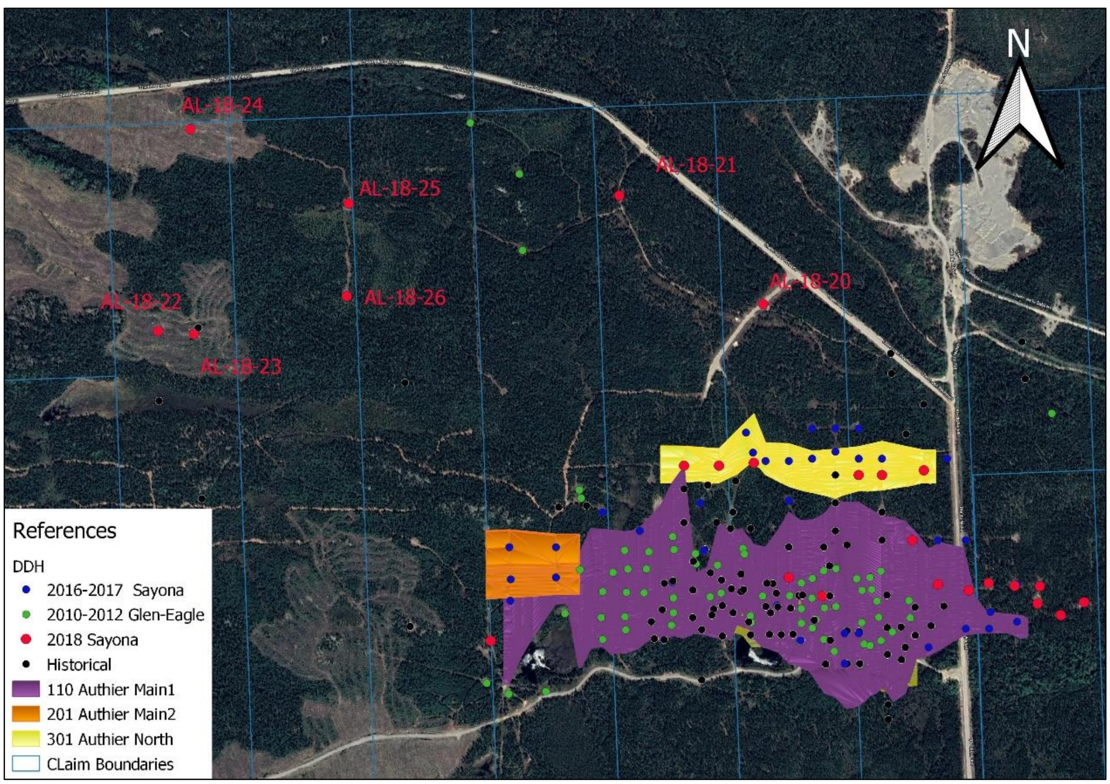


Figure 10-9: Drillhole collar location plan view, highlighting (red) Condemnation drillholes completed during Phase 3 drilling at the Authier Property

11. SAMPLE PREPARATION, ANALYSIS AND SECURITY

11.1. General

The following section presents the sample preparation, analysis and security procedures followed during the various drilling campaigns. These procedures were reviewed by SGS in 2012, while preparing the preliminary economic assessment of the Authier Lithium Project, and subsequently reviewed by Sayona Québec in 2016 during the prefeasibility study.

11.2. ALS Minerals 2010 Procedures

All samples received at ALS in 2010 from the Project were digitally inventoried using bar codes, then weighed. Samples with excess moisture were dried. Samples were crushed in a jaw and/or roll crusher to 70% passing 9 mesh. Crushed material was split in a rifle splitter to obtain a 250 g subsample, which was then pulverized to 85% passing 200 mesh using either a single component flying disk mill, or a two-component ring and puck mill.

The analyses were conducted at the ALS laboratory, an accredited laboratory under ISO/IEC 17025 standards, located in North Vancouver, British Columbia. Two analytical methods were used for samples from the Authier Lithium Deposit. The first analytical method used by ALS was the 38 elements analysis, not including lithium, using lithium metaborate fusion, followed by inductively coupled plasma mass spectrometry ("ICP-MS") (ALS code ME-MS81). The method used 0.2 g of the pulverized material and returned different detection limits for each element. The second analytical protocol used by ALS was the ore grade lithium four-acid digestion with inductively coupled plasma – atomic emission spectrometry ("ICP-AES") (ALS code Li-OG63). The Li-OG63 analytical method uses approximately 0.4 g of pulp material and returned a lower detection limit of 0.01% Li.

SGS Geological Services conducted independent check sampling of selected drill core from the Project. The analyses of the check samples were conducted at SGS Canada Inc. Minerals Services laboratory located in Toronto, Ontario ("SGS Minerals"), which is an accredited ISO/IEC 17025 laboratory. The analytical method used by SGS Minerals is the ore grade analysis using sodium peroxide fusion with induced coupled plasma optical emission spectrometry ("ICP-OES") finish methodology with a lower detection limit of 0.01% lithium (SGS code ICP90Q). This method uses 20 g of pulp material.

11.3. AGAT Laboratories 2011-2012 Procedures

Samples received at AGAT Laboratories in 2011-2012 were processed according to the following procedures at the AGAT preparation facilities in Sudbury, Ontario. All samples were inspected and compared to the chain of custody ("COC") and logged into the AGAT laboratory management system then weighed. Drying was undertaken at 60°C on all samples. Sample material was crushed in a Rocklabs Boyd or a TM Terminator Jaw Crusher to 75% passing 10 mesh (2 mm). The crushed material was split with either a rifle splitter or a rotary splitter to obtain a 250 g subsample, which was then pulverized to 85% passing 200 mesh (75 µm) using TM, TM-2 pulverizers.

The analyses were conducted at the AGAT laboratory, an accredited laboratory under ISO/IEC 17025 standards, located in Mississauga, Ontario. The analytical protocol used at AGAT is the ore grade lithium four-acid digestion with ICP-OES (AGAT code 201079) -Li. The analytical method uses approximately 0.5 g of pulp material and uses a lower detection limit of 0.0001% lithium.

11.4. SGS 2016-2017 Sampling Procedures

Drill core samples collected during the 2016 diamond drilling program were transported directly by a courier truck, contracted by Sayona Québec, to the SGS laboratory preparation facilities in Sudbury, Ontario for sample preparation. Procedures followed were based upon industry best practice. All samples were inspected and compared to the chain of custody and logged into the SGS laboratory management system. Samples were then weighed and dried. Samples were crushed to 75% passing 10 mesh (2 mm), split to obtain a 250 g subsample, which was pulverized to 85% passing 200 mesh (75 µm). Samples were then shipped to SGS Mineral Services laboratories in Lakefield, Ontario, for analysis.

Analyses of all 2016 drilling samples were conducted at the SGS laboratory located in Lakefield, Ontario, which is an accredited laboratory under ISO/IEC 17025 standards accredited by the Standards Council of Canada. The analytical protocol used at SGS Lakefield was method GE ICP90A 29 element analysis - sodium peroxide fusion that involved the complete dissolution of the sample in molten flux for ICP-AES analysis. The detection limits for lithium are 10 ppm (lower) and 10,000 ppm (upper). No geophysical or handheld tools were used.

11.5. Quality Assurance and Quality Control Procedure by Glen Eagle

Over and above the laboratory quality assurance quality control protocol ("QA/QC") routinely conducted by ALS using pulp duplicate analysis, Glen Eagle implemented an internal QA/QC protocol consisting of the insertion of reference material, i.e., analytical standards and blanks, on a systematic basis, with the samples shipped to ALS. The company also sent pulps from selected mineralized intersections to SGS Minerals for reanalysis. SGS Geological Services did not visit the ALS or SGS Minerals facilities or conduct an audit of the laboratories.

11.5.1. Analytical Standards

Two different standards were used by Glen Eagle for the internal QA/QC program: one low-grade lithium ("Low-Li") and one high-grade lithium ("High-Li") standard. Both standards were custom-made reference materials from mineralized material coming from the main pegmatite intrusion at the Authier Property. To evaluate their expected values, both Low-Li and High-Li standards were analyzed 15 times each at the SGS Minerals laboratory in Toronto and 15 times each at the ALS laboratory in North Vancouver, British-Colombia. The analytical protocol used at SGS Minerals was the mineral grade sodium peroxide fusion with ICP-OES finish described in Section 11.2. The analytical protocol used at ALS was the ore grade lithium four-acid digestion with ICP-AES finish, also described in Section 11.2.

For the Low-Li standard, the analytical results returned from SGS Minerals for the 15 samples averaged 0.63% Li_2O versus an average of 0.61% Li_2O for the 15 samples submitted to ALS. For the High-Li standard, the average of the 15 samples analyzed at SGS Minerals returned 2.91% Li_2O versus an average of 2.88% Li_2O for the 15 samples processed at ALS. Each laboratory showed relatively consistent analytical results from one sample to another for each standard analyzed. The averages for each standard also show a good correlation between SGS Minerals and ALS. The results from the analysis of these 30 samples for each Low-Li and High-Li were used to determine the expected values, based upon a mean value from the 30 samples, and the QA/QC warning/failure thresholds, i.e., ±2 standard deviations and ±3 standard deviations, respectively. Table 11-1 shows the results for each standard using both analytical protocols.

Table 11-1: Results from Custom Low-Li and High-Li standards

Glen Eagle Resources Inc. – Authier Project – Standards Certifications			
	Low-grade Standard (% Li_2O)		
	ALS Data	SGS Data	All Data
Count	15	15	30
Mean	0.614	0.629	0.622
Std. Dev	0.042	0.012	0.031
Min	0.588	0.603	0.588
Median	0.605	0.624	0.619
Max	0.764	0.646	0.764
QAQC Thresholds	Warning Range (2 x Std Dev)	Lower Limit	0.559
		Higher Limit	0.684
	Failure Limit (3 x Std Dev)	Lower Limit	0.528
		Higher Limit	0.715
	High-grade Standard (% Li_2O)		
	ALS Data	SGS Data	All Data
Count	15	15	30
Mean	2.884	2.911	2.898
Std. Dev	0.067	0.031	0.053
Min	2.756	2.820	2.756
Median	2.874	2.907	2.907
Max	3.090	2.950	3.090
QAQC Thresholds	Warning Range (2 x Std Dev)	Lower Limit	2.792
		Higher Limit	3.003
	Failure Limit (3 x Std Dev)	Lower Limit	2.739
		Higher Limit	3.056

11.6. 2010-2012 Reference Materials Results

In 2010, Glen Eagle sent samples to ALS Minerals in Vancouver, British Columbia and, starting in 2011, to AGAT in Mississauga, Ontario. During this period, 31 High-Li and 32 Low-Li were inserted into the sampling procedure. A graphic representation of reference materials ("RM") quality control failures and the labelling results are included in Figure 11-1. The red lines represent three times the standard deviation (±3σ). Of a total of 63 RM samples tested since 2010, seven RM samples (11%) produced results exceeding ±3σ. Similarly, only two RM samples (3%) produced results exceeding 10% of the expected value. Almost all RM analyses fell under the 10% difference from the expected RM value.

11.6.1. Z Scores

The Z scores were also calculated and plotted (Figure 11-1). The z-score is the difference between the observed RM result and the expected result divided by the expected standard deviation:

z-score = (x - μ) / s,

Where:

x is the observed assay;

μ is the expected assay for the RM;

s is the expected standard deviation for the RM.

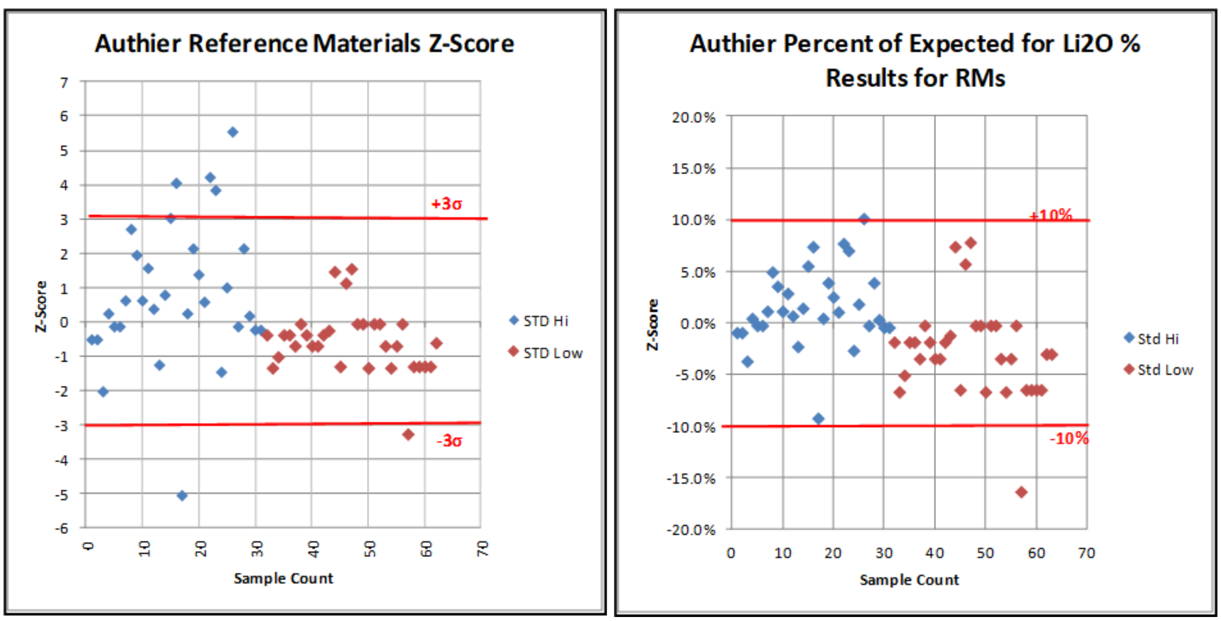


Figure 11-1: RM (STD High, STD Low) results

11.6.2. ALS Minerals 2010 Reference Materials Results

In 2010, Glen Eagle sent samples to ALS Minerals of Vancouver. In Figure 11-2, the red lines represent the absolute limits of three times the standard deviations (±3σ) and the absolute percentage differences from the RM expected values. Of a total of 31 RM analyses, two RM (6%) produced results exceeding ±3σ the expected value. Additionally, no RM produced results exceeding 10% the RM expected value. Possible mislabels are included in this analysis.

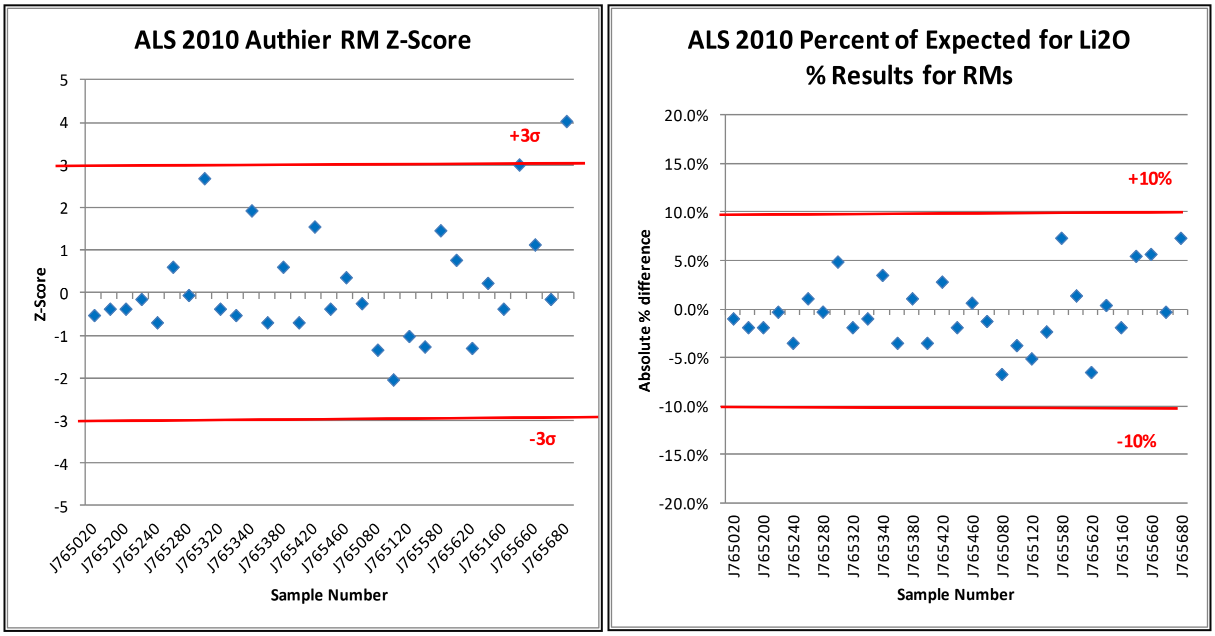


Figure 11-2: ALS 2010 RM Z-score & percentage from expected RM value

11.6.3. AGAT 2011-2012 Reference Materials Results

Beginning in 2011, Glen Eagle sent samples to AGAT Laboratories in Mississauga for analysis. In Figure 11-3, the red lines represent the absolute limits of three times the standard deviations (±3σ) and the absolute percentage differences from the RM expected values. Out of a total of 32 RM, five RM (15%) produced results exceeding ±3σ the expected value. Additionally, two RM produced results exceeding 10% of the expected value. Possible mislabels are included in this analysis. SGS Geological Services is of the opinion that certain RMs were mislabelled at that time.

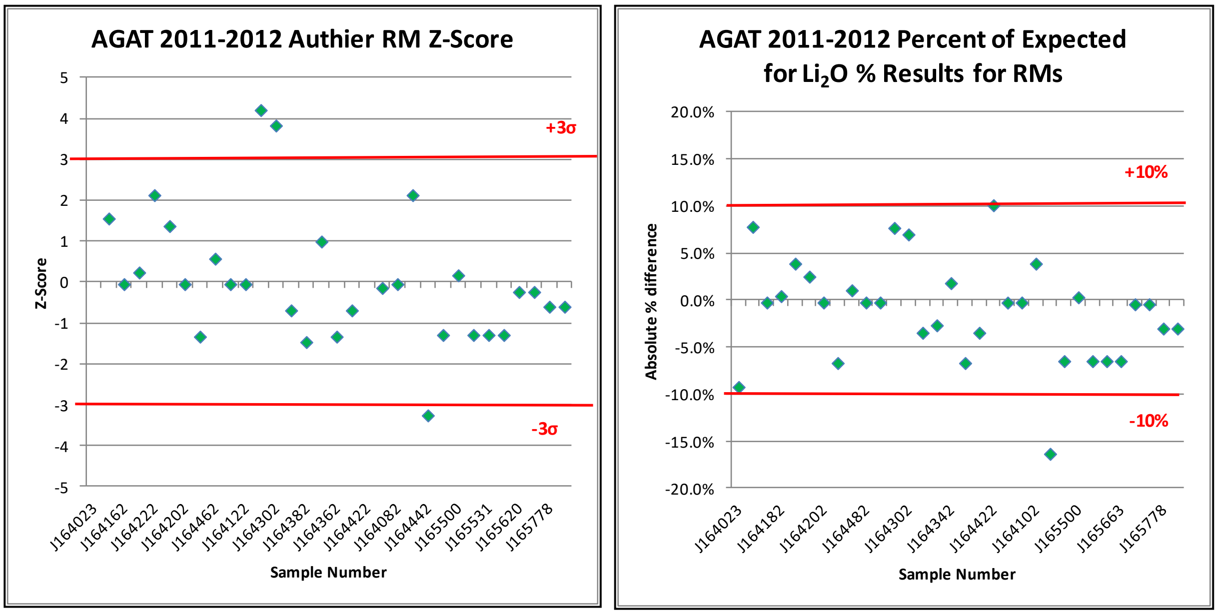


Figure 11-3: AGAT 2011-2012 RM Z-score & percentage from expected RM value

11.7. Quality Assurance and Quality Control Procedures by Sayona Québec

In addition to the laboratory QA/QC protocol routinely conducted by SGS using standards and pulp duplicate analysis, Sayona Québec applied a QA/QC protocol involving a review of laboratory-supplied internal QA/QC and in-house controls consisting of the insertion of in-house reference standards, i.e., high- and low-grade, prepared with material from the Project and certified by lab round-robin, and samples of barren material (blanks), on a systematic basis with the samples shipped to SGS. Sample sizes are considered appropriate with regard to the grain size of the sampled material.

11.7.1. Analytical Standards

Two different standards were used by Sayona Québec for the internal QA/QC program: one Low-Li and one High-Li standard. The samples were the same standards used by Glen Eagle for the 2010-2012 drilling programs. Both standards were custom-made references produced from mineralized material from the main pegmatite intrusion at the Authier Property. Both Low-Li and High-Li standards were analyzed 15 times each at the SGS Minerals laboratory in Toronto, Ontario, and 15 times each at the ALS laboratory in North Vancouver, British-Colombia.

The analytical protocol used at SGS Minerals was the mineral grade sodium peroxide fusion with ICP-OES finish described in Section 11.2. The analytical protocol used at ALS was the ore grade lithium four-acid digestion with ICP-AES finish, also described in Section 11.2.

For the Low-Li standard, the analytical results returned from SGS Minerals for the 15 samples averaged 0.63% Li_2O versus an average of 0.61% Li_2O for the 15 samples submitted to ALS. For the High-Li standard, the average of the 15 samples analyzed at SGS Minerals returned 2.91% Li_2O versus an average of 2.88% Li_2O for the 15 samples processed at ALS. Each laboratory shows relatively consistent analytical results from one sample to another for each standard analyzed. The averages for each standard also show a good correlation between SGS Minerals and ALS. The results from the analysis of the 30 samples for each Low-Li and High-Li are used to determine the expected values, based upon a mean value from the 30 samples, and the QA/QC warning/failure thresholds, i.e., ±2 standard deviations and ±3 standard deviations, respectively. Table 11-2 shows the results for each standard using both analytical protocols.

11.8. 2016 Reference Materials Results

The 2016 QA/QC follow-up was conducted by Rock Solid Data Consultancy Pty., mandated by Sayona Québec, which prepared a report that included performance of reference material (Sayona Québec and SGS).

In 2016, Sayona Québec included the two standards at random intervals during sampling, at a rate of approximately 1:20 samples. All results for both the High-Li and Low-Li reported above the expected values and fell within ±10% from expected value. The results show a consistent bias with a mean of +4.91% for High-Li and +4.56% for Low-Li. The bias might be attributed to the difference between the SGS method by which the standard samples were analyzed (SGS GE_ICP90A) and the methods used for deriving the expected value for the standards (SGS ICP90Q and ALS Li-OG63).

In Figure 11-4 and Figure 11-5, orange lines represent the ±3σ from the expected value and the red lines represent ±10% of the expected value. The results for the 29 High-Li and 25 Low-Li samples are summarized in Table 11-2.

Table 11-2: Results from custom Low-Li and High-Li standards – Sayona Québec 2016

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
High_Li	FS_ICPES	FS_ICPES	1.346	0.0250	29	1.412	0.032	0.0224	4.91%
Low_Li	FS_ICPES	4A_ICPES	0.289	0.0140	25	0.301	0.005	0.0181	4.56%

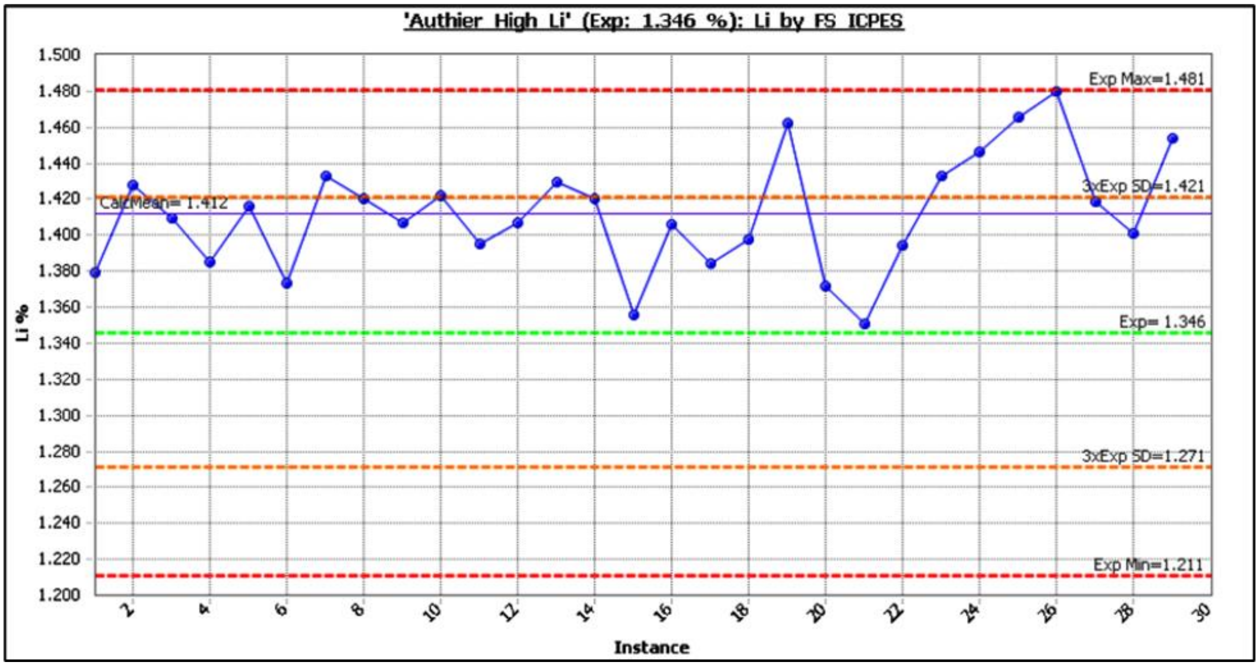


Figure 11-4: RM (STD High) results Sayona Québec 2016

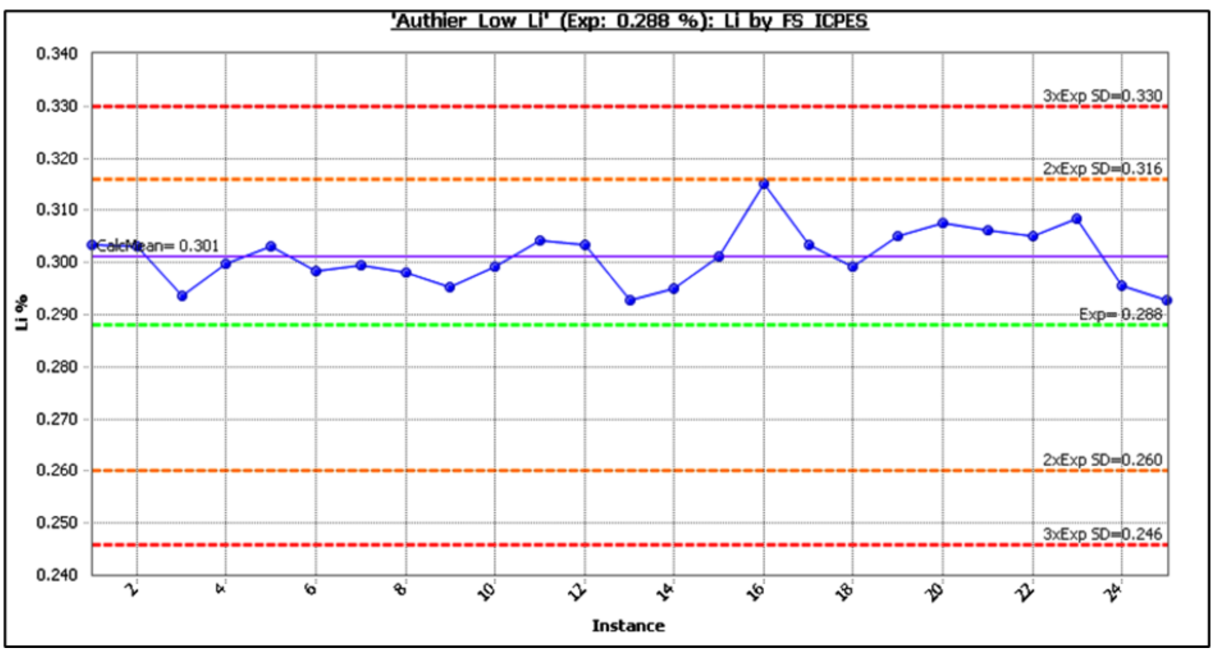


Figure 11-5: RM (STD Low) results Sayona Québec 2016

11.8.1. Company Blank Material

Sayona Québec used one non-certified silica blank during the 2016 and 2017 drilling campaigns to test for potential sample contamination during sampling, preparation and analysis processes. The material was "Special Kitty Litter" purchased from Walmart and was stored in airtight plastic tubs to prevent contamination. Each sample consisted of approximately 200 g of material scooped with a dedicated mug into the plastic sample bags. The blanks were included at routine intervals during sampling at a rate of approximately 1:20 samples. The blanks were analyzed for lithium by SGS using the sodium peroxide fusion ICPOES (GE_ICP90A) method.

The expected value and standard deviation for the blank were set to 0.001% lithium, which is the detection limit for the analysis method. The control limits were set as ±3σ from the expected value.

The blank material performed well with all samples <0.003% and no outliers reported. The results for the 57 blank samples are summarized in the Table 11-3 and Figure 11-6.

Table 11-3: Blank Summary – Sayona Québec 2016

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
Blk_SpKi Litter	FS_ICPES	FS_ICPES	0.001	0.0010	57	0.000	0.001	0.0000	na

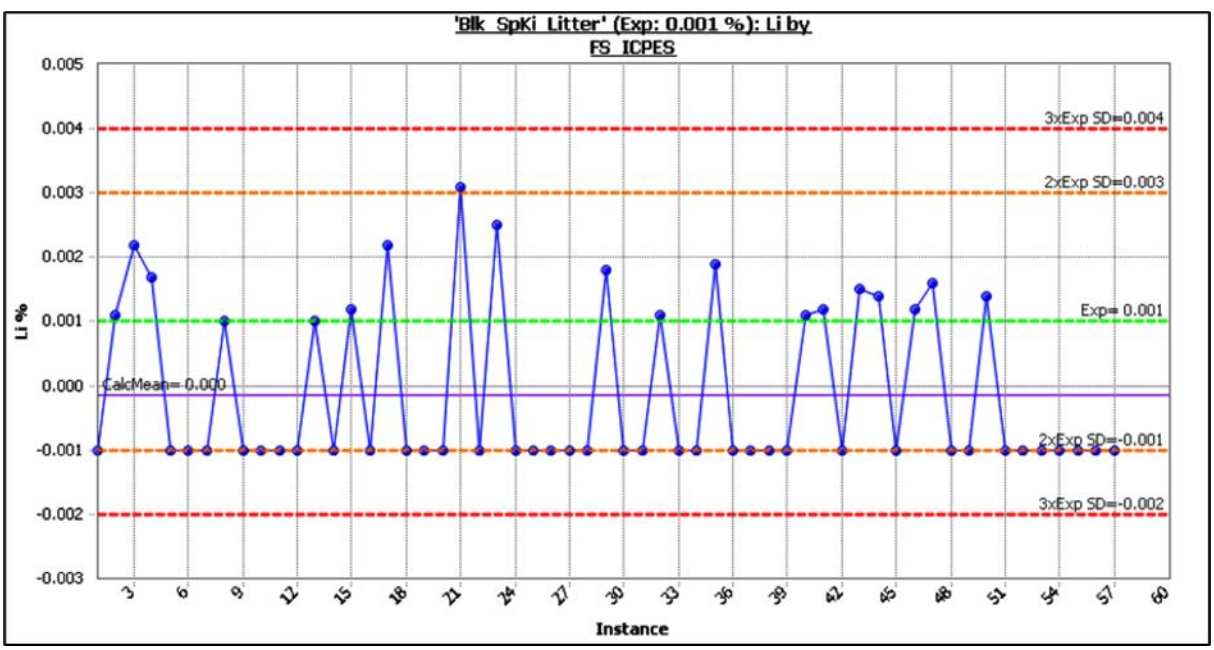


Figure 11-6: Blank Performance – Sayona Québec 2016

11.8.2. Sayona Québec Duplicates 2016

Sayona Québec did not collect duplicate samples during the 2016 drill campaign. The SGS Lakefield laboratory reported two types of laboratory duplicates in their batches, a coarse duplicate and a pulp repeat.

11.9. 2017 Reference Materials Results

The 2017 QA/QC follow-up was conducted by Rock Solid Data Consultancy Pty., mandated by Sayona Québec, which included performance of reference material of both Sayona Québec and SGS.

In 2017, Sayona Québec included the two standards at random intervals during sampling at a rate of approximately 1:20 samples, the same procedure as 2016. The Sayona Québec blank material, the SGS blank and low-grade SGS laboratory standard (RTS-3A) performed well with all samples within control limits.

The two Sayona Québec standards, High-Li and Low-Li, and SGS laboratory standards, NBS183, NIST97B and SY-4, exhibited a bias shift in the results reported during April 2017 compared to the results reported in March 2017. All results for laboratory standard NBS183, reported during April 2017, fell below 3σ from the expected value, which is in contrast to the results for March 2017 and for the 2016 drilling campaign, where all results reported within ±3σ from the expected value. The apparent bias could be due to laboratory calibration error and will be controlled by Sayona Québec through pulp check assaying in both the same lab and another lab during the Phase 3 drilling program.

In the charts that follow, the orange lines represent the ±3σ from the expected value and the red lines represent ±10% from expected value. The results for the 17 High-Li and 19 Low-Li samples are summarized in Table 11-4.

Table 11-4: Results from custom Low-Li and High-Li standards – Sayona Québec 2017

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
High_Li	FS_ICPES	UN_UN	1.346	0.0250	17	1.360	0.051	0.0377	1.05%
Low_Li	FS_ICPES	UN_UN	0.288	0.0140	19	0.289	0.010	0.0350	0.29%

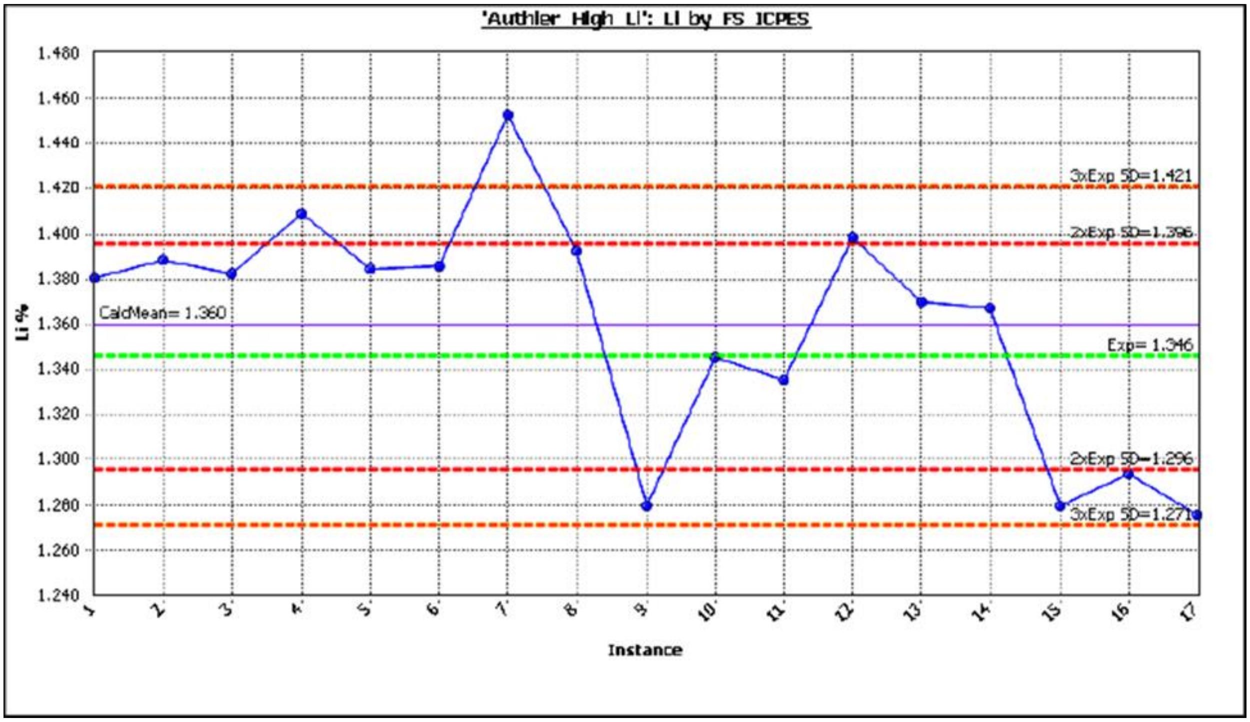


Figure 11-7: RM (STD High) results

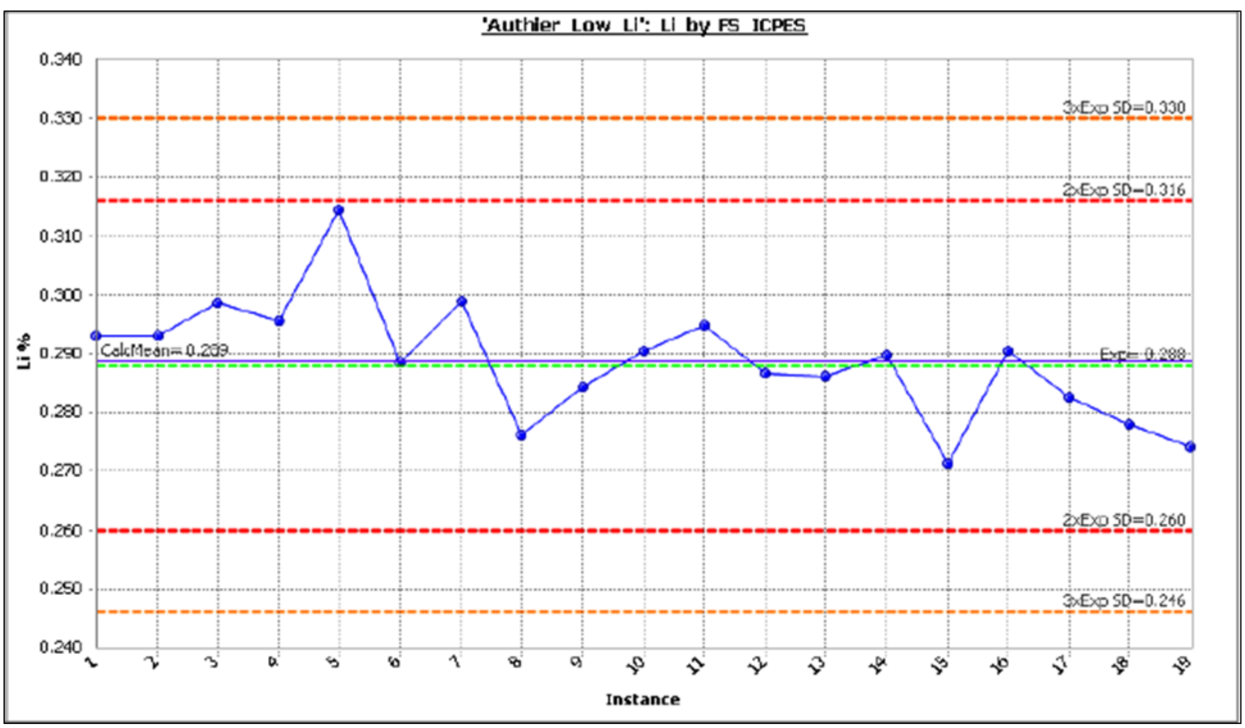


Figure 11-8: RM (STD Low) results

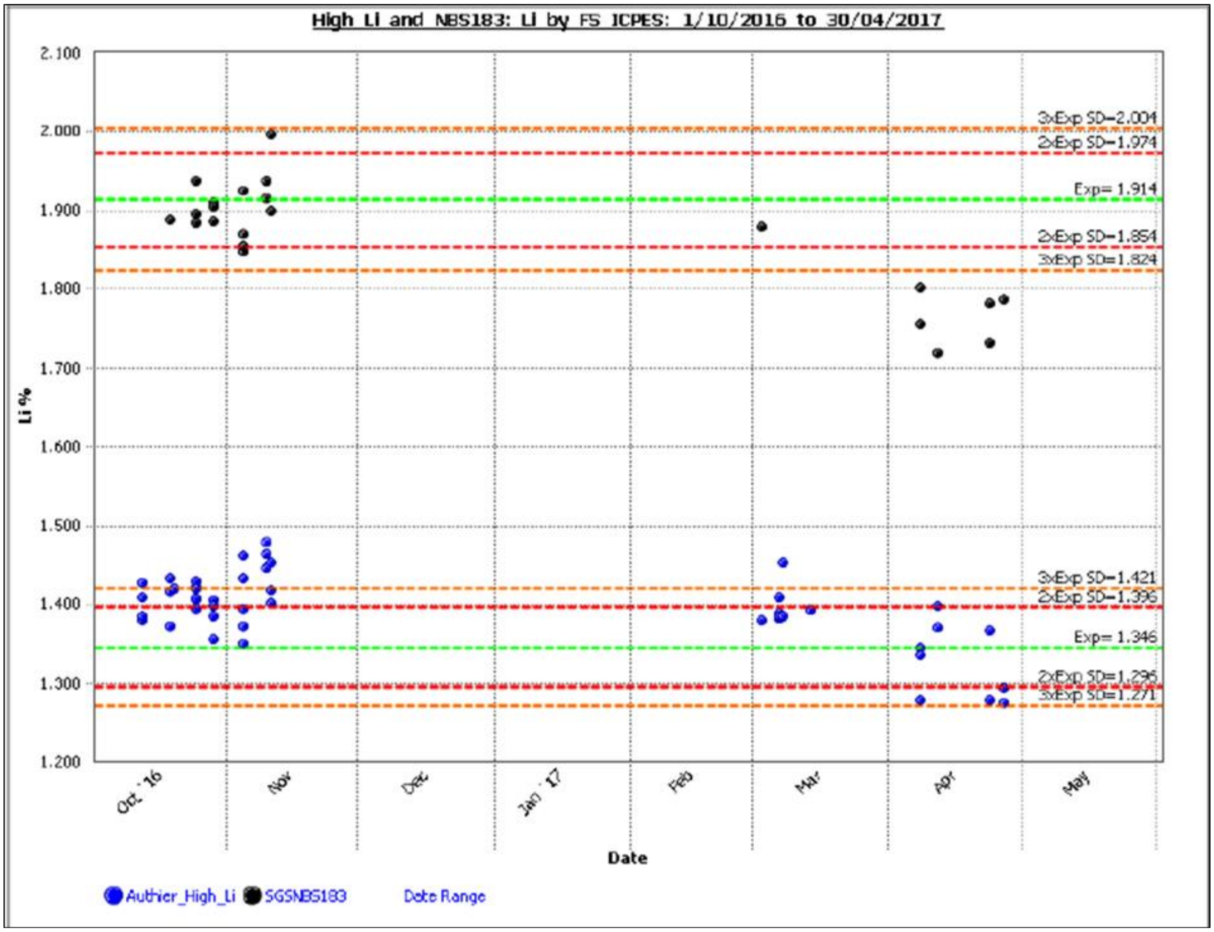


Figure 11-9: Authier High_Li and SGS NBS183 performance 2016-2017

11.9.1. Company Blank Material

Sayona Québec utilized one non-certified silica blank during the 2016 and 2017 drilling campaign to test for potential sample contamination during sampling, preparation and analysis processes. The material was "Special Kitty Litter" purchased from Walmart and was stored in airtight plastic tubs to prevent contamination. Each sample consisted of approximately 200 g of the material scooped with a dedicated mug into the plastic sample bags.

The blanks were included at routine intervals during sampling at a rate of approximately 1:20 samples. The blanks were analyzed for Li by SGS sodium peroxide fusion ICP-OES (GE_ICP90A).

The expected value and standard deviation for the blanks were set to 0.001% lithium, which is the detection limit for the analysis method. The control limits are set as ±3σ from the expected value.

The blank material performed well with all samples <0.003% and no outliers reported. The results for the 44 blank samples are summarized in Table 11-5 and Figure 11-10. Orange lines in the figure represent the ±3σ from the expected value and the red lines represent ±2σ from the expected value.

Table 11-5: Blank summary – Sayona Québec 2017

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
Blank	FS_ICPES	FS_ICPES	0.000	0.001	44	-0.001	0.001	0.0000	0.00%

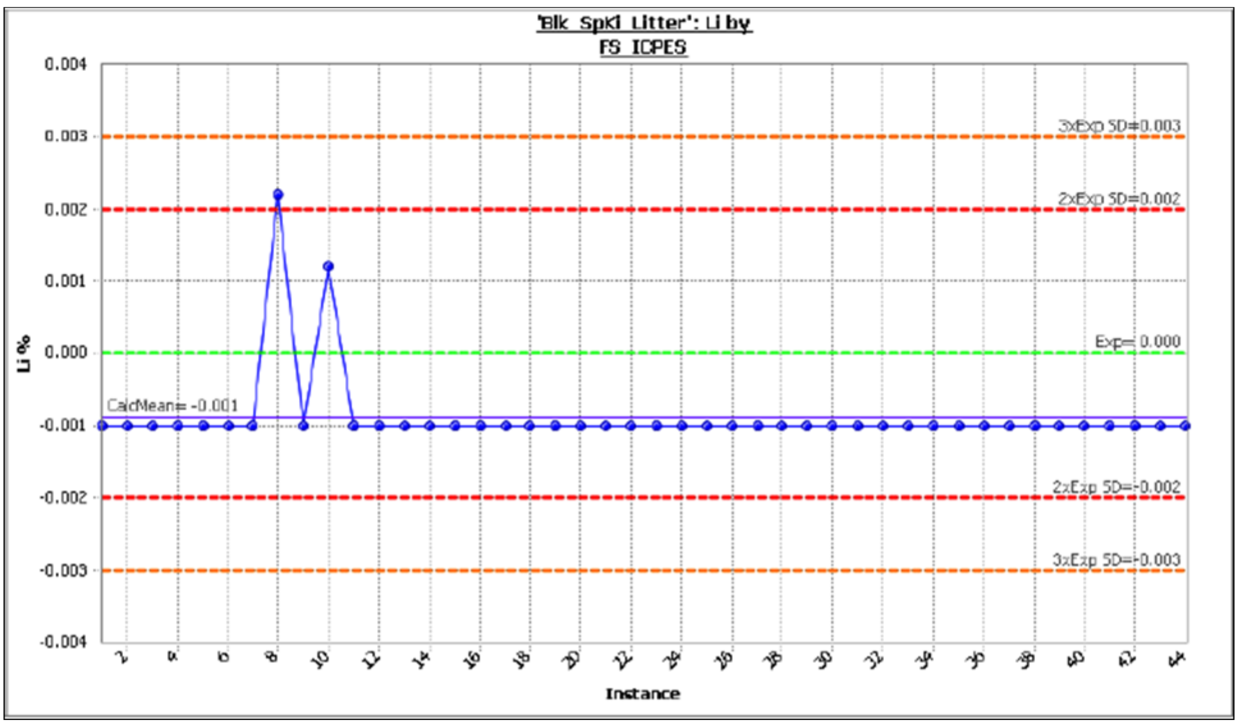


Figure 11-10: Blank performance – Sayona Québec 2017

11.9.2. Sayona Québec Duplicates 2017

Sayona Québec did not collect duplicate samples during the 2017 drill campaign. The SGS Lakefield laboratory reported two types of laboratory duplicates in their batches, a coarse duplicate and a pulp repeat.

11.10. Sayona Québec 2018 Reference Materials Results

The 2018 QA/QC follow-up was conducted by Rock Solid Data Consultancy Pty., mandated by Sayona Québec. The report included performance of reference materials for both Sayona Québec and SGS. The sampling data was managed by Rock Solid Data and stored in a custom-relational SQL database.

The report is based on quality control data associated with 2,154 m of NQ diamond drilling ("DD") from 19 drillholes (AL-18-001 to AL-18-019). A total of 364 half-core samples were collected from mineralized intersections between January and March 2018. Available quality control data include two company standards and one company blank as well as laboratory duplicates, blanks and standards. Sayona Québec did not collect duplicate samples during the report period.

The drill and quality control samples were submitted to SGS Lakefield, where they were analyzed for lithium and 27 additional elements by sodium peroxide fusion ICP-OES with HCl finish (GE_ICP91A). The lower detection limit for lithium is 0.001%. SGS reported a total of seven batches, between February 22 and March 27, 2018. The lithium analyses are the subject of this report and values are reported in percent.

The amount of drill samples, duplicates and standards reported during the sampling program are summarized in Table 11-6. Approximately 8% of all samples submitted to SGS are Sayona Québec standards and blanks. Laboratory standards and laboratory duplicates represent approximately 11% of the reported samples.

Table 11-6: Authier 2018 SGS Lakefield batch summary statistics

Number of Batches	Drill Samples	Drill Duplicates	Company Standards	Company Blanks	Laboratory Duplicates	Laboratory Standards and Blanks
7	364	0	13	20	20	28

During the Authier 2018 drilling campaign, Sayona Québec used two company standards and one blank to monitor the accuracy of the laboratory assay results. The company standards were a High-Li (approx. 1.4%) and a Low-Li (approx. 0.3%) standard.

The High-Li and Low-Li standards were custom-made from mineralized material from the main pegmatite intrusion at the Authier site and were used by Glen Eagle during their 2010-2012 drilling campaigns. The expected value and standard deviation for the standards were derived by Glen Eagle from 30 Lithium (Li_2O) analyses from SGS Toronto and ALS Vancouver. The 15 SGS Toronto analyses were by sodium peroxide fusion with ICP-OES finish (SGS code ICP90Q) and the 15 ALS Vancouver analyses were by ore grade lithium four acid digestion with ICP-AES finish (ALS code

Li-OG63). The control limits were set as ±3σ from the expected value. For further details regarding the two standards, refer to document "March-01-2013_PEA_Glen-Eagle_rev_March-11.pdf". The two standards were included at routine intervals during sampling at a rate of approximately 1:30 samples. The standards were analyzed for lithium by sodium peroxide fusion ICP-OES with HCl finish (GE_ICP91A).

Sayona Québec used one non-certified blank, logged as Blk_Spki_Litter to test for potential sample contamination during sampling, preparation and analysis processes. The Blank, Blk_SpKi_Litter was sourced from Walmart under the name "Special Kitty" Natural Clay Cat Litter. It was stored post purchase in airtight plastic tubs to prevent contamination.

The blanks were included at routine intervals during sampling at a rate of approximately 1:20 samples. Each sample consisted of approximately 200 g of the material scooped with a dedicated mug into the plastic sample bags. The blanks were analyzed for lithium by sodium peroxide fusion ICP-OES with HCl finish (GE_ICP91A).

11.10.1. Sayona Québec 2018 Standards Results

The lithium results for the company standards are summarized in Table 11-7, Figure 11-11 and Figure 11-12. A total of 13 standards were analyzed. All results for High-Li were within ±3σ from the expected value and all results for Low-Li were within ±2σ from the expected value.

Table 11-7: Sayona Québec standard reference material summary

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
High_Li	GE_ICP91A	-	1.346	0.0250	6	1.366	0.023	0.0017	1.50%
Low_Li	GE_ICP91A	-	0.288	0.0140	7	0.294	0.008	0.0027	2.25%

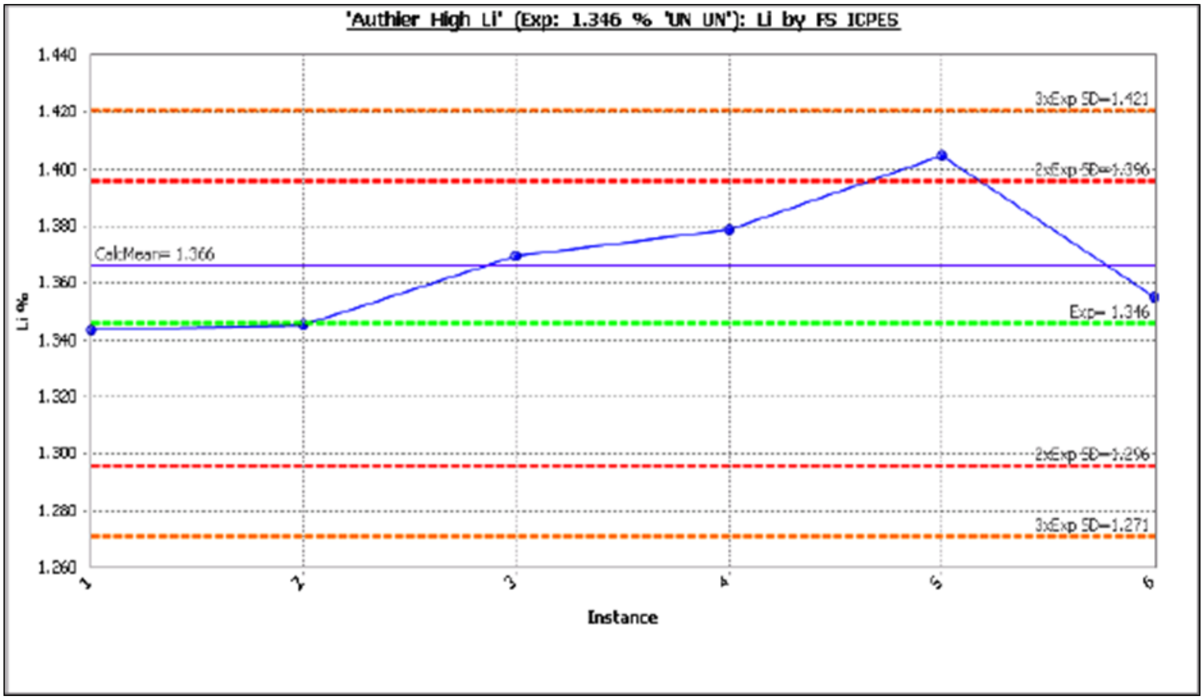


Figure 11-11: Authier High-Li performance

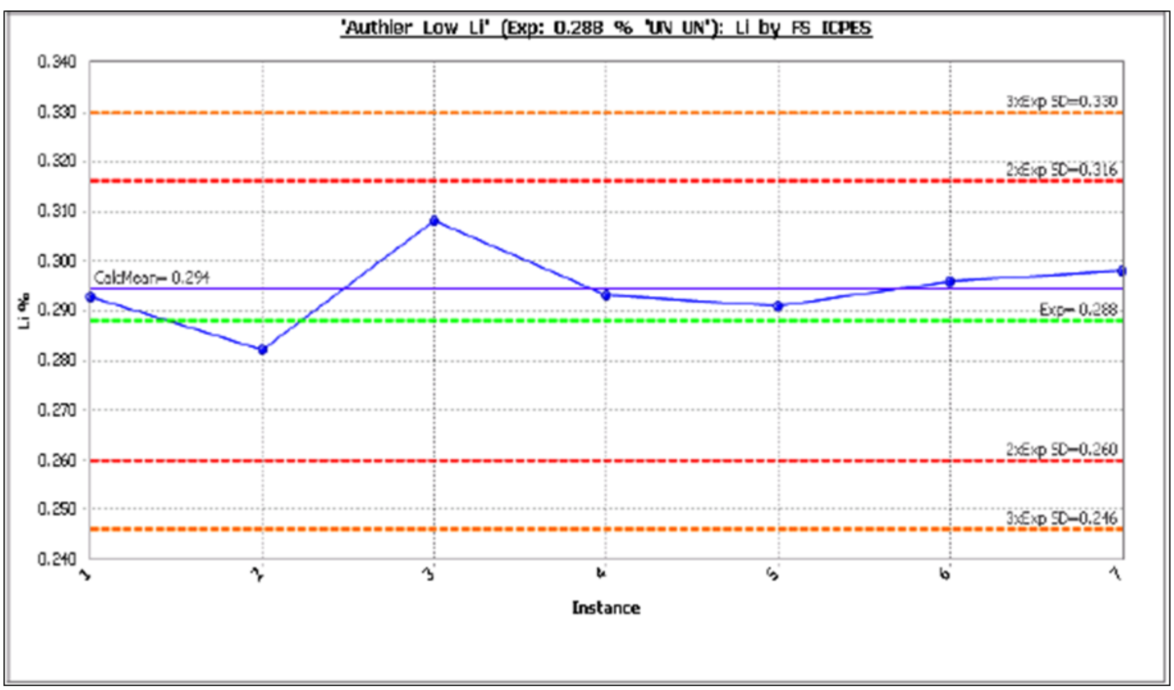


Figure 11-12: Authier Low-Li performance

11.10.2. Sayona Québec 2018 Blank Results

During the report period a total of 20 blank samples were analyzed. Results for the blanks are summarized in Table 11-8 and Figure 11-13.

Table 11-8: Sayona Québec blank summary

Li Standard(s)					No. of Samples	Calculated Values			
Standard	Method	Exp Method	Exp Value	Exp SD		Mean Li	SD	CV	Mean Bias
Blank	GE_ICP91A	-	-	-	20	0.004	0.001	0.161	-

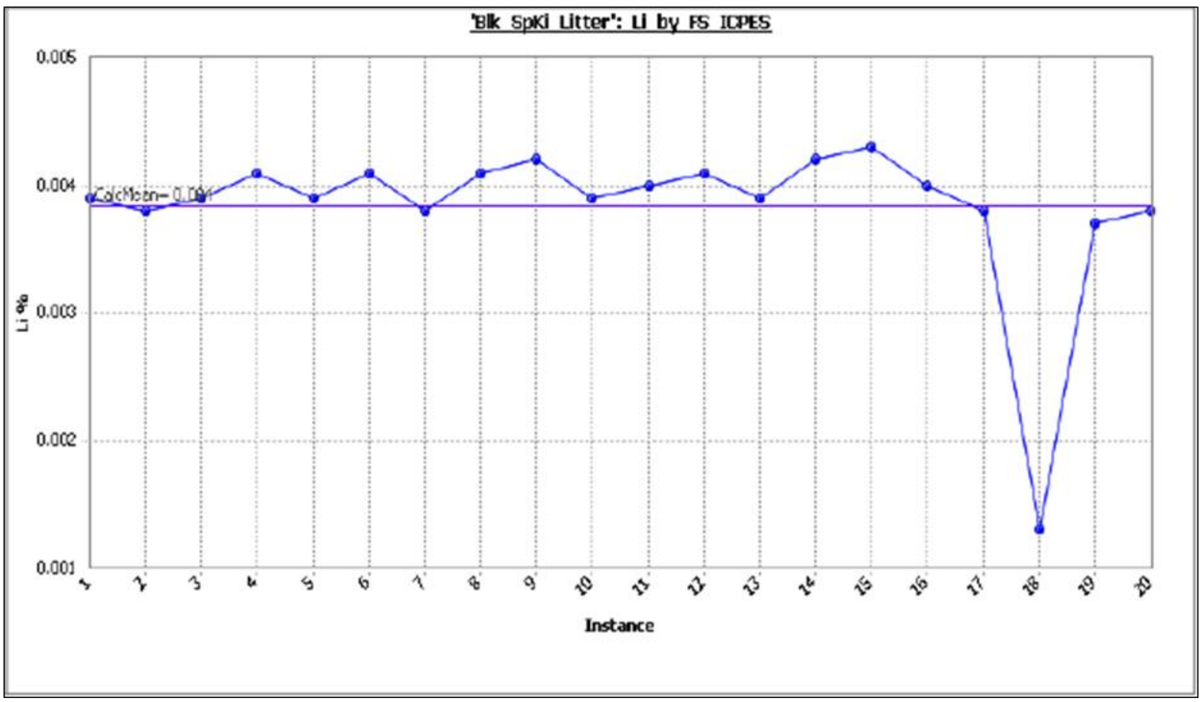


Figure 11-13: Sayona Québec blank performance

11.10.3. Sayona Québec Duplicates 2018

Sayona Québec did not collect duplicate samples during the 2018 drill campaign. The SGS Lakefield laboratory reported two types of laboratory duplicates in their batches, a coarse duplicate and a pulp repeat.

12. DATA VERIFICATION

12.1. General

Sayona Québec conducted the current mineral resource estimate ("MRE") for the Authier Deposit using an updated, validated database, which incorporates diamond drilling programs completed by Sayona in 2016, 2017 and 2018. The database also includes validated historical drilling data from the Glen Eagle programs between 2010 and 2012. The Glen Eagle drilling database was also validated by SGS Geological Services for the MRE released on November 19, 2013, by Glen Eagle.

The validation did not return any significant issues. The AL-10-XX, AL-11-XX and AL-12-XX collar coordinates present in the database were taken from signed originals and authorized copies of surveyed collar data from independent land surveying companies.

As part of the data verification, the analytical data from the database has been validated with values reported in the laboratories' analytical certificates. The total laboratory certificates verified amounts to a minimum of 20% of the overall laboratory certificates of the Property. There were no relevant errors or discrepancies noted during the validation.

The database used to produce the MRE is derived from a total of 225 holes from across the entire Authier Property, including:

- 81 historical;
- 69 drilled by Glen Eagle between 2010 and 2012; and
- 75 drilled by Sayona Québec between 2016 and 2018.

The database contains the survey collar location, lithology and analytical results.

The database cut-off date is August 31, 2021. The author is of the opinion that the final drillhole database is adequate to support the MRE.

From this database, 199 drillholes were used for the solid modelling and MRE.

There is a total of 5,049 assay intervals in the database used for the current MRE and 2,456 of them are contained inside the mineralized solids.

12.2. Check Sampling of 2010 Assay Results by SGS Geological Services

As part of the 2010 data verification program, SGS Geological Services completed independent analytical checks of drill core duplicate samples taken from Glen Eagle's 2010 diamond drilling program. SGS Geological Services also conducted analysis of twin holes completed by Sayona Québec to validate the historical analytical data. Finally, verification of the laboratories' analytical certificates and validation of the Project digital database supplied by Glen Eagle were verified for errors or discrepancies.

Thirty mineralized drill core duplicates were collected from holes AL-10-01 and AL-10-11 by SGS Geological Services. The comparison of the 2010 original and duplicate analytical values is suggesting a small analytical bias toward the original samples processed by ALS. The 2010 Glen Eagle pulp duplicate program also came to this conclusion. The 2010 analytical bias was not very significant, with the duplicate samples returning an average Li_2O value 7.9% higher compared to the original samples.

12.3. Check Sampling of 2011-2012 Assay Results by SGS Geological Services

SGS Geological Services completed analytical checks of drill core duplicate samples taken from selected Glen Eagle 2011-2012 diamond drillholes on the Authier Deposit as part of the independent data verification program. SGS Geological Services also conducted verification of the laboratories analytical certificates and validation of the database supplied by Glen Eagle for errors and discrepancies.

During the July 30, 2012 site visit by the author, Maxime Dupéré (P.Geo.), a total of 38 mineralized core duplicates from the Authier pegmatite were collected from holes AL-11-01, AL-11-16 and AL-12-20, and submitted for analysis at SGS Minerals' laboratory in Lakefield ("SGS Lakefield"), Ontario, Canada which is an accredited ISO/IEC 17025 laboratory. The analytical method used by SGS Lakefield is the ore grade analysis using sodium peroxide fusion with induced coupled plasma optical emission spectrometry ("ICP-OES") finish methodology with a lower detection limit of 0.01% Li (SGS code ICP90Q). This method uses 20 g of pulp material. Blanks were inserted respectively at the beginning and the end of the sample series. Two non-commercial reference materials were also inserted in the sample series: High-grade lithium ("High-Li") and Low-grade lithium ("Low-Li").

Figure 12-1 shows the correlation plots for the check data versus the original data. A summary of the statistical analysis conducted on the data is shown in Table 12-1.

There is a good assay correlation for Li_2O. The correlation coefficient is above 0.9. The average Li_2O grade of the duplicate assays is 13% higher than the original samples. The sign test shows that the proportion of pairs with an old sample value greater than the new sample value is 8 out of 43. The sign test clearly showed a bias at a 95% confidence level. In comparison to the previous check samplings done by SGS Geological Services, results show a clear variability of assay results between laboratories. It is SGS Geological Services, and the author's, opinion that this difference in favour of the 2010 samples for ALS and the one in favour of the old assay results from the 2012 sampling (AGAT) is less than 15% and is considered acceptable. Recommendations will be made to mitigate this difference in the recommendation section.

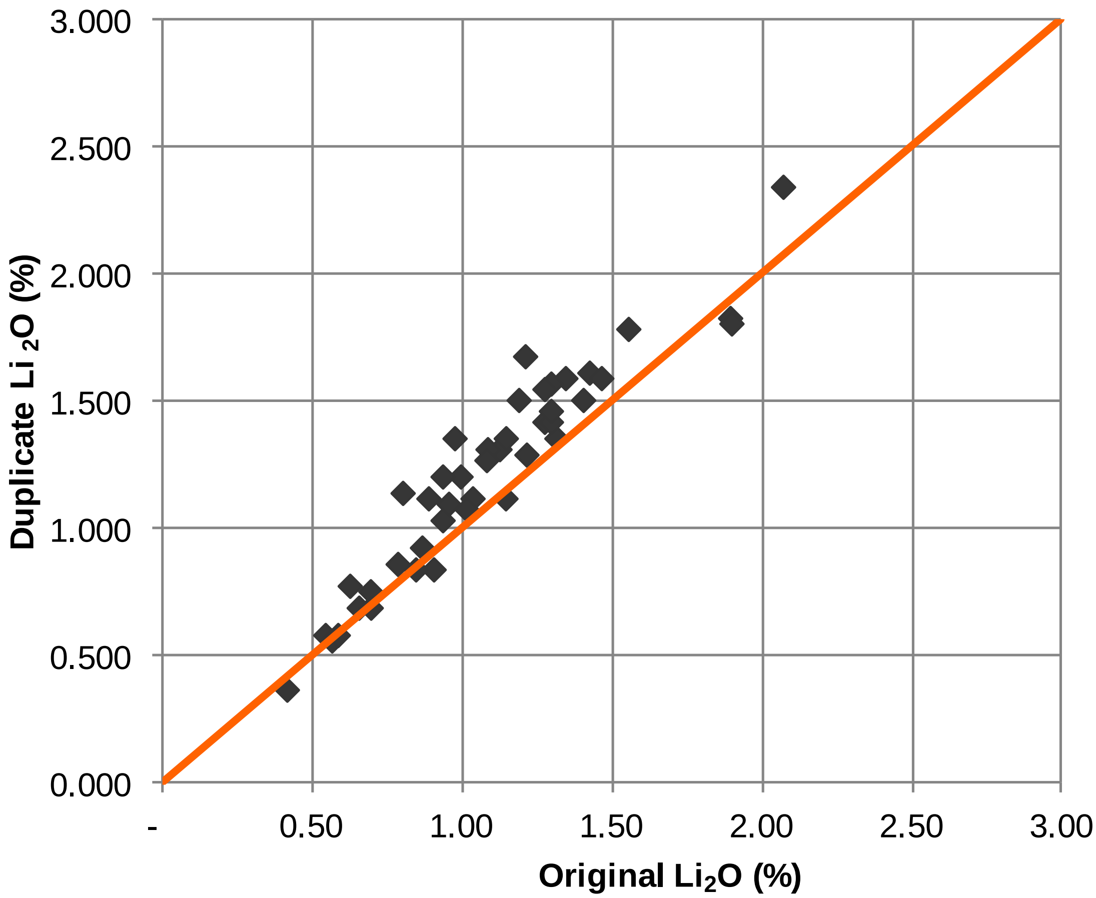


Figure 12-1: Correlation plot for independent check samples

Table 12-1: Summary statistical analysis of original and check assay results

Criteria	Count	Original < Duplicate	Original > Duplicate
All samples	43	35 81%	8 19%
> 0.75%	35	30 86%	5 14%
> 0.75% & <= 1.5%	31	28 90%	3 10%
> 1.5%	4	2 50%	2 50%

Criteria	Count	Relative Percent Difference Within Range		
		±10%	±25%	±50%
All samples	43	20 47%	19 44%	4 9%
> 0.75%	35	20 57%	11 31%	4 11%
> 0.75% & <= 1.5%	31	12 90%	15 48%	4 13%
> 1.5%	4	2 39%	2 50%	0 0%

12.4. Check Sampling of 2016 Assay Results by Sayona Québec

Sayona Québec has not conducted check sampling for 2016 samples or historical drillholes as part of the 2016 drilling program.

12.5. Check Sampling of 2017 Assay Results by Sayona Québec

Sayona Québec has not conducted check sampling for 2017 samples or historical drillholes as part of the 2017 drilling program.

12.6. Check Sampling of 2018 Assay Results by Sayona Québec

Sayona Québec has not conducted check sampling for 2018 samples or historical drillholes as part of the 2018 drilling program.

12.7. Twinning of Historical Drillholes

As part of the Stage 3 drilling program in December 2017, Sayona Québec drilled seven diamond core holes for 769.5 m, PQ diameter, to collect 5.5 tonnes of pegmatite material for the pilot plant program.

All PQ drillholes were from the same drilling pad as both of Sayona Québec's historical holes; PQ holes were sampled metre by metre (full core). The diamond core was assayed and stage-crushed to the appropriate particle size to feed the pilot plant. The samples were processed and assayed at SGS Lakefield for lithium using sodium peroxide fusion, followed by ICP-OES analysis and whole rock analysis (major elements) using X-ray fluorescence (XRF76V) with majors by lithium metaborate fusion. No internal or laboratory QA/QC was applied for the metallurgical sampling as the aim of the analysis was to estimate composition of the two composite pilot plant feed samples, which represented Years 0 to 5 and Years 5+ of the operation.

Comparisons between holes were performed, when possible, based upon holes that were collared and positioned, i.e., azimuths and dip, close enough to the original. Table 12-2 shows the results obtained.

Table 12-2: Comparative results for metallurgical pilot plant drillholes vs. original drillholes - Authier Property

Drillhole	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)	Relative Difference (%)
AL-17-32	13	78	65	1.29	4.55
AL-16-01	12	74	62	1.35	
AL-17-33	53	99	46	1.28	8.14
AL-16-02	50	99	49	1.18	
AL-17-34	56	91	35	1.09	15.05
AL-14	49.38	99.36	49.98	1.27	
AL-17-35	4.7	42	37.3	0.98	NC (1)
AL-12-09	6	33	27	0.85	
AL-17-36	67	81	14	1.47	NC (2)
	83	94.9	11.9	1.57	
	104	112	8	1.49	
AL-10-01	72	112.5	40.5	1.38	
AL-17-37	139	146	7	1.15	NC (3)
	151	167	16	0.54	
AL-16-11	135	175	40	1.39	

Drillhole	From (m)	To (m)	Thickness (m)	Grade (% Li_2O)	Relative Difference (%)
AL-17-38	34	52	18	0.96	NC (4)
	54	60	6	1.32	
	63	65	2	1.3	
R-93-06	36.58	70.1	33.52	1.12	

Table 12-2 shows a good correlation between AL-17-32 vs. AL-16-01 and AL-17-33 vs. AL-16-02, which were collared less than 5 m from original and drilled at the same azimuth and dip. The correlation is fair for AL-17-34 vs. AL-14.

Note that NC means no comparison done due to technical or operational differences:

- NC (1): No comparison was made between AL-17-35 and AL-12-09 because both holes were drilled at different azimuths and dips;
- NC (2): No comparison was made between AL-17-36 and AL-10-01 because 2 m portions of pegmatite cores from AL-17-36 were used during the pilot plant setup and assays were not reported for such intervals;
- NC (3): No comparisons were made between AL-17-37 and AL-16-11 because 2 m portions of pegmatite cores from AL-17-37 were used during pilot plant setup and assays were not reported for such intervals;
- NC (4): No comparison was made between AL-17-38 and R-93-06 because 2 m portions of pegmatite cores from AL-17-38 were used during pilot plant setup and assays were not reported for such intervals.

Considering the grade and geometry variability observed in the Authier pegmatite intrusive body, the results of the metallurgical drillhole program showed a fair to good correlation between the metallurgical versus recent and historical drillholes.

Sayona Québec has not conducted twinning of historical drillholes as part of the Phase 1 (2016) and Phase 2 (2017) drilling programs.

Before Sayona Québec's acquisition, and to validate the historical drilling data, SGS Geological Services recommended that Glen Eagle complete twin holes of selected historical drillholes from the AL-XX and the R-93-XX series. In 2010, following SGS Geological Services recommendations, Glen Eagle completed three twin drillholes to verify the historical R-93-XX drillholes series. Holes R-93-01, R-93-13, and R-93-25 were twinned with holes Al-10-11, AL-10-06 and Al-10-01, respectively.

Hole AL-10-11 intersected the mineralized interval at a distance varying between 1 m and 5 m from hole R-93-01. Hole AL-10-11 returned 0.87% Li_2O over 35.90 m, which is 3.68% lower compared to the original mineralized interval of 0.90% Li_2O over the 43.28 m intersected in hole R-93-01.

Hole AL-10-06 intersected two mineralized intervals at a distance varying between 4 m and 4.5 m from hole R-93-13. The first mineralized interval intersected by hole AL-10-13 returned 1.17% Li_2O over 8.55 m, which is 9.36% lower compared to the original mineralized interval of 1.29% Li_2O over the 8.08 m intersected in hole R-93-13. The second mineralized interval intersected by hole AL-10-06 returned 0.83% Li_2O over 8.30 m, which is 27.31% lower compared to the original mineralized interval of 1.14% Li_2O over 9.75 m that was intersected in hole R-93-13.

Hole AL-10-01 intersected the mineralized interval at a distance less than 7.5 m from hole R-93-25. Hole AL-10-01 returned 1.35% Li_2O over 51.25 m, which is 8.46% higher compared to the original mineralized interval of 1.25% Li_2O over the 49.38 m that was intersected in hole R-93-25.

Due to localization difficulties encountered in the field by Sayona Québec, the twin drillholes planned for the AL-XX drillhole series were collared too far, more than 15-20 m, from the historical holes, to be considered valid for data verification. After reviewing all the drill data, two holes, one by the recent Glen Eagle drilling (Al-10-15) and one from the R93-XX series (R93-12), intersected mineral intervals near enough holes from the AL-XX series to be considered valid for data verification.

Hole AL-10-15 intersected a mineralized interval at a distance less than 4.5 m from hole AL-18. Hole AL-10-15 returned 1.20% Li_2O over 15.4 m, which is 75.3% higher compared to the original mineralized interval of 0.69% Li_2O over 15.24 m that was intersected in hole AL-18.

Hole R-93-12 intersected a mineralized interval at a distance less than 5 m from hole AL-24. Hole R-93-12 returned 0.81% Li_2O over 12.19 m, which is 11.8% lower compared to the original mineralized interval of 0.92% Li_2O over 11.52 m that was intersected in hole AL-24.

Hole AL-12-09 intersected one mineralized interval at a distance varying between 1.5 m and 5 m from hole AL-16. The mineralized interval intersected by hole AL-12-19 returned 0.81% Li_2O over 27 m, which is 22.1% lower compared to the original mineralized interval of 1.01% Li_2O over the 27.4 m that was intersected in hole AL-16 (Figure 12-2).

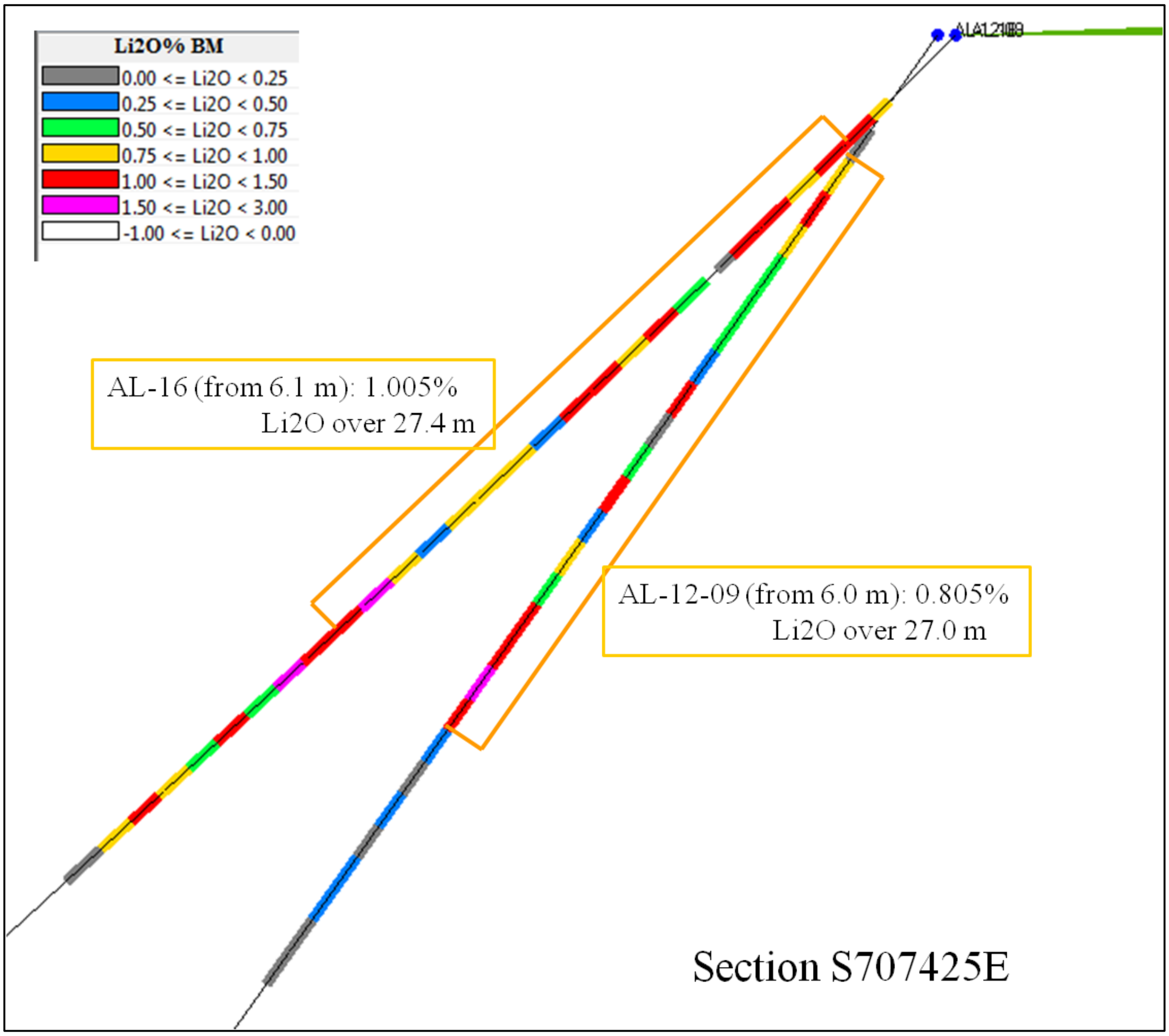


Figure 12-2: Oblique view showing results for twin holes Al-16 and AL-12-09

Hole AL-12-14 intersected one mineralized interval at an average distance of less than 8.5 m from hole AL-19. The mineralized interval intersected by hole AL-12-19 returned 0.74% Li_2O over 36 m, which is 43.4% lower compared to the original mineralized interval of 1.15% Li_2O over the 35.1 m that was intersected in hole AL-19.

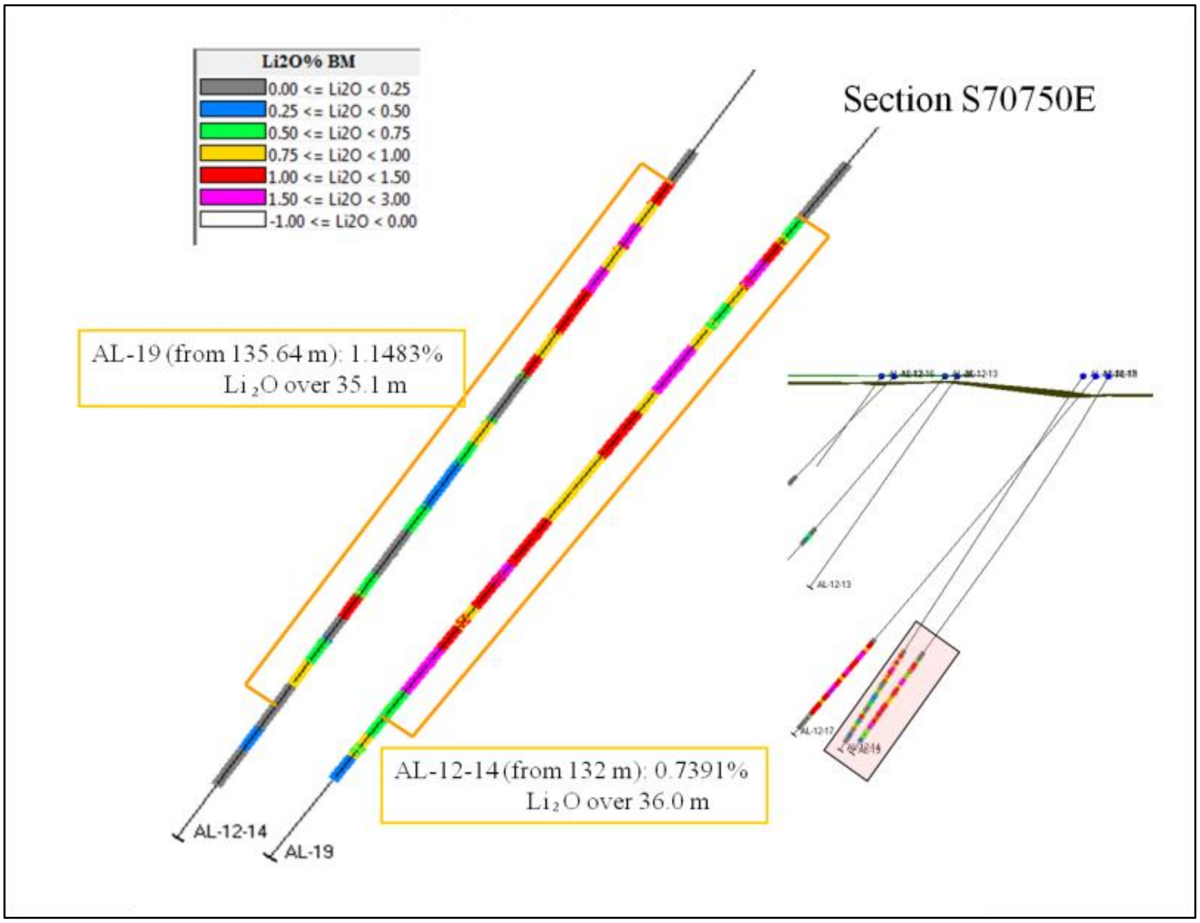


Figure 12-3: Oblique view showing results for twin holes Al-19 and AL-12-14

Considering the grade and geometry variability observed in the Authier pegmatite intrusive body, the results of the twin drillhole program showed a fair to good correlation between the recent and historical drillholes, except between historical R-93-13 and AL-10-06 as well as historical AL-19 and AL-12-14, lower mineralized intercepts of which returned Li_2O grade differences in excess of 30% and 40% differences, respectively. No systematic analytical bias was outlined. Based upon the results of the twin hole drill program, SGS Geological Services considers the historical drill data to be of acceptable quality to be included in the final drillhole database of the Project. Table 12-3 summarizes the overall results of the 2010-2012 twin hole drilling program.

Table 12-3: Comparative results from the 2010-2012 twin hole drill program at Authier

Hole ID	From	To	Length	Weighted Average Li_2O (%)	Relative Percent Difference (%)
R-93-01	35.97	79.25	43.28	0.90	3.75
AI-10-11	38.55	74.45	35.90	0.87	
R-93-13	7.16	15.24	8.08	1.29	9.82
AI-10-06	6.55	15.10	8.55	1.17	
R-93-13	31.09	40.84	9.75	1.14	31.63
AI-10-06	32.70	41.00	8.30	0.83	
R-93-25	76.20	125.58	49.38	1.25	8.11
AI-10-01	72.00	123.25	51.25	1.35	
AL-18	96.62	111.86	15.24	0.69	54.72
AI-10-15	81.00	96.40	15.40	1.20	
AI-24	79.34	90.86	11.52	0.92	12.59
R-93-12	96.93	109.12	12.19	0.81	
AL-16	6.10	33.53	27.43	1.01	22.1
AL-12-09	135.64	170.69	27.00	0.81	
AL-19	135.64	170.69	35.05	1.15	43.4
AL-12-14	132.00	168.00	36.00	0.74	

The final database includes the historical and the 2010-2012 drilling data compiled from the Glen Eagle exploration programs. Table 12-3 lists the data contained in the final drillhole database. Although the sign test clearly showed a bias at a 95% confidence level with a 7.9% difference in favour of the duplicate (SGS) Li_2O results, SGS Geological Services is of the opinion that the final drillhole database is adequate to support mineral resources estimation.

12.8. Specific Gravity of Mineralized Material

As part of the 2010 independent data verification program, SGS Geological Services conducted specific gravity ("SG") measurements on 38 mineralized core samples collected from drillholes AL-10-01 and AL-10-11. The measurements were performed using the water displacement method, i.e., weight in air divided by volume of water displaced, on representative half-core pieces weighing between 0.67 kg and 1.33 kg, with an average of 1.15 kg, yielding an average SG value of 2.71 t/m^3.

Table 12-4: Specific gravity measurements statistical parameters (2010 Program)

	Unit	Mineralized Material
Count	#	38
Mean	t/m^3	2.71
Std Dev	t/m^3	0.01
Minimum	t/m^3	2.64
Median	t/m^3	2.71
Maximum	t/m^3	2.81

In 2017, Sayona Québec performed a density validation program on both mineralized and non-mineralized material. Core samples were sent to ALS in Val-d'Or, Québec, which did the measurements using the same water displacement method. The results of these tests are presented Table 12-5.

Table 12-5: Specific gravity measurements statistical parameters (2017 Program)

	Unit	Non-mineralized Material	Mineralized Material
Count	#	14	15
Mean	t/m^3	2.90	2.70
Std Dev	t/m^3	0.07	0.05
Minimum	t/m^3	2.77	2.62
Median	t/m^3	2.91	2.70
Maximum	t/m^3	2.99	2.86

13. MINERAL PROCESSING AND METALLURGICAL TESTING

13.1. Overview

Initial testwork on the Authier Deposit was undertaken by the Québec Department of Natural Resources in 1969. Flotation tests were carried out on a bulk composite sample prepared from split drill core. Results confirmed the ore was amenable to concentration by flotation and the tests produced spodumene concentrates assaying between 5.13% and 5.81% Li_2O with lithium recovery ranging from 67% to 82%.

In 1991, Raymor Resources Ltd. conducted bench-scale metallurgical testing on mineralized pegmatite samples from the Property. An 18.3 kg sample grading 1.66% Li_2O was tested at the Centre de Recherche Minérale ("CRM", now COREM) in Québec City. The testwork produced a spodumene concentrate grading 6.30% Li_2O with lithium recovery of 73%.

In 1997, Raymor Resources Ltd. completed testing at CRM on two samples from a pegmatite dyke on the Property: 1) 18-t sample grading 1.32% Li_2O; and 2) 12-t sample grading 1.10% Li_2O. Metallurgical testing on the first sample produced a concentrate grading 5.61% Li_2O with 61% lithium recovery. Magnetic separation was used in the testing to remove iron-bearing silicate minerals. The second sample returned a final concentrate grade of 5.16% Li_2O with 58% recovery.

In 1999, metallurgical testing was conducted at COREM on a 40-t mineralized pegmatite sample from the main intrusion at the Authier Property. Figure 13-1 shows the test pit from which the sample was taken. The testing program was conducted as part of a pre-feasibility study. Results showed spodumene concentrate grades ranging from 5.78% to 5.89% Li_2O with lithium recoveries ranging from 68% to 70% from a sample with head grade of 1.14% Li_2O. A sample with head grade of 1.35% Li_2O produced a 5.96% Li_2O concentrate at 75% recovery.

Figure 13-1: Authier bulk test pit

Table 13-1 gives an overview of recent metallurgical testing programs operated by SGS Canada Inc. at their facilities in Lakefield, Ontario.

Table 13-1: Recent Authier metallurgical testing programs

Year	Owner	Sample Size	Testwork
2012	Glen Eagle	270 kg	Flotation testing
2016	Sayona Québec	430 kg	HLS and flotation testing
2017		52 kg	HLS and flotation testing
		66 kg sample	HLS and flotation testing
		120 kg sample	HLS
2018		5 t sample	Pilot plant program
2019		Pilot plant sample	Batch optimization testing

Figure 13-2 shows the locations in The Deposit from which the historical metallurgical testing samples were taken.

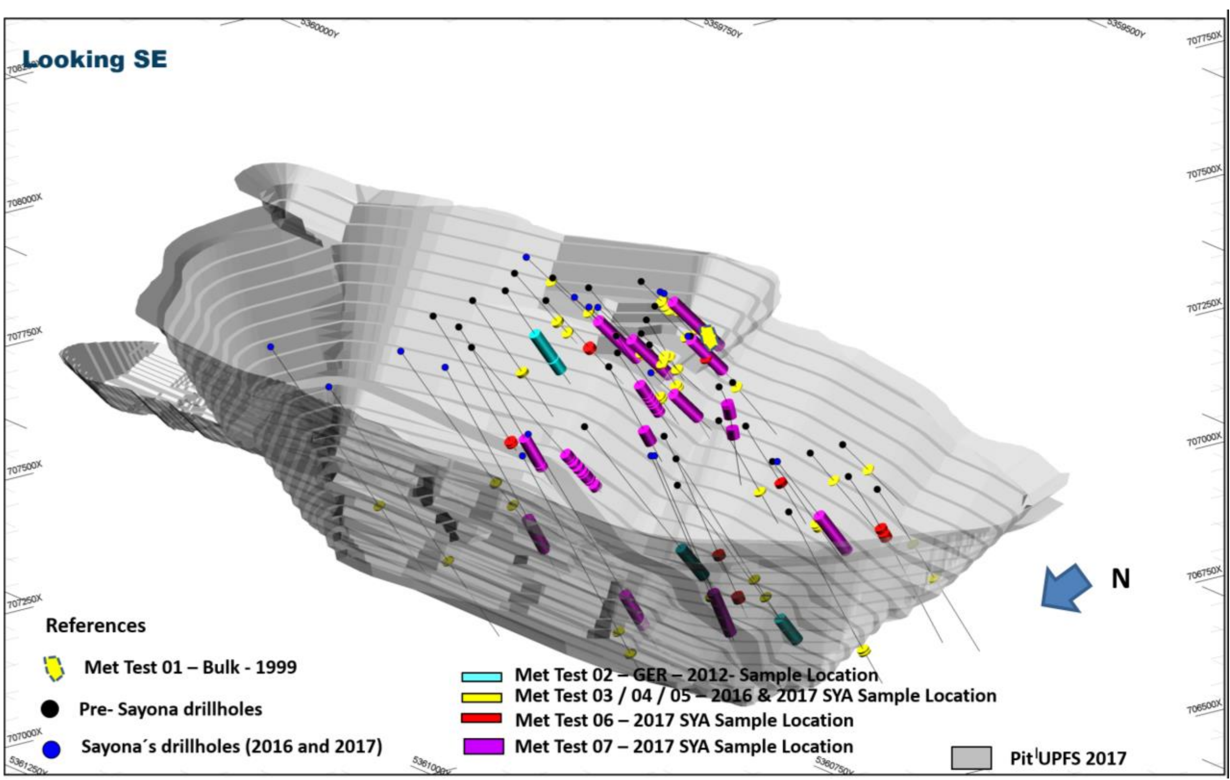


Figure 13-2: Drillhole locations for the various metallurgical testing samples

Glen Eagle Resources Inc. undertook a testing program in 2012 on a 270 kg sample as part of a Preliminary Economic Assessment ("PEA") of the Project. Batch testwork produced a concentrate grading 6.09% Li_2O with 88% lithium recovery after two stages of cleaning (without mica pre-flotation). After four stages of cleaning and passing the concentrate through a Wet High-Intensity Magnetic Separator ("WHIMS") at 15,000 gauss a concentrate grading 6.44% Li_2O was produced with 85% lithium recovery.

In 2016, Sayona completed a metallurgical testing program using drill core from 23 historical holes totalling 430 kg, representing the entire Deposit geometry (including 5% dilution). Concentrate grades varied from 5.38% to 6.05% Li_2O with a lithium recovery ranging from 71% to 79%. Results indicated that ore dilution had a negative impact on flotation performance.

In 2017, two representative samples were prepared and flotation testing was undertaken to examine the impact of the presence of dilution and the use of site water. Testwork demonstrated the ability to produce concentrate grading 6.0% Li_2O with lithium recovery greater than 80%.

The majority of the testing for the Project has focused on spodumene recovery by froth flotation. In 2016-17, Sayona performed several heavy-liquid separation ("HLS") test programs to assess the viability of producing a coarse spodumene concentrate using dense media. Testwork and studies were undertaken and showed that dense media separation ("DMS") was not a viable process option for the Authier Deposit.

A pilot plant testwork program was undertaken in 2018 at SGS Canada Inc. as part of the feasibility study. The aim of the testwork was to confirm the spodumene concentration flowsheet, operational parameters, efficiencies, and reagent consumptions. Roughly 5 t of drill core was used to prepare two composite samples representing: 1) years 0-5, and 2) years 5+ of operation. Testwork included batch and locked-cycle tests and continuous piloting.

In late 2018, an optimization batch testwork program was undertaken at SGS. Testing was performed using sub-samples from the two pilot plant composites. Tests examined the effect of spodumene conditioning, and spodumene collector optimization.

13.2. Glen Eagle Resources Inc. Testwork (2012)

In 2012, Glen Eagle Resources Inc. operated a testwork program at SGS Canada Inc. in Lakefield, Ontario on samples from the Authier Deposit. A 270 kg representative sample was prepared from three drillholes ("DH") along the strike length of the Deposit. The average grade of the sample was 1.23% Li_2O (Table 13-2), which was higher than the 1.02% Li_2O resource grade outlined in the 2012 Glen Eagle 43-101 PEA.

Table 13-2: Feed sample chemical analysis (2012 testing)

Analysis	Grade (%)
Li	0.57
Li_2O	1.23
SiO_2	74.9
Al_2O_3	15.8
Na_2O	4.22
K_2O	3.08
Fe_2O_3	0.59
CaO	0.18
MgO	0.07
P_2O_5	0.02
MnO	0.10
Cr_2O_3	0.02
LOI	0.40

Mineralogical analysis (Table 13-3) showed major components of the sample to be albite (37%), quartz (27%), microcline (16%), spodumene (15%), and muscovite (5%).

Table 13-3: Mineralogical analysis of the feed sample

Mineral	Weight (%)
Albite	37.2
Quartz	26.5
Microcline	16.2
Spodumene	14.9
Muscovite	4.8
Total	**99.6**

13.2.1. Grindability

Bond rod mill work index ("RWI") and Bond ball mill work index ("BWI") were determined to be 12.3 kWh/t and 15.6 kWh/t, respectively (Table 13-4). BWI was tested using a closing screen size of 150 µm.

Table 13-4: Grindability results (2012)

Sample	RWI (kWh/t)	BWI (kWh/t)
2012 Composite	12.3	15.6

13.2.2. Bench-scale Flotation Tests

SGS completed ten batch flotation tests based on a conventional spodumene flotation flowsheet. Variables investigated during the program included grind size, collector types, and the use of mica pre-flotation.

Stage-grinding and scrubbing were performed in a Denver flotation cell at pH 11 (using NaOH) and in the presence of lignin sulphonate (D618). De-sliming was by settling and decantation. Final concentrate was passed through a WHIMS for upgrading and iron rejection.

The testwork showed that a 6.0% Li_2O concentrate could be produced with lithium recovery greater than 80%. Test F8 showed the best flotation performance (conditions shown in Table 13-5) and resulted in the production of a spodumene concentrate grading 6.09% Li_2O (and 1.57% Fe_2O_3) with 88% lithium recovery after two cleaning stages without the use of mica pre-flotation.

Table 13-5: Test F8 test conditions (2012)

Test	Objective	Grind (P_{100})	Reagent Dosage (g/t)				
			Fuel Oil	NaOH	Na_2CO_3	D618	FA-2
F8	Test without mica flotation	-210 µm	0	275	50	450	675

Table 13-6: Test F8 bench-scale flotation results

Product	Weight (%)	Assay (%)		Dist. (%)	
		Li_2O	Fe_2O_3	Li	Fe
Non-mag final concentrate	16.1	6.44	1.06	85	24
4th Cleaner concentrate	16.7	6.29	1.58	86	37
3rd Cleaner concentrate	17.1	6.21	1.58	87	38
2nd Cleaner concentrate	17.6	6.09	1.57	88	39
1st Cleaner concentrate	18.4	5.89	1.57	89	40
Rougher concentrate	18.7	5.81	1.56	89	41
Rougher and scav. conc	21.8	5.07	1.52	90	46

Optimal flotation performance was achieved with stage-grinding to -150 µm and without mica pre-flotation. De-sliming was undertaken using dispersant at pH 11. Spodumene flotation was performed at pH 8 using a fatty acid collector.

13.3. Sayona Québec Metallurgical Testing (2016)

In 2016, nine composite samples weighing 358 kg were shipped to SGS Canada Inc. in Lakefield, Ontario for metallurgical testing. The composites were prepared using historical drill core samples. Drill core was selected to produce a sample with similar average grade and mineralogy to the Deposit as a whole. In addition, 5% ore dilution from the hanging wall was added.

13.3.1. Feed Characterization

Sample AMET1 was the main composite tested and the remaining eight composites were considered variability samples. The head assays of the nine composite samples are shown in Table 13-7. Head grades varied between 0.88% Li_2O to 1.12% Li_2O.

Table 13-7: Composite sample assays (2016)

AMET	Assay (%)												
	Li	Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Sum
1	0.52	1.12	73.9	15.7	0.81	0.62	0.34	4.42	2.83	0.03	0.11	0.67	99.4
2	0.44	0.95	72.2	15.0	0.83	0.35	0.32	4.73	2.85	0.03	0.09	0.47	96.9
3	0.41	0.88	74.2	15.6	0.59	0.19	0.21	4.88	3.13	0.02	0.09	0.57	99.5
4	0.51	1.10	72.6	15.3	1.20	1.25	0.49	4.06	2.89	0.03	0.11	0.80	98.8
5	0.51	1.10	73.6	15.3	0.95	0.98	0.47	4.17	3.06	0.02	0.10	0.70	99.4
6	0.49	1.05	73.3	15.5	0.91	0.89	0.42	4.34	3.04	0.04	0.10	0.68	99.2

AMET	Assay (%)												
	Li	Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Sum
7	0.52	1.12	71.2	15.0	0.67	0.21	0.17	4.50	2.80	0.03	0.09	0.50	95.2
9	0.48	1.03	73.5	15.1	1.03	1.09	0.42	3.96	3.08	0.02	0.09	0.83	99.1
10	0.41	0.88	74.0	15.3	0.66	0.19	0.2	4.48	3.15	0.03	0.09	0.60	98.7

Mineralogy of the nine composite samples is shown in Table 13-8. Major components of the samples were plagioclase, quartz, K-feldspar, spodumene and muscovite. Spodumene content in the AMET1 sample was 13.3% and ranged from 9.6% to 13.7% in the variability samples. Minor quantities of several iron-bearing silicate minerals were detected (e.g., biotite, amphibole).

Table 13-8: Mineralogical analysis (2016)

	Mineral	AMET Sample No.								
		1	2	3	4	5	6	7	9	10
Mineral Composition (%)	Spodumene	13.30	11.00	9.60	12.40	11.10	11.80	13.70	13.40	10.80
	Quartz	24.80	27.40	24.80	27.30	25.4	25.50	26.70	28.50	27.40
	Plagioclase	38.50	38.80	40.70	34.20	35.90	37.50	37.80	33.20	38.30
	K-Feldspar	18.60	18.70	21.50	17.90	21.00	18.60	19.10	19.20	20.60
	Muscovite	1.88	1.77	1.58	2.49	1.83	1.96	1.68	2.19	1.84
	Biotite	1.02	0.55	0.44	0.69	0.55	2.08	0.33	0.12	0.30
	Tourmaline	0.29	0.22	0.34	0.28	0.24	0.22	0.26	0.20	0.13
	Amphibole	1.29	1.11	0.48	3.21	2.77	2.12	0.06	2.39	0.43
	Chlorite	0.18	0.10	0.21	1.34	0.92	0.06	0.18	0.64	0.14
	Other	0.23	0.28	0.31	0.24	0.21	0.17	0.11	0.22	0.10
	Total	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

13.3.2. Grindability

Grindability test results are shown in Table 13-9. Bond abrasion tests were performed on five samples. Abrasion index ("AI") ranged from 0.968 g to 1.066 g and fell in at least the 98th percentile in the SGS database which classified the composite samples as very abrasive. BWI was performed on four samples and ranged from 14.2 kWh/t to 14.9 kWh/t classifying the composites as hard.

Table 13-9: Grindability results (2016)

Sample	AI (g)	BWI (kWh/t)
AMET1	1.032	14.2
AMET3	1.006	-
AMET4	-	14.8
AMET6	1.066	14.5
AMET9	0.968	14.9
AMET10	1.025	-

13.3.3. Heavy-liquid Separation

Bench-scale HLS tests were performed on five of the AMET samples. Samples were stage-crushed and the -6.4 mm / +0.86 mm size fraction was tested.

The results indicated that DMS was not a viable option. Using a heavy liquid with sg of 2.95 g/cm^3, the testwork was unable to produce a 6.0% Li_2O concentrate (the highest grade achieved was 4.7% Li_2O). For upgrading tests (separation at 2.7 g/cm^3), results suggest that it was possible to reject more than 40% of the feed mass with lithium losses of between 6% and 15%.

13.3.4. Bench-scale Flotation Tests

Testwork was undertaken on composite sample AMET1. Flotation charges were prepared with grind sizes ranging from 100% passing 300 µm to 75 µm. The results showed optimal grind size to be 100% passing 150 µm. Magnetic separation was performed ahead of flotation in a rougher (5,000 gauss) - scavenger (10,000 gauss) arrangement to reject iron-bearing silicate minerals. Results showed less than 1.5% lithium losses to the magnetic concentrate.

Table 13-11 summarizes the optimized flotation test results for AMET1 sample. Bench-scale results indicated that achieving a concentrate grade of 6.0% Li_2O was difficult and attributed to poor spodumene liberation (68.6% in case of the AMET1 composite). Results show that test F8 produced a concentrate grading 6.07% Li_2O with 71% lithium recovery. Test F15 achieved a concentrate grade of 5.88% Li_2O with 80% recovery. Both of the tests were operated with mica flotation. Based on the results, a locked-cycle test was operated (based on the F15 conditions) and resulted in the production of a 5.65% Li_2O concentrate with lithium recovery of 82%.

Table 13-10: Summary of batch test conditions for tests F8 and F15 on AMET1 sample

Test	Grind (µm)	Dosage (g/t)						
		H_2SO_4	NaOH	Na_2CO_3	Armac C	F100	FA-2	Na Silicate
F8	212	1,200	250	56	75	400	575	50
F15	150	0	125	338	50	400	580	0

Table 13-11: Summary of batch flotation tests F8 and F15 on AMET1 sample

Test	Assay (% Li_2O)	Rec. (%)	Observations / Comments
F8	6.07	71.1	Mica flotation with Armac C at pH ~2.5, coarser grind produced >6.0% Li_2O.
F15	5.88	80.3	Mica flotation with Armac C at pH 10.5. Conc. grade 5.9% Li_2O, rec. >80%.

Testwork results showed spodumene liberation did not exceed 74% in any size fraction. The optimal grind size was found to be 100% passing 150 µm and achieving high-grade spodumene concentrate (>6.0% Li_2O) at high recoveries (>80%) was challenging and attributed to poor spodumene liberation.

13.4. Sayona Québec Metallurgical Test Programs (2017)

Several metallurgical testing programs were undertaken at SGS Canada Inc. in Lakefield, Ontario during 2017 to investigate:

- The effect of head grade and dilution on flotation performance (August 2017);
- Impact of grind size and the use of site water on flotation performance (October 2017); and
- HLS testing (October and December 2017).

13.4.1. Bench-scale Flotation (August 2017)

Two composite samples were prepared from a total of 52 kg of drill core from four holes distributed about the ore body. The sample intervals were selected to provide representative: 1) grade (as compared to the resource), and 2) grain size domains (as identified in the core logs: coarse, medium and fine). A high-grade ("HG") composite and a low-grade ("LG") composite were prepared based on the drill core lithia content. Sub-samples from the HG and LG composites were combined to produce an average composite ("AG") grading roughly 1.0% Li_2O. Waste (dilution) material was included in certain test samples. Assays for each composite sample are given in Table 13-12. Note the relatively high Fe_2O_3 content (9.39%) in the waste composite.

Table 13-12: Composite assays for the August 2017 test program

Sample	Assay (%)												
	Li	Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	P_2O_5	MnO	LOI	Sum
HG	0.71	1.53	74.9	15.3	0.50	0.05	0.15	3.86	2.57	0.02	0.11	0.65	98
LG	0.20	0.43	74.4	15.4	0.60	0.17	0.21	5.98	2.68	0.03	0.10	0.56	100
AG	0.46	0.98	74.7	15.4	0.55	0.11	0.18	4.92	2.63	0.03	0.10	0.60	99
Waste	0.002	0.004	45.6	6.34	9.39	24.5	7.56	0.35	0.02	0.02	0.17	5.66	100

Tests were operated to confirm flotation response at a coarser grind size than previously tested and to demonstrate the impact of head grade and the presence of dilution on metallurgical performance. Tests were undertaken on the HG, LG, and AG samples with grind sizes of 150 um and 180 um. Tests were also operated on AG samples which were diluted with waste rock.

Samples were stage-ground to the appropriate grind size and passed through a WHIMS at 5,000 gauss and 12,000 gauss. De-sliming was performed with F100 dispersant at pH 11. Mica flotation employed Aero 3030C collector. Spodumene flotation was undertaken using 630 g/t FA-2 collector with three stages of cleaning. Table 13-13 summarizes the batch results for the August 2017 testwork program.

Table 13-13: August 2017 metallurgical testing – Flotation test results

Test	Details	Head (% Li_2O)	Conc. Grade (%)		Li Rec. (%)
			Li_2O	Fe_2O_3	
F1	HG, 150 um	1.47	6.22	1.75	83.9
F2	HG, 180 um	1.50	6.45	1.87	86.2
F3	LG, 150 um	0.42	5.52	2.21	66.1
F4	LG, 180 um	0.42	5.36	2.59	49.5
F5	AG, 150 um, diluted	0.97	5.41	2.58	79.8
F6	AG, 150 um, undiluted	0.99	6.32	1.75	82.6
F7	AG, 180 um, diluted	0.99	5.43	2.62	78.1
F8	AG, 180 um, undiluted	1.00	6.31	1.84	85.2

Test results indicated that the LG composite was unable to produce 6.0% Li_2O concentrate while the HG composite achieved the target grade (6.0% Li_2O) and recovery (>80%) with a coarser grind (P100 of 180 µm). All concentrates had relatively high iron content ranging from 1.75% to 2.65% Fe_2O_3.

13.4.2. Bench-scale Flotation (October 2017)

A 66 kg sample was prepared from drill cores to provide a sample with representative grade and grain size as identified in the core logging process: coarse, medium and fine. The composite assays are shown in Table 13-14. The composite sample head grade was 1.08% Li_2O. HLS and flotation tests were undertaken on the composite sample.

Table 13-14: Composite assays for the October 2017 test program

Sample	Assay (%)									
	Li	Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O	MnO
Oct. Comp.	0.51	1.08	74.6	15.4	0.70	0.12	0.17	4.26	3.22	0.08

Figure 13-3 shows the grade-recovery curves for the four tests from the October 2017 testing program. All tests were able to produce greater than 6.0% Li_2O concentrate at roughly 80% recovery. Tests using site water showed slightly better results than tests using tap water.

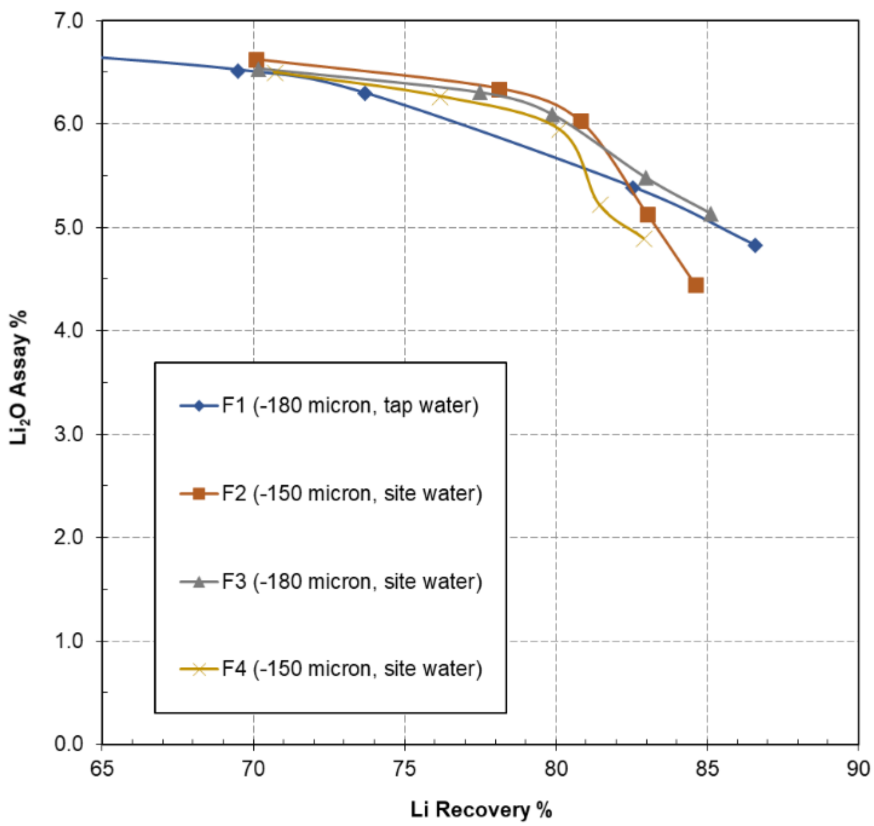


Figure 13-3: Grade-recovery curves for the October 2017 testwork

13.4.3. Heavy Liquid Separation (October 2017)

The aim of the October 2017 HLS testing program was to confirm the results obtained in the 2016 program. The feed sample used for testing was the same sample as for the October 2017 bench-scale flotation tests (Table 13-15). Samples were stage-crushed and the -6.4 mm / +0.86 mm size fraction was tested. There was slight improvement in the HLS results as compared to the 2012 testwork program. Using a heavy liquid with sg of 2.95 produced a concentrate grade of 6.16% Li_2O but with low lithium recovery of 13.9% (Table 13-15). The results indicated that DMS was not a viable option for the Project.

Table 13-15: HLS combined sinks results (October 2017)

HL SG (g/cm³)	Weight (%)	Assays (%)		Dist. (%)
		Li_2O	Fe_2O_3	Li
3.10	0.8	6.91	1.16	5.0
3.00	1.4	6.66	1.10	8.7
2.95	2.4	6.16	1.08	13.9
2.90	2.8	5.95	1.06	15.4
2.80	8.8	4.56	0.99	37.2
2.70	21.0	3.21	0.88	62.4
2.60	53.3	1.48	0.63	72.7

13.4.4. Heavy Liquid Separation (December 2017)

The objective of the December 2017 HLS testing program was to test various size fractions. A 120-kg composite sample was prepared from seven DH across the Authier Deposit. The sample was prepared to reflect the average life-of-mine lithium grade and a representative spodumene grain size across the Deposit. The composite assays are shown in Table 13-16.

Table 13-16: Composite assays for the December 2017 test program

Sample	Assay (%)							
	Li	Li_2O	SiO_2	Al_2O_3	Fe_2O_3	CaO	Na_2O	K_2O
Composite	0.53	1.14	74.2	15.5	0.69	0.21	4.27	3.22

Historical HLS testwork for the Project examined a top crush size of 6.35 mm. Samples for the current study were crushed to a top size of 6.35 mm, 4.75 mm and 3.35 mm. Sub-samples of each were screened at 1,000 µm, 850 µm and 500 µm. Undersize fractions were not tested. The objective was to test finer size fractions to determine if improved separation could be achieved due to increased spodumene liberation.

Results showed that concentrates grading >6.0% Li_2O could be produced using heavy liquid with an sg of 3.0 g/cm^3 with low lithium recoveries ranging from 7% to 13% (extrapolation of the data shows the potential for up to ca. 18% lithium recovery).

Tests undertaken using heavy liquid with an sg of 2.7 g/cm^3 showed the potential to upgrade flotation feed. Results showed mass pull ranging from 50% to 62% with 88% to 93% lithium recovery (combined screen undersize and HLS sinks). The grade of the flotation feed stream ranged from 1.6% to 2.0% Li_2O. The testwork results coupled with an economic analysis indicated that DMS was not a viable option for the Authier Project.

13.5. Sayona Québec Pilot Plant Program (2018)

A pilot plant testwork program was undertaken at SGS Canada Inc. from December 2017 to May 2018. SGS received a roughly 5-t sample of drill core from the Authier Deposit for testing. The samples were crushed and analysed on a metre-by-metre basis. Two composite samples were prepared to represent 1) Years 0-5 and 2) Years 5+ of operation. The pilot plant feed samples were crushed to 100% passing 3.36 mm. An 80-kg sub-sample from each composite was set aside for batch testing. The testwork program included: feed characterization, grindability tests, batch tests, locked-cycle tests, and continuous pilot plant operation.

13.5.1. Feed Characterization

Chemical analysis of the two composite pilot plant feed samples is shown in Table 13-17. The head grades of the two composite samples were 1.01% Li_2O and 1.03% Li_2O, respectively. The only significant differences in chemical composition were slightly elevated concentrations of iron and magnesium in Composite 1.

Table 13-17: Chemical compositions of the pilot plant feed samples

Analysis	Composite 1	Composite 2
	Years 0-5	Years 5+
Li	0.47	0.48
Li_2O	1.01	1.03
SiO_2	73.5	74.9
Al_2O_3	15.6	15.6
Fe_2O_3	0.79	0.56
MgO	0.39	0.10
CaO	0.25	0.17
Na_2O	4.69	4.56
K_2O	2.72	2.95
MnO	0.10	0.09
sg	2.71	2.71

Samples of each composite were analyzed by X-ray diffraction ("XRD"). Results of semi-quantitative mineralogical analysis are shown in Table 13-18. Feldspars, quartz and spodumene are the major constituents in the samples. The presence of hornblende, clinochlore and biotite in Composite 1 correspond to elevated concentrations of iron and magnesium in the sample (Table 13-17).

Table 13-18: Semi-quantitative XRD results (Rietveld Analysis)

Mineral	Composite 1	Composite 2
	Years 0-5 (wt %)	Years 5+ (wt %)
Albite	36.2	33.9
Quartz	31.1	34.8
Spodumene	11.3	9.7
Microcline	9.6	11.0
Muscovite	4.0	9.3
Hornblende	3.4	-
Biotite	1.6	1.2
Clinochlore	2.7	-
Total	**100**	**100**

13.5.2. Grindability

Table 13-19 summarizes the grindability testwork results obtained during the pilot plant program. Six drill core samples were selected for variability grindability testing. Bond low-energy impact crushing work index ("CWI") ranged from 12.1 kWh/t to 19.5 kWh/t (moderately soft to medium range). Bond BWI was measured for the six aforementioned samples and for the two composite pilot plant feed samples. BWI ranged from 12.7 kWh/t to 15.8 kWh/t with an average of 14.6 kWh/t ranking the samples as moderately soft to moderately hard. AI ranged from 0.806 g to 1.009 g. The material tested is highly abrasive and fell in the 95-98th percentile in the SGS abrasion index database.

Table 13-19: Summary of grindability results

Sample	Hole no.	CWI	BWI	AI
		(kWh/t)	(kWh/t)	(g)
1	AL-17-034 47-49 m	13.0	12.7	0.912
2	AL-17-034 54-56 m	14.7	14.5	0.806
3	AL-17-037 167-171 m	12.1	15.8	0.953
4	AL-17-036 81-83 m	15.8	15.8	1.009
5	AL-17-036 102-104 m	19.5	15.2	1.005
6	AL-17-038 53-54 m	15.0	14.9	0.962
PP1	Composite 1 - Yr 0-5	-	13.7	-
PP2	Composite 2 - Yr 5+	-	14.1	-

13.5.3. Bench-scale Flotation Tests

Over forty bench-scale batch tests were operated to confirm and optimize the flowsheet and reagent schemes prior to piloting. Batch tests were undertaken on each composite and included: stage-grinding, magnetic separation (5,000 gauss and 10,000 gauss), de-sliming, mica flotation, and spodumene flotation. Initial batch tests focused on replicating the results from October 2017 testwork. The flowsheet was modified as the testwork program progressed to incorporate successful variations to optimize the flowsheet. The optimized flowsheet, based on tests F37 to F43, is presented in Figure 13-4.

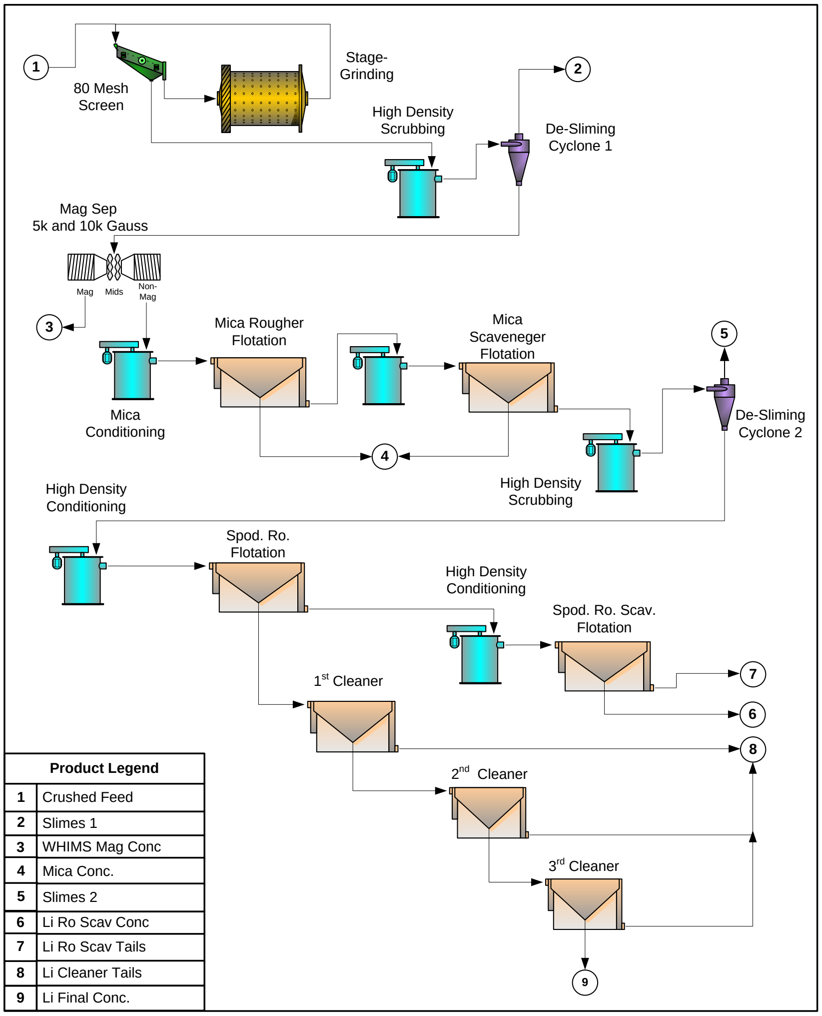


Figure 13-4: Optimized batch flowsheet

For the optimized tests, sub-samples of Composite 1 or 2 were stage-ground to 100% passing 180 µm. The stage-ground feed was scrubbed and de-slimed by decantation. The de-slimed material was processed through a lab-scale WHIMS at 5,000 gauss and 10,000 gauss. Mica flotation was undertaken on the non-magnetic fraction. Rougher and scavenger flotation was undertaken using Armac T collector. The mica scavenger tailings were scrubbed at high density, de-slimed, and conditioned at a pulp density of roughly 65% w/w solids with Sylfat FA-2 spodumene collector. Rougher and scavenger flotation were undertaken with, typically, three stages of cleaning. Reagent dosages for the optimized batch tests operated on Composite 1 or Composite 2 are shown in Table 13-20. Armac T dosage ranged from 100 g/t to 110 g/t and FA-2 dosage ranged from 780 g/t to 1,080 g/t.

Table 13-20: Reagent dosages for selected batch tests

Feed	Test	Dosage (g/t)					
		NaOH	Na_2CO_3	Armac T	F100	FA-2	Na Silicate
Composite 1	F34	250	300	110	250	1,080	0
	F37	388	150	110	250	1,080	0
	F40	312	125	110	250	780	0
Composite 2	F30	275	175	100	250	1,080	25
	F42	375	162	110	250	980	0
	F43	450	512	110	250	980	0

Figure 13-5 shows the grade-recovery curves for selected batch tests. The results show that 80% lithium recovery was achieved at a concentrate grade of 6.0% Li_2O for both composite samples.

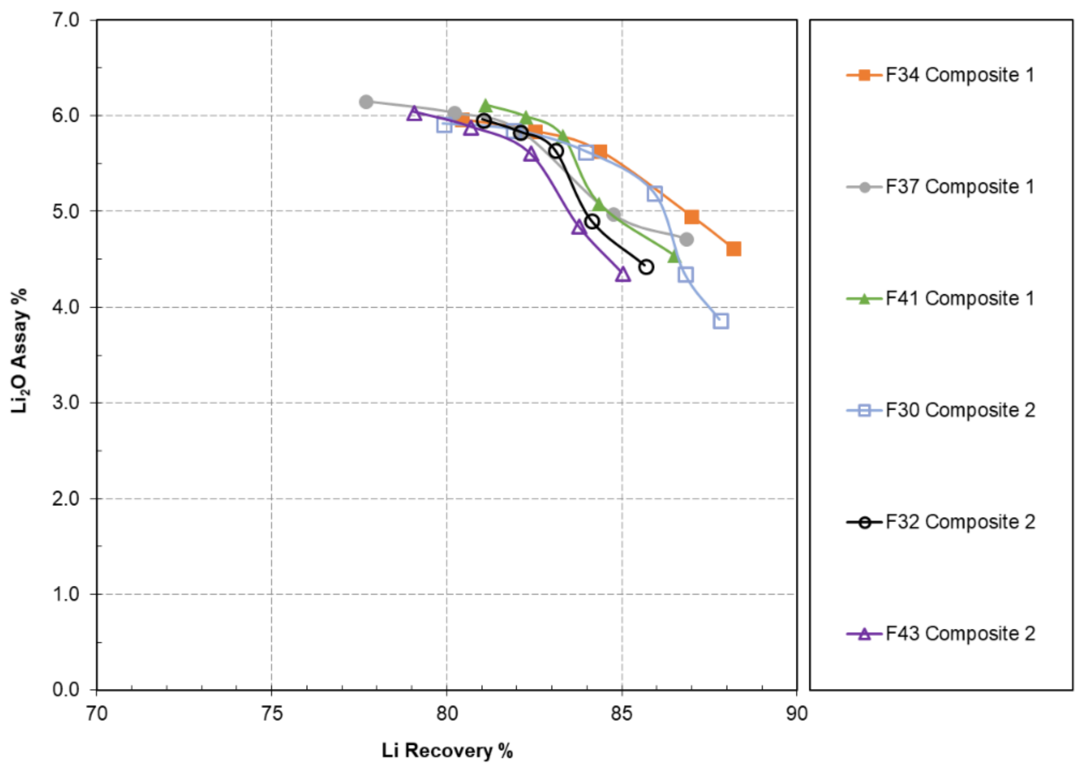


Figure 13-5: Batch test grade-recovery curves

Table 13-21 shows the detailed results for the optimized batch tests.

Table 13-21: Selected batch test results for Composite 1 and Composite 2

Test No.	Combined	Weight		Assays (%)											Distribution (%)									
Objective	Product	g	%	Li	Li_2O	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	MgO	MnO	P_2O_5	Fe_2O_3	Li	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	MgO	MnO	P_2O_5	Fe_2O_3
F34 (Comp 1)	3rd Li Con	267.4	13.6	2.77	5.96	63.7	24.7	0.87	0.80	0.38	0.65	0.16	0.05	1.65	80.4	11.7	21.3	4.4	2.3	12.2	21.1	18.7	32.4	24.9
Studying the Effect of Higher Temp in Conditioning	Li 2nd Cl Con	280.1	14.2	2.71	5.84	63.9	24.5	0.94	0.89	0.37	0.64	0.16	0.05	1.63	82.5	12.3	22.1	4.9	2.7	12.5	21.9	19.2	33.0	25.8
	Li 1st Cl Con	296.9	15.0	2.62	5.63	64.3	24.2	1.04	1.06	0.36	0.63	0.15	0.05	1.59	84.4	13.1	23.1	5.8	3.4	12.9	22.8	19.8	33.9	26.6
	Li Ro Con	348	17.7	2.30	4.95	65.6	22.9	1.31	1.62	0.34	0.58	0.14	0.04	1.43	87.0	15.7	25.7	8.6	6.0	14.1	24.6	20.9	36.4	28.1
	Li Ro+Sc Con	379	19.2	2.14	4.62	66.3	22.3	1.43	1.89	0.33	0.56	0.13	0.04	1.35	88.2	17.3	27.3	10.2	7.7	15.0	25.6	21.5	37.1	28.9
	Mica Con	58	2.9	0.26	0.56	58.4	23.6	6.80	2.62	0.22	1.59	0.12	0.03	2.67	1.6	2.3	4.4	7.4	1.6	1.5	11.2	3.1	4.2	8.8
	Mica Ro+Sc Con	122.3	6.2	0.23	0.50	63.9	20.0	5.62	3.50	0.30	1.62	0.09	0.05	2.20	3.1	5.4	7.9	12.9	4.6	4.5	24.0	4.7	13.6	15.2
	Li Ro Tail	1,306	66.2	0.02	0.04	78.2	13.3	2.76	5.76	0.17	0.05	0.01	0.01	0.13	2.8	70.2	56.1	67.6	80.4	26.9	7.2	6.2	31.7	9.5
	Li Ro+Sc Tail	1,275	64.6	0.01	0.03	78.3	13.3	2.76	5.78	0.17	0.04	0.01	0.01	0.12	1.7	68.7	54.6	66.0	78.7	26.0	6.2	5.6	30.9	8.6
	10A Mags Con	36	1.8	0.62	1.32	48.2	17.5	2.05	1.34	1.24	5.60	3.99	0.04	16.14	2.4	1.2	2.0	1.4	0.5	5.3	24.1	61.8	3.4	32.3
	5A Mags Con	16	0.8	0.50	1.08	47.9	16.7	1.39	1.59	0.86	3.18	6.07	0.04	20.20	0.9	0.5	0.9	0.4	0.3	1.6	6.2	42.4	1.6	18.2
	F34 Total Slimes	161.2	8.2	0.27	0.58	67.4	15.8	3.16	4.95	2.55	1.02	0.09	0.04	1.64	4.7	7.5	8.2	9.6	8.5	49.2	20.1	6.3	15.0	15.0
	Head (calc.)	1,973	100	0.47	1.00	73.7	15.7	2.70	4.74	0.42	0.42	0.12	0.02	0.90	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.47	1.01	73.5	15.6	2.72	4.69	0.25	0.39	0.10	0.03	0.79										
F37 (Comp 1)	3rd Li Con	257.1	13.0	2.86	6.16	63.3	24.6	0.88	0.75	0.36	0.76	0.18	0.05	1.61	77.7	11.1	20.3	4.2	2.0	9.4	23.7	21.3	22.6	24.6
Armac T in mica, and higher density in conditioning	Li 2nd Cl Con	270.8	13.6	2.80	6.04	63.5	24.4	0.95	0.83	0.35	0.75	0.18	0.05	1.60	80.2	11.8	21.2	4.8	2.4	9.7	24.8	21.9	23.1	25.7
	Li 1st Cl Con	286.3	14.4	2.71	5.84	63.8	24.1	1.05	0.97	0.34	0.74	0.17	0.05	1.57	82.1	12.5	22.2	5.6	2.9	9.9	25.8	22.4	23.7	26.7
	Li Ro Con	347	17.5	2.31	4.97	65.6	22.6	1.37	1.64	0.31	0.66	0.14	0.04	1.36	84.7	15.6	25.2	8.9	6.0	10.9	27.7	23.0	25.8	28.1
	Li Ro+Sc Con	375	18.9	2.19	4.72	66.2	22.1	1.47	1.85	0.30	0.63	0.14	0.04	1.31	86.8	17.0	26.7	10.3	7.3	11.5	28.6	23.6	26.8	29.1
	Mica Ro Con	42	2.1	0.28	0.60	53.2	18.6	6.09	2.50	0.31	1.67	0.10	0.06	2.18	1.2	1.5	2.5	4.8	1.1	1.3	8.5	1.9	4.6	5.5
	Mica Ro+Sc Con	79.2	4.0	0.28	0.59	45.2	16.1	4.13	1.78	0.67	3.54	0.86	0.05	7.21	2.3	2.5	4.1	6.1	1.5	5.4	34.0	31.3	6.6	34.0
	Li Ro Tail	1,337	67.4	0.03	0.07	83.0	14.5	2.96	6.16	0.48	0.09	0.01	0.02	0.16	4.3	75.9	62.2	73.8	87.1	65.8	14.7	8.8	52.5	13.0
	Li Ro Scav Tail	1,309	66.0	0.02	0.03	6.3	1.4	0.24	0.47	0.36	0.06	0.00	0.00	0.08	2.2	5.7	5.8	5.8	6.6	47.2	9.9	2.8	6.5	6.0
	10A Mags	50	2.5	0.62	1.33	88.1	22.6	4.04	5.83	3.06	2.59	1.46	0.04	5.70	3.3	3.0	3.6	3.8	3.1	15.7	15.8	33.9	3.7	17.1
	5A Mags	22	1.1	0.61	1.31	146.6	35.3	7.30	10.93	6.35	2.67	0.18	0.07	4.42	1.4	2.2	2.4	2.9	2.5	13.9	7.0	1.8	2.6	5.7
	Total Slimes	170.8	8.6	0.30	0.64	66.9	15.1	2.76	5.02	3.52	0.82	0.06	0.03	1.15	5.4	7.8	8.3	8.8	9.1	61.1	16.9	4.6	9.0	11.6
	Head (calc.)	1,984	100	0.48	1.03	73.7	15.7	2.70	4.77	0.50	0.42	0.11	0.03	0.85	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.47	1.01	73.5	15.6	2.72	4.69	0.25	0.39	0.10	0.03	0.79										
F40 (Comp 1)	3rd Li Con	265.7	13.4	2.80	6.03	64.8	24.8	0.86	0.82	0.30	0.42	0.13	0.06	1.36	78.8	12.0	21.4	4.3	2.3	10.7	13.6	16.0	27.9	20.3
600 g/t Collector Dosage	Li 2nd Cl Con	273.3	13.8	2.76	5.94	65.0	24.6	0.91	0.89	0.30	0.42	0.13	0.06	1.35	79.8	12.3	21.9	4.6	2.6	10.9	13.9	16.3	28.1	20.7
	Li 1st Cl Con	287.8	14.5	2.67	5.74	65.3	24.3	0.99	1.04	0.29	0.41	0.13	0.06	1.32	81.3	13.1	22.7	5.4	3.2	11.2	14.5	16.7	28.9	21.3
	Li Ro Con	336	17.0	2.33	5.03	66.7	23.0	1.24	1.64	0.27	0.38	0.11	0.05	1.19	83.1	15.6	25.1	7.8	5.9	12.3	15.6	17.1	30.6	22.3
	Li Ro + Sc Con	383	19.3	2.10	4.52	67.7	22.0	1.43	2.03	0.26	0.37	0.10	0.05	1.10	85.2	18.0	27.4	10.2	8.3	13.5	17.1	17.8	32.2	23.7
	Mica Ro Con	63	3.2	0.23	0.50	72.3	19.5	6.34	3.97	0.31	1.65	0.08	0.07	1.82	1.5	3.2	4.0	7.5	2.7	2.7	12.7	2.2	7.2	6.5
	Mica Ro+Sc Con	131.8	6.7	0.23	0.50	44.2	12.7	3.54	2.17	0.42	2.13	0.21	0.04	4.05	3.2	4.1	5.4	8.8	3.0	7.4	34.2	12.6	9.0	30.0
	Li Ro Tail	1,278	64.6	0.03	0.06	77.2	13.1	2.67	5.85	0.31	0.07	0.01	0.02	0.14	3.6	68.6	54.6	64.0	79.8	53.5	11.3	6.8	46.2	9.7
	Li Ro+Sc Tail	1,232	62.2	0.01	0.03	3.3	0.7	0.12	0.25	0.18	0.04	0.00	0.00	0.04	1.6	2.8	3.0	2.8	3.2	30.4	5.3	1.1	3.2	2.8
	10A Mags	50	2.5	0.78	1.67	193.0	48.7	8.96	13.07	3.57	4.73	2.60	0.09	10.48	4.1	6.7	7.9	8.4	7.0	23.9	28.8	60.4	8.1	29.4
	5A Mags	24	1.2	0.77	1.66	345.2	81.5	16.66	25.37	6.29	4.93	0.40	0.15	9.71	2.0	5.9	6.5	7.6	6.6	20.5	14.6	4.6	6.4	13.3
	Total Slimes	183.3	9.3	0.30	0.65	68.3	15.8	3.04	5.04	2.08	0.89	0.07	0.03	1.57	5.9	8.7	9.4	10.4	9.8	51.0	19.9	5.7	9.6	16.1
	Head (calc.)	1,980	100	0.48	1.03	72.7	15.5	2.69	4.74	0.38	0.42	0.11	0.03	0.90	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.47	1.01	73.5	15.6	2.72	4.69	0.25	0.39	0.10	0.03	0.79										

Test No.	Combined	Weight		Assays (%)											Distribution (%)									
Objective	Product	g	%	Li	Li_2O	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	MgO	MnO	P_2O_5	Fe_2O_3	Li	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	MgO	MnO	P_2O_5	Fe_2O_3
F30 (Comp 2)	3rd Li Con	271.9	13.9	2.75	5.92	64.7	24.3	0.98	0.93	0.23	0.13	0.14	0.04	1.10	79.9	12.1	21.8	4.7	2.8	8.8	18.0	18.4	20.5	22.9
	3rd Li Con	281.5	14.4	2.72	5.86	64.8	24.2	1.02	0.97	0.23	0.13	0.14	0.04	1.10	81.9	12.5	22.4	5.0	3.1	9.0	18.8	18.8	21.1	23.8
	Li 2nd Cl Con	300.1	15.3	2.62	5.64	65.2	23.8	1.16	1.12	0.22	0.13	0.13	0.04	1.08	83.9	13.5	23.6	6.1	3.8	9.5	20.5	19.2	21.8	24.9
	Li 1st Cl Con	333	17.0	2.42	5.21	66.0	23.1	1.39	1.41	0.22	0.13	0.12	0.04	1.03	85.9	15.1	25.3	8.2	5.3	10.2	22.8	19.5	23.0	26.2
	Li Ro Con	401	20.5	2.02	4.36	67.7	21.5	1.77	2.01	0.21	0.13	0.10	0.03	0.90	86.8	18.7	28.4	12.5	9.1	11.8	26.3	19.8	25.6	27.7
	Li Ro+Sc Con	457	23.3	1.80	3.87	68.8	20.6	1.93	2.36	0.20	0.12	0.09	0.03	0.83	87.8	21.6	30.9	15.5	12.1	13.2	28.8	20.6	27.7	29.2
	Mica Ro Con	46.0	2.3	0.26	0.56	58.2	24.7	7.24	2.44	0.18	0.33	0.10	0.07	2.03	1.3	1.8	3.7	5.9	1.3	1.2	7.7	2.2	6.1	7.1
Slight changes to F12	Mica Ro+Sc Con	87	4.4	0.28	0.60	61.2	22.7	6.85	2.82	0.23	0.35	0.10	0.09	1.72	2.6	3.6	6.5	10.4	2.7	2.8	15.6	4.2	14.5	11.4
	Li Ro. Tail	1,256	64.2	0.02	0.04	78.4	13.0	2.95	5.48	0.16	0.02	0.01	0.02	0.13	2.4	67.7	53.9	65.3	77.3	28.5	14.8	6.6	47.4	12.5
	Li Ro+Sc Tail	1,201.1	61.4	0.01	0.02	78.5	13.0	2.95	5.50	0.16	0.02	0.01	0.02	0.12	1.4	64.8	51.4	62.3	74.2	27.1	12.2	5.8	45.3	11.0
	10A Mags	29.6	1.5	0.86	1.84	52.8	18.2	1.96	1.78	0.51	1.00	4.52	0.04	16.24	2.7	1.1	1.8	1.0	0.6	2.2	15.1	64.6	2.2	36.8
	5A Mags	16.6	0.8	0.79	1.70	55.4	18.3	1.71	2.00	0.51	0.75	5.76	0.04	12.90	1.4	0.6	1.0	0.5	0.4	1.2	6.3	46.2	1.3	16.4
	Head (calc.)	1,958	100	0.48	1.03	74.3	15.5	2.90	4.55	0.36	0.10	0.11	0.03	0.67	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.48	1.03	74.9	15.6	2.95	4.56	0.17	0.10	0.09	0.02	0.56										
F42 (Comp 2)	3rd Li Con	288	14.4	2.77	5.96	64.7	24.1	0.98	1.02	0.21	0.10	0.14	0.04	1.01	81.0	12.7	22.4	4.9	3.3	9.7	13.2	19.7	28.4	22.8
	Li 2nd Cl Con	298	14.9	2.71	5.84	64.9	23.9	1.04	1.11	0.21	0.10	0.14	0.04	1.00	82.1	13.2	23.0	5.4	3.7	10.0	13.9	20.0	28.9	23.4
	Li 1st Cl Con	312	15.5	2.63	5.65	65.2	23.6	1.12	1.24	0.21	0.10	0.13	0.04	0.99	83.1	13.8	23.7	6.1	4.3	10.4	14.9	20.3	29.5	24.2
	Li Ro Con	363	18.1	2.28	4.91	66.8	22.2	1.38	1.79	0.20	0.10	0.12	0.03	0.90	84.1	16.5	26.0	8.7	7.2	11.9	16.7	20.8	30.8	25.4
	Li Ro+Sc Con	409	20.4	2.06	4.44	67.7	21.3	1.55	2.12	0.21	0.10	0.11	0.03	0.84	85.6	18.9	28.1	11.0	9.6	13.4	19.0	21.5	33.0	26.8
	Mica Ro Con	80.8	4.0	0.23	0.50	104.9	21.3	5.49	6.64	0.30	0.18	0.04	0.06	0.58	1.9	5.8	5.5	7.7	5.9	3.9	6.8	1.7	11.3	3.7
	Mica Ro+Sc Con	196	9.7	0.22	0.48	50.2	10.9	2.58	3.03	0.17	0.20	0.18	0.03	1.78	4.4	6.7	6.9	8.8	6.6	5.4	17.9	16.9	13.0	27.2
F39 but with Composite 2	Li Ro. Tail	1,243	62.0	0.02	0.05	75.5	12.8	2.88	5.31	0.25	0.05	0.01	0.01	0.12	2.7	63.9	51.1	62.2	73.1	49.0	27.3	6.4	30.8	11.3
	Li Ro+Sc Tail	1,198	59.7	0.01	0.02	1.5	0.3	0.07	0.11	0.10	0.01	0.00	0.00	0.01	1.2	1.2	1.3	1.4	1.4	18.4	5.4	0.5	1.4	1.0
	10A Mags	39.1	1.9	0.93	2.00	266.7	65.1	13.69	17.93	4.81	1.49	2.74	0.16	8.45	3.7	7.1	8.2	9.3	7.8	30.1	26.6	52.4	15.2	25.9
	5A Mags	15.8	0.8	0.88	1.89	604.4	141.7	32.19	42.51	11.37	2.80	0.70	0.35	11.11	1.4	6.5	7.2	8.9	7.4	28.7	20.2	5.4	13.6	13.7
	Total Slimes	165.8	8.3	0.30	0.64	68.6	16.0	3.54	4.83	1.78	0.34	0.07	0.04	1.14	5.0	7.7	8.5	10.2	8.9	47.1	25.6	5.9	15.0	14.7
	Head (calc.)	2,007	100	0.49	1.06	73.2	15.5	2.86	4.50	0.31	0.11	0.10	0.02	0.64	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.48	1.03	74.9	15.6	2.95	4.56	0.17	0.10	0.09	0.02	0.56										
F43 (Comp 2)	3rd Li Con	278	13.8	2.81	6.05	64.4	24.2	0.92	0.95	0.22	0.10	0.12	0.04	1.04	79.0	12.1	21.6	4.4	2.9	5.9	12.0	16.7	28.6	21.7
	Li 2nd Cl Con	291	14.4	2.74	5.90	64.7	23.9	1.00	1.06	0.22	0.10	0.12	0.04	1.03	80.6	12.7	22.4	5.0	3.4	6.1	12.9	17.1	29.0	22.5
	Li 1st Cl Con	312	15.4	2.61	5.62	65.1	23.5	1.12	1.25	0.22	0.11	0.11	0.04	1.01	82.3	13.7	23.5	6.0	4.3	6.5	14.3	17.6	30.0	23.6
	Li Ro Con	366	18.2	2.26	4.86	66.7	22.1	1.40	1.81	0.21	0.11	0.10	0.03	0.92	83.7	16.5	26.0	8.9	7.3	7.6	16.9	18.5	32.9	25.2
	Li Ro+Sc Con	414	20.5	2.03	4.37	67.7	21.2	1.58	2.14	0.21	0.11	0.09	0.03	0.87	85.0	18.9	28.2	11.3	9.7	8.5	19.2	18.9	34.1	26.8
	Mica Ro Con	82.4	4.1	0.23	0.50	74.3	15.6	4.08	4.68	0.23	0.14	0.03	0.05	0.46	1.9	4.1	4.1	5.8	4.2	1.9	5.1	1.3	10.8	2.8
	Mica Ro+Sc Con	166	8.2	0.22	0.48	44.6	10.1	2.37	2.65	0.17	0.20	0.18	0.03	2.03	3.8	5.0	5.4	6.8	4.8	2.7	14.5	15.2	12.5	25.3
F41 but with Composite 2	Li Ro Tail	1,252	62.0	0.02	0.04	77.0	13.0	2.95	5.46	0.27	0.05	0.01	0.01	0.14	2.5	65.1	52.3	64.0	74.6	32.3	25.7	6.7	33.2	12.8
	Li Ro+Sc Tail	1,205	59.7	0.01	0.02	2.4	0.5	0.10	0.17	0.12	0.01	0.00	0.00	0.01	1.2	2.0	2.0	2.1	2.3	13.7	4.8	0.6	2.2	1.1
	10A Mags	50.3	2.5	0.92	1.98	217.1	53.8	11.06	14.29	11.39	1.49	2.25	0.11	7.15	4.7	7.4	8.7	9.6	7.9	55.3	32.5	56.7	13.7	27.0
	5A Mags	27.9	1.4	0.90	1.94	330.6	78.1	17.74	23.28	20.06	1.86	0.35	0.15	6.20	2.5	6.2	7.0	8.6	7.1	54.0	22.5	4.9	10.9	13.0
	Total Slimes	183.3	9.1	0.29	0.62	66.3	15.3	3.36	4.67	3.83	0.34	0.06	0.03	1.02	5.3	8.2	9.0	10.6	9.4	67.7	27.3	5.6	13.1	14.0
	Head (calc.)	2,018	100	0.49	1.05	73.4	15.4	2.86	4.54	0.51	0.11	0.10	0.02	0.66	100	100	100	100	100	100	100	100	100	100
	Head (Dir.)			0.48	1.03	74.9	15.6	2.95	4.56	0.17	0.10	0.09	0.02	0.56										

13.5.4. Locked-cycle Tests

A locked-cycle test was performed on each composite sample. The conditions for the tests were based on batch tests F41 and F43. The flowsheet for the locked-cycle tests in shown in Figure 13-6. Feed samples were stage-ground to 100% passing 180 µm. Reagent dosages for the tests are given in Table 13-22. The only differences in the test conditions were the slight increase in Armac T dosage from 110 g/t (Composite 1) to 120 g/t (Composite 2) and the addition of MIBC (10 g/t) ahead of mica flotation for Composite 2.

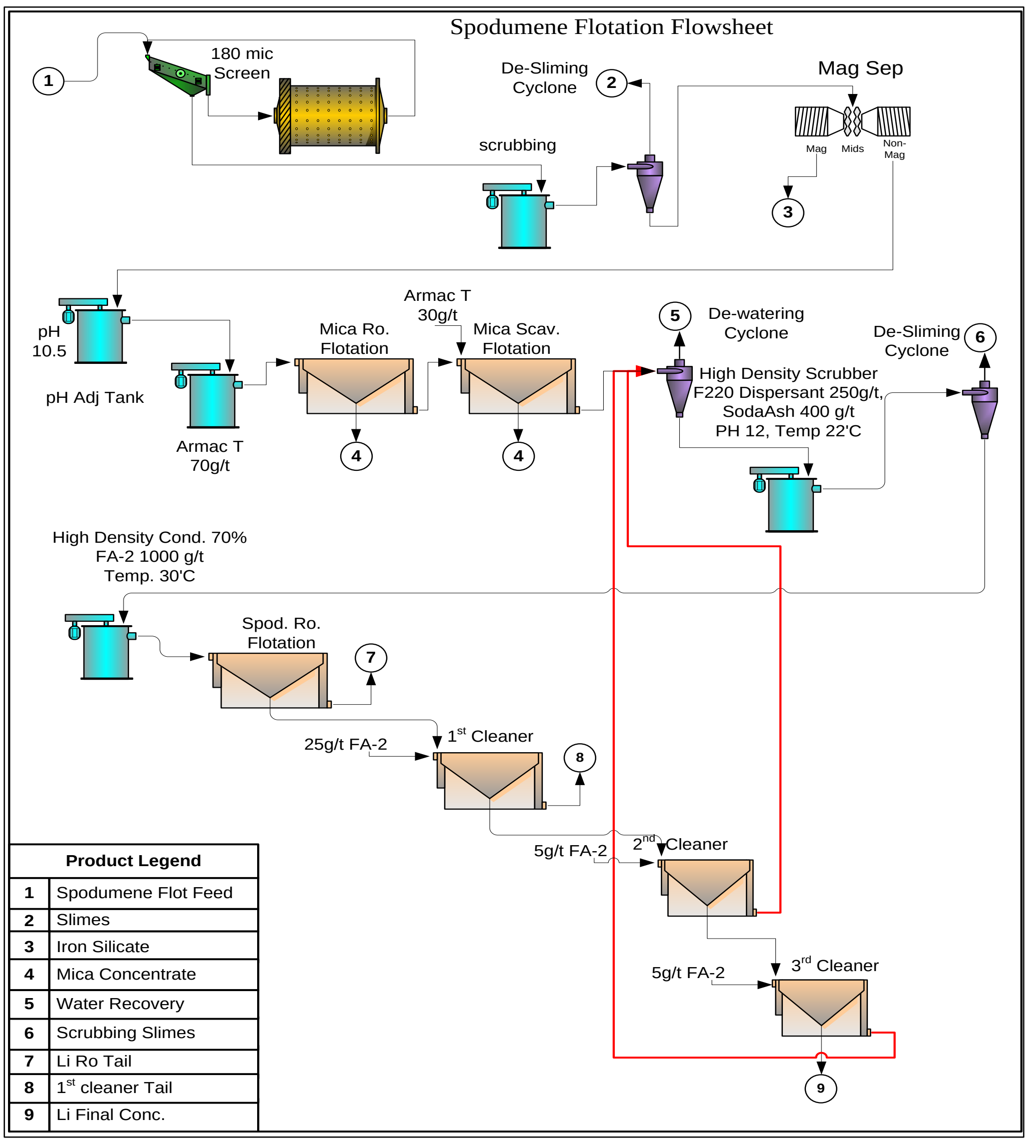


Figure 13-6: Locked-cycle flowsheet (Composite 1)

Table 13-22: Reagent dosages for the locked-cycle batch tests

Feed	Dosage (g/t)					
	NaOH	Na_2CO_3	Armac T	MIBC	F100	FA-2
Composite 1	150	600	110	0	250	1,035
Composite 2	150	600	120	10	250	1,035

Table 13-23 shows the detailed results for the locked-cycle batch tests. Results on Composite 1 and Composite 2 showed an average concentrate grade of 5.85% Li_2O at 84% recovery, and 5.86% Li_2O at 83% recovery, respectively.

Table 13-23: Locked-cycle test results

Composite 1 | Projected Balance Cycles B to F																			
Combined	**Weight**		**Assays %**									**Global Distribution %**							
Product	**g**	**%**	**Li**	**Li_2O**	**SiO_2**	**Al_2O_3**	**K_2O**	**Na_2O**	**CaO**	**MgO**	**Fe_2O_3**	**Li**	**SiO_2**	**Al_2O_3**	**K_2O**	**Na_2O**	**CaO**	**MgO**	**Fe_2O_3**
Li 3rd Cl Conc	1,709.6	14.5	2.72	5.86	63.3	24.5	0.98	0.77	0.42	0.93	1.81	83.8	12.5	22.7	5.3	2.3	14.7	33.6	31.4
Li 1st Cl Tail	417.1	3.5	0.58	1.24	72.9	16.7	3.01	4.57	0.17	0.34	0.57	4.3	3.5	3.8	4.0	3.4	1.5	3.0	2.4
Li Ro Tail	8,106.6	68.7	0.02	0.04	77.7	13.3	2.80	5.76	0.17	0.05	0.05	2.8	72.7	58.5	71.6	83.4	28.5	9.3	4.1
Slime 2	571.6	4.8	0.33	0.72	69.2	15.1	2.71	5.11	2.79	0.60	0.74	3.4	4.6	4.7	4.9	5.2	32.6	7.2	4.3
Mica Ro. Conc.	134.5	1.1	0.26	0.55	57.3	23.8	6.87	2.65	0.24	1.31	2.72	0.6	0.9	1.7	2.9	0.6	0.7	3.7	3.7
Mica Scav. Conc.	304.8	2.6	0.24	0.52	59.2	22.7	6.84	2.61	0.25	1.66	2.66	1.3	2.1	3.8	6.6	1.4	1.6	10.7	8.2
Mag Sep	173.2	1.5	0.57	1.24	42.2	16.9	1.54	0.78	1.34	6.55	21.86	1.8	0.8	1.6	0.8	0.2	4.8	24.0	38.3
Slime 1	376.3	3.2	0.28	0.59	67.5	16.0	3.28	4.92	2.06	1.07	2.00	1.9	2.9	3.3	3.9	3.3	15.9	8.5	7.6
Total Feed	11,793.7	100.0	0.47	1.01	73.5	15.6	2.69	4.74	0.42	0.40	0.84	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Direct Feed			0.47	1.01	73.5	15.6	2.72	4.69	0.25	0.39	0.79								
Combined Slimes		8.0	0.31	0.67	68.5	15.4	2.94	5.03	2.50	0.78	1.24	5.3	7.5	7.9	8.8	8.5	48.4	15.7	11.9
Combined Mag Sep		1.5	0.57	1.23	42.2	16.9	1.54	0.78	1.34	6.55	21.86	1.8	0.8	1.6	0.8	0.2	4.8	24.0	38.3

Composite 2 | Projected Balance Cycles B to F																			
Combined	**Weight**		**Assays %**									**Global Distribution %**							
Product	**g**	**%**	**Li**	**Li_2O**	**SiO_2**	**Al2O3**	**K_2O**	**Na_2O**	**CaO**	**MgO**	**Fe_2O_3**	**Li**	**SiO_2**	**Al_2O_3**	**K_2O**	**Na_2O**	**CaO**	**MgO**	**Fe_2O_3**
Li 3rd Cl Conc	1,701.4	14.6	2.72	5.85	65.1	24.5	0.93	0.93	0.26	0.10	1.09	82.8	12.8	23.0	4.7	3.0	10.5	12.8	24.3
Li 1st Cl Tail	366.7	3.1	0.42	0.90	74.9	15.6	3.08	4.91	0.16	0.10	0.40	2.7	3.2	3.2	3.4	3.4	1.4	2.7	1.9
Li Ro Tail	7,480.1	64.1	0.02	0.05	77.9	13.0	2.88	5.51	0.17	0.06	0.16	3.0	67.4	53.7	63.9	77.7	30.9	31.7	15.2
Slime 2	252.5	2.2	0.41	0.88	67.0	14.8	2.46	4.89	4.85	0.28	0.41	1.9	2.0	2.1	1.8	2.3	29.6	5.3	1.4
Mica Ro. Conc.	396.0	3.4	0.17	0.37	62.9	21.9	7.03	2.93	0.15	0.26	1.42	1.2	2.9	4.8	8.3	2.2	1.4	7.7	7.3
Mica Scav. Conc.	623.9	5.3	0.17	0.37	73.0	15.8	5.17	3.97	0.19	0.15	0.45	1.9	5.3	5.5	9.6	4.7	2.9	7.2	3.6
Mag Sep 10A	115.2	1.0	0.97	2.10	54.8	17.9	2.49	2.04	0.44	1.16	16.39	2.0	0.7	1.1	0.9	0.4	1.2	9.9	24.6
Mag Sep 5A	99.6	0.8	0.84	1.81	56.9	19.5	1.94	2.31	0.54	0.97	9.19	1.5	0.7	1.1	0.6	0.4	1.3	7.2	11.9
Slime 1	627.4	5.4	0.26	0.57	69.8	16.2	3.70	4.96	1.37	0.33	1.19	3.0	5.1	5.6	6.9	5.9	20.7	15.5	9.8
Total Feed	11,662.7	100.0	0.48	1.03	74.1	15.5	2.89	4.55	0.36	0.11	0.66	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Direct Feed			0.48	1.03	74.9	15.6	2.95	4.56	0.17	0.10	0.56								
Combined Slimes		7.5	0.31	0.66	69.0	15.8	3.34	4.94	2.37	0.32	0.97	4.8	7.0	7.7	8.7	8.2	50.3	20.9	11.1
Combined Mag Sep		1.8	0.91	1.96	55.7	18.7	2.23	2.16	0.49	1.07	13.05	3.5	1.4	2.2	1.4	0.9	2.5	17.1	36.6

13.5.5. Continuous Pilot Plant Tests

The concentrator pilot plant was operated by SGS Canada Inc. in Lakefield, Ontario. Pilot plant operation commenced on April 5, 2018, and concluded on April 26, 2018, in a series of 13 campaigns (operational shifts). Three feed samples were tested: a low-grade commissioning sample, Composite 1 and Composite 2. The commissioning sample was initially fed to the pilot plant to confirm mechanical reliability, robust operating procedures and analytical laboratory capabilities. Once commissioning was complete, the two composite pilot plant samples were processed through the plant. The plant operated for over 100 h and processed over 5 t of feed material.

The pilot plant flowsheet for campaign PP06 is shown in Figure 13-7. The circuit was fed at a rate of 50 kg/h of crushed ore (-3.36 mm) to a rod mill in closed-circuit with a 180 µm vibrating screen. The screen undersize fed a dewatering hydrocyclone. The cyclone underflow fed the magnetic separation circuit which consisted of a LIMS and WHIMS unit in series. The magnetic concentrates were combined and sent to tailings. The non-magnetic fraction fed a de-sliming cyclone. The slimes were sent to tailings while the underflow stream fed the mica-conditioning tank where sodium hydroxide and Armac T collector were added. The conditioning tank overflowed to feed three Denver A5 mica rougher cells. The rougher tails fed a second conditioning tank where supplemental Armac T was added prior to three Denver A5 mica scavenger cells. The mica rougher and scavenger concentrates were combined and sent to tailings.

The mica scavenger tails were de-watered and fed to the attrition scrubber where sodium hydroxide and dispersant were added prior to de-sliming. The cyclone underflow was collected and thickened (to 60% w/w solids) and fed to spodumene conditioning. The thickening stage was implemented due to the small-scale of the pilot-scale hydrocyclone (1") which were prone to plugging under the testing conditions.

The slurry was conditioned with FA-2 collector and soda ash in a 20-L tank with double impeller. The conditioning tank overflowed to feed four Denver A5 spodumene rougher cells. Rougher tailings were discarded. The first and second cleaners were both single Denver D12 machines. Soda ash was added to spodumene flotation cells as required to maintain the pulp pH at 8.5. Final concentrate was collected separately on a shift basis.

Reagent dosages for the optimized pilot plant campaigns are shown in Table 13-24. For the optimized conditions, Armac T dosage ranged from 112 g/t to 220 g/t and FA-2 dosage ranged from 656 g/t to 1,106 g/t.

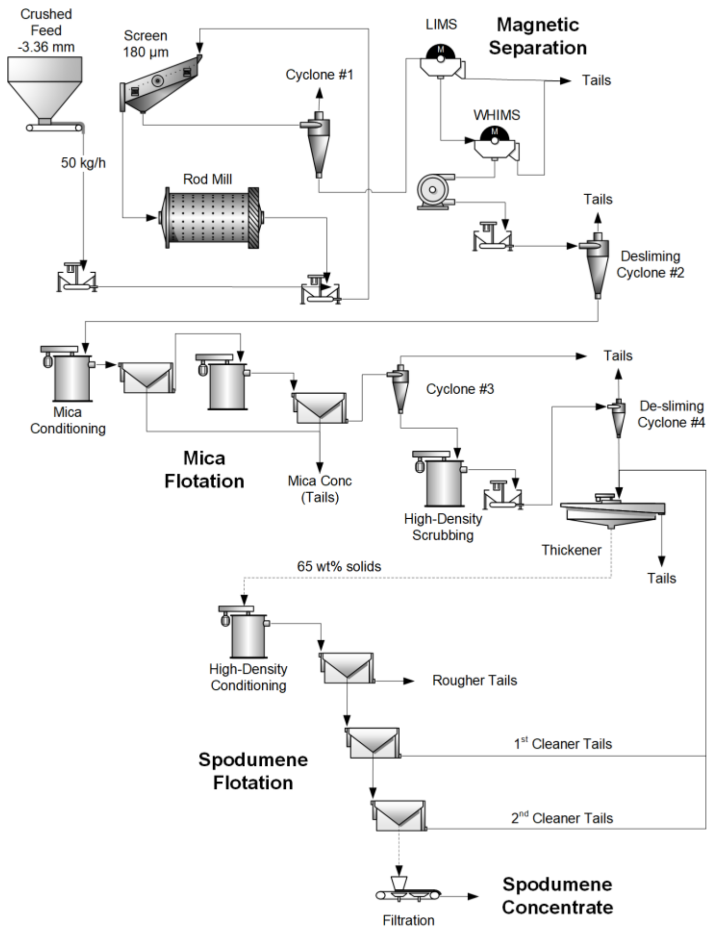


Figure 13-7: Pilot plant flowsheet (PP-06)

Table 13-24: Reagent dosages for selected pilot plant tests

Test	Feed	P_{80} (µm)	Dosage (g/t)				
			Na_2CO_3	Armac T	MIBC	F100	FA-2
PP-11S	Composite 1	188	576	130	21	254	693
PP-11F		188	576	130	21	254	693
PP-12F		189	543	220	21	266	656
PP06	Composite 2	180	402	112	19	242	1,065
PP-07S1		182	600	121	19	264	1,106
PP-07S2		182	600	212	19	264	1,106

Note: NaOH consumption was not measured during pilot plant operation

Pilot plant mass balance data was reconciled using Bilmat software. Reconciled data for the selected campaigns is summarized in Table 13-25. For the optimized flowsheets, pilot plant operation on Composite 1 produced concentrate ranging from 5.9% to 6.0% Li_2O with recoveries ranging from 67% to 71%. Fe_2O_3 content in the spodumene concentrates ranged from 1.70% to 1.89%. For Composite 2, concentrate grade ranged from 5.8% to 6.2% Li_2O with lithium recovery from 73% to 79%. Iron content in the spodumene concentrates ranged from 0.96% to 1.16% Fe_2O_3.

Table 13-25: Selected pilot plant mass balances

Composite 1 | PP-11S Mass Balance

Stream	Mass Pull (%)	Assay (%)															
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		MgO		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	1.06	1.08	72.9	73.3	15.7	15.9	0.89	0.82	0.39	0.42	0.30	0.23	4.67	4.69	2.66	2.69
Combined Mag Con	3.7	2.11	2.11	58.8	58.8	19.5	19.5	6.29	6.42	3.44	3.39	0.69	0.70	2.16	2.16	2.52	2.52
Combined Mica Con	3.6	0.21	0.21	67.7	67.7	17.9	17.9	0.98	0.98	0.50	0.50	0.22	0.22	3.45	3.45	6.44	6.43
Combined Slimes	14.5	0.69	0.69	70.1	70.0	15.9	15.9	1.60	1.64	0.65	0.64	0.72	0.79	5.02	5.02	3.19	3.18
Spod Ro Tails	65.6	0.20	0.21	76.6	76.6	13.7	13.6	0.27	0.26	0.08	0.07	0.17	0.19	5.54	5.57	2.64	2.61
Spod Cl Conc	12.6	5.95	5.96	62.3	62.3	24.5	24.5	1.70	1.71	0.77	0.76	0.39	0.41	0.80	0.81	1.08	1.08

Streams	Mass Pull (%)	Recovery (%)							
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Combined Mag Con	3.7	7.3	3.0	4.6	26.2	32.8	8.6	1.7	3.5
Combined Mica Con	3.6	0.7	3.4	4.1	4.0	4.7	2.7	2.7	8.8
Combined Slimes	14.5	9.4	14.0	14.7	26.3	24.4	35.5	15.6	17.4
Spod Ro Tails	65.6	12.4	68.9	57.0	19.6	13.1	36.8	77.8	65.2
Spod Cl Conc	12.6	70.2	10.7	19.6	24.0	25.0	16.5	2.2	5.1

PP-11F Mass Balance

Stream	Mass Pull (%)	Assay (%)															
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		MgO		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	1.01	0.99	73.5	72.8	15.5	15.6	0.62	1.10	0.29	0.43	0.27	0.26	4.70	4.69	2.73	2.71
Cyclone #1 O/F	2.9	0.62	0.62	70.4	70.4	16.3	16.3	2.54	2.48	0.76	0.75	0.41	0.41	5.04	5.04	3.30	3.30
Cy#1 U/F	97.1	1.03	0.99	73.6	73.2	15.5	15.6	0.57	0.98	0.27	0.41	0.26	0.25	4.69	4.68	2.71	2.71
Combined Mag Con	3.6	1.41	1.42	74.4	74.4	16.0	16.0	0.61	0.60	0.22	0.22	0.21	0.21	4.67	4.67	2.32	2.32
Non Mags	93.5	1.01	1.01	73.6	73.5	15.5	15.5	0.56	0.49	0.28	0.28	0.26	0.22	4.69	4.74	2.73	2.66
Cyclone #2 O/F	2.9	0.64	0.65	72.5	72.5	15.7	15.7	0.73	0.72	0.47	0.46	0.32	0.32	5.14	5.14	3.14	3.14
Cy#2 U/F	90.6	1.02	1.01	73.6	73.8	15.5	15.5	0.56	0.61	0.27	0.26	0.26	0.22	4.68	4.70	2.71	2.65
Combined Mica Con	18.6	0.16	0.16	73.3	73.5	14.8	14.8	0.58	0.54	0.41	0.37	0.19	0.21	4.23	4.22	4.65	4.74
Mica Tail	72.0	1.25	1.27	73.7	74.2	15.7	15.7	0.55	0.46	0.23	0.22	0.28	0.22	4.79	4.79	2.21	2.19
Cyclone #3 O/F	1.9	1.12	1.12	69.5	69.5	16.5	16.5	1.16	1.16	0.68	0.67	0.91	0.95	4.96	4.96	2.54	2.54
Cy#3 U/F	70.1	1.25	1.29	73.8	74.3	15.6	15.7	0.54	0.53	0.22	0.22	0.26	0.21	4.79	4.83	2.20	2.17
Cyclone #4 O/F	1.4	1.12	1.12	61.7	61.7	14.5	14.5	0.76	0.76	0.66	0.65	5.10	7.16	4.32	4.32	2.02	2.02

PP-11F Mass Balance																	
Stream	Mass Pull (%)	Assay (%)															
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		MgO		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Cy#4 U/F	68.7	1.25	1.29	74.1	74.0	15.7	15.8	0.53	0.61	0.21	0.22	0.16	0.22	4.80	4.82	2.21	2.14
Ro Con	16.2	5.34	5.29	63.3	63.3	23.7	23.6	1.62	1.53	0.78	0.74	0.33	0.35	1.18	1.19	1.42	1.44
Spod Ro Tail	56.5	0.25	0.26	76.6	76.6	13.7	13.7	0.27	0.25	0.08	0.07	0.12	0.18	5.66	5.57	2.46	2.56
1st Cl Con	13.8	5.73	5.74	62.7	62.7	24.3	24.3	1.69	1.66	0.82	0.79	0.35	0.36	0.91	0.93	1.15	1.17
1st Cl Tail	2.4	3.11	3.14	66.7	66.7	20.7	20.7	1.23	1.24	0.58	0.59	0.22	0.22	2.73	2.72	2.96	2.94
Spod Cl Con	12.2	5.90	5.91	62.4	62.3	24.5	24.6	1.74	1.72	0.84	0.86	0.36	0.38	0.78	0.76	1.04	1.03
2nd Cl Tail	1.6	4.46	4.49	65.0	65.0	22.4	22.4	1.32	1.33	0.63	0.64	0.26	0.26	1.85	1.84	1.99	1.98
Spod Feed	72.7	1.39	1.25	73.6	73.7	16.0	15.7	0.57	0.56	0.24	0.21	0.17	0.21	4.66	4.64	2.23	2.37
Combined Slimes	9.1	0.81	0.81	69.5	69.5	15.9	15.9	1.41	1.38	0.64	0.63	1.22	1.56	4.94	4.94	2.89	2.89

Streams	Mass Pull (%)	Recovery (%)							
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cyclone #1 O/F	2.9	1.8	2.8	3.1	11.9	7.7	4.5	3.1	3.5
Cy#1 U/F	97.1	98.2	97.2	96.9	88.1	92.3	95.5	96.9	96.5
Combined Mag Con	3.6	5.0	3.6	3.7	3.5	2.8	2.8	3.6	3.1
Non Mags	93.5	93.2	93.6	93.2	84.6	89.5	92.7	93.3	93.4
Cyclone #2 O/F	2.9	1.8	2.8	2.9	3.3	4.7	3.4	3.1	3.3
Cy#2 U/F	90.6	91.4	90.7	90.3	81.2	84.9	89.3	90.2	90.1
Combined Mica Con	18.6	2.9	18.6	17.8	17.4	26.5	13.3	16.8	31.7
Mica Tail	72.0	88.4	72.2	72.5	63.8	58.4	76.0	73.4	58.4
Cyclone #3 O/F	1.9	2.1	1.8	2.0	3.5	4.4	6.4	2.0	1.7
Cy#3 U/F	70.1	86.4	70.4	70.6	60.3	54.0	69.6	71.4	56.6
Cyclone #4 O/F	1.4	1.6	1.2	1.3	1.7	3.3	27.4	1.3	1.1
Cy#4 U/F	68.7	84.8	69.2	69.2	58.5	50.7	42.2	70.1	55.6
Ro Con	16.2	85.5	14.0	24.8	42.1	44.0	20.3	4.1	8.5
Spod Ro Tail	56.5	13.9	58.9	50.0	24.6	15.2	25.6	68.1	50.9
1st Cl Con	13.8	78.1	11.8	21.6	37.4	39.1	18.2	2.7	5.8
1st Cl Tail	2.4	7.5	2.2	3.2	4.8	4.9	2.0	1.4	2.6
Spod Cl Con	12.2	70.9	10.3	19.2	33.9	35.5	16.6	2.0	4.7
2nd Cl Tail	1.6	7.2	1.4	2.3	3.4	3.6	1.6	0.6	1.2
Spod Feed	72.7	99.4	72.8	74.8	66.8	59.2	45.8	72.1	59.4
Combined O/F	9.1	7.3	8.6	9.3	20.5	20.0	41.6	9.6	9.6

PP-12 Mass Balance																	
Stream	Mass Pull (%)	Assay (%)															
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		MgO		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	0.99	0.97	73.3	72.9	15.6	15.6	0.80	1.09	0.38	0.43	0.28	0.26	4.64	4.68	2.75	2.77
Cyclone #1 O/F	3.9	0.56	0.56	69.3	69.3	16.3	16.3	2.46	2.41	0.86	0.85	0.43	0.43	5.06	5.06	3.39	3.39
Cy#1 U/F	96.1	1.01	0.99	73.4	73.2	15.5	15.6	0.74	0.96	0.36	0.41	0.27	0.24	4.62	4.64	2.72	2.73
Combined Mag Con	2.5	2.00	2.00	57.7	57.7	19.6	19.6	7.44	6.93	3.77	3.63	0.75	0.76	2.03	2.03	2.58	2.58
Non Mags	93.5	0.98	0.92	73.8	73.9	15.4	15.4	0.55	0.49	0.27	0.26	0.26	0.21	4.69	4.75	2.72	2.72
Cyclone #2 O/F	2.9	0.56	0.56	72.5	72.5	15.6	15.6	0.63	0.63	0.44	0.44	0.30	0.30	5.17	5.17	3.18	3.18
Cy#2 U/F	90.6	0.99	0.95	73.9	74.0	15.4	15.4	0.55	0.51	0.26	0.24	0.26	0.21	4.67	4.73	2.71	2.69
Combined Mica Conc	16.2	0.15	0.15	72.9	73.0	14.9	14.9	0.69	0.68	0.44	0.43	0.19	0.21	4.18	4.16	4.81	4.81
Mica Tail	74.4	1.18	1.27	74.1	74.6	15.5	15.5	0.52	0.47	0.22	0.20	0.27	0.22	4.78	4.71	2.25	2.20
Cyclone #3 O/F	1.8	1.01	1.01	67.9	67.9	16.3	16.3	1.31	1.31	0.80	0.80	1.39	1.49	4.87	4.87	2.64	2.64
Cy#3 U/F	72.6	1.18	1.27	74.2	74.8	15.5	15.6	0.50	0.60	0.21	0.22	0.25	0.21	4.78	4.75	2.24	2.24
Cyclone #4 O/F	1.6	1.05	1.05	64.9	64.9	15.0	15.0	0.83	0.83	0.69	0.69	3.93	5.06	4.53	4.53	2.24	2.24
Cy#4 U/F	71.0	1.19	1.33	74.5	73.9	15.5	15.5	0.50	0.53	0.20	0.21	0.16	0.22	4.78	4.68	2.24	2.19
Ro Con	15.5	5.39	5.61	62.8	62.9	23.9	23.9	1.71	1.63	0.79	0.82	0.37	0.38	1.06	1.08	1.41	1.43
Spod Ro Tail	59.8	0.30	0.30	76.8	76.8	13.8	13.9	0.24	0.22	0.08	0.08	0.12	0.18	5.54	5.60	2.48	2.48
1st Cl Con	13.4	5.76	5.55	62.3	62.4	24.4	24.3	1.80	1.70	0.82	0.81	0.40	0.41	0.82	0.85	1.08	1.09
1st Cl Tail	2.1	3.11	3.12	66.1	66.1	21.0	21.0	1.15	1.15	0.62	0.62	0.18	0.18	2.54	2.52	3.50	3.48
Spod Cl Con	11.2	5.91	5.89	62.0	61.9	24.5	24.6	1.87	1.90	0.85	0.85	0.42	0.44	0.71	0.69	0.95	0.94
2nd Cl Tail	2.2	4.99	5.03	63.9	63.9	23.5	23.5	1.44	1.46	0.69	0.69	0.26	0.26	1.37	1.35	1.73	1.72
Spod Feed	75.4	1.35	1.25	73.9	73.7	15.9	15.7	0.54	0.56	0.23	0.21	0.17	0.21	4.62	4.64	2.26	2.37
Combined Slimes	10.2	0.71	0.72	69.3	69.3	15.9	15.9	1.49	1.47	0.70	0.70	1.10	1.29	4.98	4.98	3.02	3.02

Streams	Mass Pull (%)	Recovery (%)							
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Cyclone #1 O/F	3.9	2.2	3.7	4.1	12.0	8.9	6.1	4.3	4.9
Cy#1 U/F	96.1	97.8	96.3	95.9	88.0	91.1	93.9	95.7	95.1
Combined Mag Con	2.5	5.1	2.0	3.2	23.5	25.2	6.9	1.1	2.4
Non Mags	93.5	92.7	94.3	92.7	64.5	65.9	87.1	94.6	92.8
Cyclone #2 O/F	2.9	1.6	2.9	2.9	2.3	3.4	3.1	3.2	3.4
Cy#2 U/F	90.6	91.0	91.4	89.8	62.2	62.5	84.0	91.4	89.4
Combined Mica Con	16.2	2.4	16.2	15.6	13.9	18.6	10.9	14.6	28.5
Mica Tail	74.4	88.6	75.2	74.2	48.3	43.9	73.1	76.7	60.9
Cyclone #3 O/F	1.8	1.9	1.7	1.9	3.0	3.9	9.1	1.9	1.8

Streams	Mass Pull (%)	Recovery (%)							
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	MgO	CaO	Na_2O	K_2O
Cy#3 U/F	72.6	86.7	73.5	72.3	45.4	40.0	64.0	74.8	59.2
Cyclone #4 O/F	1.6	1.7	1.4	1.5	1.6	2.8	22.0	1.5	1.3
Cy#4 U/F	71.0	85.1	72.2	70.8	43.7	37.2	41.9	73.3	57.9
Ro Con	15.5	84.6	13.3	23.8	33.0	32.5	20.5	3.5	8.0
Spod Ro Tail	59.8	18.3	62.7	53.2	17.8	12.2	25.0	71.5	54.0
1st Cl Con	13.4	77.9	11.4	20.9	29.9	29.0	19.0	2.4	5.3
1st Cl Tail	2.1	6.7	1.9	2.9	3.1	3.5	1.4	1.2	2.7
Spod Cl Con	11.2	66.8	9.5	17.6	25.9	25.0	17.0	1.7	3.9
2nd Cl Tail	2.2	11.1	1.9	3.3	4.0	4.0	2.1	0.7	1.4
Spod Feed	75.4	102.9	76.0	77.0	50.8	44.7	45.4	75.1	62.0
Combined O/F	10.2	7.4	9.7	10.5	18.9	19.0	40.3	11.0	11.3

Composite 2 | PP-06 Mass Balance															
Stream	Mass Pull (%)	Assay (%)													
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	1.05	1.08	74.6	74.5	15.5	15.7	0.64	0.58	0.22	0.16	4.53	4.60	2.85	2.88
Combined Mag Con	2.5	2.28	2.28	64.2	64.2	19.3	19.3	4.82	4.90	0.31	0.31	2.67	2.67	2.32	2.32
Combined Mica Con	13.6	0.15	0.15	75.9	75.9	14.0	14.0	0.44	0.45	0.11	0.12	4.08	4.07	4.79	4.78
Combined Slimes	11.8	0.75	0.75	70.5	70.5	16.0	16.0	1.52	1.56	0.80	0.91	4.77	4.76	3.46	3.45
Spod Ro Tails	59.8	0.20	0.19	77.5	77.9	13.7	13.4	0.22	0.21	0.12	0.14	5.42	5.49	2.69	2.73
Spod Cl Con	12.3	6.19	6.08	65.2	64.8	24.4	24.6	1.22	1.30	0.23	0.25	0.88	0.83	1.01	0.96

Streams	Mass Pull (%)	Recovery (%)						
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Combined Mag Con	2.5	5.4	2.1	3.1	18.6	3.4	1.5	2.0
Combined Mica Con	13.6	2.0	13.8	12.3	9.5	7.0	12.2	22.9
Combined Slimes	11.8	8.5	11.1	12.2	28.0	42.9	12.4	14.3
Spod Ro Tails	59.8	11.6	62.2	53.1	20.5	33.7	71.5	56.5
Spod Cl Con	12.3	72.6	10.7	19.3	23.5	13.0	2.4	4.3

PP-07S1 Mass Balance

Stream	Mass Pull (%)	Assay (%)													
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	0.95	1.05	74.4	75.1	15.5	15.7	0.62	0.50	0.24	0.15	4.60	4.57	2.89	2.92
Combined Mag Con	2.3	1.94	1.94	61.6	61.6	19.4	19.4	6.03	6.35	0.38	0.39	2.58	2.58	2.46	2.46
Combined Mica Con	13.2	0.18	0.17	73.0	72.9	15.5	15.5	0.54	0.56	0.13	0.14	4.24	4.24	5.24	5.23
Combined Slimes	9.9	0.58	0.58	69.3	69.2	16.0	16.0	1.21	1.27	1.14	1.49	4.93	4.93	3.61	3.61
Cyclone #4 U/F	74.6	1.10	1.23	75.7	75.3	15.4	15.4	0.39	0.38	0.13	0.15	4.68	4.75	2.40	2.41
Flot Feed	79.0	1.24	1.59	75.3	74.5	15.7	16.1	0.42	0.42	0.13	0.15	4.57	4.40	2.39	2.34
Ro Con	17.0	5.35	5.07	66.1	66.5	23.4	23.1	1.09	1.09	0.22	0.21	1.44	1.59	1.41	1.54
Spod Ro Tails	62.1	0.12	0.10	77.8	78.4	13.5	13.2	0.24	0.28	0.11	0.13	5.42	5.59	2.65	2.67
Cl Tails	4.4	3.60	3.55	69.1	69.0	20.6	20.6	0.96	0.96	0.20	0.20	2.66	2.57	2.17	2.11
Spod Cl Con	12.5	5.97	5.93	65.1	64.9	24.4	24.4	1.13	1.22	0.22	0.24	1.01	0.97	1.15	1.10

Streams	Mass Pull (%)	Recovery (%)						
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Combined Mag Con	2.3	4.7	1.9	2.9	22.3	3.7	1.3	2.0
Combined Mica Con	13.2	2.4	12.9	13.1	11.4	7.2	12.1	23.8
Combined Slimes	9.9	6.1	9.3	10.3	19.3	48.2	10.7	12.4
Cyclone #4 U/F	74.6	86.7	75.9	73.7	47.0	40.9	75.9	61.8
Flot Feed	79.0	103.5	80.0	79.6	53.8	44.6	78.5	65.1
Ro Con	17.0	95.6	15.1	25.5	29.6	15.6	5.3	8.3
Spod Ro Tails	62.1	7.9	65.0	54.1	24.2	29.0	73.2	56.8
Cl Tails	4.4	16.8	4.1	5.9	6.8	3.7	2.6	3.3
Spod Cl Con	12.5	78.8	11.0	19.7	22.8	11.9	2.8	5.0

PP-07S2

Stream	Mass Pull (%)	Assay (%)													
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Feed	100	0.99	1.10	74.5	74.2	15.5	15.6	0.58	0.49	0.21	0.15	4.64	4.58	2.80	2.90
Combined Mag Con	2.4	1.99	1.98	61.9	61.9	19.6	19.6	5.86	6.11	0.39	0.40	2.58	2.58	2.54	2.54
Combined Mica Con	14.0	0.19	0.19	74.4	74.4	15.2	15.2	0.27	0.28	0.12	0.13	4.55	4.56	4.83	4.79
Combined Slimes	11.8	0.67	0.67	71.6	71.6	16.0	16.0	1.16	1.21	0.68	0.77	4.96	4.97	3.52	3.50
Cyclone #4 U/F	71.7	1.17	1.38	75.4	75.8	15.4	15.5	0.37	0.38	0.14	0.15	4.67	4.65	2.30	2.23
Flot Feed	76.3	1.27	1.51	75.2	74.9	15.6	15.9	0.39	0.43	0.14	0.15	4.59	4.49	2.30	2.28

PP-07S2															
Stream	Mass Pull (%)	Assay (%)													
		Li_2O		SiO_2		Al_2O_3		Fe_2O_3		CaO		Na_2O		K_2O	
		Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.	Adj.	Meas.
Ro Con	17.9	5.08	4.88	67.1	67.4	22.7	22.4	1.07	1.04	0.23	0.23	1.61	1.69	1.44	1.48
Spod Ro Tails	58.4	0.10	0.08	77.6	77.7	13.4	13.1	0.19	0.19	0.12	0.14	5.50	5.71	2.56	2.60
Cl Tails	4.5	2.86	2.84	70.8	70.7	19.0	19.0	0.78	0.78	0.18	0.18	3.25	3.18	2.31	2.29
Spod Cl Con	13.4	5.83	5.78	65.9	65.7	24.0	24.1	1.16	1.20	0.25	0.26	1.05	1.03	1.15	1.13

Streams	Mass Pull (%)	Recovery (%)						
		Li_2O	SiO_2	Al_2O_3	Fe_2O_3	CaO	Na_2O	K_2O
Feed	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Combined Mag Con	2.4	4.9	2.0	3.1	24.4	4.6	1.3	2.2
Combined Mica Con	14.0	2.7	14.0	13.7	6.6	8.2	13.7	24.1
Combined Slimes	11.8	8.0	11.4	12.2	23.5	38.6	12.7	14.9
Cyclone #4 U/F	71.7	84.4	72.6	71.0	45.6	48.6	72.3	58.8
Flot Feed	76.3	97.6	77.0	76.6	51.6	52.5	75.5	62.6
Ro Con	17.9	91.9	16.2	26.3	32.8	19.7	6.2	9.2
Spod Ro Tails	58.4	5.7	60.8	50.3	18.8	32.8	69.2	53.3
Cl Tails	4.5	13.1	4.3	5.6	6.1	3.9	3.2	3.8
Spod Cl Con	13.4	78.8	11.8	20.7	26.7	15.8	3.0	5.5

Continuous pilot plant operation produced roughly 400 kg of spodumene concentrate. Concentrate from each campaign (operating shift) was individually collected. The spodumene concentrate produced during pilot plant campaign PP-11 was analyzed by QEMSCAN. The mineralogical composition of the concentrate sample is presented in Table 13-26.

Table 13-26: Mineralogical analysis of PP11 spodumene concentrate

Mineral	Composite 1
	Years 0-5
	(wt %)
Spodumene	77.9
K-Feldspar	7.1
Plagioclase	5.5
Quartz	3.3
Biotite	2.2
Muscovite	1.0
Amphibole/Pyroxine	0.8
Fe-Al Silicate	0.7
Chlorite	0.8
Other	0.7
Total	**100**

13.5.6. Summary of 2018 Pilot Plant Testwork Program

The 2018 pilot plant program confirmed the flowsheet and design parameters for the Authier Lithium Project process plant. Testwork confirmed:

- Grind size (P80) of 180 µm;
- WHIMS was necessary to remove iron-bearing silicate minerals prior to flotation;
- Mica flotation in a rougher-scavenger arrangement;
- High-density conditioning with fatty acid collector was required to achieve >75% recovery;
- Two stages of spodumene cleaning were needed to achieve spodumene concentrate grade of 6.0% Li_2O with >75% lithium recovery.

13.6. Sayona Québec Batch Optimization Test Program (2018)

A sub-sample of each of the two pilot plant feed samples (Composite 1 and Composite 2) were tested during the optimization test program undertaken at SGS in 2018. The program included sample preparation, stage-grinding, wet high-intensity magnetic separation, and flotation.

The main objectives of the program were to:

- Determine optimal pulp density during spodumene conditioning; and
- Test the effect of spodumene collector dosage on concentrate lithium grade and recovery.

The lithium grades of Composite 1 and Composite 2 were similar, at 1.03% Li_2O and 1.08% Li_2O, respectively. The iron content in Composite 1 was higher (0.77% Fe_2O_3) than that of Composite 2 (0.46% Fe_2O_3). The metallurgical target was the production of a concentrate grading 6.0% Li_2O with 80% lithium recovery.

The samples were stage-ground to a K80 of 180 µm. WHIMS was undertaken on the flotation feed. A preliminary flotation test was conducted on Composite 1 using similar conditions to those used in optimized laboratory flotation tests during the pilot plant program. The results of the test were similar to those of the baseline test, producing a 3rd cleaner concentrate grading 6.03% Li_2O with 77.2% lithium recovery.

Multiple batch tests were undertaken and the mica tailings streams were homogenized to form a single spodumene flotation feed sample to eliminate variations due to the upstream processes. Lithium losses to the combined slimes, magnetic concentrate, and mica concentrate were similar for both Composite 1 and Composite 2, averaging 6.1%, 3.3%, and 2.6%, respectively.

The spodumene flotation tests on Composite 1 and Composite 2 evaluated the impact of conditioning pulp density and collector dosage on flotation performance. The results for both samples showed a significant improvement in concentrate lithium recovery was obtained when the conditioning pulp density was increased from 50% to 55% solids. Further increases in pulp density resulted in more marginal increases in lithium recovery for both composites (Figure 13-8 and Figure 13-9).

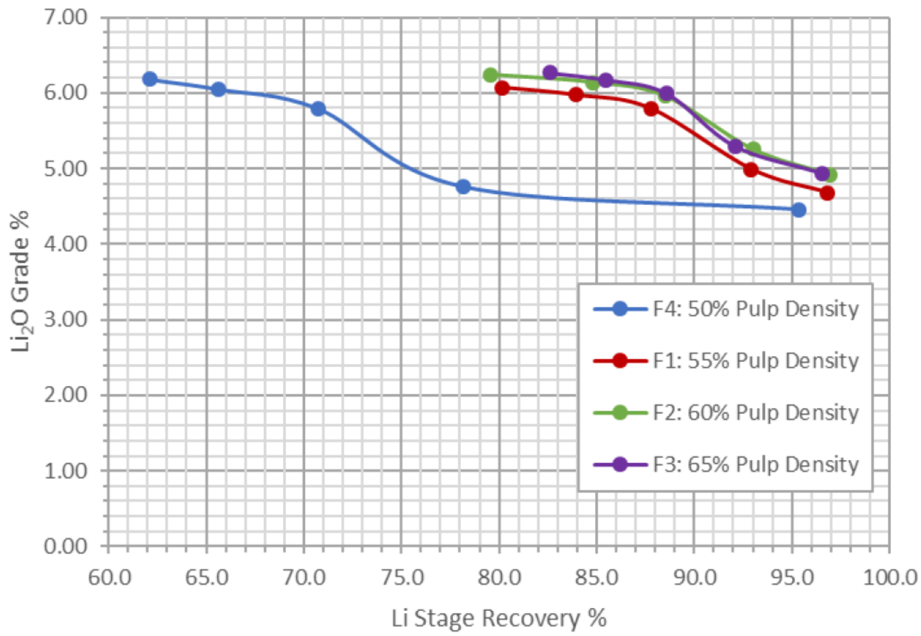


Figure 13-8: Effect of pulp density during spodumene conditioning (Composite 1)

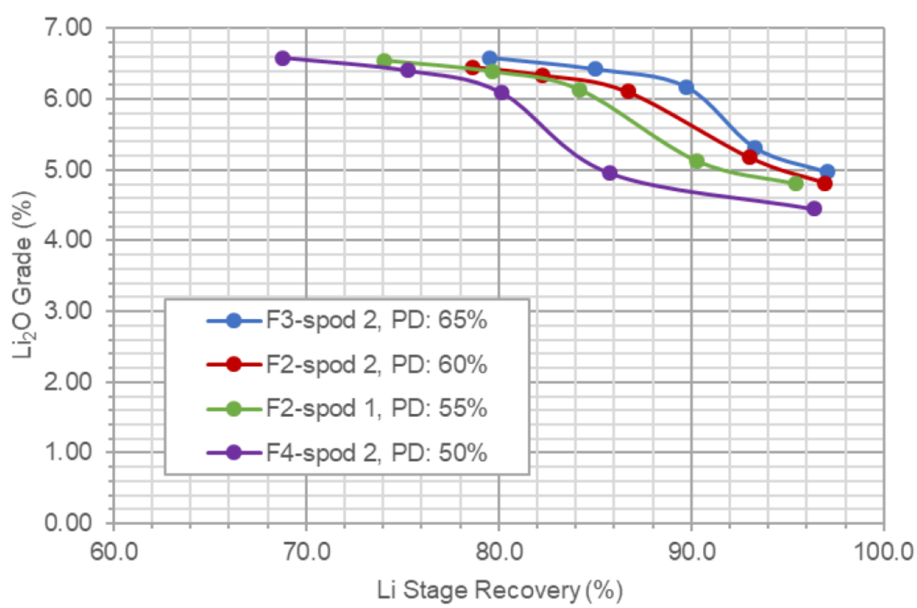


Figure 13-9: Effect of pulp density during spodumene conditioning (Composite 2)

A conditioning pulp density of 60% w/w solids was selected for the tests evaluating collector dosage; from the results of these tests, it was determined that a spodumene collector dosage of 800 g/t was sufficient to produce a concentrate grading >6% Li_2O with high lithium recovery (>75%) from both composites. The iron content was higher in the spodumene concentrates produced in the flotation tests on Composite 1 (average 1.70% Fe_2O_3) compared to those produced in the flotation tests on Composite 2 (average 1.12% Fe_2O_3).

14. MINERAL RESOURCE ESTIMATE

Completion of the current updated Mineral Resource Estimate involved the assessment of a drillhole database, which included all data for drilling completed through early 2018, an updated three-dimensional ("3D") geologically controlled wireframe model, revised pit optimization parameters from BBA, review of the classification of the Mineral Resource Estimate (Measured, Indicated and Inferred) and review of available written reports.

Inverse Distance Squared ("ID^2") restricted to a geologically controlled wireframe model was used to Interpolate Li_2O (%) grades into a block model. Measured, Indicated and Inferred Mineral Resources are reported in the summary tables in Section 14.6. The Mineral Resource Estimate takes into consideration that the current Deposit will be mined by open-pit mining methods.

In order to complete an updated Mineral Resource Estimate for the Deposit, a database comprising a series of comma delimited spreadsheets containing drillhole and channel information was provided by Sayona Québec. The database included diamond drillhole collar data (NAD83 / UTM Zone 17), survey data, assay data, and lithology data. The data was then imported into the GeoBase database management software operated in Access®. Once importation was completed a validation process was done for any inconsistencies of length, grade, lithological records and aberrant deviation records. The Database was then imported in the SGS proprietary geological modelling and resource estimation software called Genesis© for statistical analysis, QA/QC verification, block modelling and resource estimation and classification.

Historical drillholes remain present in the database. Some twin drilling and sampling were done previously and permitted the use of the historical data.

This section reports the results of the October 6, 2021 updated Mineral Resource Estimate ("MRE") for the Authier lithium Project. The Mineral Resource update is using the digital database supplied by Sayona (as of August 21, 2021) which includes drillhole data completed by Sayona and previous owners since 2009. The effective date of the Authier MRE is October 6, 2021. Additional density results of the surrounding waste rock material were taken into account in this study.

The MRE is derived from a computerized resource block model. The construction of the block model starts with the modelling of 3D wireframe solids of the mineralization using drillhole Li_2O% analytical results and lithological data. The solids from the past Mineral Resource estimation were updated to fit the new data and interpretations were changed in certain sections of the Deposit given the new data from the 2017-2018 infill drilling and exploration. The analytical data contained within the wireframe solids was normalized to generate fixed length analytical composites. The composite data was used to interpolate the block grades. Blocks were regularly spaced on a defined grid, filling the 3D selected wireframe solids. An optimized pit shell model, using the pit optimization software Whittle©, was produced by SGS Geological Services in 2021. The interpolated blocks located below the bedrock/overburden interface, within the optimized pit shell and above a determined cut-off grade, constitute the Mineral Resources. The blocks are then classified based on confidence levels using proximity to composites, composite grade variance and mineralized solid geometry. The 3D wireframe modelling, block model, and MRE were completed by SGS based on information provided by Sayona.

14.1. Exploratory Data Analysis

Exploratory data analysis for lithium (%Li_2O) was completed on both original analytical data and composite data contained within the modelled mineralized solids. The coordinates of the drillholes were measured in the field in UTM coordinates. In 2018, a high precision LiDAR topographic surface was completed by Sayona. All drillhole collars were draped to the LiDAR surface.

The database used for the current MRE comprises data for 192 surface drillholes, totalling 31,123.82 metres, completed in the Deposit area between 1993 and 2018. The database totals 5,049 drill core assay samples representing 6,608.31 metres of drilling. Drill core was assayed mostly for pegmatite occurrences and surrounding host rock, both hanging and footwall.

A database validation process was done for any inconsistencies (gaps & overlaps) of length, grade, lithological records, drillhole locations collar and aberrant downhole surveys. Table 14-1 shows the database available data statistics.

Table 14-1: Database statistics

Database Description	Record Number
Holes	192
Surveys	1,289
Assays	5,049
Intervals	203
Lithologies	2,738
Alterations	589
Mineralization	592

14.1.1. Analytical Data

There is a total of 5,049 assay intervals in the database used for the current MRE and 2,406 of them are contained inside the mineralized solids (Authier Main1 (110), Authier Main2 (201) and Authier North (301)). Drill core was assayed mostly for pegmatite occurrences and surrounding host rock, both hanging wall and footwall. Table 14-2 shows the range of Li_2O values from the analytical data inside the mineralized solids.

Table 14-2: Range of analytical data inside mineralized solids

Assays in 2020 Authier Envelope	Li_2O (%)
Min Value	-
Max Value	2.77
Average	1.01
Length Weighted Average	1.00
Sum of Length	3,234
Variance	0.24
Standard Deviation	0.49
% Variation	0.48
Median	1.00
First Quartile	0.66
Third Quartile	1.37
Count*	2,405
Count Missing (-1)	1

Assays received in Li values were transformed into Li_2O values using the conversion factor of 2.153. This conversion factor was used upon conversations with Sayona and peers, according to sources such as the *Ministry of Petroleum and Mines of British Columbia*: https://www2.gov.bc.ca/gov/content/industry/mineral-exploration-mining/british-columbia-geological-survey/mineralinventory/documentation/minfile-coding-manual?keyword=element&keyword=conversion#appendices

The core holes drilled on the Project are generally oriented south (163° to 194°), perpendicular to the general orientation of the pegmatite intrusions, and have a weak to moderate deviation towards the west (Figure 14-3). Their spacing is typically 25 m with larger spacing of 50 m spacing between sections 706750 mE and 707975 mE. The drillhole dips range from 43° to 75° with an average of 50° and the drillhole intercepts range from approximately 70% of true width to near true width of the mineralization.

14.1.2. Mineralized Intervals Data

Mineralized intervals were selected for the modelling of the 3D wireframe. A minimum grade of 0.4% Li_2O over a minimum drillhole interval length of 2 m was generally used as a guideline to define the width of mineralized interpretations on sections, i.e., polygons. Only Pegmatite intervals were kept even if there were good results either on the footwall or hanging wall side of the pegmatite body. Some lower-grade pegmatite intervals were kept for geological continuity. Mineral intervals that were not retained during the creation of the interpretation on sections were discarded.

A special attention was made to discriminate the spodumene-bearing pegmatite from the baren pegmatite intervals. A separate solid was created for the barren pegmatite. It is usually present, but not always, at the footwall and at the hanging wall.

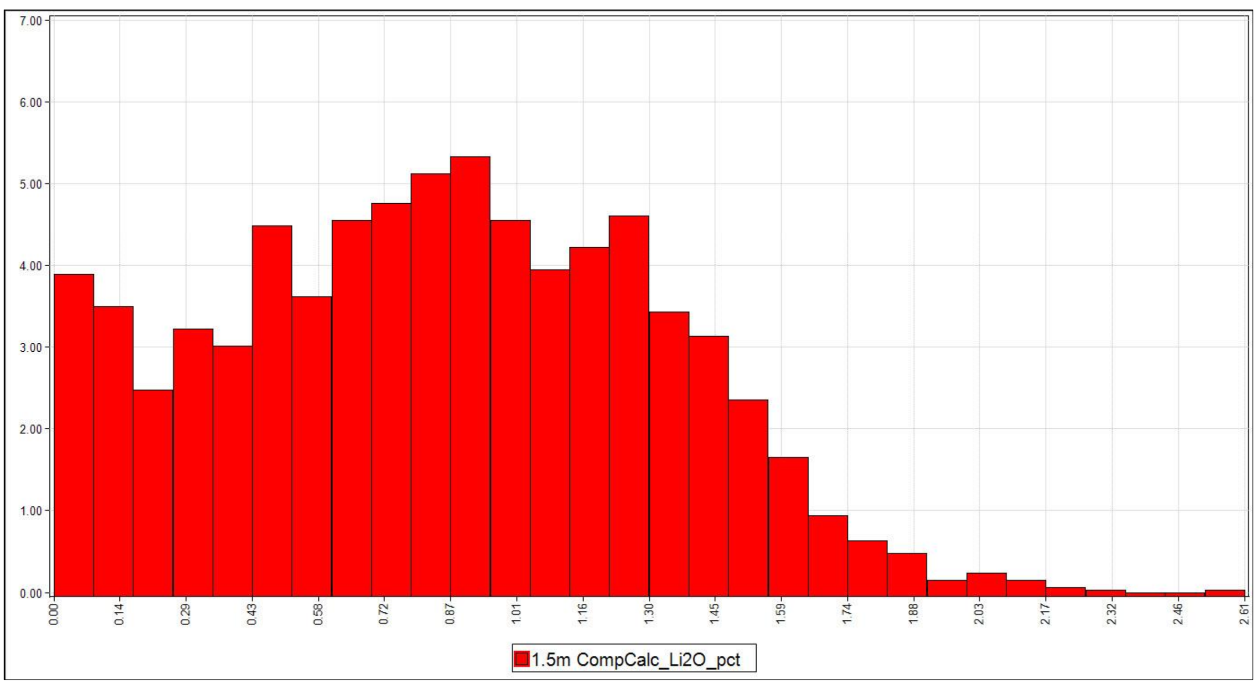
14.1.3. Composites Data

Block model grade interpolation was conducted on composited analytical data. A 1.5 m composite calculated length has been selected based on the average thickness of 1 m (2016-2018) assay lengths and previous 1.5 m assays lengths. Approximately 24% of the assay data has an average1.5 m assayed length and 45% of assays are between 1 m and 1.5 m. Compositing is conducted within the downhole mineralized intervals that were also used for 3D solid creation. A maximum of 1.5 m and a minimum of 0.25 m was applied to composite creation settings. Calculated length composites are created by finding the appropriate length of the composites to fit entirely the mineralized intervals. The calculated length was established for every interval trying to be as close as possible to the specified 1.5 m lengths. No capping was applied on the composite analytical data.

Table 14-3 shows the statistics of the analytical composites used for the interpolation of the resource block model and Figure 14-1 and Figure 14-2 show the related histograms for Li_2O. Figure 14-3 and Figure 14-4 display the spatial distribution of the composites in plan and longitudinal view respectively (hole collars are shown as blue circles and sample composites are shown as black diamonds).

Table 14-3: Statistics for the 1.5-m composites for Li_2O

Descriptive Statistics	Li_2O(%)
Min Value	-
Max Value	2.61
Average	0.70
Length Weighted Average	0.70
Sum of Length	4,936.02
Variance	0.32
Standard Deviation	0.57
% Variation	0.81
Median	0.71
First Quartile	0.08
Third Quartile	1.16
Count	3,321
Count Missing	-



* Histogram does not show the very low-grade composites associated to the internal Waste (999) and the barren pegmatite (100) solids

Figure 14-1: Histograms of the composites

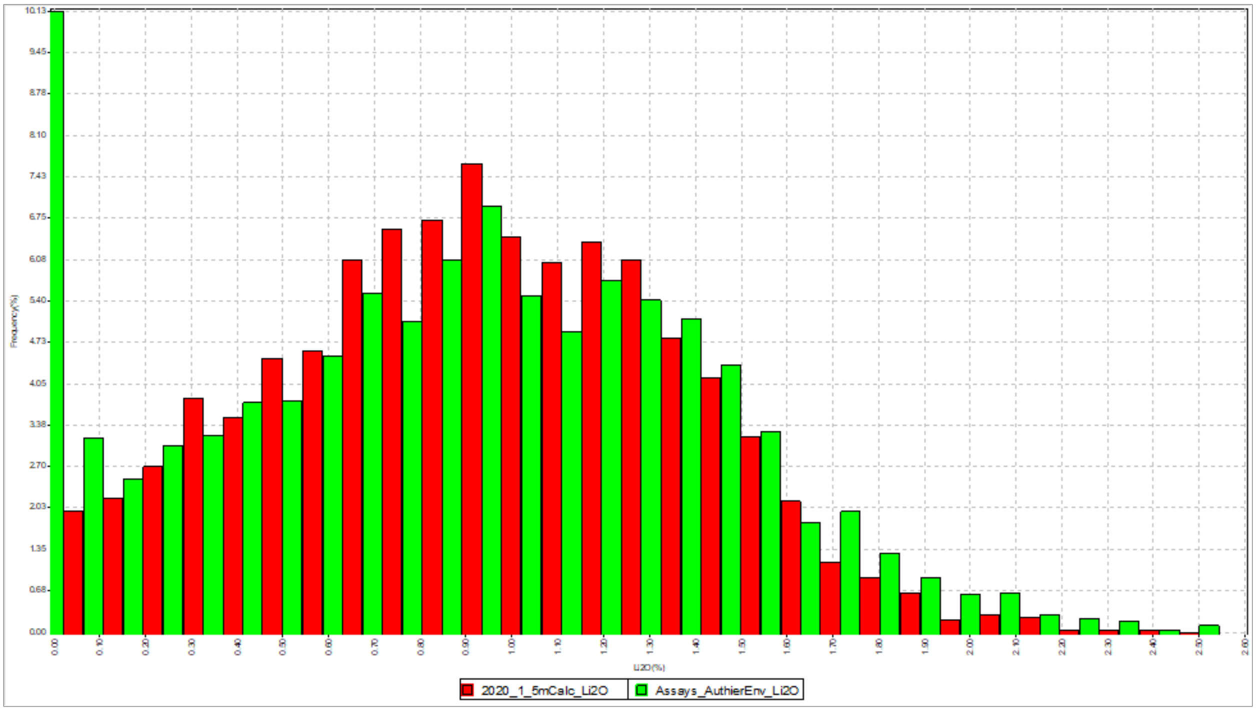


Figure 14-2: Histograms of the original samples compared to the composites

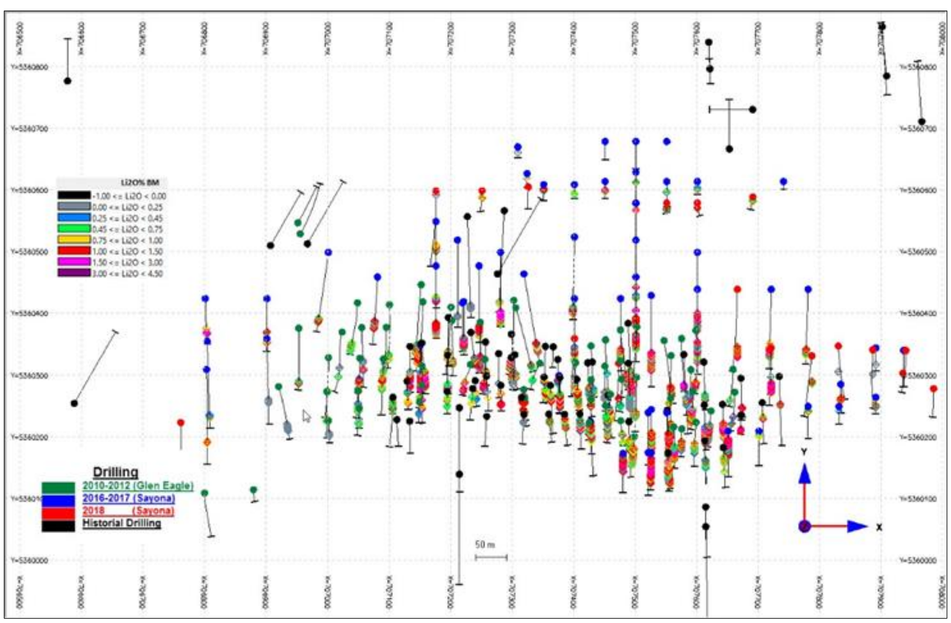


Figure 14-3: Plan view showing the spatial distribution of the composites

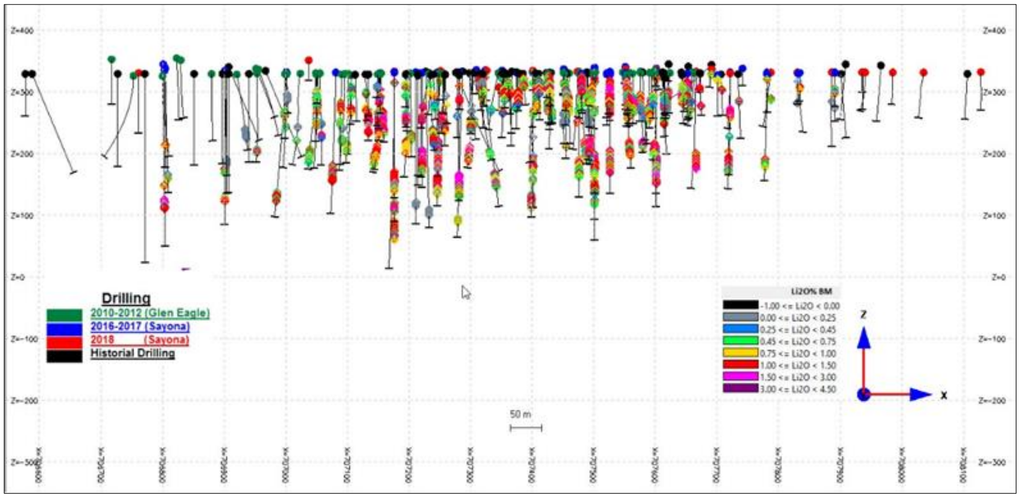


Figure 14-4: Longitudinal view showing the distribution of the composites (looking north)

14.1.4. Specific Gravity

An average specific gravity of 2.71 t/m^3 was used to calculate tonnage from the volumetric estimates of the block model. The average specific gravity is derived from the 38 specific gravity measurements (Table 14-4) taken by SGS from representative mineralized core samples from the 2010 drilling campaign. In 2017, 15 additional specific gravity measurements were added. The new total of 53 measurements were used to verify the specific gravity that is still 2.71 t/m^3.

Table 14-4: Specific gravity statistics on Authier

Authier Project - Spodumene pegmatite S.G. (t/m^3)	
Count	53
Mean	2.711
Std Dev	0.006
Relative Std Dev	0.25%
Minimum	2.62
Median	2.71
Maximum	2.86

14.2. Geological Interpretation

In 2021, the update of the 2017-2018 geological interpretation helped with updating the 3D wireframe solids of the mineralization. For the purpose of modelling, sections (looking east) were generated every 25 m, with intermediate sections where it was necessary to tie in the solids. The modelling was first completed on sections to define mineralized polygons using the lithologies and analytical data for lithium. A minimum grade of 0.4% Li_2O over a minimum drillhole interval length of 2 m was generally used as a guideline to define the width of mineralized interpretations (Figure 14-9) The final 3D wireframe model was constructed by meshing the defined mineralized interpretations based on the geological interpretation. Host rock and internal waste were considered and dealt with during modelling.

The updated interpretation continues to show the Main zone, with an E-W strike and dipping between 30° (Main2 3D wireframe solid) to 55° (upperpart of Main 1 3D wireframe solid), averaging -45° towards the north (Figure 14-8 & Figure 14-9). The Authier North 3D wireframe solid is not connected to the Main zone and forms a flat shallow north dipping structure at about 15-20°.

Local smaller 3D wireframe solids of significant sized xenolith material (waste) located inside the Main 3D solid were also modelled.

The Main and North 3D wireframe solids were cut by the latest 2018 overburden/bedrock contact surface. (See below).

There is also the presence of a barren pegmatite body mostly surrounding, sporadically, the main zone. Assay results indicate no or very low lithium values. This solid was also modelled for additional knowledge of the Deposit.

In fall 2021, BBA did a review of the barren host rock surrounding the Authier pegmatite. A total of four solids were made and given to SGS for added knowledge. These solids are not part of the resource modelling and act as added knowledge.

14.2.1. Topographic and Overburden/Bedrock Contact Surfaces

In 2018, a high precision LiDAR topographic surface was flown by Sayona. All drillhole collars were draped to the surface. An overburden/bedrock interface 3D surface has been generated and updated with 2017-2018 data by triangulating the lower intercept of the overburden-coded lithology from the drillhole dataset. This overburden/bedrock contact surface was used to cut the Main and North 3D solids.

Figure 14-9 shows the final 3D wireframe solids in isometric view. The different colors of the 3D wireframe solids do not represent any specific parameters and are used to help the visual differentiation.

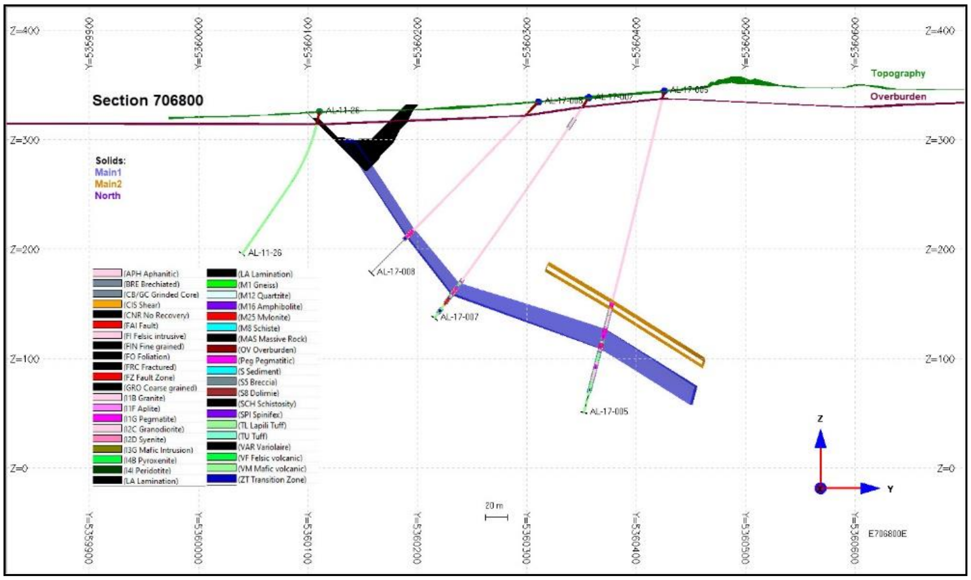


Figure 14-5: Section E706800 (looking west) interpretations of the mineralized solids

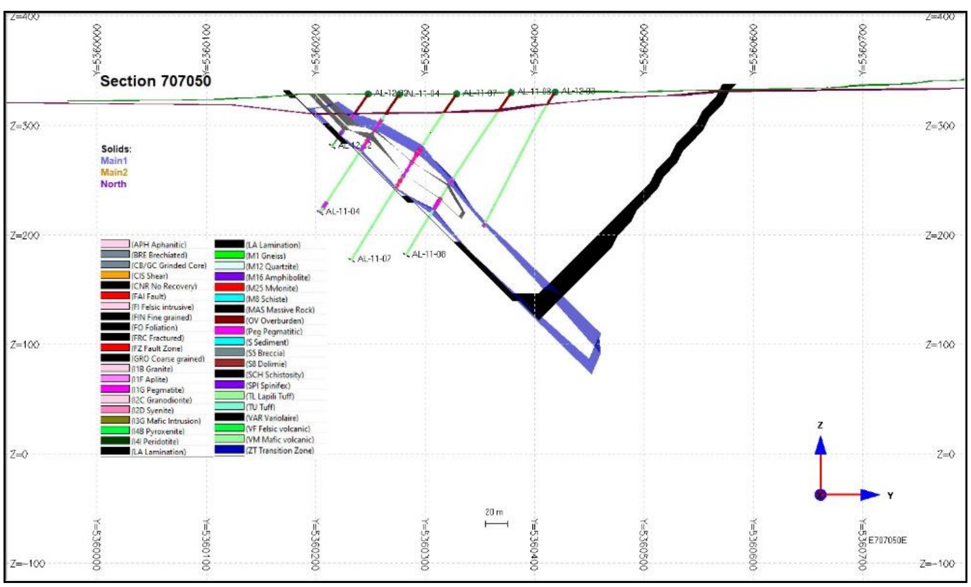


Figure 14-6: Section E707050 (looking west) interpretations of the mineralized solids

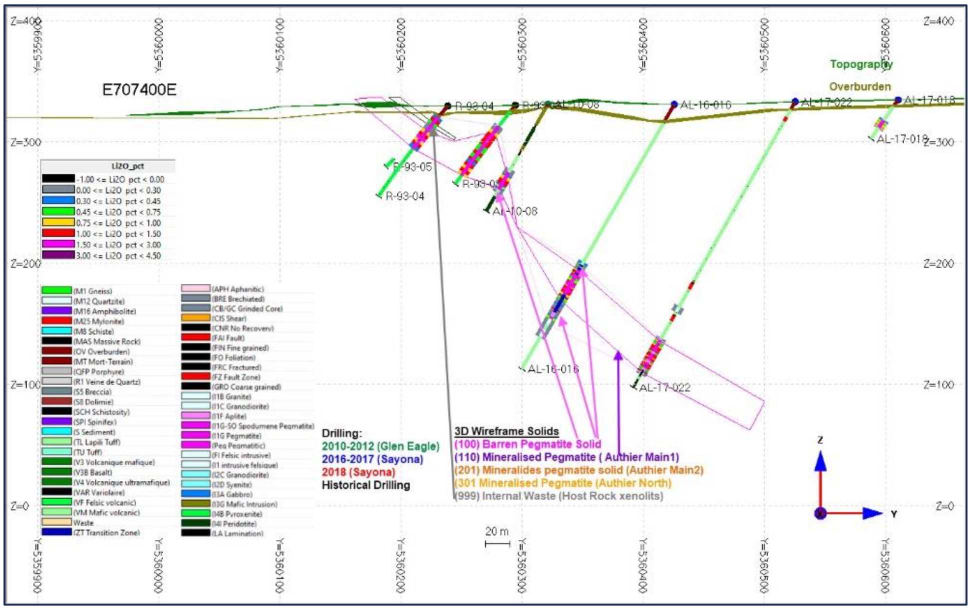


Figure 14-7: Section E707400 (looking west) interpretations of the mineralized solids

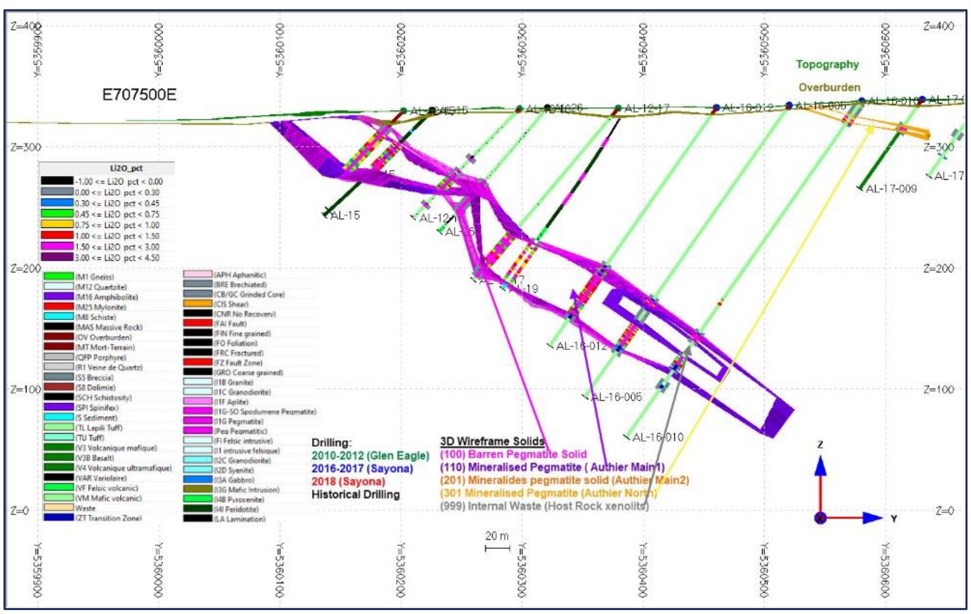


Figure 14-8: Section E707500 (looking west) interpretations of the mineralized solids

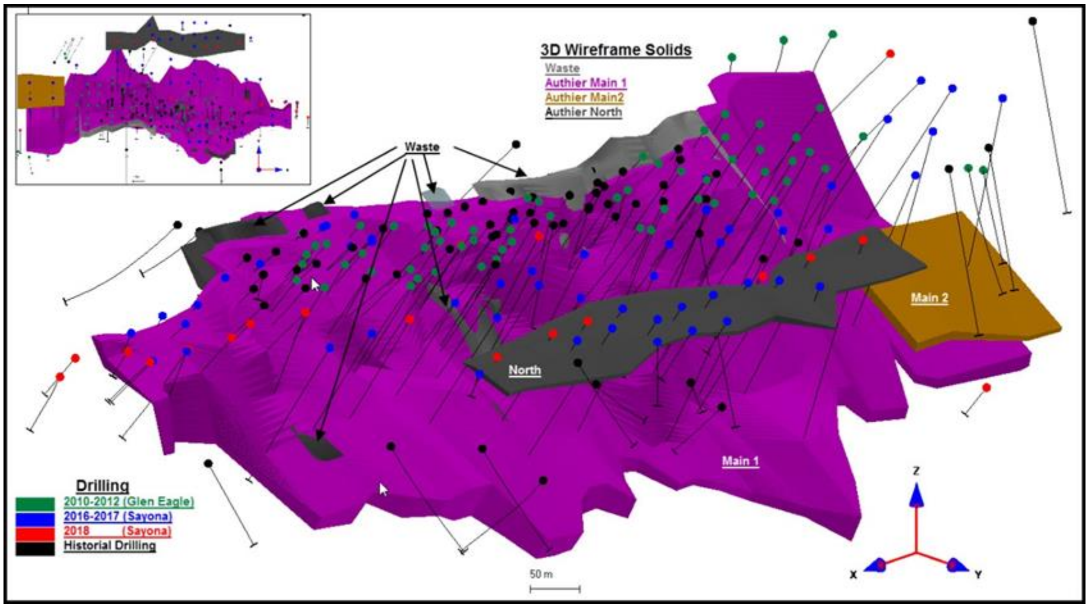


Figure 14-9: Isometric view of the final mineralized solids

14.3. Resource Block Modelling

A block size of 3 m (NE-SW) by 3 m (NW-SE) by 3 m (vertical) was selected for the resource block model of the Authier Project based on drillhole spacing, width and general geometry of mineralization, but primarily by the selected SMU from the feasibility study. The 3 m vertical dimension corresponds to the bench height of a potential small open-pit mining operation. The 3 m NE-SW dimension corresponds to about the selected degree of selectivity Sayona is wanting to achieve during mining. It also accounts for the variable geometry of the mineralization in that direction. The 3 m NW SE block dimension accounts for the average minimum width of the mineralization modelled at Authier. The resource block model contains 473,962 blocks located inside the mineralized solids (Authier Main1(110), Authier Main2 (201), Authier North (301)) totalling 7,993,779.19 m^3 and two barren solids (Internal waste (999), Barren Pegmatite (100)) totalling 2,539,939.33 m^3, for a total volume (mineralized and unmineralized) of 10,533,712.52 m^3 (Authier Main1, Authier Main2 and Authier North solids only). The Block model was created with block fractions ranging from 0 to 1. Table 14-5 summarizes the parameters of the block model limits.

Table 14-5: Resource block model parameters

Direction	Block Size (m)	Block Model Origin (Block Edge)	Number of Blocks	Coordinates (Block Edges)	
				Min (m)	Max (m)
NE-SW (x)	3	706699.5	407	706699.5	707920.5
NW-SE (y)	3	5359998.5	235	5359998.5	5360703.5
Elevation (z)	3	-51.5	133	-51.5	347.5

14.4. Grade Interpolation Methodology

14.4.1. Geostatistical Study 2018-2020

In 2018 (revised in 2020) SGS revised the geostatistical study of the Main1 3D wireframe solid. In order to determine the continuity and distribution of the Li_2O grades, the 1.5 m composites were submitted to a variographic study. The variographic study helped in the determination of the search ellipse criteria and for the kriging parameters for the block interpolation process.

The composites show a normal distribution (Figure 14-1) with a relatively low coefficient of variation (standard deviation to the Mean) of 52%. A variogram was generated for the Main zone orientation (including the Main2) dip north.

The resulting model variogram for the Main zone (2020) can be shown with the following function (Table 14-6):

Table 14-6: Variography settings

Name	Variable	Type	Sill	Longest Range	Median Range	Shortest Range	Azimuth	Dip	Spin
2020Main1	Li_2O	Nugget	0.3	0	0	0	0	0	0
2020Main1	Li_2O	Exponential	0.2	15	15	5	90	0	-55
2020Main1	Li_2O	Exponential	0.5	20	20	10	90	0	-55

Where N represents a nugget effect of 30% and maximum continuity of 60 m* is found along both the strike and the dip orientations (-55°). The shortest range is found across the mineralization with a range of 15 m* towards the south and 35° of dip (Figure 14-12).

* Exponential component ranges are three times longer than in this table in reality, i.e., First Exponential component: 45 m, 45 m, 15 m. Second Component: 60 m, 60 m, 30 m.

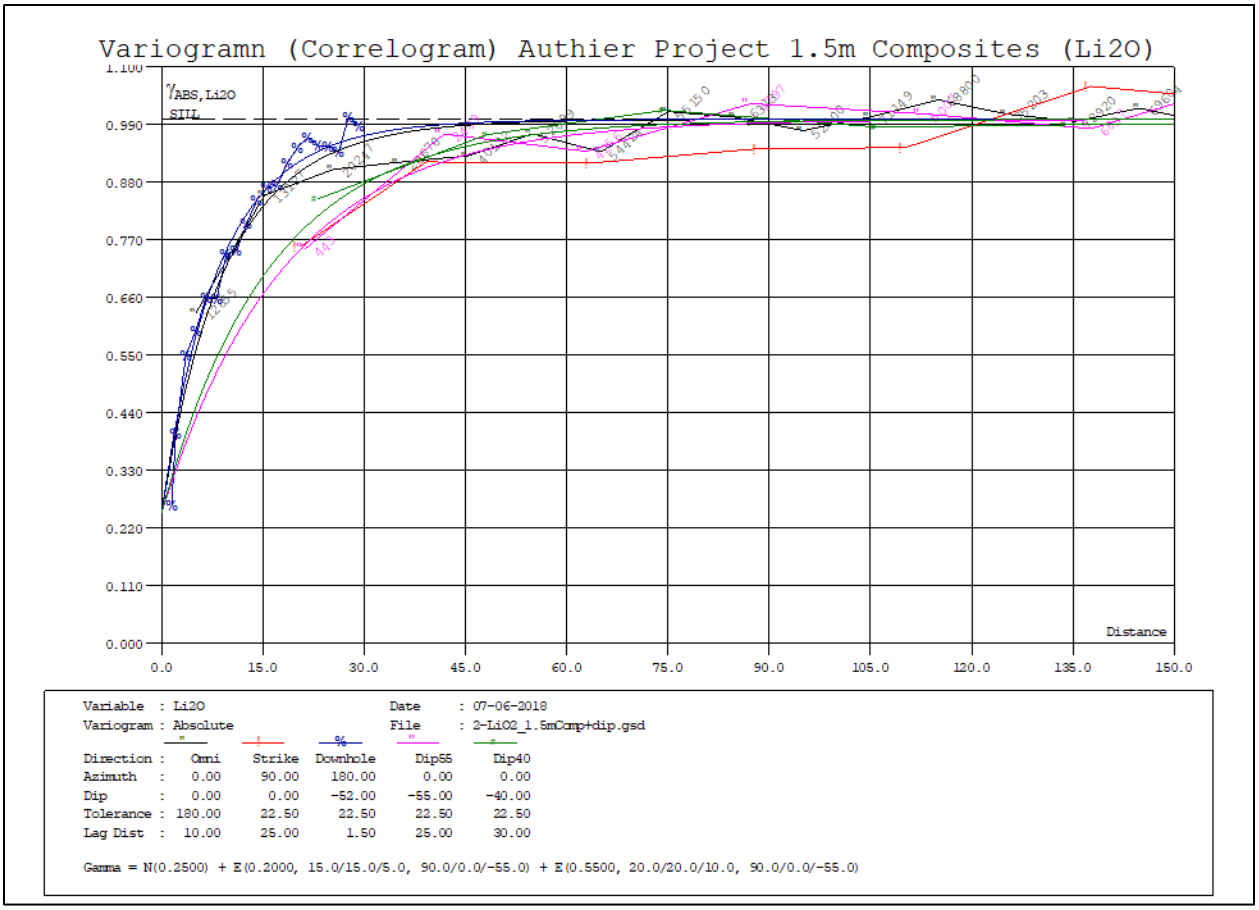


Figure 14-10: Variogram of the 1.5 m composites for Li_2O% grades

14.4.2. Block Model Interpolation

The retained grade interpolation for the Authier lithium resource block model is the ID^2 methodology. The interpolation process was conducted using three successive passes with more inclusive search conditions from one pass to the next until most blocks were interpolated for each mineralized zone, including the barren pegmatite.

Variable search ellipse orientations were used to interpolate the blocks. The general dip direction and strike of the mineralized pegmatite were modelled on each section and then interpolated in each block (Figure 14-11). During the interpolation process, the search ellipse was orientated following the orientation grid (Figure 14-11). The orientation grid generated the interpolation direction, azimuth-dip (dip direction) and spin (strike direction) for each block, hence better representing the dip and orientation of the mineralization.

The first pass was interpolated using a search ellipsoid distance of 50 m (long axis) by 50 m (intermediate axis) and 25 m (short axis) with an average orientation of 90° azimuth (local grid), -55° dip and 0° spin which represents the general geometry of the pegmatites in the Deposit. Using search conditions defined by a minimum of five composites, a maximum of 15 composites and a maximum of two composites per hole (minimum of three holes), 40% of the blocks were estimated. For the second pass, the search distance was twice the search distance of the first pass and composite selection criteria were kept the same as for the first pass. A total of 79% of the blocks were interpolated following the second pass. Finally, the search distance of the third pass was increased to 300 m (long axis) by 300 m (intermediate axis) by 150 m (short axis) and again the same composites selection criteria were applied. The purpose of the last interpolation pass was to interpolate the remaining un-estimated blocks mostly located at the edges of the block model, representing 21% of the blocks.

Figure 14-11 illustrates the three search ellipsoids used for the different interpolation passes. Figure 14-12 shows the results of the block model interpolation in oblique view.

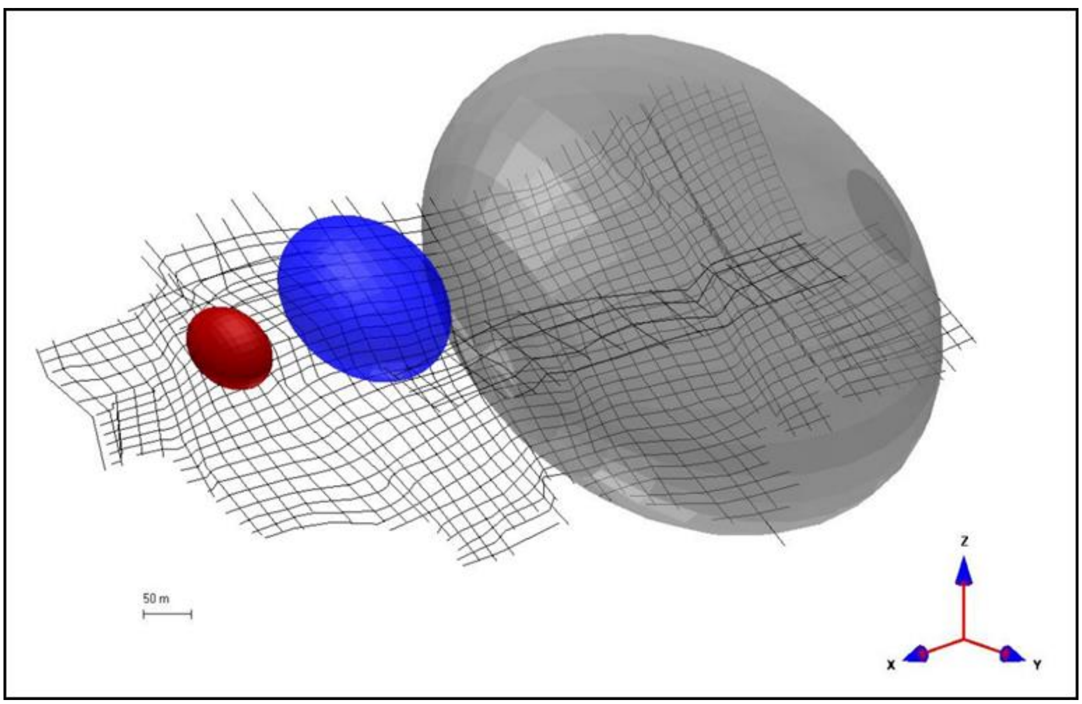


Figure 14-11: Search ellipsoids and orientation grid used in the interpolation process

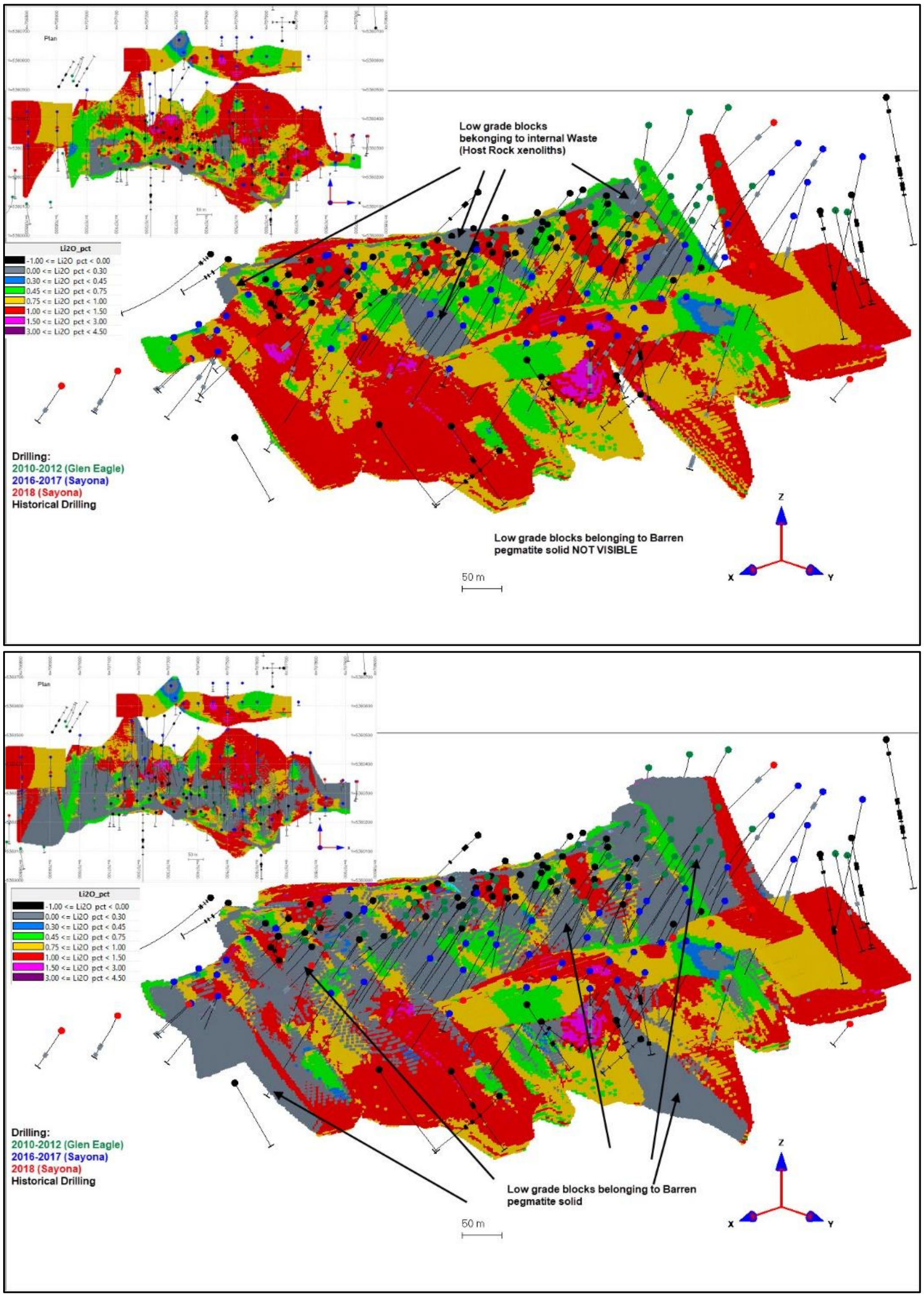


Figure 14-12: Isometric and plan views of the interpolated block model (ID²)

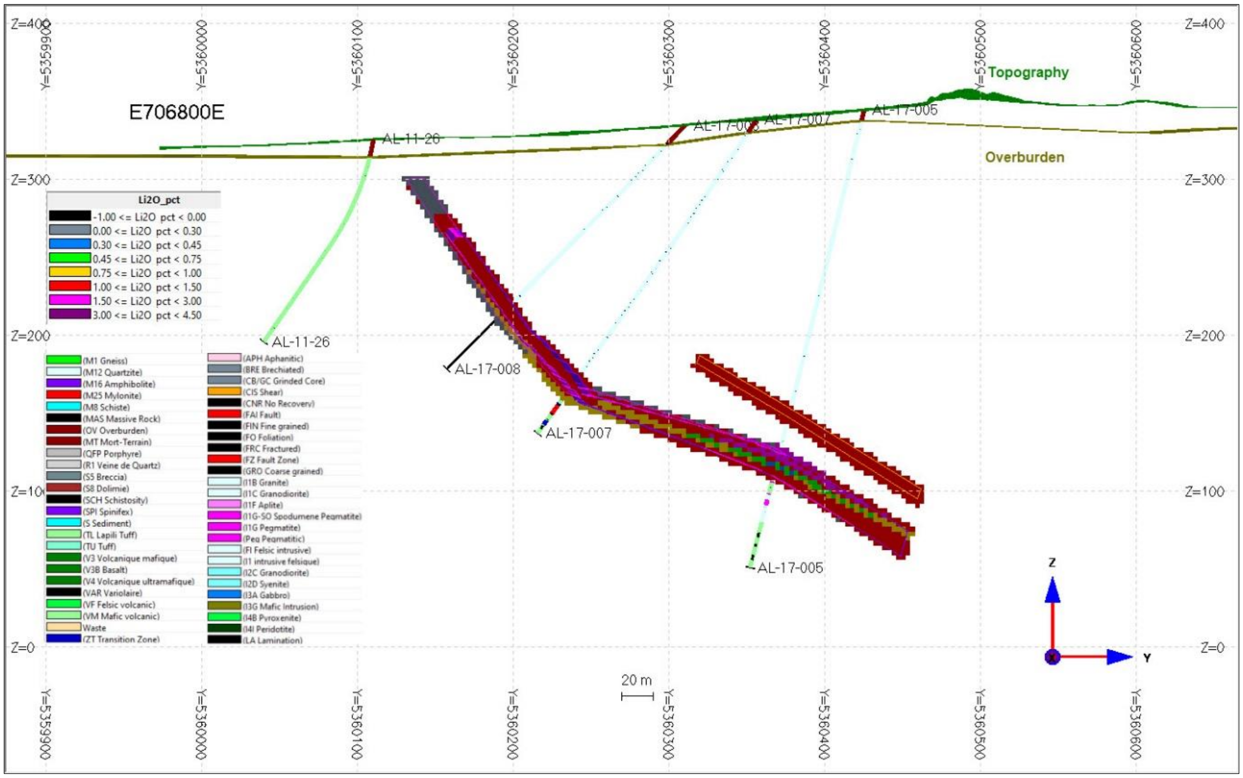


Figure 14-13: Section E706800 (looking west) view of the interpolated block model (ID²)

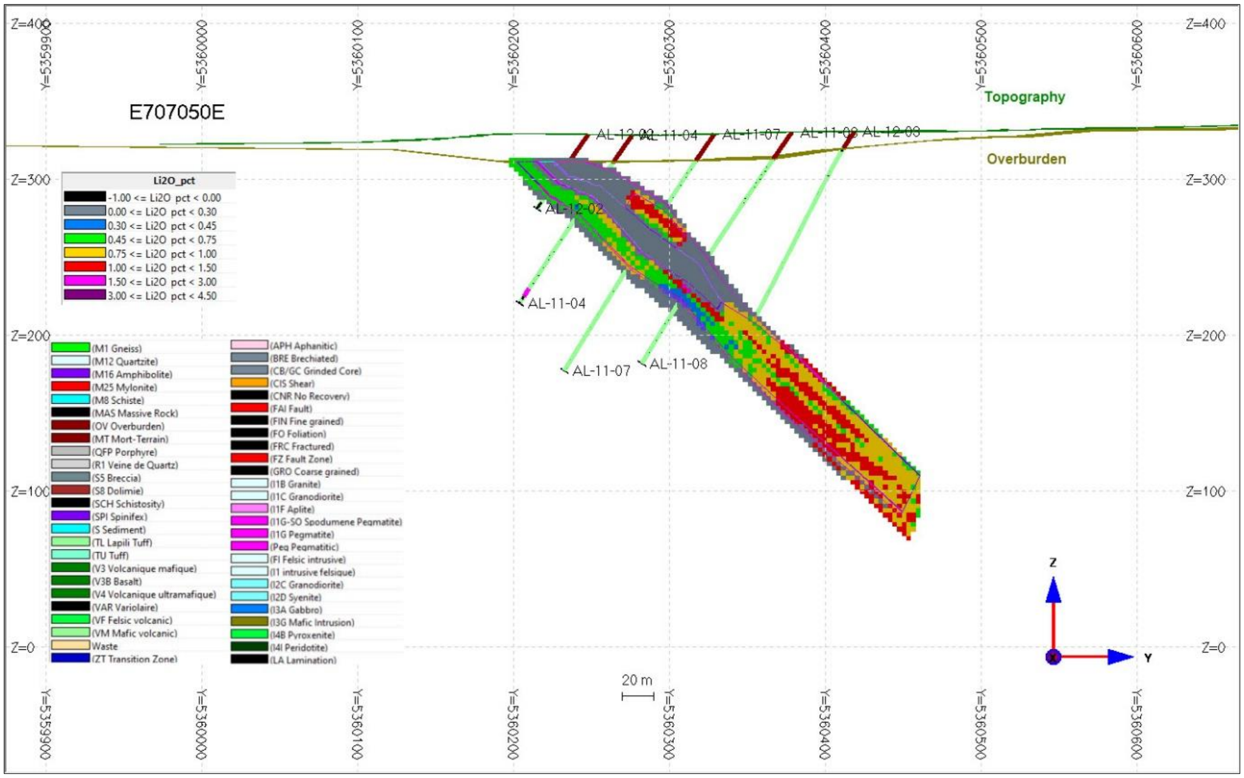


Figure 14-14: Section E707050 (looking west) view of the interpolated block model (ID²)

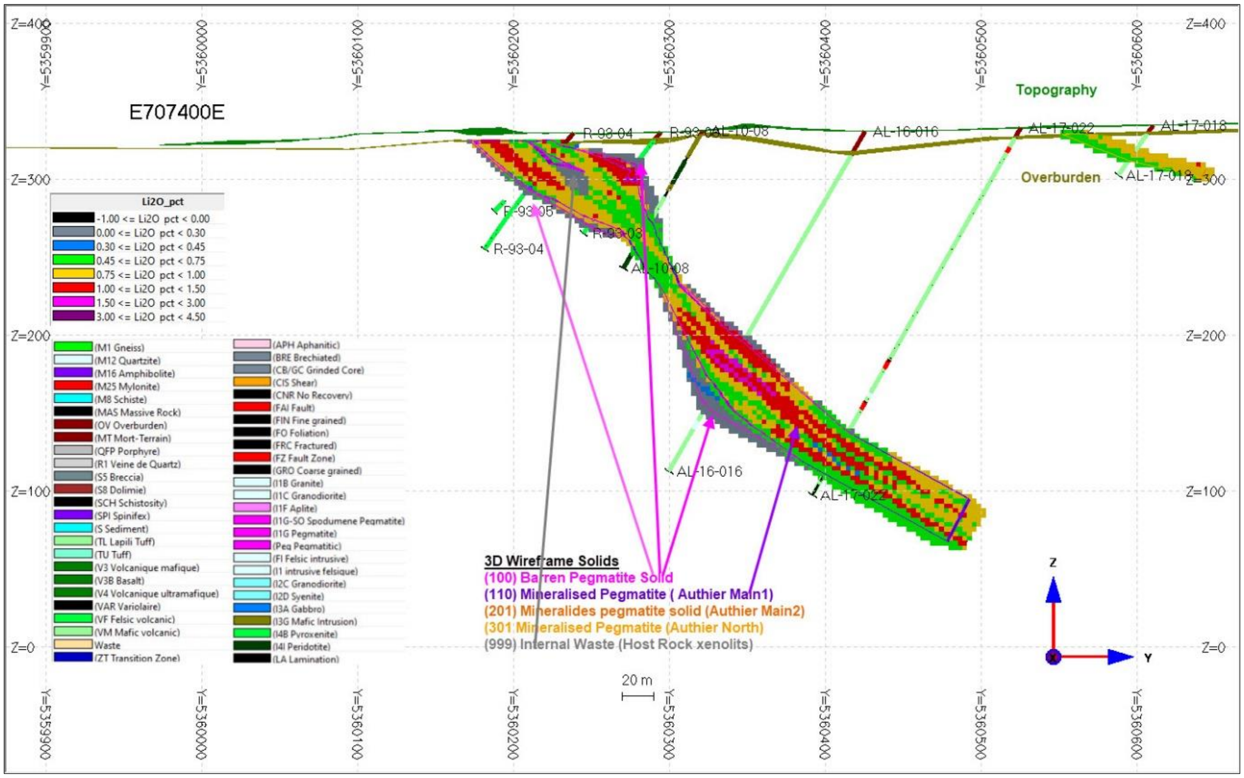


Figure 14-15: Section E707400 (looking west) view of the interpolated block model (ID²)

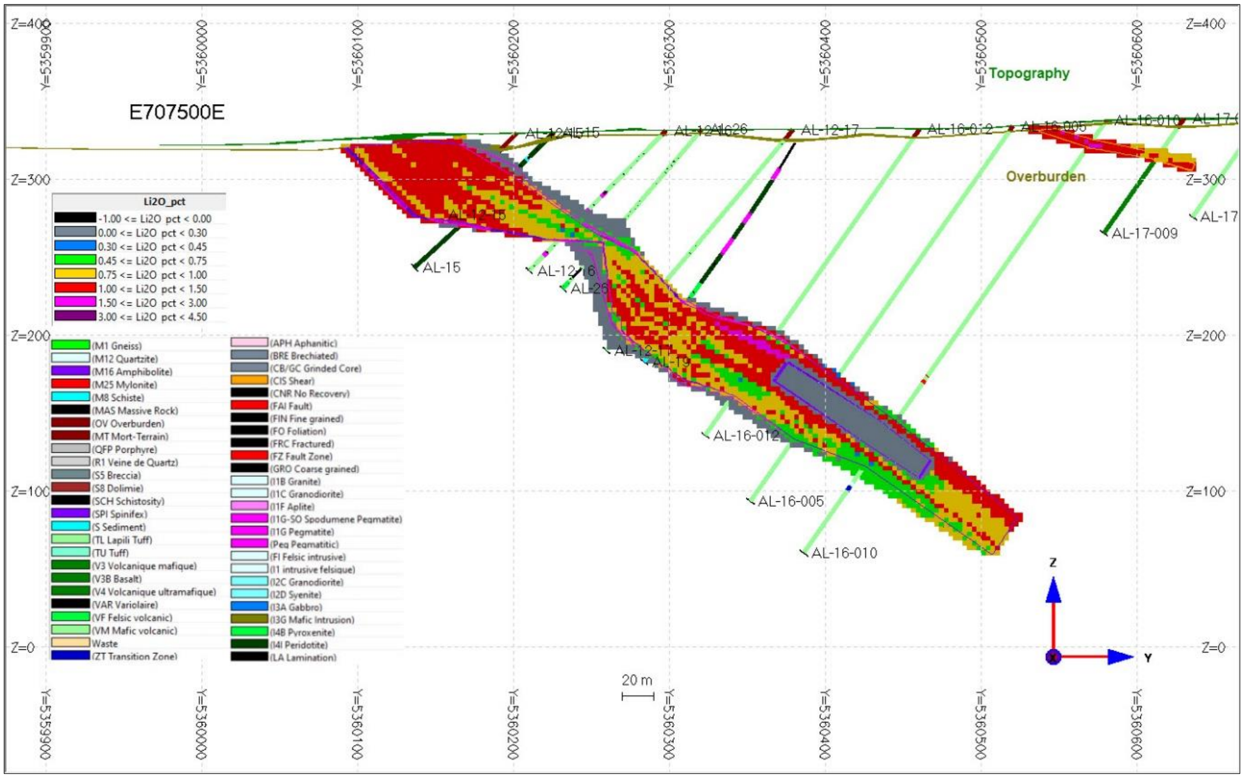


Figure 14-16: Section E707500 (looking west) view of the interpolated block model (ID²)

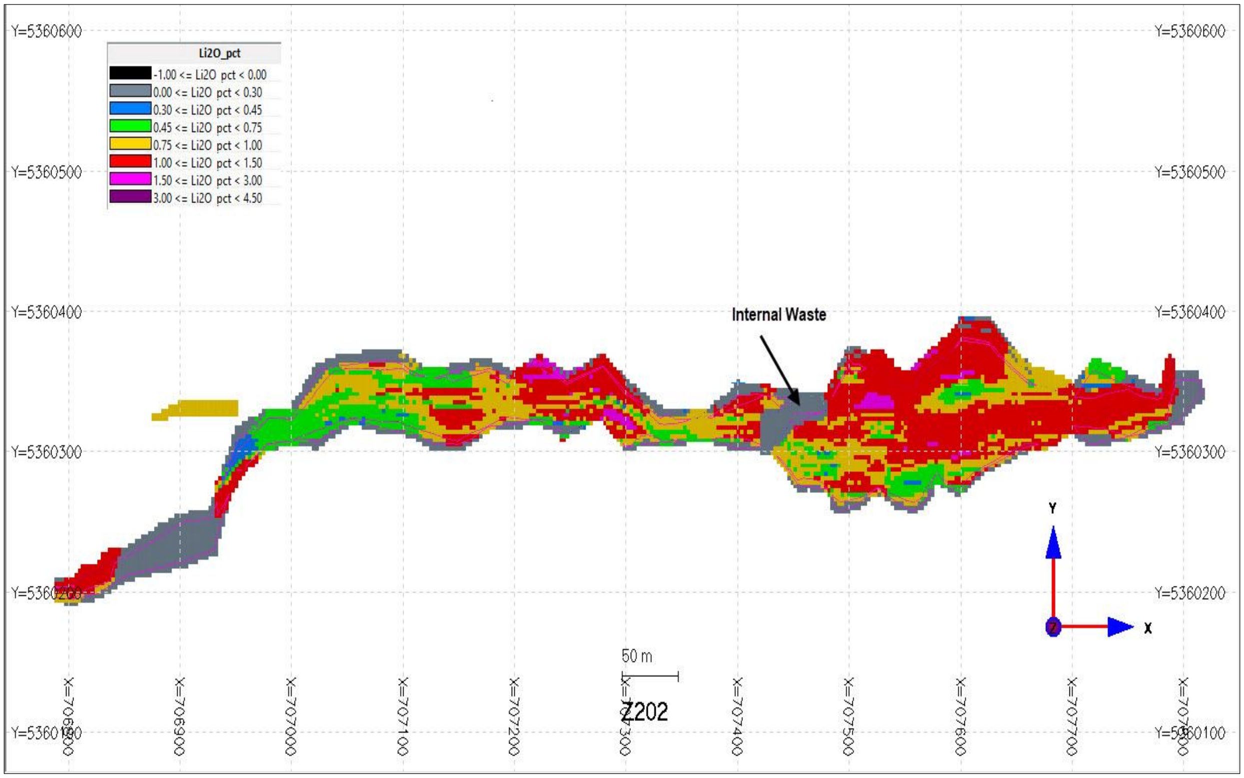


Figure 14-17: Bench (Z202) view of the interpolated block model (ID²)

14.4.3. Statistical Validation of the Interpolation Process

In order to validate the interpolation process, the block model was compared, statistically, to the assays and composites. The distribution of the assays, composites and blocks are normal and show a similar average value with decreasing levels of variance (Figure 14-18 to Figure 14-22). The assays and composites have respective averages of 0.79% Li_2O and 0.69% Li_2O with variances of 0.34 and 0.32. The resulting interpolated blocks have an average value of 0.74% Li_2O with a variance of 0.20% (Figure 14-10

Furthermore, the block values were compared to the composite values located inside the interpolated blocks (Figure 14-23). This enables us to test for possible over- or under-evaluation of the grade by the search parameters by testing the local correlation.

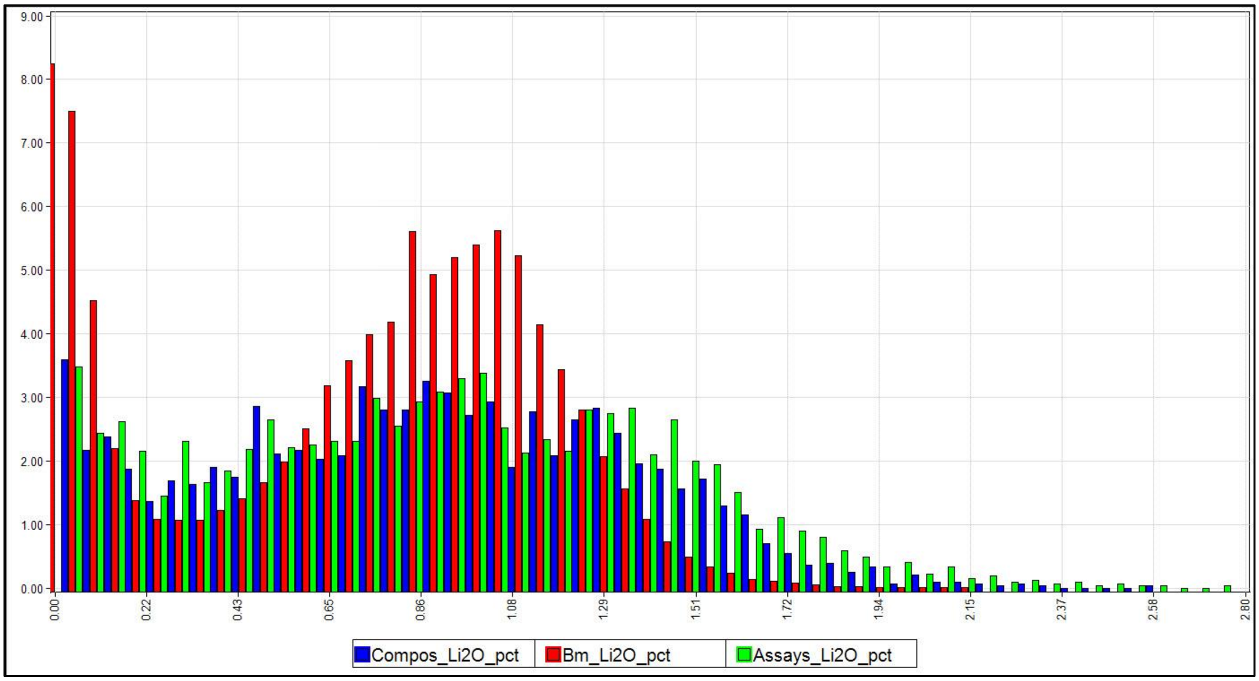


Figure 14-18: Histogram of blocks (ID^2) vs. composites vs. assays

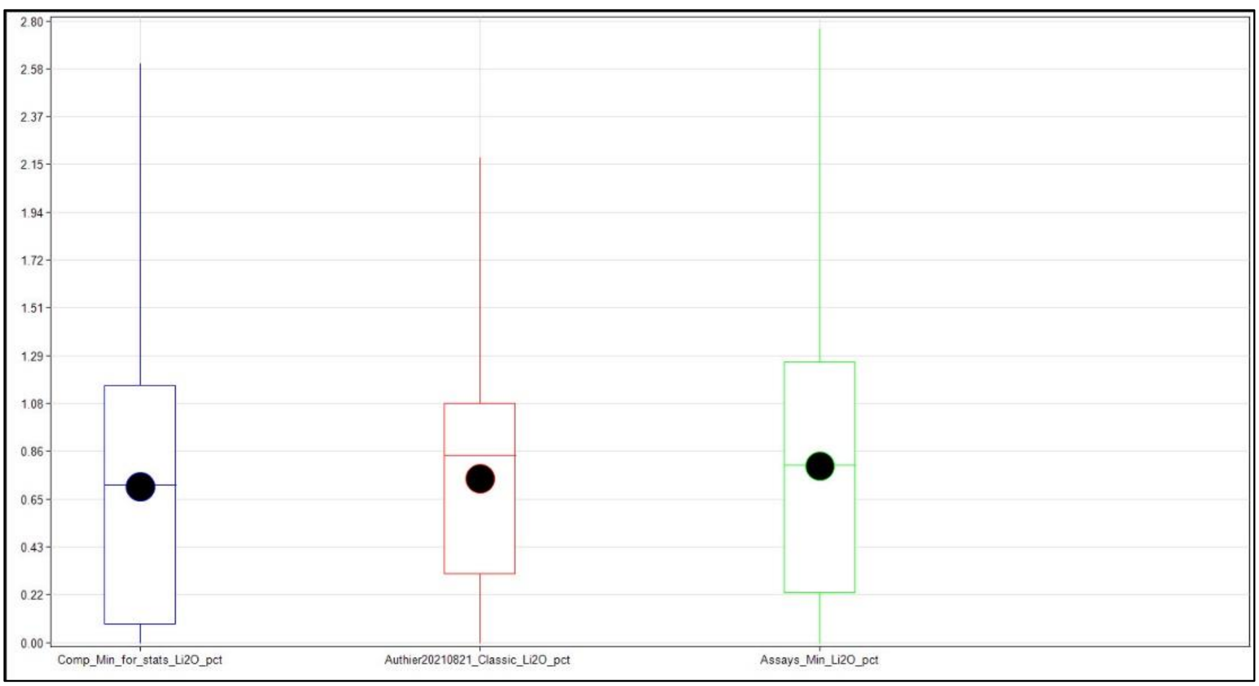


Figure 14-19: Boxplot of blocks (ID^2) vs. composites vs. assays

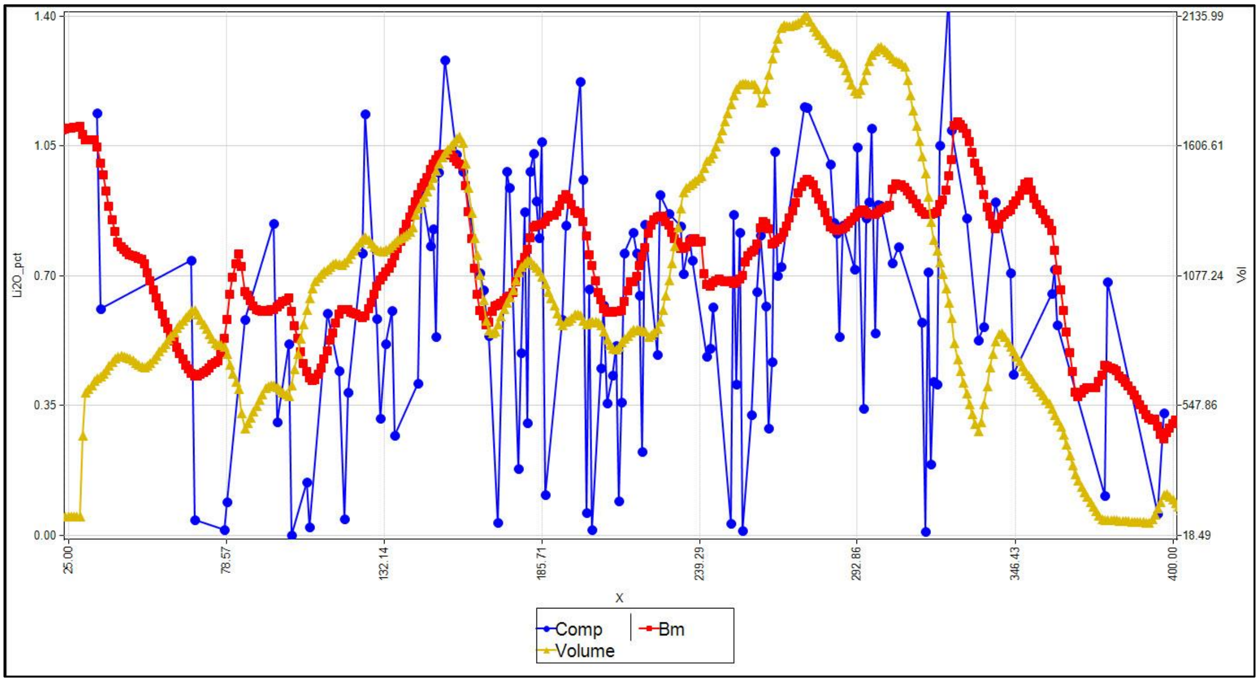


Figure 14-20: Swath plot (X) of blocks vs. composites vs. volume

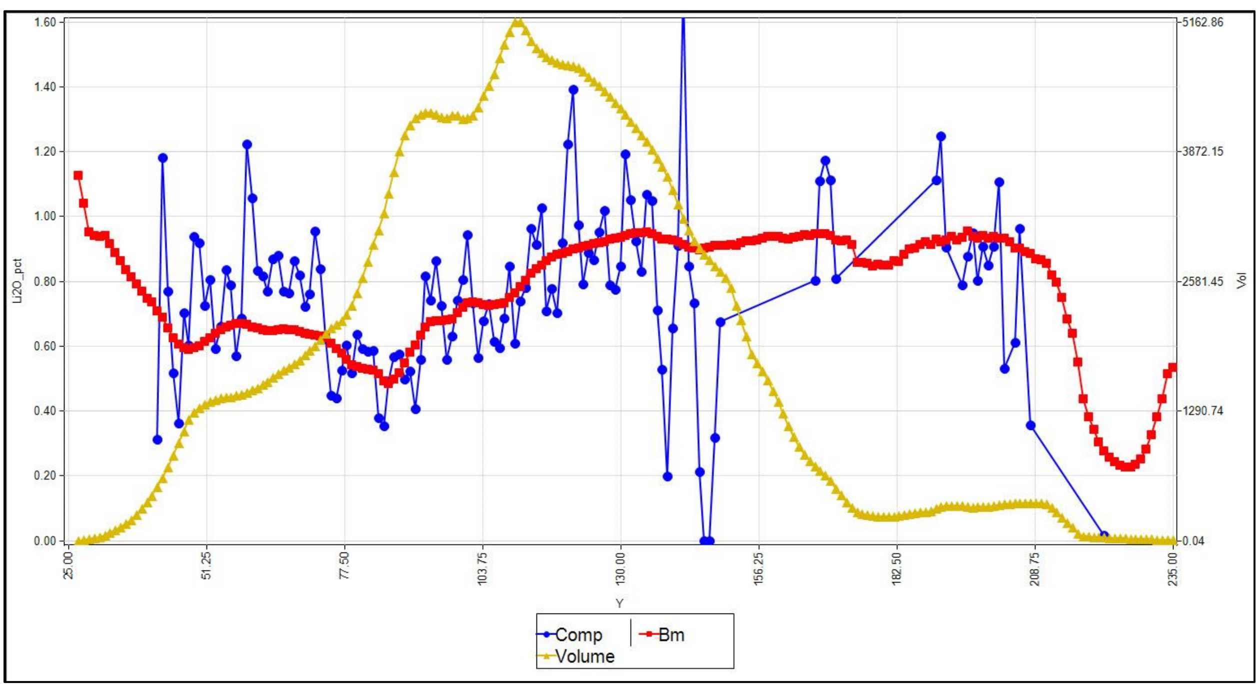


Figure 14-21: Swath plot (Y) of blocks vs. composites vs. volume

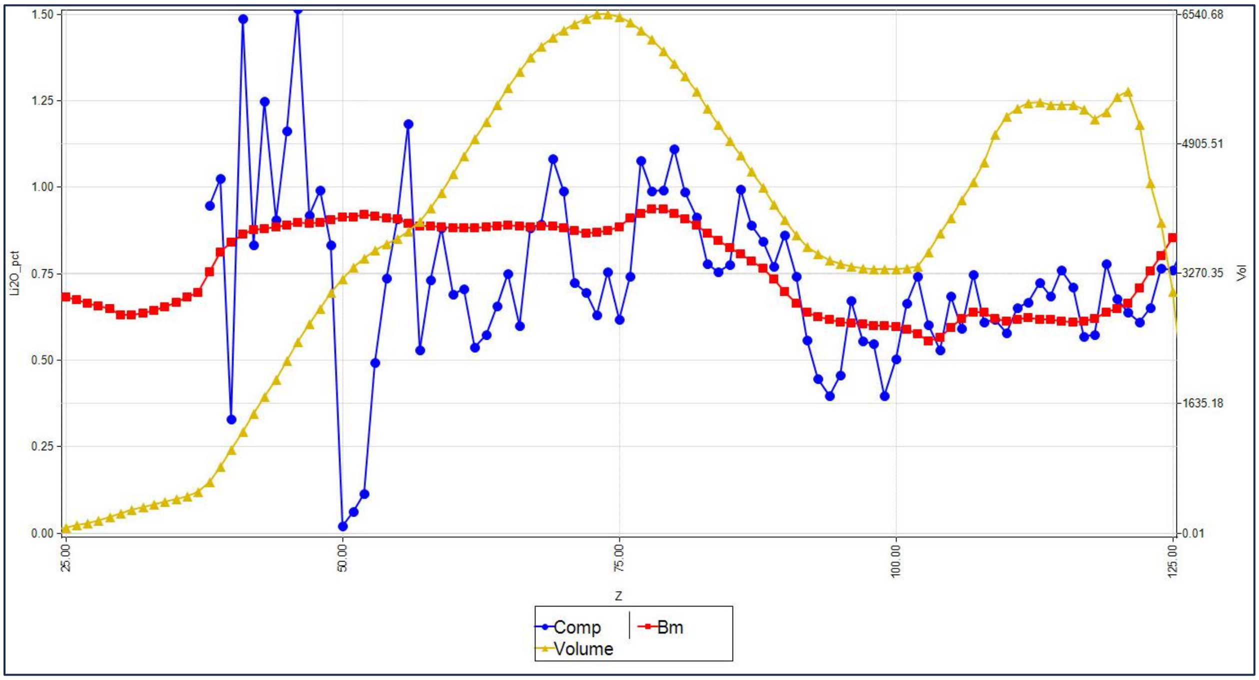


Figure 14-22: Swath plot (Z) of blocks vs. composites vs. volume

Table 14-7: Statistical comparison of assay, composite and block data statistics report

Statistics Li_2O(%)	Blocks	Composites	Assays
Min Value	0.00	0.00	0.00
Max Value	2.18	2.61	2.76
Average	0.74	0.69	0.79
Length Weighted Average		0.70	0.79
Sum of Length		4,936.02	4,330.58
Variance	0.20	0.32	0.34
Standard Deviation	0.44	0.57	0.58
% Variation	0.60	0.81	0.74
Median	0.84	0.71	0.80
First Quartile	0.30	0.08	0.22
Third Quartile	1.08	1.16	1.26
Count	473,962	3,321	3,251

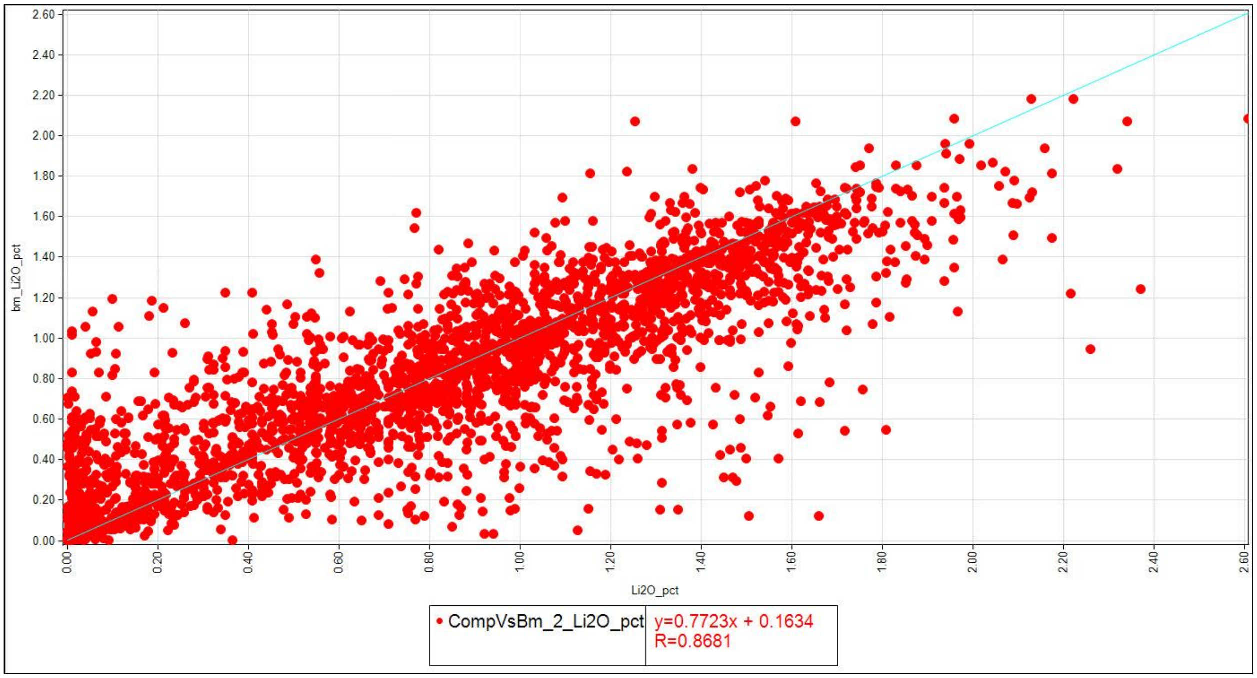


Figure 14-23: Block values versus composites inside those blocks comparison

14.5. Mineral Resource Classification

The Mineral Resources at Authier Lithium are classified into Measured, Indicated and Inferred categories. The Mineral Resource classification follows the CIM definitions and guidelines and is based on the density of analytical information, the grade variability and spatial continuity of mineralization. The Mineral Resources were classified in two successive stages: automatic classification followed by manual editing of final classification results.

The first automatic classification stage is focused on composites (and drillholes) rather than blocks. The classification process focuses around each composite respecting a minimum number of nearby composites from a minimum number of holes located within a search ellipsoid of a given size and orientation. For the Measured resource category, the search ellipsoid was 50 m (strike) by 50 m (dip) by 25 m with a minimum of seven composites in at least three different drillholes (maximum of two composites per hole) An ellipse fill factor of 55% was applied to the Measured category i.e., that only 55% of the blocks were tagged as Measured within the search ellipse. For the Indicated category, the search ellipsoid was twice the size of the Measured category ellipsoid using the same composite selection criteria. An ellipse fill factor of 55% was applied to the Indicated category. All remaining blocks were considered to be in the Inferred category.

This automatic classification, centred on composites, is preferred to the more classical method of classification, centred on blocks, in a sense that it is significantly limiting the spotted dog effect.

The second classification stage involved the manual addition of indicated block clusters into the Measured category. The objective was to smooth the spotted dog effect most evident in the Measured category; and also to take into account the geological continuity and grade. The second stage consisted of the reassignment of selected Indicated blocks within the Measured category general area into the Measured category. The second classification stage also involved the manual transfer of Indicated blocks clusters into the Inferred category. The objective was to assign a more appropriate classification to areas where the density and quality of geological information was insufficient.

Figure 14-24 to Figure 14-29 show the block model automatic classification on different sections and benches and the final manual classification of the blocks on sections, plan views and isometric view with respective categories (categories: Measured – red, Indicated – blue, and Inferred – grey).

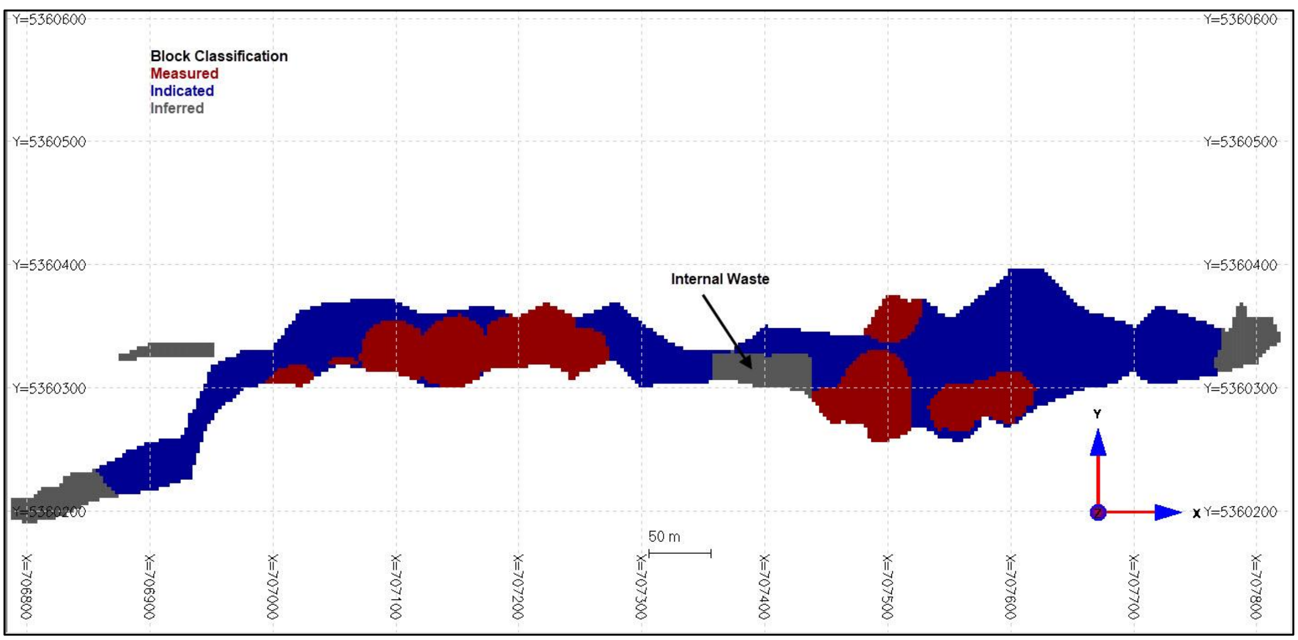


Figure 14-24: Classified block model on bench (Z202)

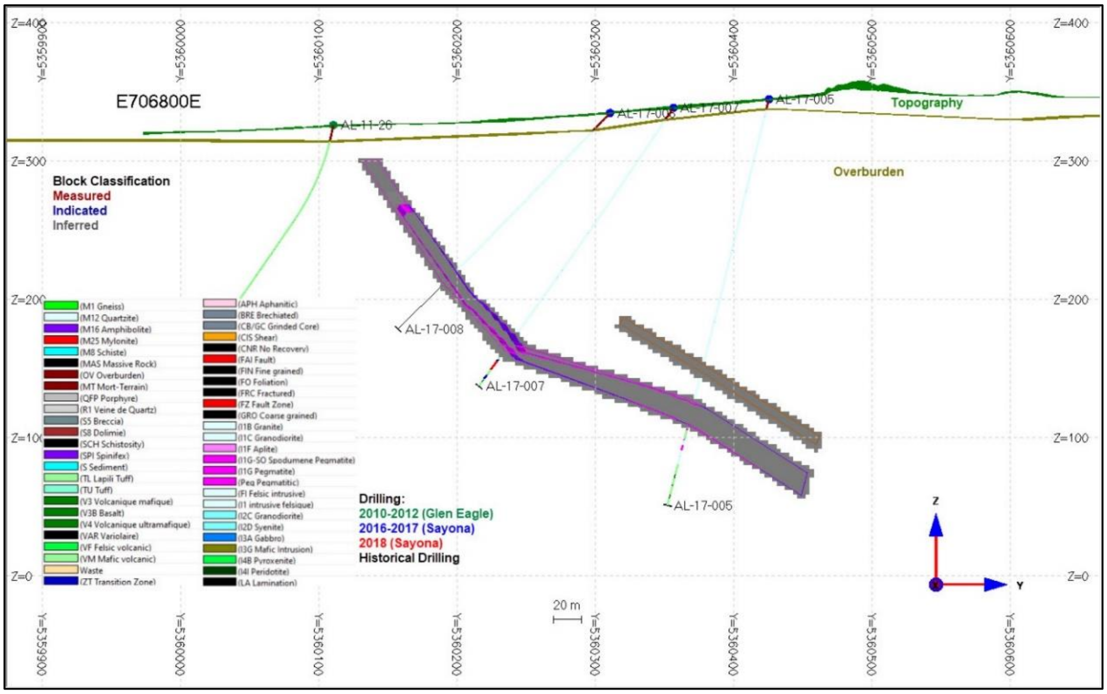


Figure 14-25: Classified block model on section E706800

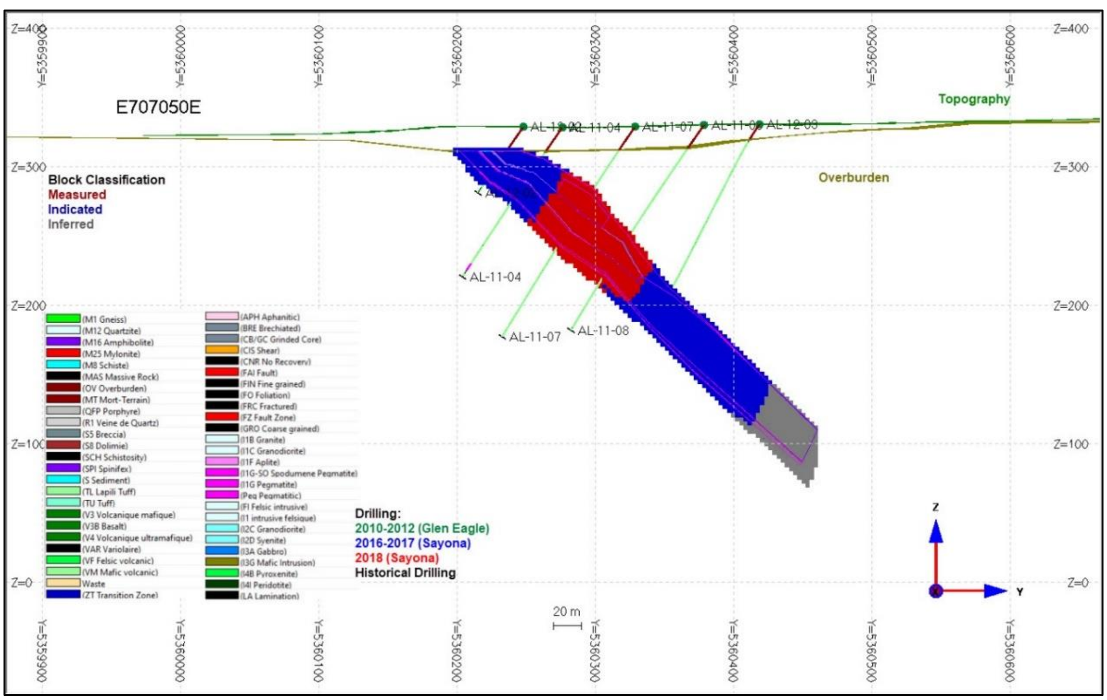


Figure 14-26: Classified block model on section E707050

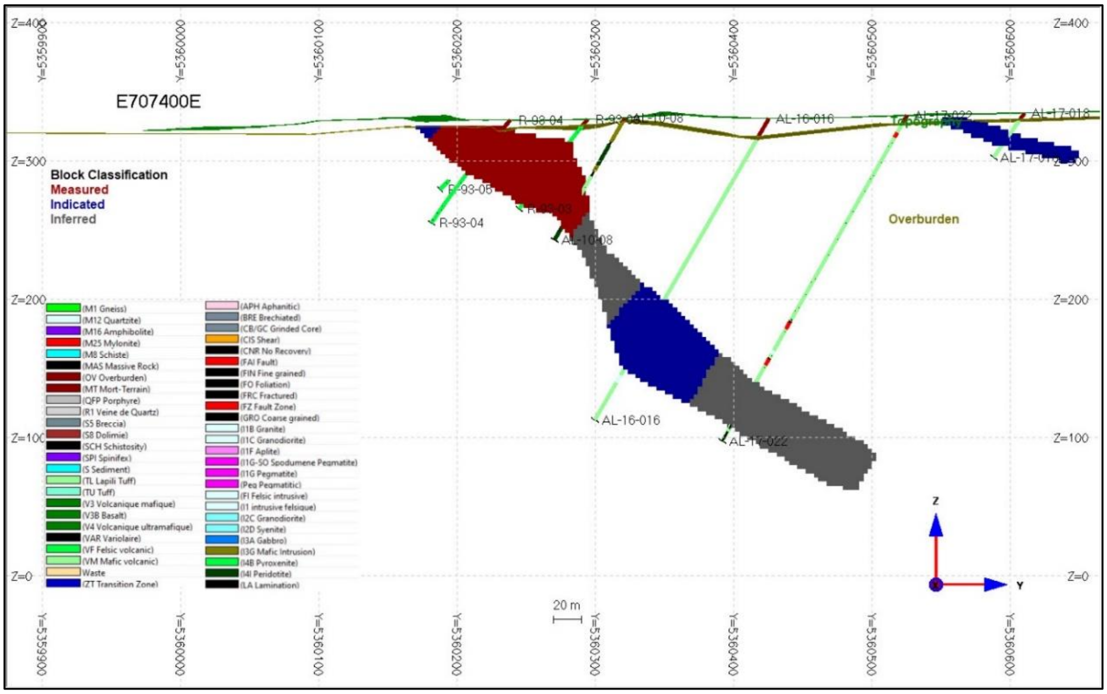


Figure 14-27: Classified block model on section E707400

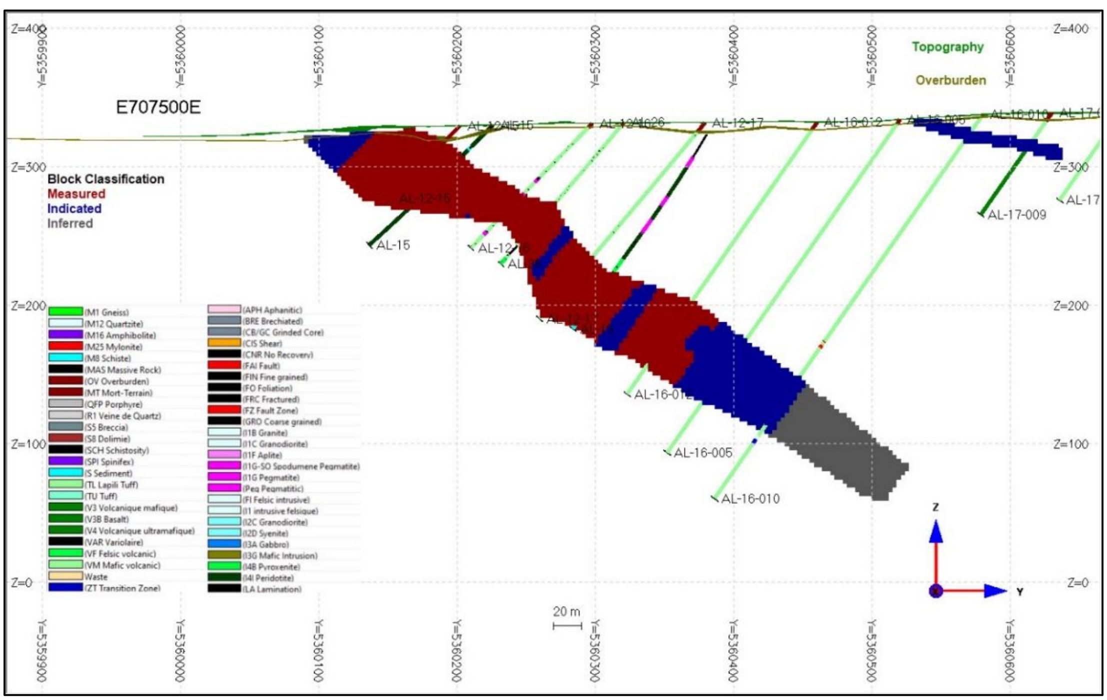


Figure 14-28: Classified block model on section E707500

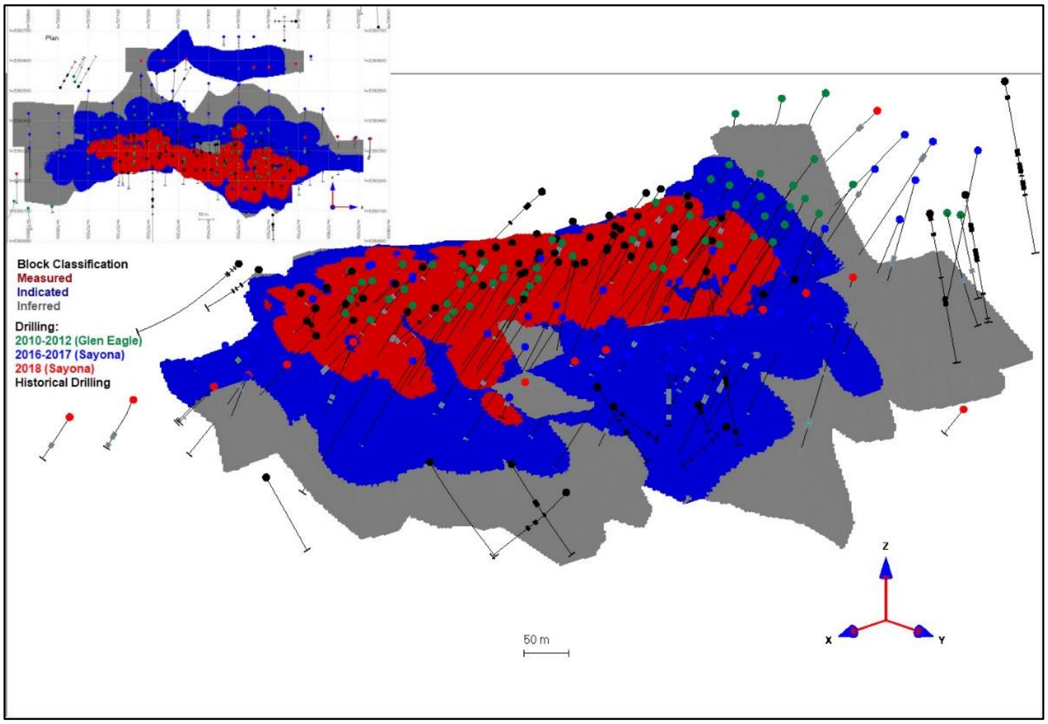


Figure 14-29: Block model final classification in plan and isometric views

14.6. Classified Mineral Resource Estimates

The Mineral Resources of Authier Lithium are reported using an open-pit mining perspective. Due to the significant depth extent of the resource block model, it is considered that not all the interpolated blocks could meet the requirement of a reasonable prospect of economic extraction stated in the CIM guidelines for resources estimation. To define the Mineral Resources of Authier lithium, SGS created and used an optimized pit shell, that was done in the Whittle software, which corresponds to the ultimate pit shell in the present study at a revenue factor of 1. The final Mineral Resources include the resource blocks located within the optimized pit shell, below the overburden/bedrock interface and above the cut-off grade of 0.55% Li_2O established by Sayona and BBA. See Table 14-9 for optimization parameters.

The final MRE within the open-pit are reported at a cut-off of 0.55% Li_2O and total 6.04 Mt, with an average grade of 0.988% Li_2O in the Measured category, and 8.10 Mt, with an average grade of 1.03% Li_2O in the Indicated category, for a combined total of 14.1 Mt at an average of 1.01% Li_2O in the Measured and Indicated categories. An additional 3.00 Mt, with an average grade of 1.00% Li_2O in the Inferred category is also present at Authier Lithium. The effective date of the Authier MRE is October 6, 2021 and Table 14-8 shows the final resource classifications.

Figure 14-31 shows the block model according to Li_2O grade in isometric view of the block model with the selected optimized pit shell. Figure 14-32 shows the classified block model in isometric view of the block model with the selected optimized pit shell.

Table 14-8: Authier Lithium Deposit in pit Mineral Resource Estimate

Cut-Off Grade (Li_2O %)	Category	Tonnage* (t)	Average Grade (% Li_2O)
0.55	Measured	6,042,000	0.98
	Indicated	8,098,000	1.03
	Measured + Indicated	**14,140,000**	**1.01**
	Inferred	2,996,000	1.00

Notes:

1. The Mineral Resource estimate has been estimated using the Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Definitions Standards for Mineral Resource and Mineral Reserve in accordance with National Instrument 43-101 – Standards of Disclosure for Mineral Projects. Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability. Inferred Mineral Resources are exclusive of the Measured and Indicated Resources.
2. Bulk density of 2.71 t/m³ is used.
3. Effective date October 6, 2021.
4. Only block centroids had to be inside the pit to be considered.
5. Pit used: Authier20210821_977.dxf.

* Rounded to the nearest thousand.

Table 14-9: Parameters used by SGS for the pit optimization

Parameters	Value	Unit	References
Sales Revenues			
Concentrate Price (6% Li_2O: 2.81% Li)	977	USD/tonne	Sayona
	1221.25*	CAD/tonne	Sayona
Operating Costs			
Mining Mineralized Material	6.26	CAD/t milled	BBA
Mining Overburden	5	CAD/t	BBA
Mining Waste	5.26	CAD/t	BBA
Process, General and Administration	5.71	CAD/t milled	BBA
Freight Mine to Refinery	61.09	CAD/Conc.	Sayona
Metallurgy and Royalties			
Concentration Recovery	78	%	JQCI
Royalties on claims	15.23	CAD/t conc.	Sayona

Parameters	Value	Unit	References
Geotechnical Parameters			
Pit Slopes	43° and 54°	Degrees	BBA
Mineralized Material Density	2.71	t/m³	SGS Canada Inc.
Waste Material Density	2.94	t/m³	BBA
Overburden	1.9	t/m³	BBA
Cut-Off Grade	0.55	% Li_2O	Sayona

**Exchange rate: 0.75*

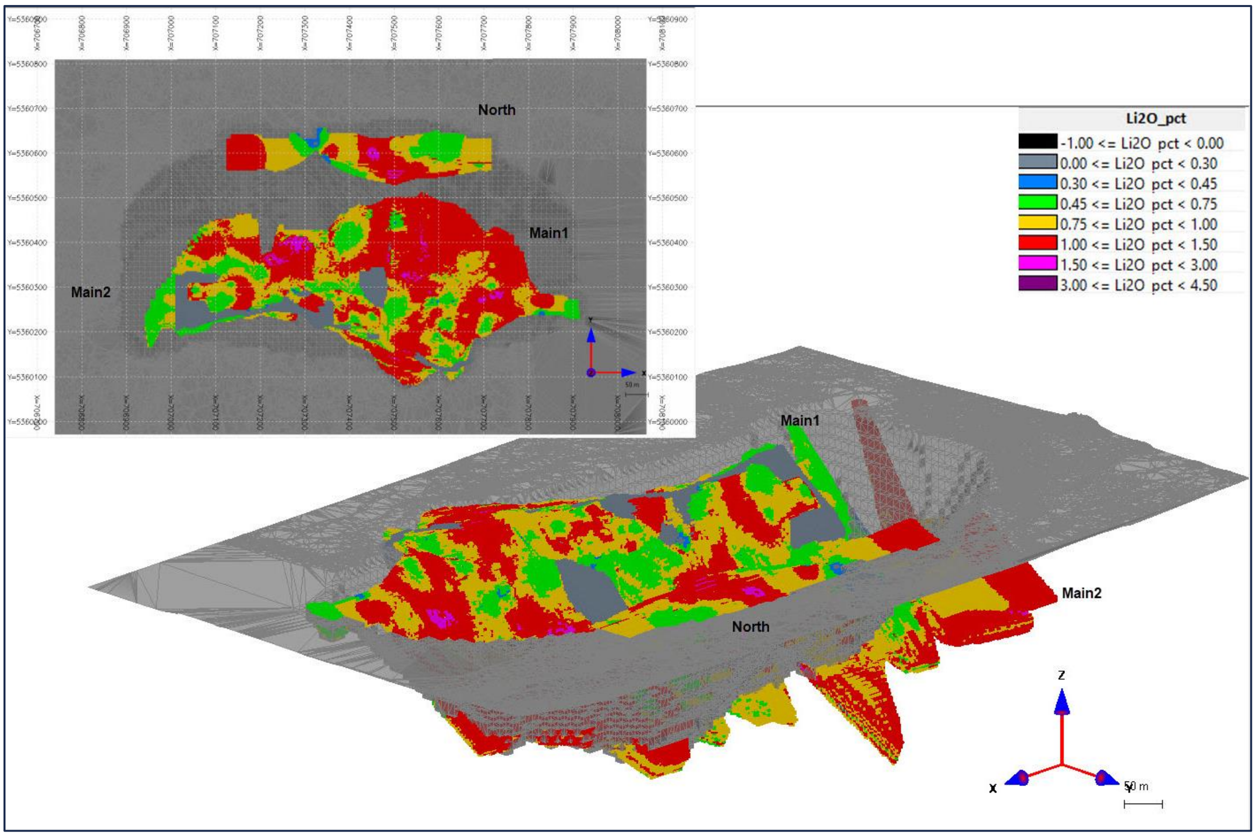


Figure 14-30: Optimized pit shell and block model (no waste/barren material included) in plan and isometric views

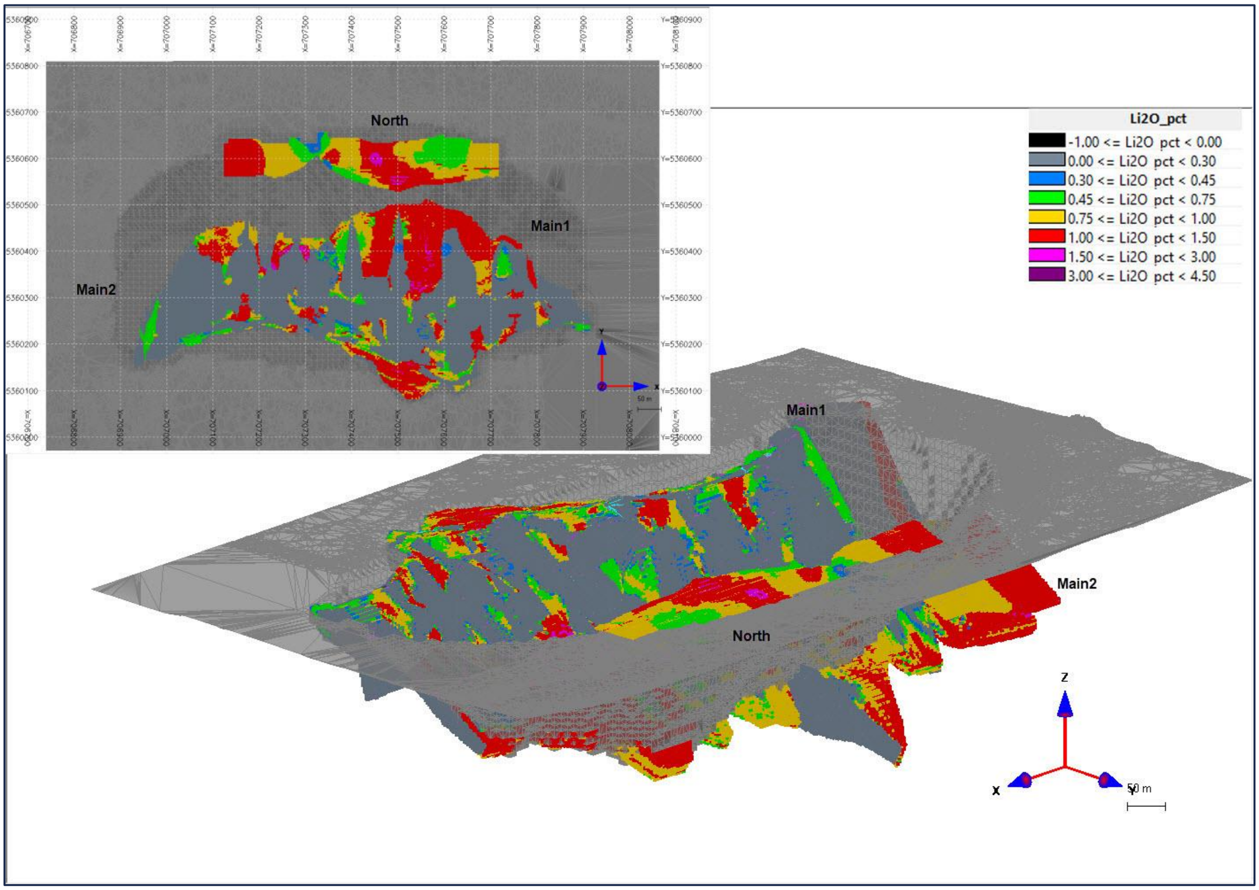


Figure 14-31: Optimized pit shell and block model (waste/barren material included) in plan and isometric views)

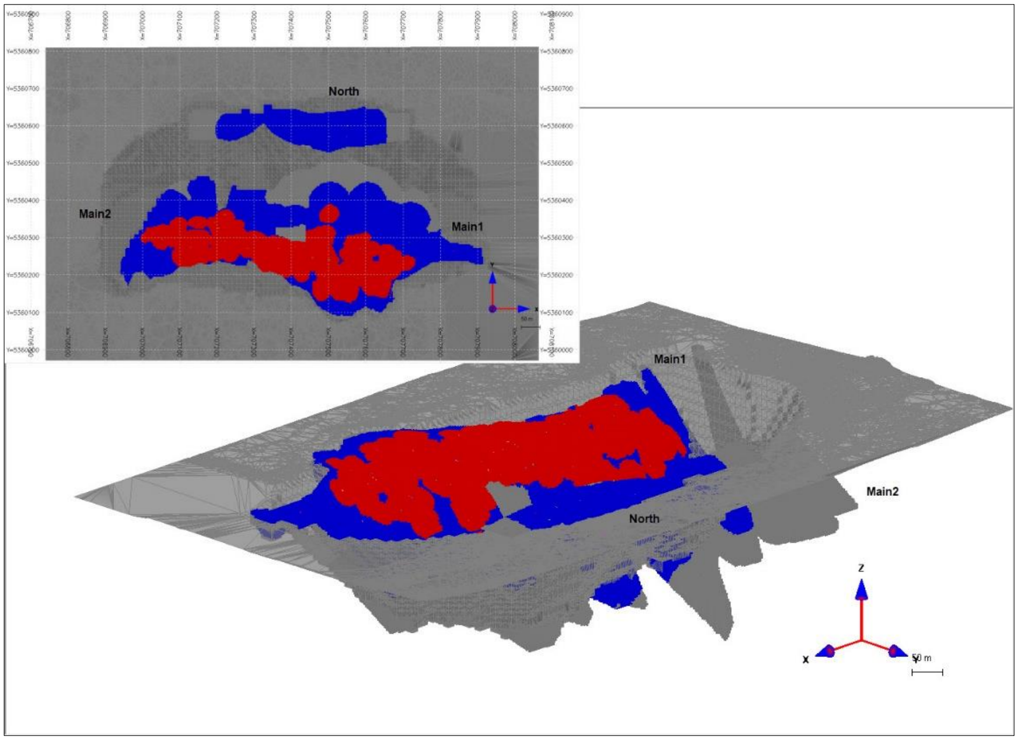


Figure 14-32: Optimized pit shell and classified block model in plan and isometric views

14.7. Sensitivity Analysis

A limited sensitivity analysis was conducted using different estimation methods, from Ordinary Kriging ("OK") to Inverse Distance Cubed ("ID^3"). The Sensitivity analysis outlined that the OK Mineral Resources and grades are affected by smoothing and that the ID^3 estimation is the one with the highest average grades. Overall, the ID^2 and ID^3 are relatively close in terms of tonnage and average grades.

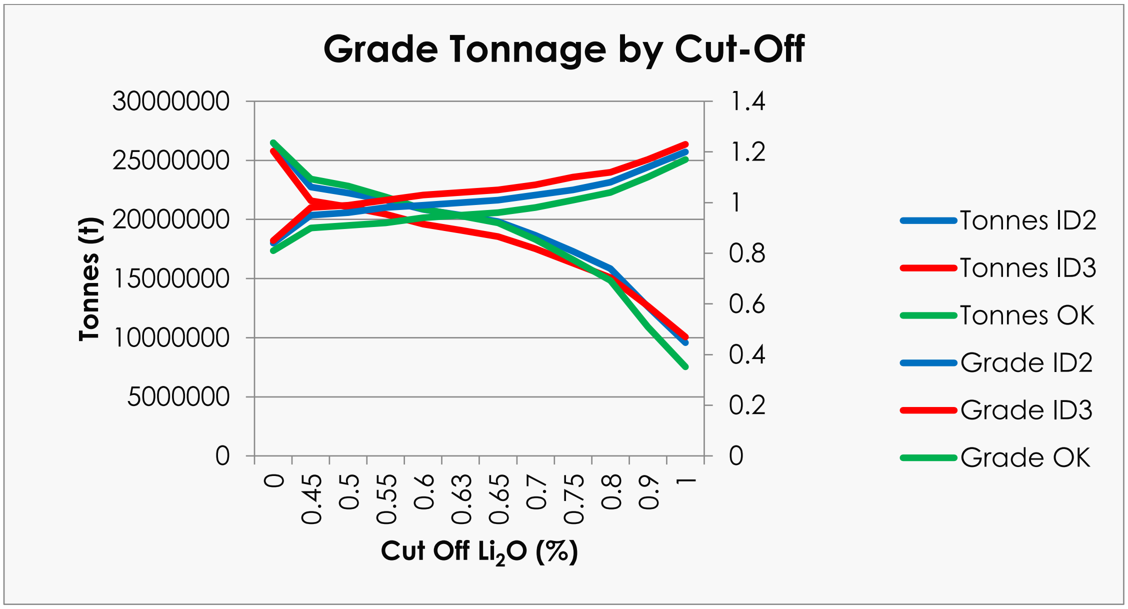


Figure 14-33: Grade tonnage curve depending on type of estimation

Drilling by Sayona has shown that the main Authier pegmatite is reasonably predictable in both grade and geological continuity, given the consistency of mineralized widths and grades along the strike extension tested so far.

Additional review of the geological model highlighted the presence of sterile pegmatite, mostly at the upper contact and the lower contact of the Main pegmatite dyke.

The resource expansion achieved by Sayona on the Authier mineralized pegmatite has been basically at depth and along strike.

At mid to deep levels (beyond 100 metres down surface) Sayona's drilling has consistently intercepted mineralized pegmatite returning widths ranging from 20 to 40 metres and average grades equal to or higher than 1% Li_2O, even in areas untested by previous owners.

The combination of an extensional east - west structural array together with a competent brittle ultramafic metamorphic host rock allowed the placement of a wide single mineralized pegmatite body.

There is a limited number of areas at shallow and deep levels that returned little or no mineralized pegmatite due to faulting interpreted as syn-mineral and post-mineral. However, the core part of the Authier pegmatite is not significantly affected by such faulting.

This combination of characteristics makes the main Authier mineralized pegmatite predictable in both, geology and grade and allows SGS to expand the mineralization included in both Measured and Indicated resource categories based on geological continuity.

15. MINERAL RESERVE ESTIMATE

15.1. Summary

The Mineral Reserve estimate was completed by BBA Inc. in March 2023 and is based on the November 2021 block model prepared by SGS and used to report the Mineral Resources presented in Chapter 14 of this report. Reporting of the Mineral Reserve estimate has been carried out following the Canadian Institute of Mining, Metallurgy and Petroleum's (CIM) Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines and National Instrument NI 43-101 reporting standards.

The Mineral Reserve estimate has changed for this updated definitive feasibility study ("UDFS") relative to the UDFS that was prepared by BBA with an effective date of February 2019. The Authier Lithium ore will now be sent to the North American Lithium ("NAL") spodumene concentrator located in La Corne, Québec to be blended with the NAL run-of-mine ("ROM") ore. The ROM ore will be stockpiled and loaded into highway trucks that will transport the ore to the NAL site during weekdays. At the NAL site, the ore will be combined with the NAL ore and fed to the crusher. The life-of-mine ("LOM") production plan has been reviewed to reflect the new processing strategy and the annual ore production has been reduced from the previous 833,000 tpy to approximately 530,000 tpy. The waste and overburden piles, as well as mine equipment fleet, workforce and cost estimates, were updated based on the revised LOM plan.

The Project LOM plan and subsequent Mineral Reserve estimate are based on an ore selling price of 120 CAD/t. A memorandum of understanding ("MOU") was developed between the Authier operation and NAL operation, in which NAL agrees to buy 100% of the Authier ore material at a selling price of 120 CAD/t, delivered to the NAL ore pad area. The effective date of the Mineral Reserve estimate is March 27, 2023, and based on an exchange rate of 0.75 USD:1.00 CAD.

Development of the LOM plan included pit optimization, pit design, mine scheduling and the application of modifying factors to the Measured and Indicated portion of the in-situ Mineral Resource. Tonnages and grades are reported as ROM feed at the NAL crusher and account for mining dilution, geological losses and operational mining loss factors.

Table 15-1 summarizes the Proven and Probable Mineral Reserve estimate for the Project.

The author is of the opinion that no other known risks including legal, political or environmental, would materially affect potential development of the Mineral Reserve estimate, except for those already discussed in this report.

Table 15-1: Authier Lithium Project Mineral Reserve estimate

Ore Reserves Category	Tonnage (Mt)	Grade % Li_2O	Contaminant % Fe	Contained Li_2O* (kt)
Open Pit				
Proven Mineral Reserve	6.2	0.93	0.92	57.6
Probable Mineral Reserve	5.1	1.00	0.98	50.7
Total Mineral Reserve	**11.2**	**0.96**	**0.95**	**108.3**

*Metallurgical recovery not applied

Notes:

1. Mineral Reserves are measured as dry tonnes at the crusher above a diluted cut-off grade of 0.55% Li_2O.
2. Mineral Reserves result from a positive pre-tax financial analysis based on an ore selling price of 120 CAD/t and an exchange rate of USD0.75:CAD1.00. The selected optimized pit shell is based on a revenue factor of 0.86 applied to a base case selling price of USD850/t of spodumene concentrate.
3. The reference point of the Mineral Reserves is the NAL crusher feed.
4. In-situ Mineral Resources are converted to Mineral Reserves based on pit optimization, pit design, mine scheduling and the application of modifying factors, all of which supports a positive LOM cash flow model. According to CIM Definition Standards on Mineral Resources and Reserves, Inferred Resources cannot be converted to Mineral Reserves.
5. The Mineral Reserves estimate for the Project have been estimated by Ms. Isabelle Leblanc, P.Eng. OIQ #144395, a Qualified Person as defined by NI 43-101.
6. The Mineral Reserve estimate is valid as of March 27, 2023.
7. Totals may not add up due to rounding for significant figures.

15.2. Resource Block Model

The resource model for the Project was provided to BBA by SGS Canada via a web link. The resource model was supplied in a file called "20211117Authier.csv". The model was supplied with the 3D wireframes used to define the different lithological zones. The overburden surface was also provided.

The block model file provided contained the mineralized zones and the waste material. The resource estimate considers a parent block size of 3 m x 3 m x 3 m. The resource model considers a constant pegmatite density of 2.71 t/m³.

15.3. Topography Data

Sayona provided BBA with a LiDAR topographic survey completed in 2016 by *Geoposition arpenteurs géomètres* (LiDAR, 2016).

Topographic contours were provided at 0.5 m intervals for the Project site in the UTM NAD 83 coordinate system. This surface was used as the reference datum for the Mineral Reserves estimate.

15.4. Mining Block Model

Based on the resource model described above, BBA created a mining block model to be used for mine design and planning purposes. The resource model was sub-celled along the boundaries of the different lithologies. Overburden material was assigned a constant density of 1.90 t/m³. The waste densities were provided in the resource model from SGS.

The sub-celled model was then regularized to the parent block size of 3 m x 3 m x 3 m, with tonnages and grades coded for each type of material. Resource classification was conserved from the resource model. The final sub-celled mining block model is called “2008.dm” created from the Deswik Project “6015032 R00.dcf”. The model was then exported to MineSight for mine planning as “3005.csv”.

15.5. Modifying Factors

For the conversion of Mineral Resources to Mineral Reserves, it is necessary to apply a variety of modifying factors.

15.5.1. Metallurgical Recoveries

ROM ore is subject to a variety of metallurgical recovery factors, once feed material enters the crusher. Refer to Chapter 13 of this report and to the "Definitive Feasibility Study Report for the North American Lithium Project" (BBA, 2023) for additional details regarding these parameters.

15.5.2. Mill Cut-off Grade Calculation

The breakeven cut-off grade (“COG”) is calculated considering costs for processing, G&A, and other costs related to concentrate production and transport. Based on a 6.0% Li_2O concentrate selling price of 850 USD per tonne, the COG would be 0.32% Li_2O. However, due to metallurgical recovery limitations, a metallurgical COG of 0.55% Li_2O was selected based on iterative analysis.

15.5.3. Mining Dilution and Mining Ore Losses

The Project is host to spodumene-bearing pegmatite dykes. The main dyke, which represents most of the resource, dips approximately 25° to 50° and has a varying thickness between 4 m and 55 m. A second minor dyke is located just to the north of the main dyke, dips approximately 15° and has an average thickness of 7 m.

As an industrial mineral, the specification of the final product must meet relatively tight tolerances for Li_2O content, as well as contaminants, such as iron. The contaminant grade in the final product is directly linked to the quantity of diluting host waste rock in the mill feed.

Dilution is the quantity of non-economically viable material that will be sent to the mill during mining activities. Ore losses are the quantity of economically viable material that will be sent to the waste rock stockpiles. Typical causes for dilution and ore losses include blast movement, improper identification of ore and waste zone limits (i.e., grade control), and selectivity limitations of loading equipment.

A detailed dilution model was developed by BBA and coded into the mining block model. This was then used throughout the mine planning process.

BBA used Deswik's Stope Optimizer tool (Deswik.SO) to generate shapes of continuous mineralization with a minimum lithium content. This approach provided an automated method of evaluating on a local scale, whether the combination of a particular dyke width, pegmatite grade and distance to the next dyke, i.e., waste separation, could result in producing a mill feed above a diluted COG of 0.55% Li_2O. Mineable shapes were created by the tool. Mineralized material that did not pass this selectivity test were considered as ore losses.

Three scenario of varied dilution skin were generated and a dilution skin of 0.75 m was retained. Based on this methodology and the final pit design, the mining ore losses are approximately 2.3% and the mining dilution is approximately 9.0% dilution. To account for operational errors and additional re-handling, an additional mining ore losses factor of 2.0% was applied, for a total ore losses factor of 4.3%.

15.6. Pit Optimization

15.6.1. Inputs

The purpose of pit optimization is to determine the ultimate pit limits that satisfy business objectives. By running a series with a sensitivity on selling prices (revenue factor), the results can also be used to determine the most economical mining phases. Pit optimization was completed using the Pseudoflow command with the Deswik mining software. Inferred resources were not considered as potential ROM ore feed.

This report's financial evaluation is based on the selling of ore material to the NAL operation. However, the pit optimization was developed based on the integration of the costs and parameters associated with the concentration of the ore and production and selling of a 6.0% Li_2O spodumene concentrate.

The input parameters used for the pit optimization are presented in Table 15-2. Note that the selling prices, costs and technical parameters used were based on the best available information at the time of the study, including adjusted costs from the 2019 UDFS and geotechnical information from Journeaux Assoc.'s (Journeaux) report (2018).

Table 15-2: Pit optimization parameters for the Authier Lithium Project

Item	Value	Unit	Notes
Revenue			
Concentrate price	850	USD/t of conc.	Average of Roskill Real Contract 2023-2030: USD 857/t conc. (December 2021)
Concentrate grade	6.0%	Li_2O	
Transportation cost	59.69	USD/t of conc.	Previous estimate for Authier
Royalty	Based on each claim		
Economics			
Currency	-	Canadian Dollars	
Exchange rate	0.760	USD/CAD	
Discount rate	8.0%		
Cost basis			
Mining			
Mining cost - overburden	5.40	CAD/t mined	BBA estimate. Assuming contract mining
Mining cost - ore	8.73	CAD/t mined	
Mining cost - waste	6.91	CAD/t mined	
Processing & G&A			
Cost	39.31	CAD/t milled	
Operating parameters			
Ore production	1,682	tpd	
Overall Mill Recovery	74.1%		Incl. ore sorter losses and mill recovery

Item	Value	Unit	Notes
Revenue			
Geotechnical parameters			
OSA - north wall	53.0	°	Based on BBA adjustment to Journeaux's report; -4° to accommodate ramp
OSA - south wall	42.0	°	
OSA - east and west walls	48.0	°	Assumed by BBA for transition between North and South walls
OSA - overburden	14.0	°	Journeaux
Limits and constraints			
Lease	Claims_Authier_Actifs.dxf Claims_Authier_Suspended.dxf		Sayona stated that discussions with MERN were held concerning the suspended claims and will be reactivated when needed.
Setbacks	No setback	m	

The optimized parameters do not necessarily correspond with the final design parameters used in the UDFS. A pit optimization has been run using the final Project's costs and revenue parameters. The resulting optimized pit shell has been compared to the initial selected pit shell and deemed sufficiently close to consider the initial selected pit shell adequate.

15.6.2. Results

The optimizer estimates best, average- and worst-case discounted values. The best case requires that each shell be mined sequentially while the worst-case mines the deposit on a bench-by-bench basis. The best case is generally impracticable as shell increments can be very small and therefore not minable by themselves. The worst case is always achievable but gives much lower discounted cash flows. In practice, a compromise between the two cases is generally achieved by staging the pit using suitable pushbacks. The average case discounted values are used as a measure to compare optimization results. A discount rate of 8% and ROM feed rate of 0.53 Mtpy have been used in this analysis. The values returned by the optimizer do not include capital investments and are only used as a relative indicator of the sensitivity of the Project to changes in costs.

The revenue factor 0.86 pit shell was selected as a guide for the final pit limits. This selection was based on maximizing project reserves while respecting a relatively high NPV. This pit shell contained approximately 11.3 Mt of ROM ore feed and is within 10% of the highest average case discounted cash flow.

Table 15-3: Pit optimization results

Revenue Factor Shell	ROM Feed (Mt)	Grade (% Li_2O)	Waste (Mt)	Strip Ratio n/a	DCF_{BEST} (M$)	DCF_{WORST} (M$)	DCF_{AVG} (M$)
0.40	0.45	1.2	0.20	0.4	41.42	41.42	41.42
0.42	0.67	1.1	0.35	0.5	56.43	56.25	56.34
0.44	0.91	1.1	0.64	0.7	72.19	71.71	71.95
0.46	1.15	1.1	0.95	0.8	86.62	85.71	86.17
0.48	1.62	1.0	1.46	0.9	110.76	108.79	109.78
0.50	1.94	1.0	1.88	1.0	125.24	122.21	123.72
0.52	2.06	1.0	2.03	1.0	129.96	126.48	128.22
0.54	2.17	1.0	2.21	1.0	134.35	130.39	132.37
0.56	2.41	1.0	2.56	1.1	142.47	137.42	139.95
0.58	2.58	1.0	2.95	1.1	148.26	142.40	145.33
0.60	2.73	1.0	3.20	1.2	152.43	145.85	149.14
0.62	3.66	1.0	7.25	2.0	179.89	167.04	173.46
0.64	3.77	1.0	7.65	2.0	182.61	168.81	175.71
0.66	3.88	1.0	8.00	2.1	184.87	170.16	177.52
0.68	3.99	1.0	8.39	2.1	187.17	171.41	179.29
0.70	4.12	1.0	8.94	2.2	189.60	172.54	181.07
0.72	4.19	1.0	9.22	2.2	190.76	172.92	181.84
0.74	4.54	1.0	11.20	2.5	196.48	174.26	185.37
0.76	4.64	1.0	11.76	2.5	197.99	174.37	186.18
0.78	7.69	1.0	32.82	4.3	220.10	165.16	192.63
0.80	8.22	1.0	36.96	4.5	224.17	159.08	191.62
0.82	8.40	1.0	38.21	4.6	225.33	156.84	191.08
0.84	11.08	1.0	59.25	5.3	232.08	117.60	174.84
0.86	**11.35**	**1.0**	**61.40**	**5.4**	**233.02**	**112.81**	**172.91**
0.88	11.59	1.0	63.63	5.5	233.73	107.45	170.59
0.90	11.72	1.0	64.52	5.5	234.00	105.15	169.57
0.92	11.82	1.0	65.48	5.5	234.19	102.41	168.30
0.94	11.96	1.0	66.64	5.6	234.38	99.11	166.75
0.96	12.11	1.0	67.85	5.6	234.50	96.03	165.26
0.98	12.27	1.0	69.27	5.6	234.56	91.71	163.14
1.00	12.39	1.0	70.40	5.7	234.57	88.31	161.44

These results are presented graphically in Figure 15-1.

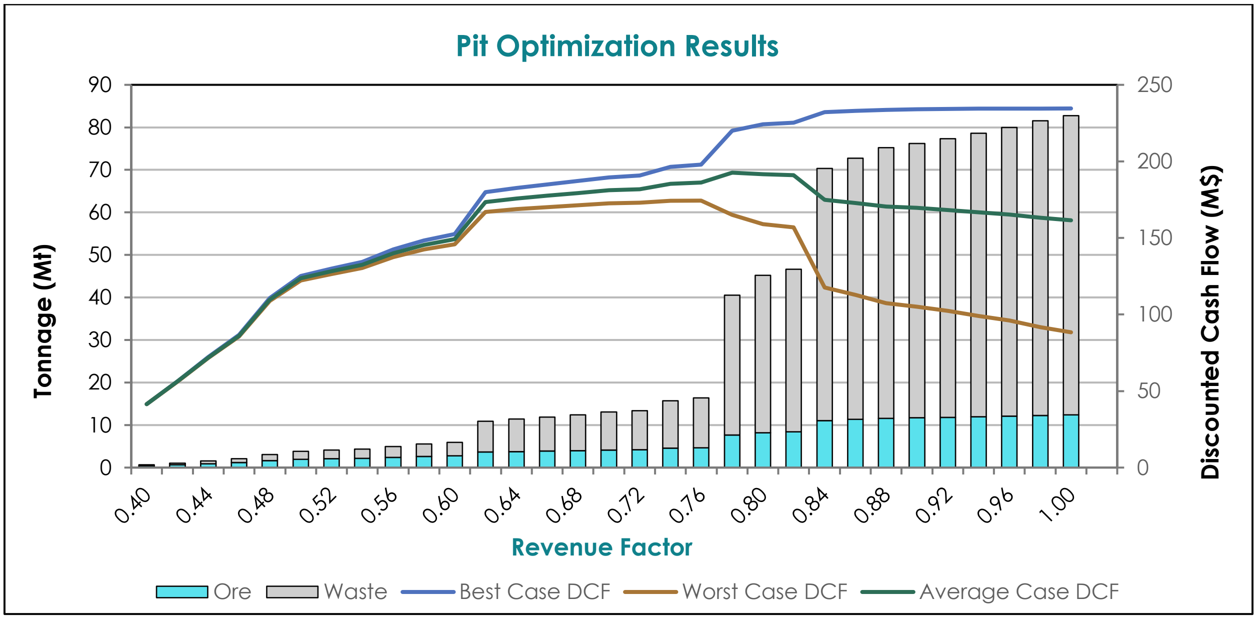


Figure 15-1: Pit optimization results

With the exception of the revenue factors, BBA did not perform a sensitivity analysis on other parameters. It is recommended that pit optimization sensitivity be conducted on the following parameters:

- Metallurgical recovery;
- Overall pit slopes;
- Dilution and ore losses.

15.7. Mine Design

15.7.1. Geotechnical Parameters

The geotechnical requirements for the UDFS pit design were prepared by Journeaux and their recommendations were provided in a report titled "Open Pit Slope Design Authier Lithium Project Feasibility Study". Recommendations were provided for the overall slope angle ("OSA"), inter ramp angle ("IRA"), bench face angle ("BFA") and catch bench width.

BBA performed an internal review of the Journeaux (2018) report and provided additional recommendations to ensure stability of the pit walls:

- Increase the berm width from 7.2 m to 8.2 m;
- Integrate a 16.4 m geotechnical berm on the southwest wall where the pit wall height exceeded 120 m.

For design purposes, the following IRA, BFA and catch berm width with triple-bench arrangement were retained and are summarized by sector in Table 15-4.

Table 15-4: Pit design geotechnical parameters

Pit Slope Sector	IRA (°)	BFA (°)	Berm Width (m)
North	57.7	80.0	8.2
South	47.3	65.0	8.2
Transition	52.4	72.5	8.2
Overburden	14.0	14.0	10.0*

**only at bedrock contact*

BBA recommends that further geotechnical work be undertaken prior to advancing to the next stage of the Project.

An illustration of the different slope zones is presented in Figure 15-2. Journeaux did not specify the parameters for the transition zone. BBA has assumed that the values for the transition zone are between the north and south wall values.

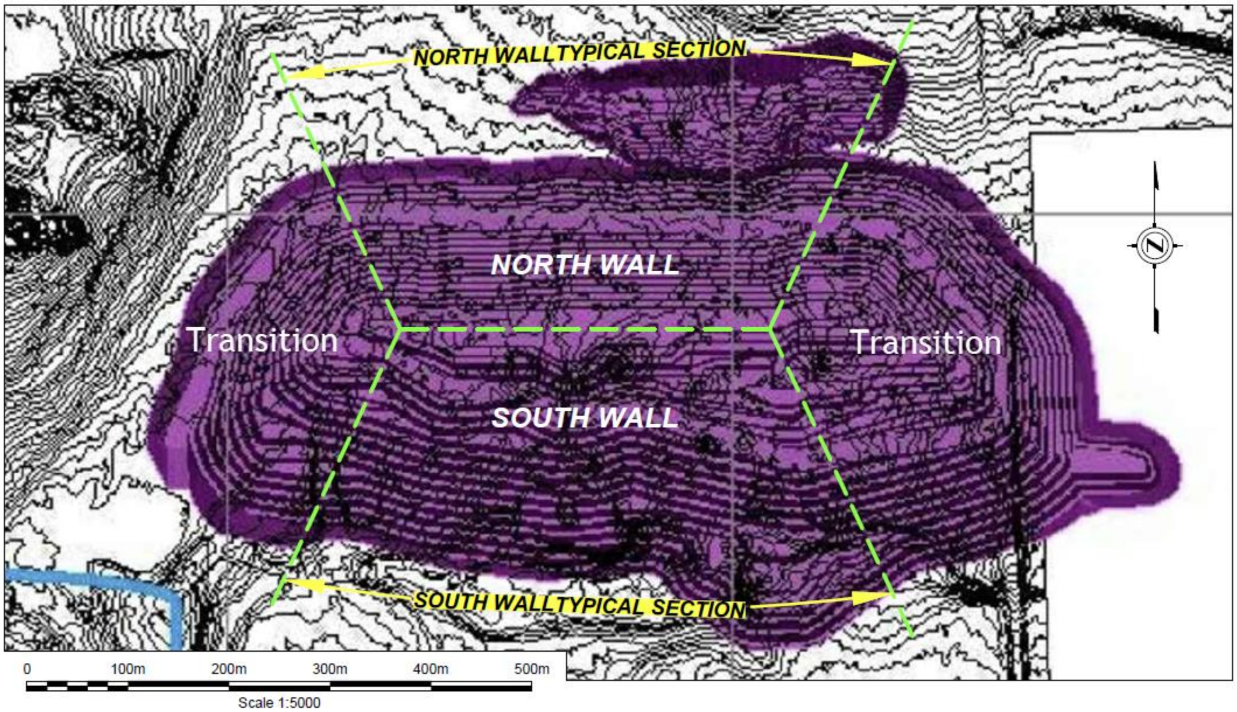


Figure 15-2: Pit slope design sectors

15.7.2. Pit Design Parameters

The detailed mine design was carried out using the selected pit shell as a guide. The proposed pit design includes the practical geometry required in a mine, including pit access and haulage ramps to all pit benches, pit slope designs, benching configurations, smoothed pit walls and catch benches. The major design parameters used are described in Table 15-5 and Table 15-6.

Table 15-5: Pit design parameters

Item	Value			Unit
	North Wall	South Wall	Transition	
Overburden				
Berm Width	0			m
Bench Face Angle (BFA)	14			degree
Set back at the bedrock/OB contact	10			m
Rock				
Bench Height	6	6	6	m
Benching Arrangement	Triple	Triple	Triple	m
Berm Width	8.2	8.2	8.2	m
Inter-Ramp Angle (IRA)	57.7	47.3	52.4	degree
Bench Face Angle (BFA)	80	65	72.5	degree

Table 15-6: In-pit haul roads design parameters

Item	Value	Unit	Notes
Road Width (dual lane)	23	m	Based on 60-65 tonne class haul truck
Road Width (single lane)	17	m	Bottom benches
Max. no. of benches at single lane	9	n/a	Based on 6 m bench height
Maximum Grade - Overburden	10	%	
Maximum Grade - Hard Rock	10	%	
Benches without ramp access at bottom	1	n/a	

The design outlines a pit of ~1,000 m in length (east-west), an average of 640 m width (north-south) and down to a final pit depth of 200 m.

Figure 15-3 presents plan and isometric views of the ultimate Authier Lithium pit.

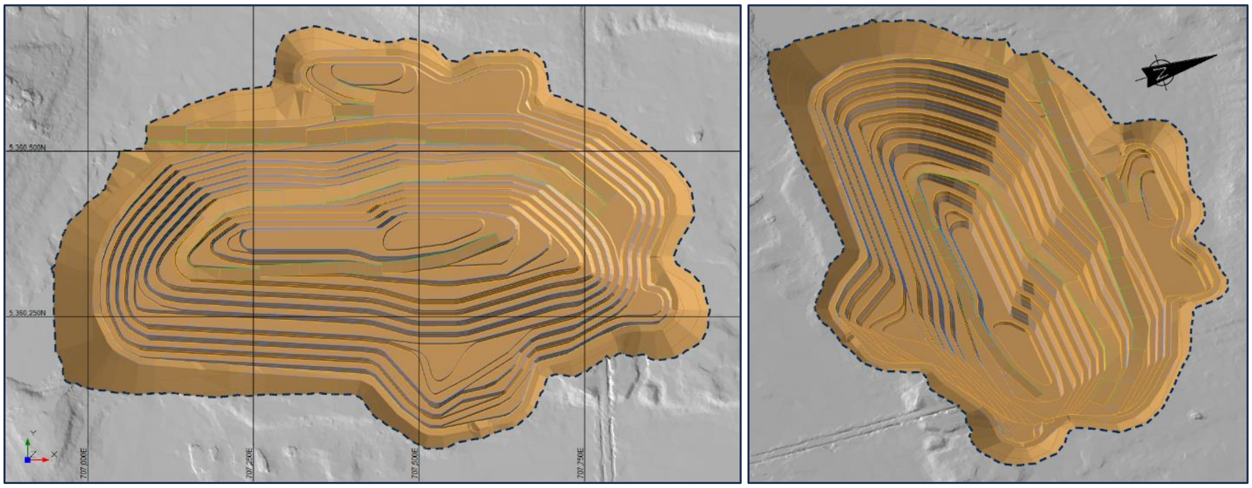


Figure 15-3: Ultimate Authier Lithium pit – plan and isometric views

16. MINING METHODS

The Authier Lithium Project will be an open-pit mining operation. The mining activities will be performed by a mining contractor, with Sayona supervising the work and providing technical services. The following section describes the mining methods that were evaluated for this Project.

16.1. Mining Phases

The goal of phasing is to prioritize the mining of more profitable resources and to defer waste stripping to improve project economics. Pit shells from the pit optimization exercise were selected to guide the design of the mining phases. A total of five phases were designed for the Project.

The material quantities of each phase are shown in Table 16-1.

Table 16-1: Material quantities by Phase

Material	Unit	Phases					Total
		1	2	3	4	5	
Total In Pit	**(Mt)**	**5.2**	**12.0**	**1.4**	**26.1**	**34.8**	**79.6**
Waste Rock	(Mt)	2.6	7.9	0.8	22.3	29.5	63.0
Overburden	(Mt)	0.6	2.6	0.4	1.2	0.6	5.4
Total ROM Feed	(Mt)	2.0	1.5	0.3	2.7	4.8	11.2
	(% Li_2O)	0.96	0.93	0.84	0.93	1.00	0.96
Strip Ratio	($t_{waste+OB}$: t_{ROM})	1.6	6.9	4.2	8.7	6.3	6.1

Note: Totals may not add up due to rounding.

The pit Phases design are presented in Figure 16-1 to Figure 16-5.

Phase 1 is located on the south portion of the pit to access the shallow pegmatite rock of the main zone. Phase 1 has a low strip ratio of 1.6:1.

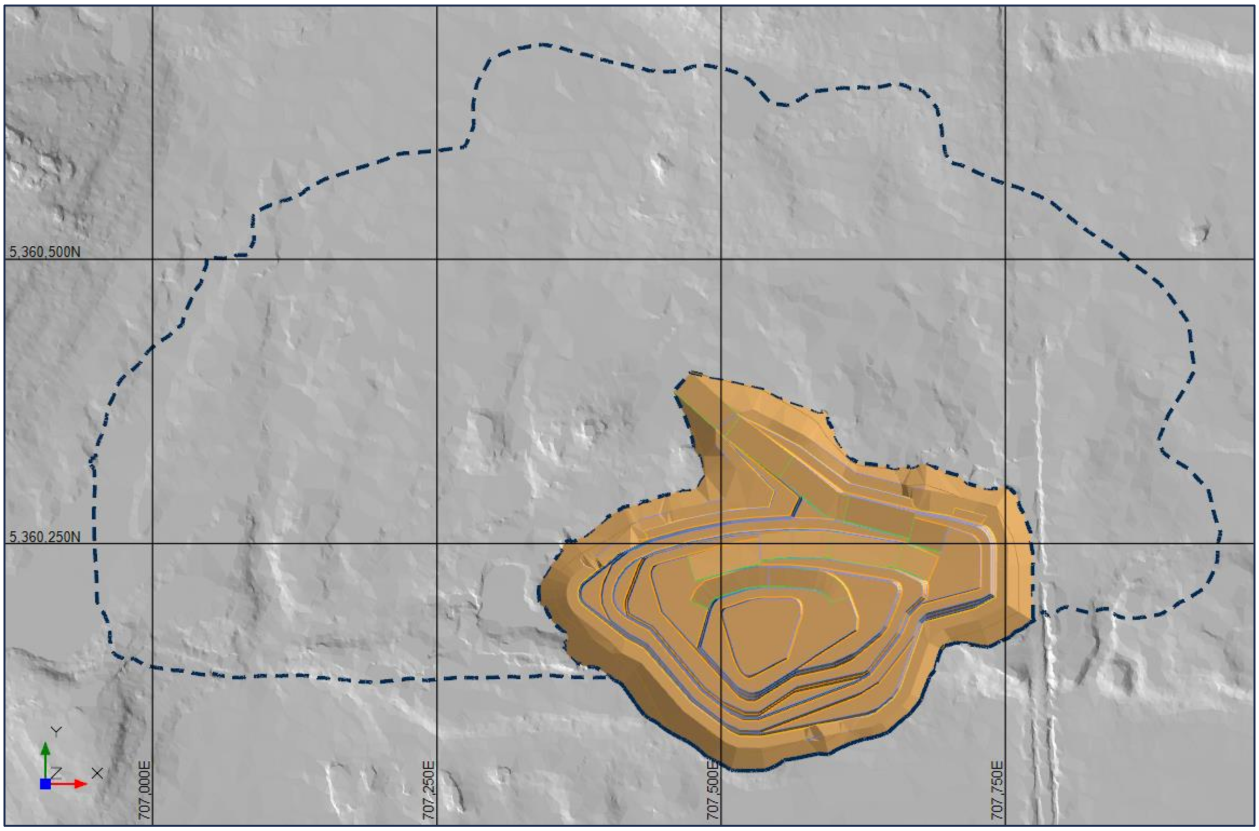


Figure 16-1: Pit Phase 1 design

The pit extends to the west for Phase 2 and another access ramp is developed. The strip ratio rises to 6.9:1 as the pit reaches an area of increased overburden thickness.

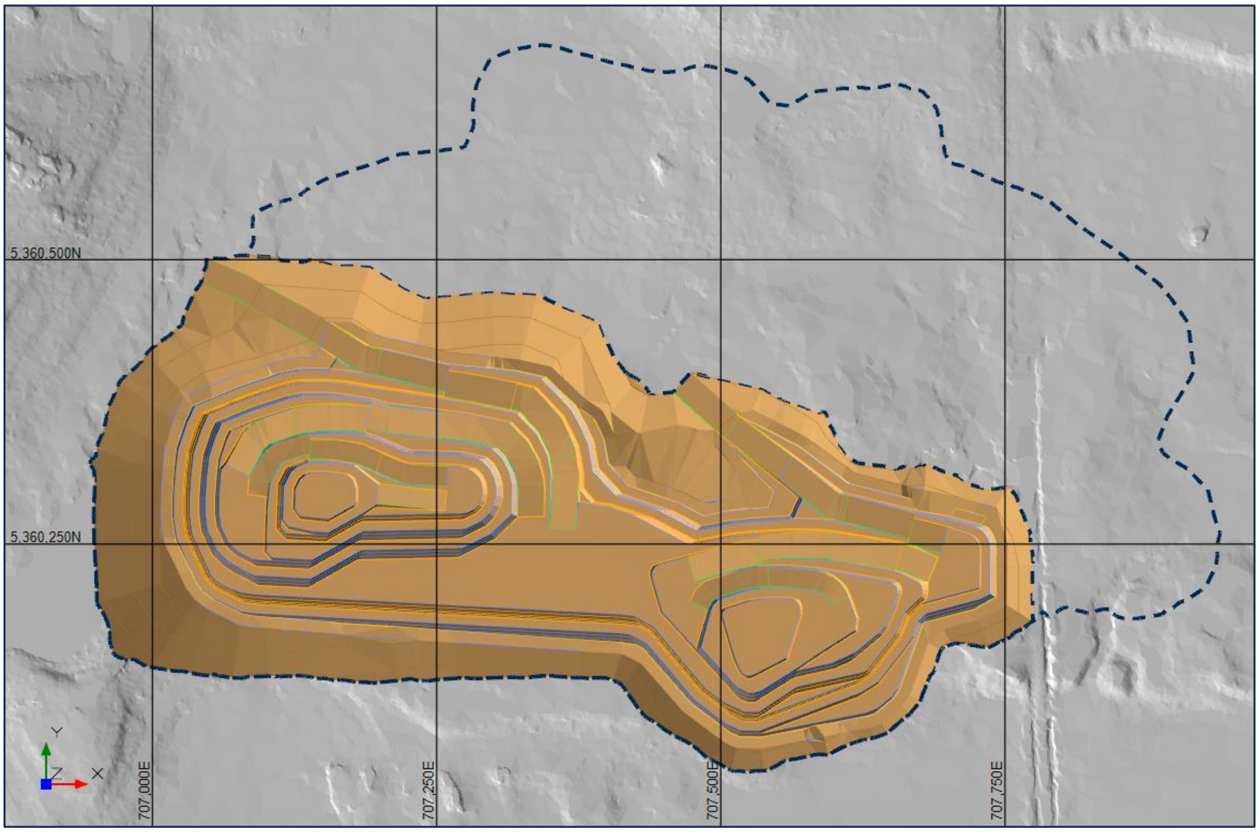


Figure 16-2: Pit Phase 2 design

A temporary access ramp will be developed for Phase 3, which consists of mining of the north zone. This phase will be mined at a lower rate to ensure that the lower-grade material of the north zone is blended with the higher-grade ore from the main zone.

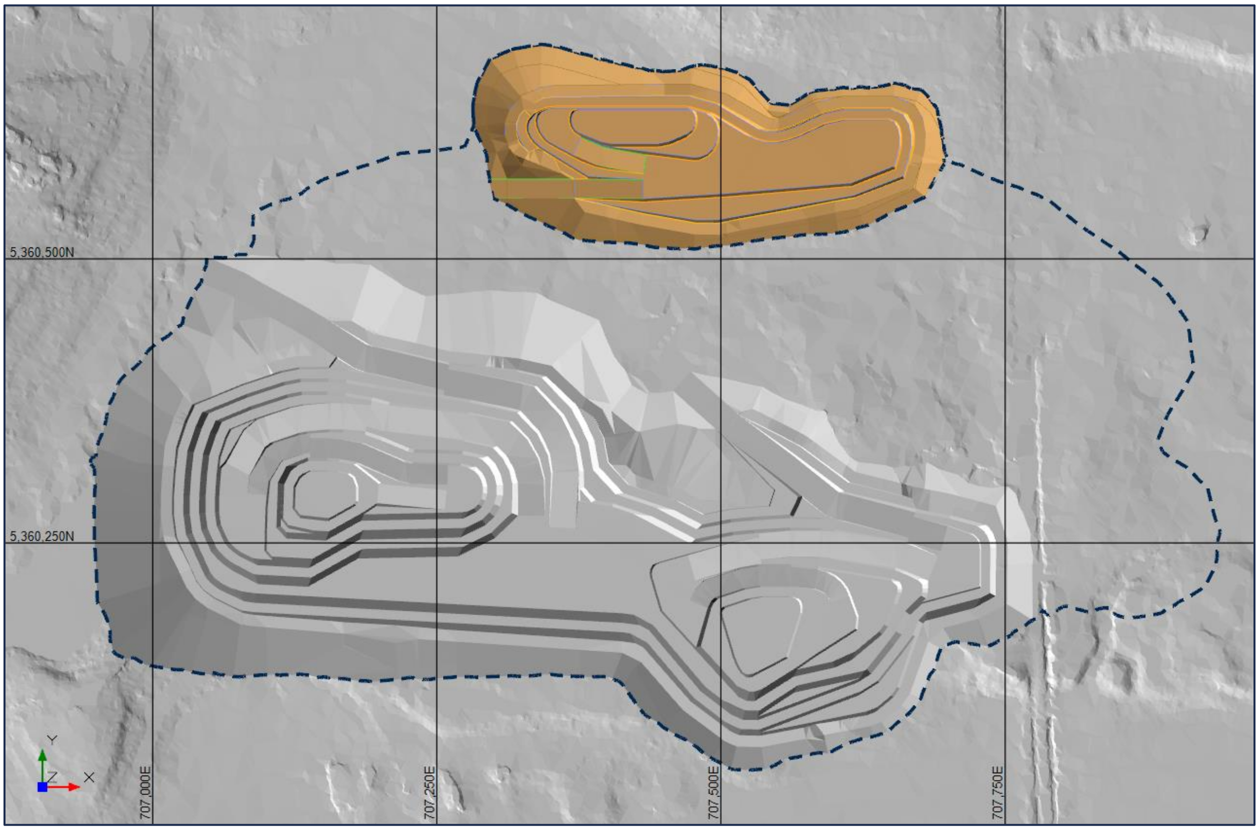


Figure 16-3: Pit Phase 3 design

Phase 4 is a pushback of Phase 2. Phase 4 presents the highest strip ratio at 8.7:1.

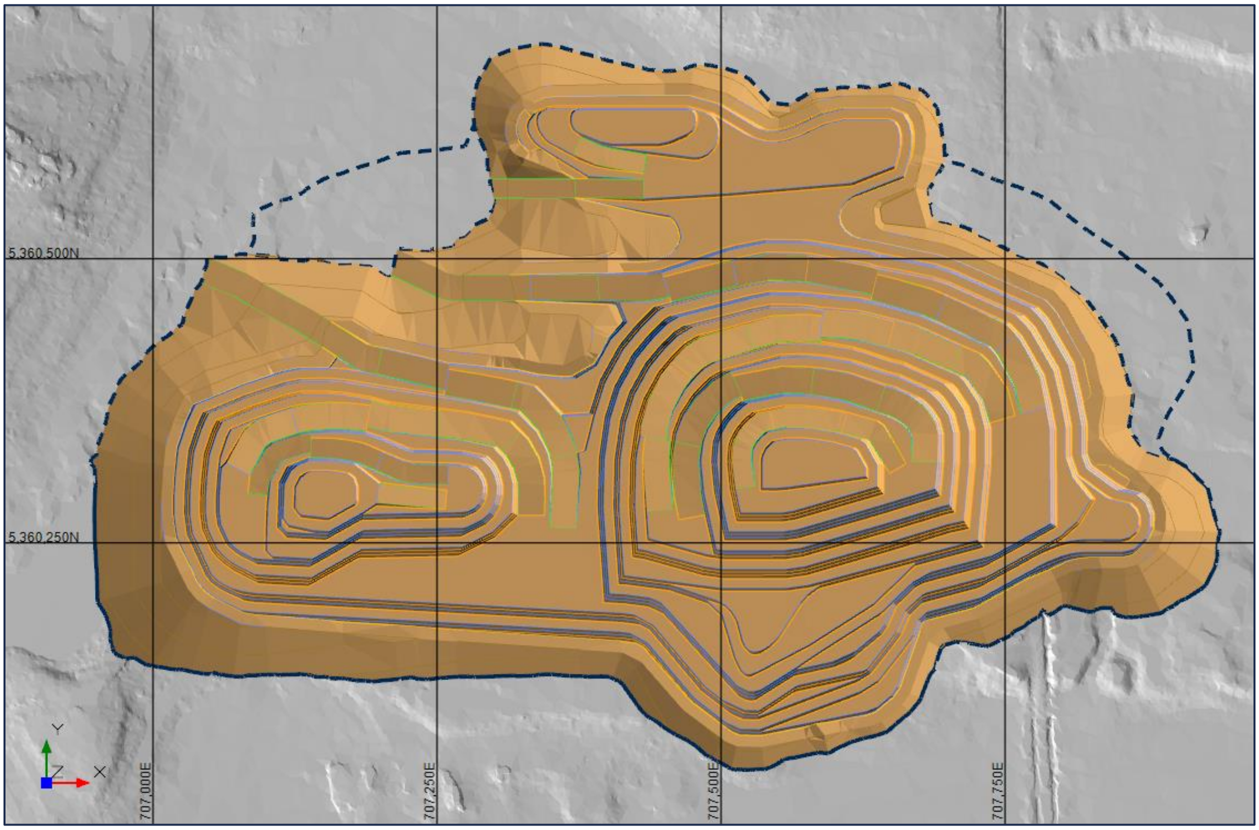


Figure 16-4: Pit Phase 4 design

Phase 5 completes the pushback sequence. The final ramp is located on the north wall to minimize the haulage distances and facilitate the mining of the last pushback. A single-lane ramp is used for the bottom benches to minimize the life of mine strip ratio.

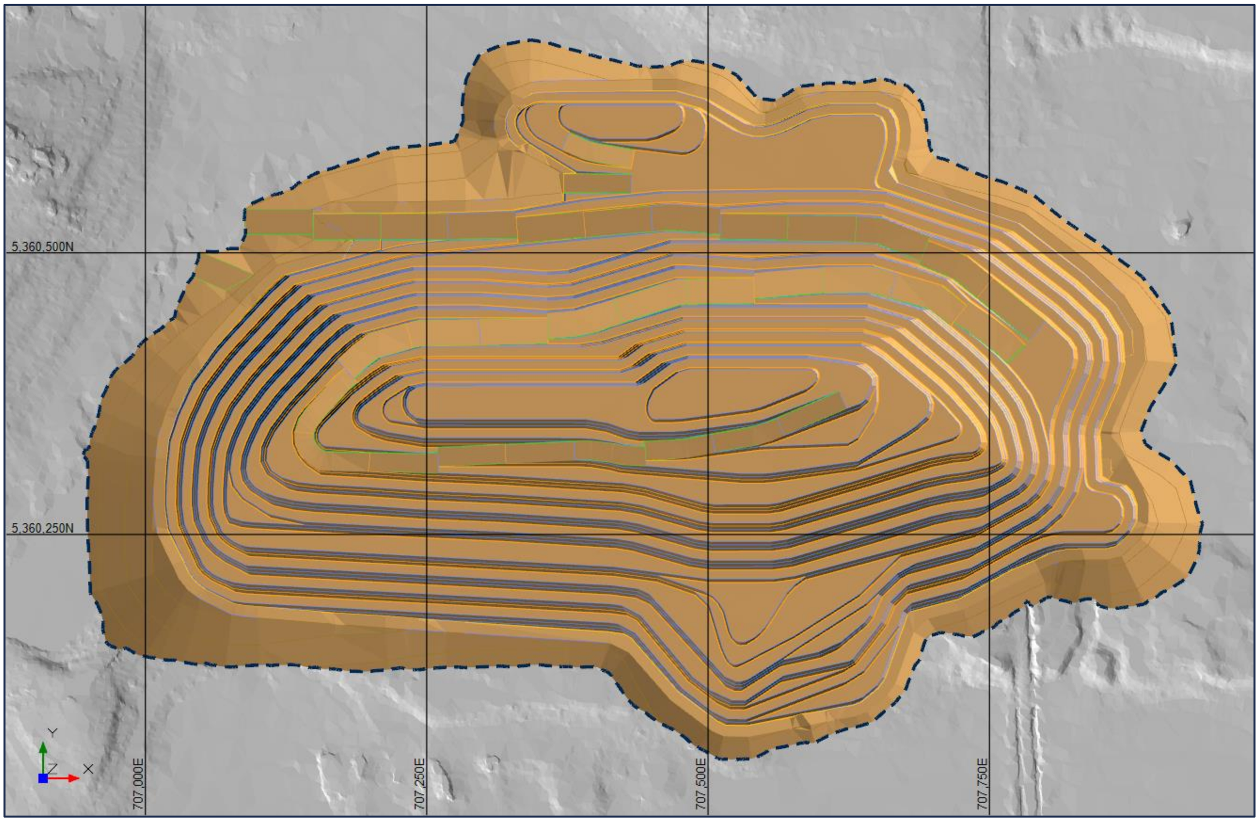


Figure 16-5: Pit Phase 5 and ultimate pit design

16.2. Mine Infrastructure

16.2.1. Dewatering

The hydrogeological study, completed in 2018 by Richelieu Hydrogéologie Inc., demonstrated that the mining activities will not affect the quality of the water.

Dewatering applies to the management of groundwater that, if not diverted from the pit or pumped from it, would impede mining operations or add to operating costs, notably for access to ore, blasting, and wear and tear on machinery. Dewatering requirements for the Project were estimated by Technosub, a supplier of mine dewatering equipment. The pumping system has been designed in three stages to take into account the increasing water inflow over the life of mine ("LOM") (surface and underground combined) estimated in the hydrogeological report.

The underground and surface water inflows are currently being reviewed. It is recommended to re-evaluate the dewatering requirements according to the revised water inflow.

16.2.2. Ore Rehandling Area

Authier Lithium ore will be transported to the North American Lithium ("NAL") site for processing. As such, all ore mined from the pit will be temporarily stockpiled on an ore rehandling area situated to the north of the pit. The ore will then be loaded onto highway transport trucks for transport to the NAL site. Ore transportation will only occur during the day, only on weekdays (i.e., Monday to Friday).

16.2.3. Haul Roads

To give more flexibility to the mining operation, mining haul roads have been designed to accommodate 2-way traffic for 60 t class haul trucks even though the recommended haul truck is the 40-t class haul truck. Roads will incorporate drainage ditches as well as a safety berm when a drop of more than 3 m exists beyond the road edge. Single-lane haul routes are proposed in some locations (e.g., last benches of phases or the final pit). Table 16-2 lists the specified haul road dimensions used for the updated definitive feasibility study ("UDFS").

Table 16-2: Road design parameters

Parameters	Unit	Dual Lane	Single Lane
Haul Truck	-	60 t class	60 t class
Operating Width	m	5.7	5.7
Running Surface Multiplier	factor	3.0	2.0
Running Surface Width	m	17.0	11.5
Tire Diameter	m	2.7	2.7
Berm Height : Tire Ratio	ratio	0.5	0.5
Berm Height	m	1.3	1.3
Berm slope xH:1V Ratio	ratio	1.3H:1.0V	1.3H:1.0V
Berm Width (Top)	m	0.5	0.5
Berm Width (Bottom)	m	4.0	4.0
No. of Berms - Surface Road	number	2	2
No. of Berms - Pit Ramp	number	1	1
No. of Berms - Pit Slot	number	0	0
Ditch Depth	m	0.75	0.50
Ditch slope xH:1V Ratio	ratio	1.0H:1.0V	1.0H:1.0V
Ditch Width (Bottom)	m	0.5	0.5
Ditch Width (Top)	m	2.0	1.5
No. of Ditches - Surface Road	number	0	0
No. of Ditches - Pit Ramp	number	1	1
No. of Ditches - Pit Slot	number	2	2
Overall Width - Surface Road	m	25.0	19.5
Overall Width - Pit Ramp	m	23.0	17.0
Overall Width - Pit Slot	m	21.0	14.5
Maximum Grade - Permanent Road	%	10.0	10.0
Maximum Grade - Temporary Road	%	12.0	12.0
Haul Road Drainage Crossfall	%	2.0	2.0

16.2.4. Explosives Storage

One magazine of explosives will be brought on site by the explosive provider. The magazine will house priming explosives, such as caps and detonating cords. A small amount of explosives and boosters will be delivered directly to site as part of the contract mining operations. Further details are provided in Chapter 18 of this Report.

16.3. Life of Mine Planning

A LOM plan with a 1,560 tpd crusher capacity was completed for the Authier UDFS using MineSight's Mine Plan Schedule Optimizer ("MPSO"). Details are presented below.

16.3.1. Strategy & Constraints

The following constraints and objectives were considered during the development of the LOM plan:

- Mine plan aligned with NAL mine production plan (BBA, 2023). To be combined with NAL ore and feed to the NAL concentrator;
- Project ramp-up in Q3 2025;
- Annual mill feed of approximately 530 ktpy;
- No long-term stockpile;
- Maximum mining rate of approximately 6 Mtpy;
- Mill feed grade ≥0.8% Li_2O;
- Mine planning strategy: maximize NPV.

16.3.2. Results

The run of mine ("ROM") ore feed contained in the final pit is sufficient for a mine life of 22 years.

Due to the phase designs, very little waste material is mined to supply the mill in the first two years. This strategy keeps the mining activities to a minimum, allowing the operation to improve its mining practices and equipment needs and, consequently, keeps mine operating costs low.

The overall pit has a variable strip ratio. The annual mining productivity gradually increases to 6.0 Mt in Year 5, and gradually decreases from Year 13 to the end of the mine life.

Table 16-3 presents the mine plan summary and Figure 16-6 shows the Authier Lithium LOM production profile.

Figure 16-7 to Figure 16-17 show isometric views of the Authier Lithium pit evolution over time, according to the production profile.

Table 16-3: Authier Lithium LOM plan

Physicals	Unit	Pre-Prod	LOM									
		2025	2025	2026	2027	2028	2029	2030	2031-2035	2036-2040	2040-2046	Total
Total Moved	**(kt)**	**395**	**1,350**	**2,415**	**2,427**	**3,035**	**6,521**	**6,517**	**32,636**	**26,891**	**8,643**	**90,829**
Total Expit	**(kt)**	**395**	**1,089**	**1,883**	**1,893**	**2,494**	**5,983**	**5,979**	**29,986**	**24,245**	**5,656**	**79,604**
Expit Waste Rock	(kt)	138	466	1,289	1,019	447	4,363	4,303	26,730	21,600	2,668	63,023
Expit Overburden	(kt)	257	362	61	341	1,508	1,082	1,138	607	0	0	5,356
Expit Ore to Ore Rehandling Area	(kt)	0	261	533	534	540	538	538	540	2,647	2,631	11,225
Expit Ore to Ore Rehandling Area	(% Li_2O)	0.000	0.973	0.939	0.944	0.920	0.851	0.904	0.928	0.966	1.042	0.964
Rehandling	(kt)	0	261	533	534	540	538	538	2,649	2,645	2,987	11,225
Stripping Ratio	(t_{waste}:t_{RoM})	0.00	1.00	2.00	3.00	4.00	5.00	6.00	10.32	8.17	0.89	6.09

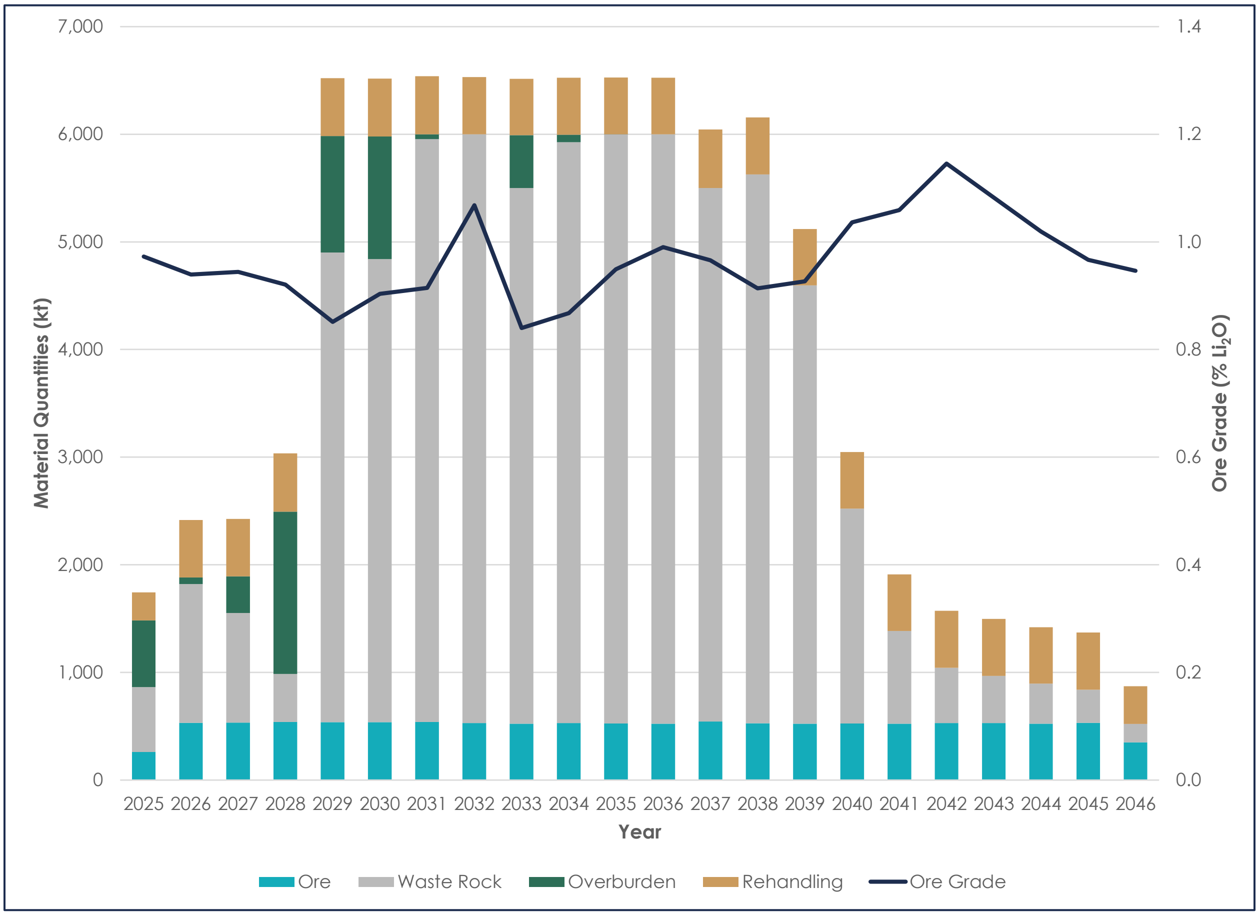


Figure 16-6: Authier Lithium LOM production profile

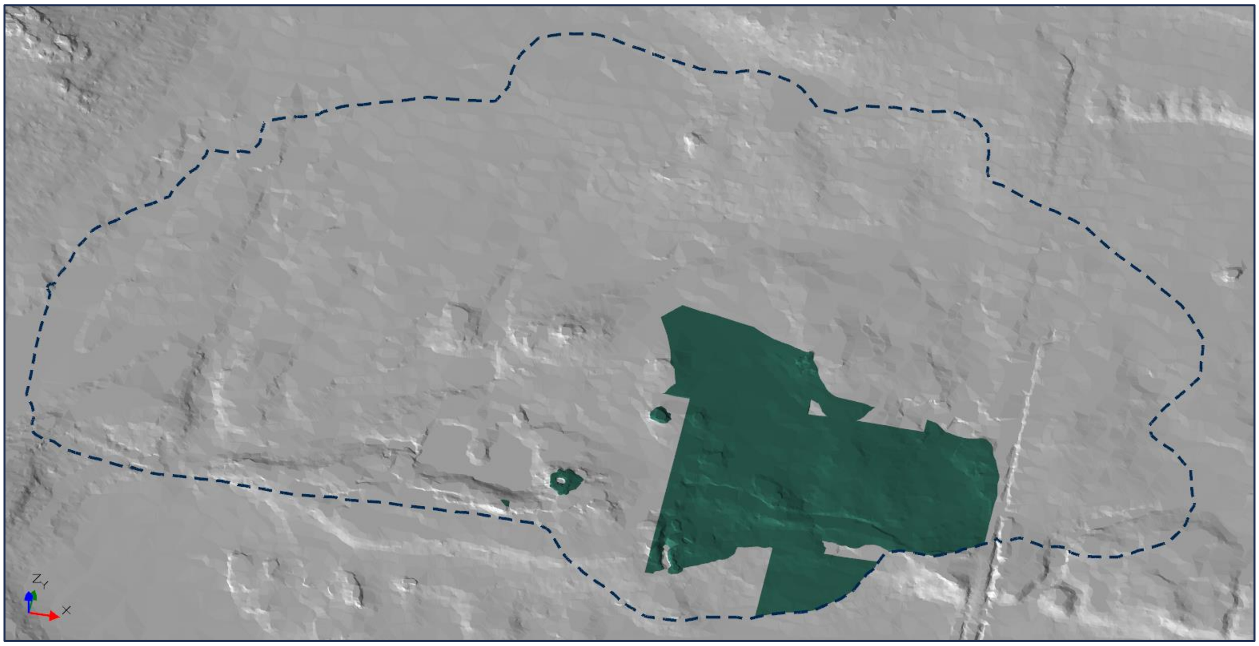


Figure 16-7: Isometric view of 2025 pre-production period

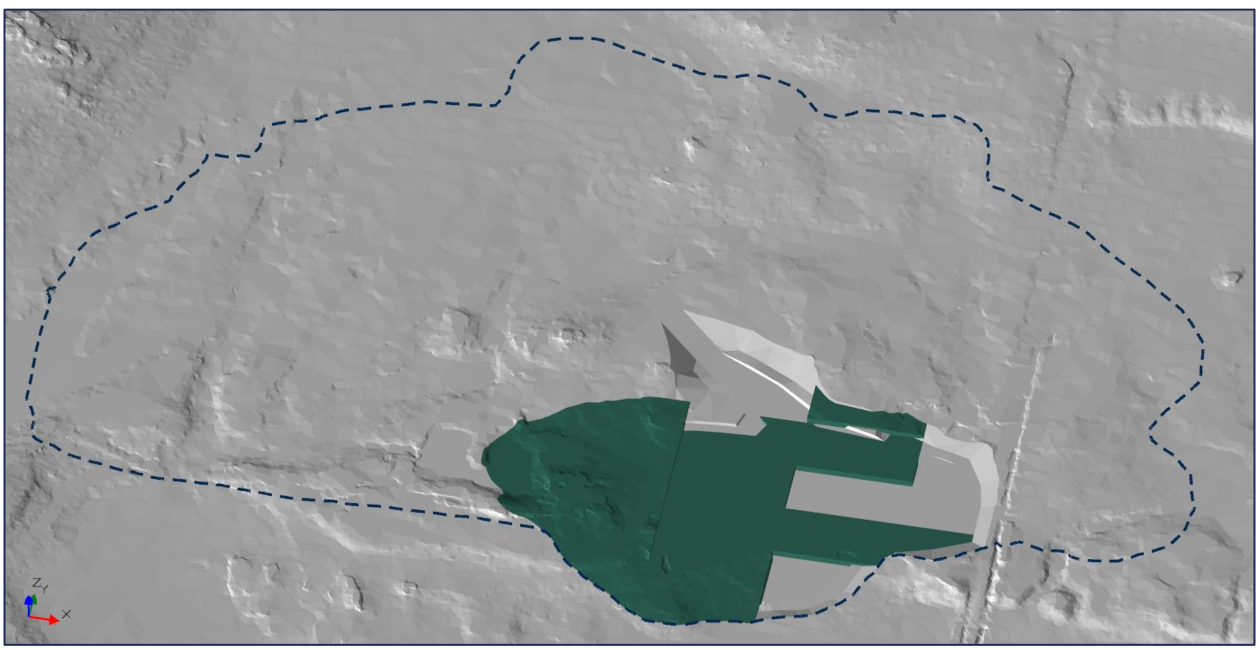


Figure 16-8: Isometric view of 2025 production period

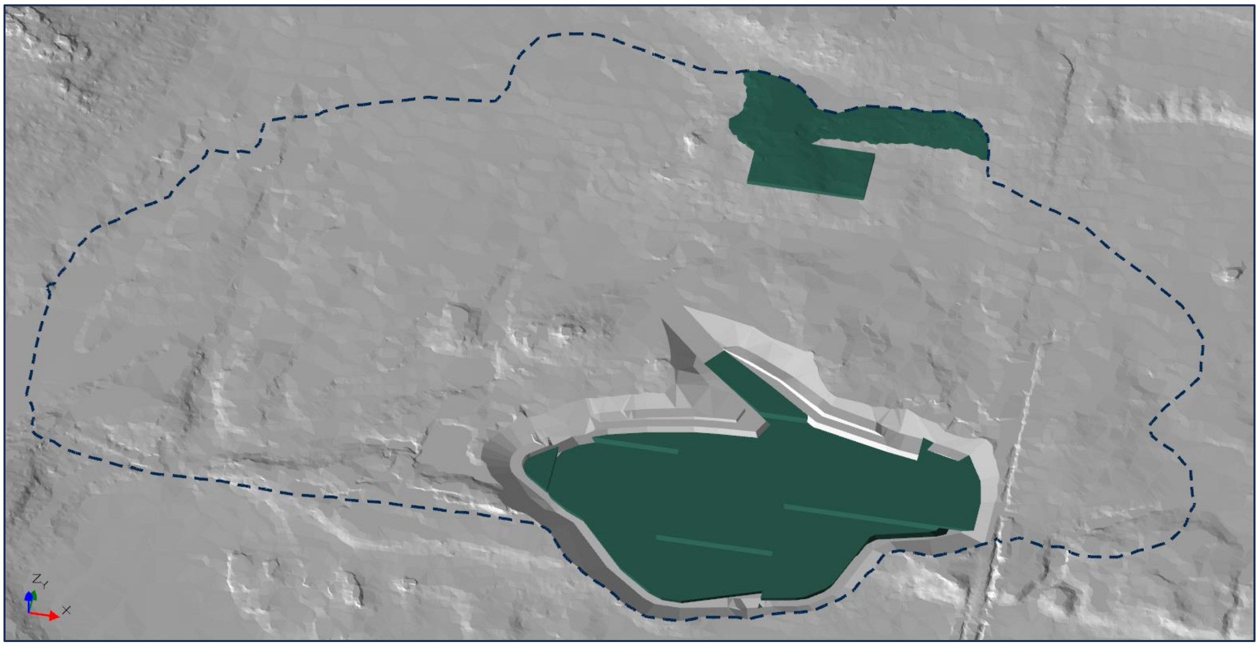


Figure 16-9: Isometric view of 2026

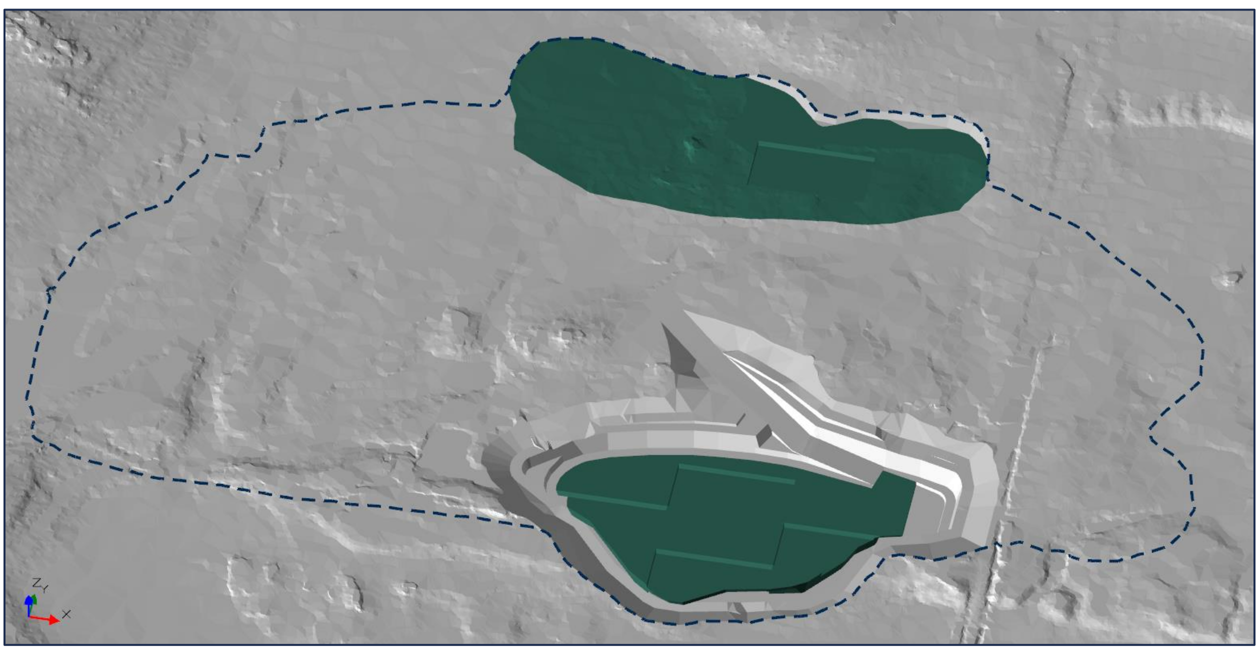


Figure 16-10: Isometric view of 2027

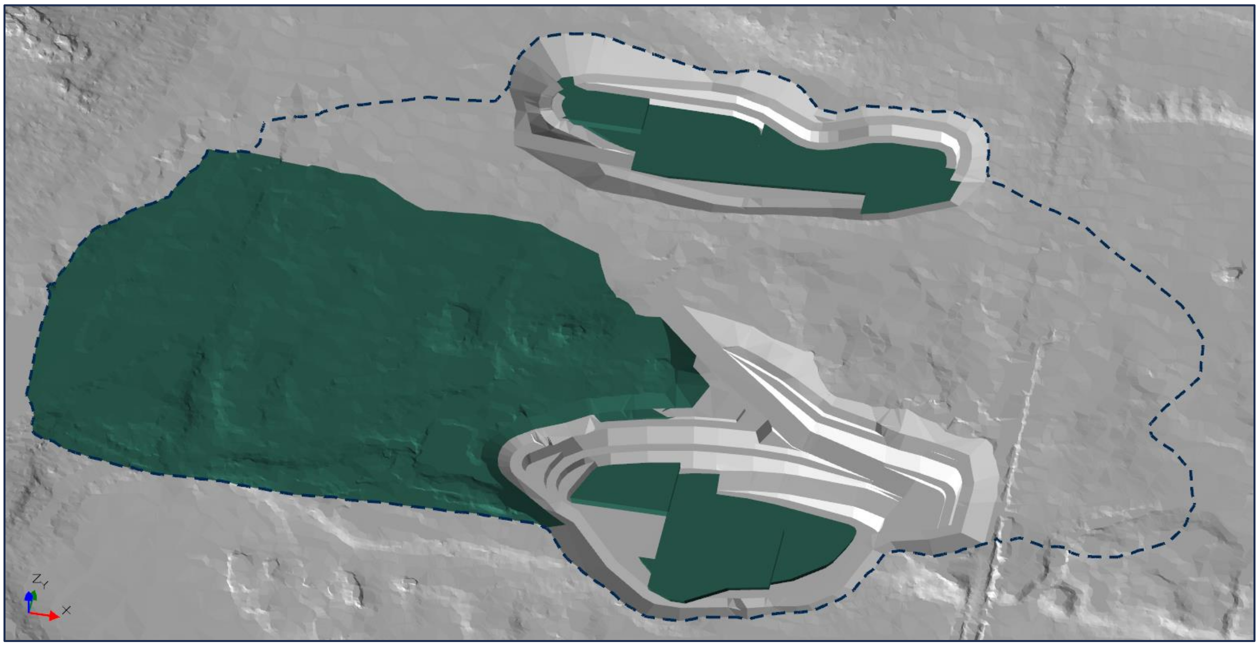


Figure 16-11: Isometric view of 2028

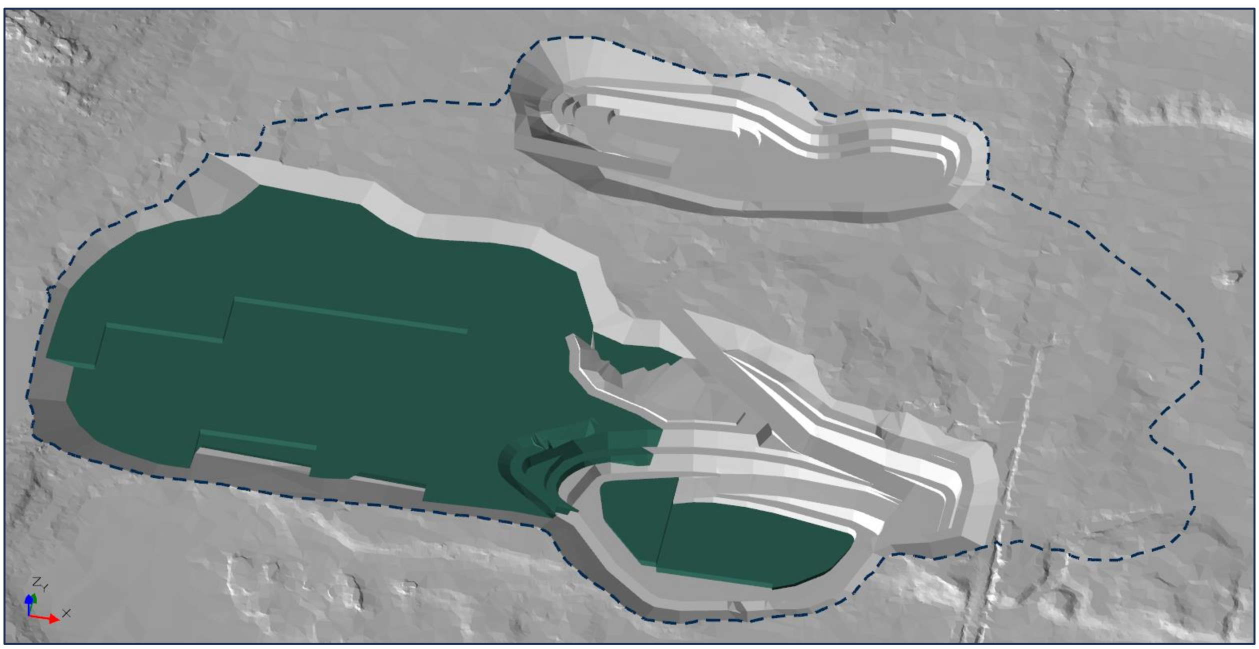


Figure 16-12: Isometric view of 2029

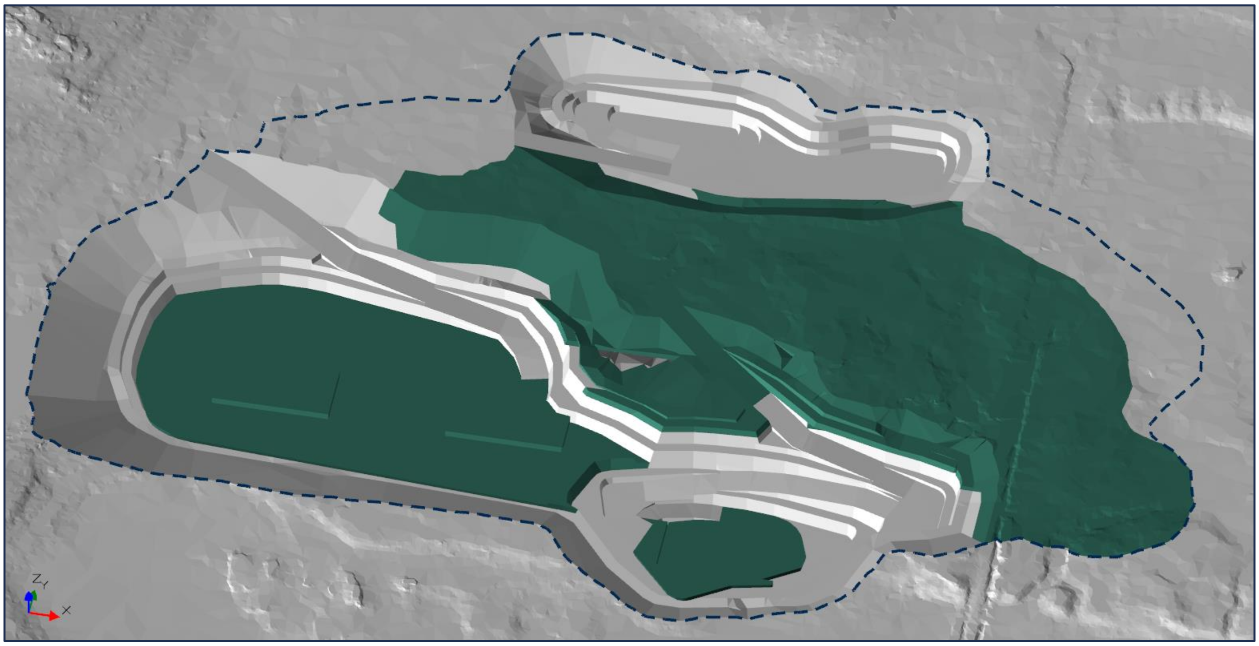


Figure 16-13: Isometric view of 2030

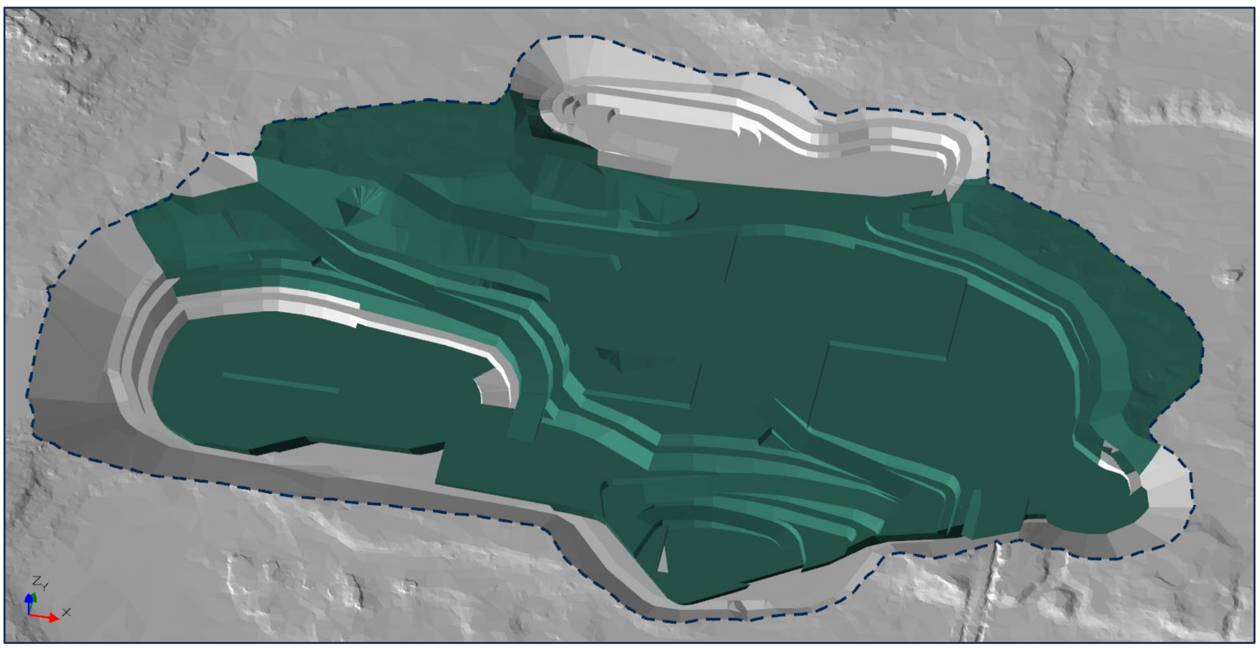


Figure 16-14: Isometric view of 2031-35

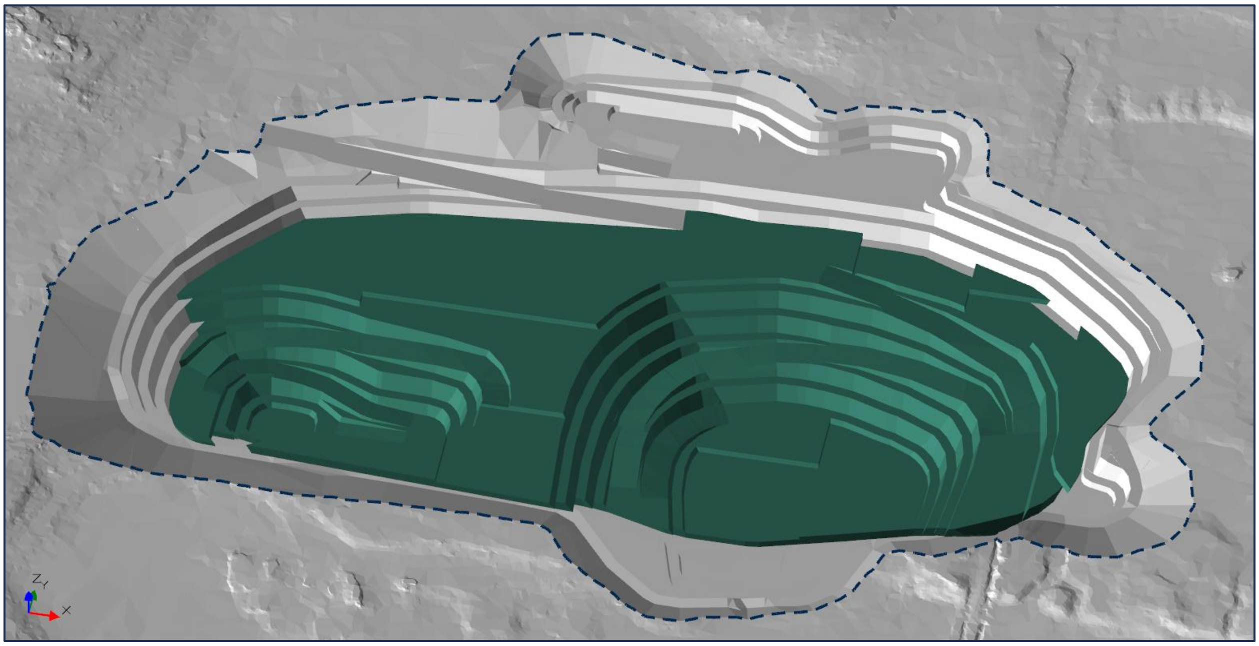


Figure 16-15: Isometric view of 2036-2040

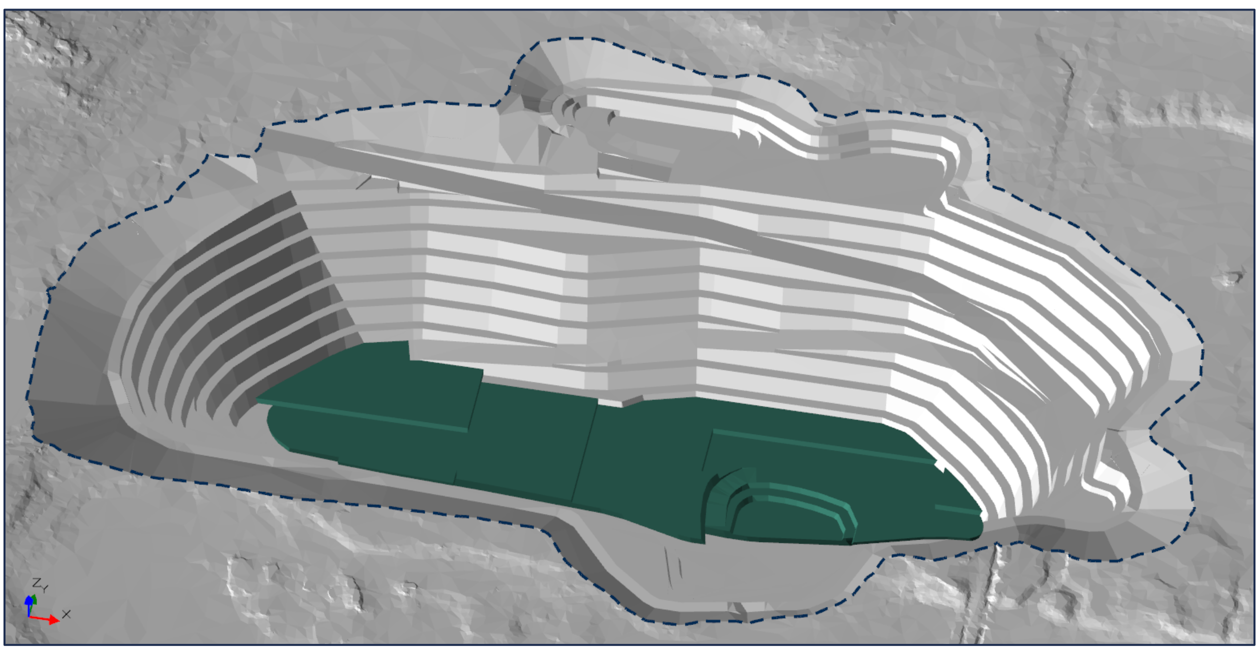


Figure 16-16: Isometric view of 2041-2046

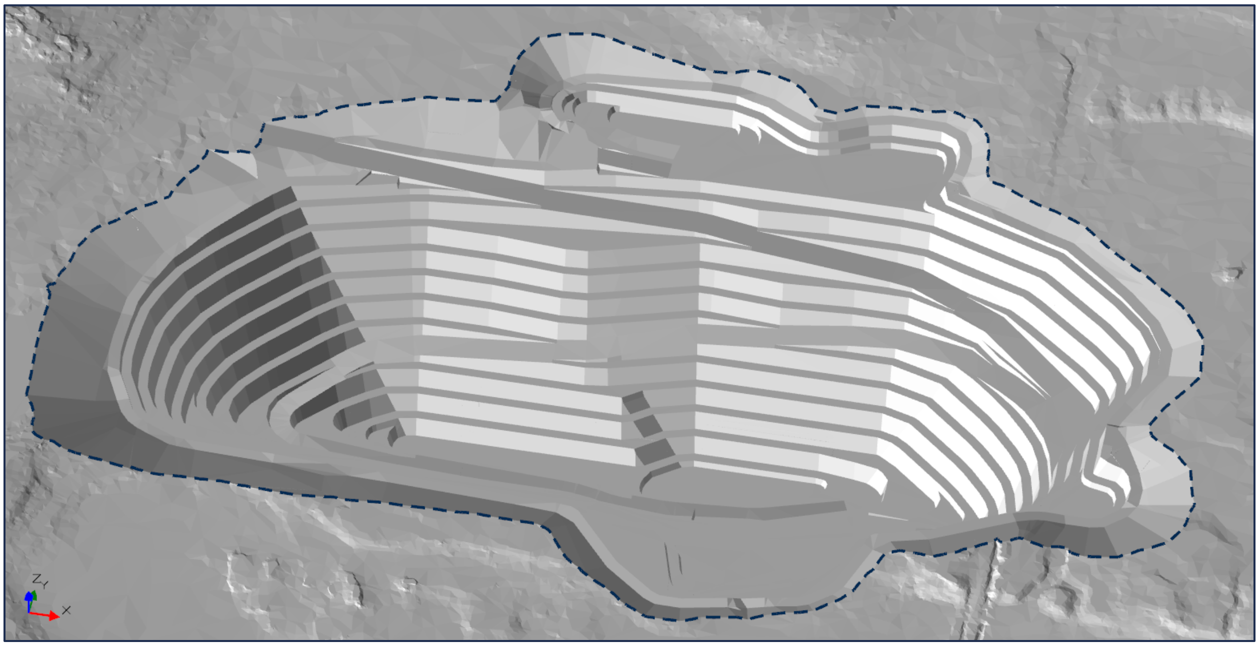


Figure 16-17: Isometric view at the end of 2046

16.4. Mine Operations

All mining activities will be undertaken by a mining contractor. For the purposes of this study, certain equipment types were considered, and the requirements estimated. However, the actual equipment used at the site will need to be determined during negotiations with the mining contractor.

16.4.1. Contract Mining

Mining activities will be conducted by a mining contractor for the entire LOM. The mining contractor will be responsible for:

- Mine equipment fleet (production fleet, auxiliary fleet and support equipment);
- Mine equipment operator;
- Mine operations supervision;
- Mine equipment maintenance;
- Tree clearing and grubbing;
- Overburden removal and bench preparation;
- Drilling, blasting, loading and hauling of ore and waste material;

- Mine dewatering;
- Overall site maintenance;
- Ore re-handling (loading transport trucks for ore transfer between Authier and NAL).

16.4.2. Roster

The mine will operate 365 days per year with two 12-hour shifts per day. It is expected that mining contractor equipment operators, mechanics and supervisors will work on a seven-working-day / seven-rest-day schedule. All other mining contractor staff, as well as Sayona's on-site staff, will work regular 40-hour work weeks. The labour requirements for the entire mine life are presented in Chapter 21.

16.4.3. Drilling

Drilling and blasting activities represent a crucial process when developing and sustaining a hard-rock mining operation. The performance and efficiency of this primary rock fragmentation process can heavily impact the mining dilution and ore losses, as well as other downstream activities, such as loading, hauling, crushing and grinding.

Blast fragmentation curves were developed based on rock characterization, types of explosives, blast patterns and powder factors. An ore P_{80} particle size of 300 mm was targeted.

All hard rock material will be drilled with 3.5" diameter holes by top hammer drill rigs. Production blasts will be on 6 m bench heights. The drillhole patterns in ore and waste material are presented in Table 16-4.

Table 16-4: Drilling ore and waste patterns

Drill Pattern		Ore	Waste
Bench Height	m	6.0	6.0
Hole Diameter	in.	3.5	3.5
Hole Diameter	mm	89	89
Burden	m	2.8	3.0
Spacing	m	2.8	3.0
Sub-Drill	m	0.6	0.6

Pre-split drillholes will be drilled every 1.50 m along the pit walls to improve the pit wall quality.

16.4.4. Blasting

Production drillholes will be loaded with a bulk emulsion explosive, whereas pre-split drillholes will be loaded with a continuous packaged emulsion. The production blasts will be detonated with an electronic blasting system. Electronic detonators offer greater flexibility and precision for the blast sequence, which can, in turn, improve rock fragmentation and diggability, and better control the blast movement.

Based on the drilling patterns listed above and blast fragmentation curves for host rock and pegmatite, by using an emulsion blasting agent with an average density (in the hole) of 1.15 g/cm^3, the powder factor will vary from 0.21 kg to 0.26 kg of explosives per tonne of rock.

16.4.5. Loading

A maximum of two 10.5 t-capacity hydraulic backhoe excavators and one 10.0 t-capacity production wheel loader will be required. These equipment units are compatible with the haul truck selected.

The excavators will be used to load all material from the pit. Especially in ore, the excavators can selectively mine the ore material to better control dilution and ore losses.

The wheel loader will be used to reclaim material from the ore stockpile into the transportation trucks. In case of breakdown of an excavator in the pit, this equipment could be used to mine waste material.

16.4.6. Hauling

A maximum of eight 40 t-capacity rigid haul trucks will be required throughout the mine life. It should be noted that the ramp width was evaluated considering a larger truck, in case the mining contractor would like to use other trucks.

The ore will be hauled to the ore stockpile just north of the ultimate pit limit. The waste rock, overburden and organic material will be hauled and stockpiled on the waste rock storage facility ("WRSF"). The overburden and organic material will be used to progressively rehabilitate the WRSF over the life of the Project (see Chapter 18 for more details).

The hauling equipment fleet requirements were estimated based on the quantities of material to be transported in each period and the representative haul cycle times. The haul cycle times were estimated with the MS Haulage simulation software.

16.4.7. Auxiliary

The auxiliary equipment fleet will consist of a variety of support equipment.

A 265 hp bulldozer will be required on the waste stockpile. A 14 ft moldboard motor grader will be required for preparing and grading the haul roads. A 50 t auxiliary excavator will be required for pit wall scaling and other secondary work around the pit (e.g., pit dewatering activities, ditches, rock breaking, etc.). The operation will also need a water / sand spreader for watering the roads in the summer for dust suppression and spreading sand for better traction in the winter. Finally, tower lights, an equipment transporter, a fuel and lube truck, and pick-up trucks will be needed.

All estimated mine equipment requirements over the mine life are presented in Table 16-5.

Table 16-5: Mine equipment requirements over the LOM

Equipment	Pre-Prod	Production										
	2023	2023	2024	2025	2026	2027	2028	2029	2030	2031-2035	2036-2040	2041-2044
Production Equipment												
Haul Truck – 40-t	2	2	2	2	3	6	7	7	7	8	8	2
Excavator – 10-t capacity	1	1	1	1	1	2	2	2	2	2	2	2
Wheel Loader – 10-t capacity	1	1	1	1	1	1	1	1	1	1	1	1
Drill – 3.5 in.	1	1	1	1	1	2	2	2	2	2	2	1
Auxiliary Equipment												
Bulldozer	1	1	1	2	2	2	2	2	2	2	2	2
Motor Grader	1	1	1	1	1	1	1	1	1	1	1	1
Auxiliary Excavator	1	1	1	1	1	1	1	1	1	1	1	1
Wheel Dozer	0	1	1	1	1	1	1	1	1	1	1	1
Water Truck / Sand Spreader	1	1	1	1	1	1	1	1	1	1	1	1
Support Equipment												
Fuel & Lube Truck	1	1	1	1	1	1	1	1	1	1	1	1
Service Truck	1	1	1	1	1	1	1	1	1	1	1	1
Pick-Up Trucks	3	3	3	3	3	3	3	3	3	3	3	3
Tower Lights	6	6	6	6	6	6	6	6	6	6	6	6

16.4.8. Mine Maintenance

The mining contractor is expected to provide their own maintenance building and execute all maintenance on their equipment.

16.4.9. Mine Technical Services

The mine technical services team will consist of a senior engineer supported by a mining engineer, mining technicians, and a senior geologist supported by geology technicians. Some of these staff are shared with the NAL operation.

17. RECOVERY METHODS

The current Project considers mining Authier ore for shipment to the North American Lithium ("NAL") concentrator for processing. There is a memorandum of understanding that the NAL operation will purchase the Authier ore; therefore, no details on the recovery methods are provided in this Report.

For details on the recovery methods of the NAL mill, refer to the report entitled "Definitive Feasibility Study Report for the North American Lithium Project" with an effective date of March 27, 2023 (BBA, 2023).

18. PROJECT INFRASTRUCTURE

The proposed new site infrastructure for the Project include:

- Run of mine ("ROM") and loadout pad;
- Administrative building;
- Dry room;
- Fuel storage;
- Lay down area for mining contractor equipment shop;
- Explosive magazine;
- A waste rock stockpile;
- A mine wastewater treatment plant;
- Site access road;
- Mine hauling and service roads; and
- Mine water management infrastructure, including, ditches, basins, pipelines, and pumping stations.

Given that the ore will be processed at North American Lithium ("NAL"), the site no longer requires a tailings storage facility.

A preliminary site layout is presented in Figure 18-1 and shows the operational requirements for the site, light and heavy vehicle traffic flows, site access, pit access, water management infrastructure and ore and waste rock stockpiles.

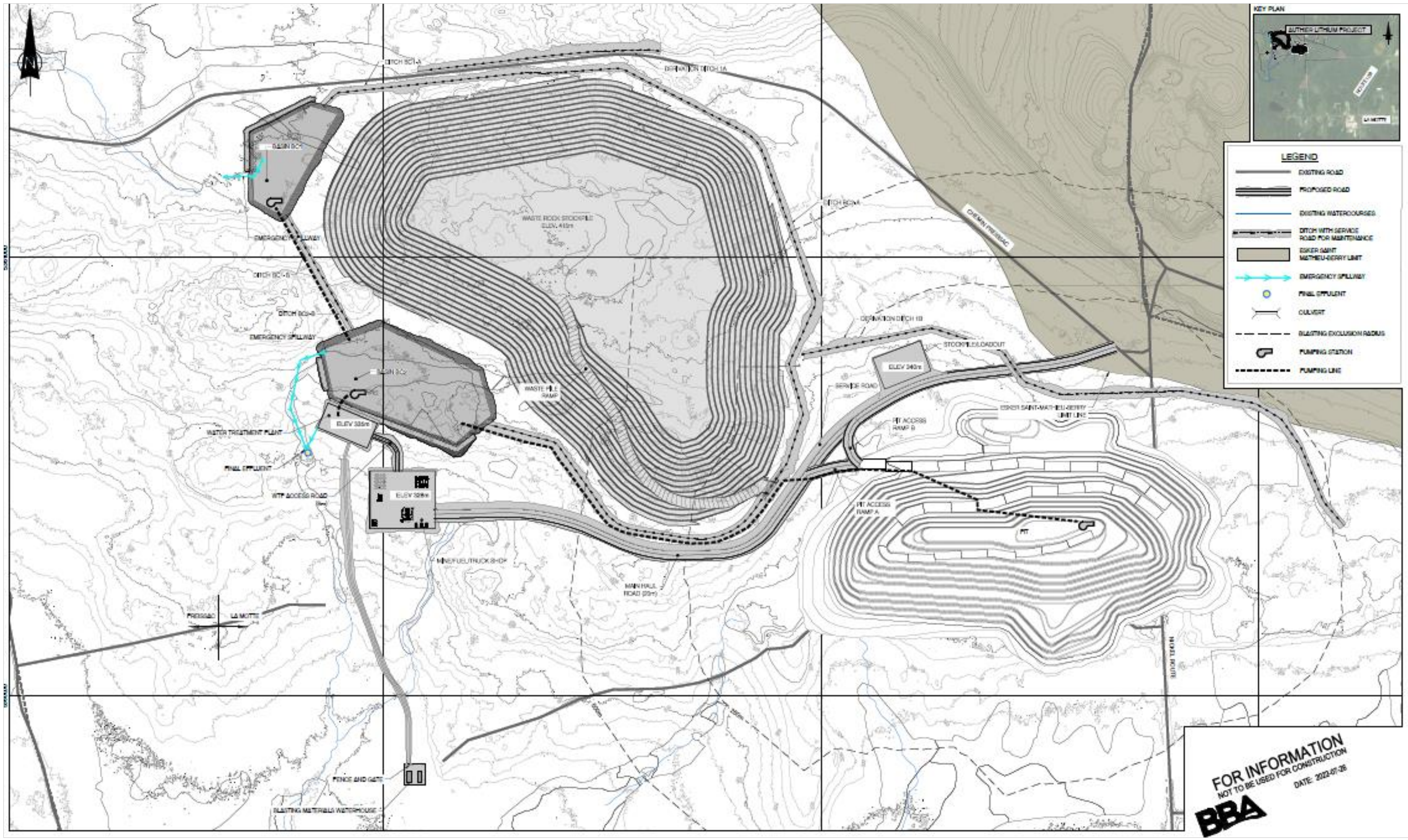


Figure 18-1: Site layout

18.1. Waste Rock Storage Facility

The following standards and regulations were used for the design of the waste rock storage facility ("WRSF") and its related water management structures:

- Directive 019 specific to the mining industry in Québec;
- Metal and Diamond Mining Effluent Regulations ("MDMER") in Canada;
- Loi sur la sécurité des barrage (The Dam Safety Law applied in Québec) ("LSB") and the associated regulation ("RSB");
- The Dam Safety Guideline produced by the Canadian Dam Association (2007);
- Manuel de conception des ponceaux (MTQ, 2004);
- Règlement sur la santé et la sécurité du travail dans les mines, Loi sur la santé et la sécurité du travail - Québec (2014) (Québec health and safety regulations);
- The Québec and/or the Canadian Legal framework applied to the environment and water sectors.

18.1.1. General Project Description

Following the 2019 feasibility study, several project modifications and constraints have been considered while redesigning the WRSF:

- Waste rock is considered metal leaching. For this reason, the pile foundation and cover will need to be engineered as impervious layers;
- Runoff water will be considered potentially contaminated by metals and total suspended solids ("TSS"). Site water management infrastructure (ditches and basins) will need to be designed with engineered impervious features;
- Ore will not be processed at the Authier site; therefore, no tailings will be produced and the codisposal approach is no longer required;
- Site inorganic overburden and organic material will be handled inside the limit of the waste rock stockpile footprint. Inorganic overburden will be used as the foundation layer of the impervious structure. For closure, both inorganic overburden and organic material will be progressively used as waste rock stockpile cover;
- On the western side of the considered waste rock pile location, two fish habitats have been confirmed. Infrastructure had to be located outside these protected habitats;
- On the western side, the footprint of the facility should not be expanded over the limits of the La Motte municipality;

- At the eastern side, the footprint of the facility cannot be expanded towards the Saint-Mathieu-Berry Esker. The Waste rock stockpile must stay inside the eastern limit of the 2019 footprint;
- If possible, as per risk management, avoid locating water management basins directly and in close proximity, upstream of the mine open-pit;
- The life of mine ("LOM") was reviewed from 15 to 22 years;
- Based on the listed project changes and considering the LOM extension, open-pit and mining plan modifications, the volumetric requirement of the waste rock pile has been estimated at around 75% of the 2019 designed codisposal facility capacity. Maintaining similar facility crest elevation, the resulting footprint will also be reduced. During the execution of the Updated Definitive Feasibility Study ("UDFS"), different arrangements and locations for the waste rock, overburden and organics stockpiles, as well as associated water management infrastructure, were studied by BBA. The final infrastructure location is provided in Figure 18-2;
- The updated location has been defined as per the following steps:
  - Analysis of site characteristics: geotechnical baseline data, site watersheds, surface drainage, environmental restricted areas;
  - Volumetric compliance for waste storage: the targeted combined volume was around 31 Mm^3 of material (waste rock, overburden, and organics). The resulting design intends to manage all materials in the same footprint;
  - The overburden and organics will be temporarily stored in the waste rock footprint until its eventual reuse for progressive mine closure;
  - Analysis of the environmental and social constraints of the selected waste storage facility footprint. This includes Sayona engagements with environmental authorities as stated in previous studies.

18.1.2. Design Update

The waste materials that will be managed at Authier are waste rock, overburden and organics. The expected LOM tonnages extracted from the mining plan are summarized in Table 18-1.

Table 18-1: Summary of the LOM waste material from Authier pit

Waste type	Quantity
Waste rock ("WR")	63,000,000 t
Overburden ("OB")	4,609,354 t
Organic material ("ORG") *	740,646 t

** Pit organic layer is assumed at 1 m thickness*

Results of the geochemical characterization of waste rock concluded:

- Waste rock is not acid generating material;
- A good amount of waste rock could be considered metal leaching (approximatively 70%);
- Waste rock will not be considered as high-risk level mining waste.

It is expected that an average of 30% of waste rock will be considered as inert. However, Sayona's approach at this stage is to consider that all waste rock will be stored in the same stockpile.

For these reasons, as per Directive 019, level A groundwater protection measures will have to be applied at the foundation of the waste rock stockpile. Based on the available geotechnical and hydrogeological investigation information, the current design assumes that the in-situ soils will not meet *Québec Directive 019* requirements. To ensure aquifer protection, a geomembrane impervious structure is required. Furthermore, the facility closure plan should also consider the imperviousness of the stockpile final surface. At this stage of the Project, it is assumed that the pit overburden and organic material will form the cover structure. Material will be placed between 1% to 2% slope grades to ensure proper water drainage at the crest.

At the selected location, the waste rock stockpile foundation is characterized by the presence of rock outcrops. Moreover, in different locations, bedrock appears to be close to surface. To install impervious liners, the foundation will require some preparation. It must include organic stripping, site grading earthworks and a layer of subgrade soil for the geomembrane. Soil cover will also be required as a protection layer for the impervious liner. Geotechnical investigations indicate that pit overburden material could be appropriate to form the geomembrane structure.

In summary, overburden and organic material will be used during construction and closure of the WRSF. The designed concepts allow management and storage of all Authier waste materials within the same footprint, as presented in Figure 18-2.

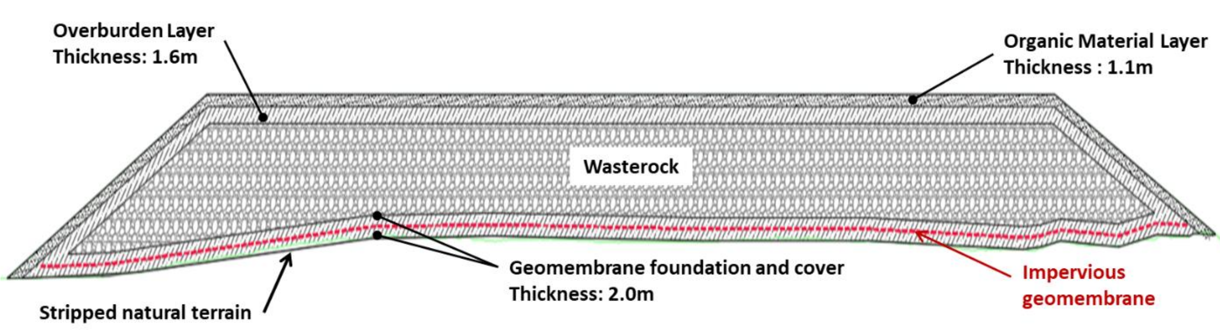


Figure 18-2: Waste rock stockpile cross-section - Overall concept

Material deposition will take place during different phases. A synchronized operation between pit development and waste rock stockpile construction must be planned. Remaining tonnages will be temporarily stored at the non-developed area of the waste rock stockpile footprint. Waste rock, overburden and organic material production have been extracted from the mining plan and are presented in Table 18-2.

Table 18-2: Authier waste LOM production

Period	Waste Material Type			
	Waste Rock	Overburden (estimated)	Organic Material (estimated)	Total
	(Mt)	(Mt)	(Mt)	(Mt)
YR1	0.60	0.53	0.09	1.22
YR2	1.31	0.03	0.01	1.35
YR3	1.01	0.31	0.05	1.37
YR4	0.43	1.31	0.21	1.95
YR5	4.38	0.92	0.15	5.45
YR6	4.26	1.02	0.16	5.44
YR7	5.49	0.00	0.00	5.49
YR8	5.49	0.00	0.00	5.49
YR9	4.93	0.47	0.07	5.47
YR10	5.44	0.02	0.00	5.46
YR11	5.47	0.00	0.00	5.47
YR12	5.48	0.00	0.00	5.48
YR13	4.95	0.00	0.00	4.95
YR14	5.04	0.00	0.00	5.04
YR15	4.07	0.00	0.00	4.07

Period	Waste Material Type			
	Waste Rock	Overburden (estimated)	Organic Material (estimated)	Total
	(Mt)	(Mt)	(Mt)	(Mt)
YR16	1.99	0.00	0.00	1.99
YR17	0.86	0.00	0.00	0.86
YR18	0.51	0.00	0.00	0.51
YR19	0.44	0.00	0.00	0.44
YR20	0.38	0.00	0.00	0.38
YR21	0.30	0.00	0.00	0.30
YR22	0.17	0.00	0.00	0.17
Total	**63.00**	**4.61**	**0.74**	**68.35**

The waste rock stockpile footprint will be surrounded by four surface drainage ditches. Runoff is collected and directed to two water management basins. Ditches and basins will also consider a geomembrane structure in the design. Optimization of the facility construction and design should be completed in detailed engineering.

18.1.3. Design Summary

Authier waste rock, overburden and organic materials will be contained in the same storage facility. The design update was performed with the following parameters:

- Final overall slope angle: 2.5H:1V;
- Bench slope angle: to be finalised in detailed engineering;
- Bench height: to be finalised in detailed engineering;
- Ramp width: 22 m;
- Access ramp slope: 10%;
- Waste rock placed density: 2.3 t/m³;
- Dry overburden placed density: 1.7 t/m³;
- Dry organic material placed density: 1.3 t/m³;
- The organic layer thickness was assumed to be 1 m, which corresponds to approximately 14% of the total soil excavated;
- Facility foundation condition has been established from the most recent geotechnical information collected by BBA in 2020;
- The pile has a footprint of approximately 75 ha, and a maximum height of ±83 m. The average height is about 72 m;
- Organic material will be stripped from the waste rock facility foundation and will be further used in the closure plan. The foundation layer thickness is assumed at 30 cm.

Table 18-3 summarizes the capacities of waste material to be managed.

Table 18-3: Waste rock storage facility required capacity

Parameter	Quantity
Overburden quantity	4.61 Mt
Overburden volume	2.71 Mm³
Tonnage of pit footprint organic material	0.74 Mt
Tonnage of stockpile footprint organic material*	0.38 Mt
Organic material volume	0.86 Mm³
Waste rock quantity	63.00 Mt
Waste rock volume	27.39 Mm³
Total stockpile capacity	30.96 Mm³

** This material is currently projected to be placed at the stockpile footprint*

Extracted materials from the pit will be continuously placed on the waste rock stockpile. The construction sequence will require coordination between both pit and stockpile developments. Construction efforts will change every year as per material storage needs. Table 18-4 summarizes the LOM volumetric requirements of the WRSF.

Table 18-4: Waste rock stockpile volumetric LOM requirements

Period	Waste Material Type			
	Waste rock	Overburden (estimated)	Organic Material (estimated)	Total
	(Mm³)	(Mm³)	(Mm³)	(Mm³)
(YR1)	0.26	0.31	0.07	0.64
(YR2)	0.57	0.02	0.00	0.59
(YR3)	0.44	0.18	0.04	0.66
(YR4)	0.19	0.77	0.16	1.12
(YR5)	1.90	0.54	0.11	2.56
(YR6)	1.85	0.60	0.13	2.58
(YR7)	2.39	0.00	0.00	2.39
(YR8)	2.39	0.00	0.00	2.39
(YR9)	2.14	0.27	0.06	2.47
(YR10)	2.37	0.01	0.00	2.38

Period	Waste Material Type			
	Waste rock	Overburden (estimated)	Organic Material (estimated)	Total
	(Mm³)	(Mm³)	(Mm³)	(Mm³)
(YR11)	2.38	0.00	0.00	2.38
(YR12)	2.38	0.00	0.00	2.38
(YR13)	2.15	0.00	0.00	2.15
(YR14)	2.19	0.00	0.00	2.19
(YR15)	1.77	0.00	0.00	1.77
(YR16)	0.87	0.00	0.00	0.87
(YR17)	0.37	0.00	0.00	0.37
(YR18)	0.22	0.00	0.00	0.22
(YR19)	0.19	0.00	0.00	0.19
(YR20)	0.17	0.00	0.00	0.17
(YR21)	0.13	0.00	0.00	0.13
(YR22)	0.07	0.00	0.00	0.07
Total	**27.39**	**2.71**	**0.57**	**30.67**

18.1.4. Stability Analysis for WRSF and Related Infrastructure

The following stability analyses have been performed considering different loading conditions. The geotechnical study focuses on the Authier waste rock stockpile and its related water management infrastructure. Figure 18-3 presents the analyzed sections. Stability analysis considers the stockpile and geomembrane structure constituent materials presented in Figure 18-2. Facility foundation stratigraphy was established from the factual data gathered by BBA in 2020 and by Richelieu in 2018. The following areas are identified:

- The foundation of the northwest area is mostly silt;
- The foundation of the west and south areas is till which mixes with sand and silt;
- The foundation of the southeast area is sandy till;
- The foundation of the east (northeast) area is loose sand.

The properties of foundation soils and waste rock pile were estimated based on available geotechnical reports and typical data collected from literature, as well as several simplifying assumptions (see below). The geotechnical parameters used in this stability analysis are presented in Table 18-5.

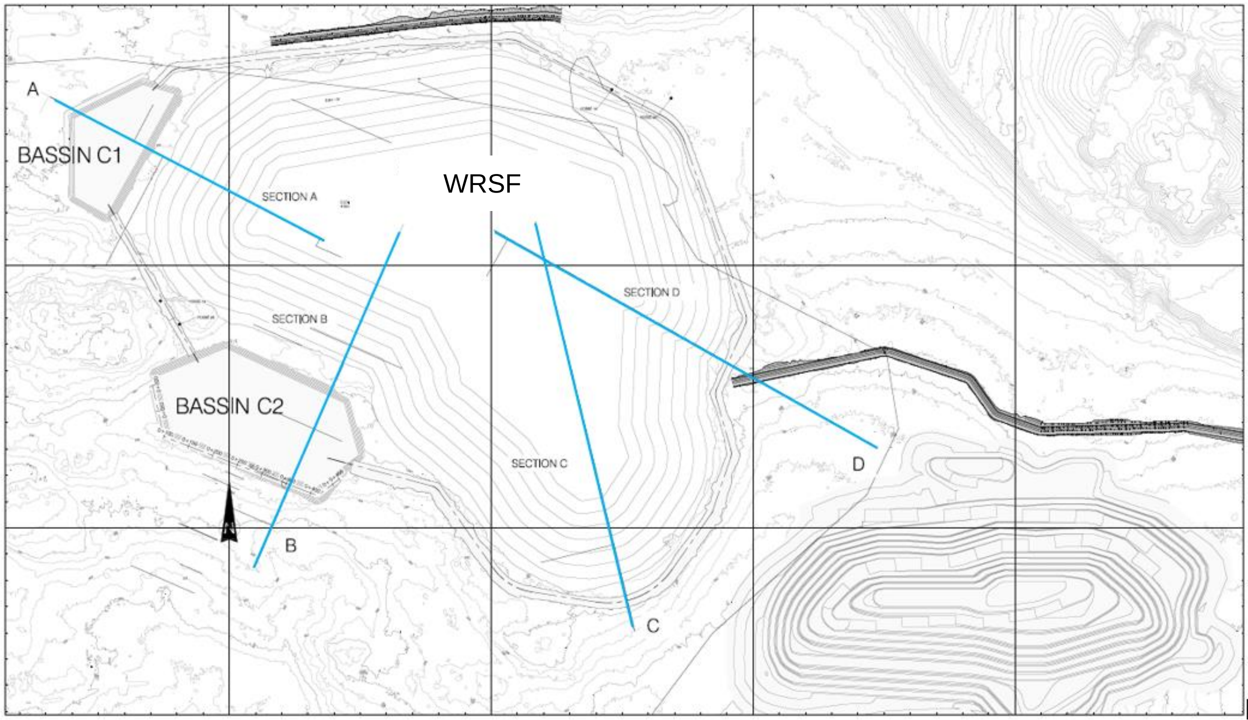


Figure 18-3: Critical sections for stability analysis

Table 18-5: Geotechnical parameters of waste rock stockpile constituent materials

Materials	γ (kN/m³)	C' (kPa)	Φ' (˚)	Su (kPa)	Ksat (m/s)
Waste rock	22	0	36	N/A	1×10^{-4}
Foundation (compact to dense silty sand)	19	0	32	N/A	1×10^{-6}
Compacted till	19	0	34	N/A	1×10^{-7}
Foundation till	18	0	33	N/A	$1x10^{-6}$
Foundation silt	16.5	0	32	N/A	1×10^{-9}
MG56	21	0	35	N/A	N/A
Organic material	13	0	28	N/A	N/A
Rip rap	22	0	37	N/A	N/A

The results of slope stability analysis under different loading conditions are presented in Table 18-6 for both global and local stability. The obtained factors of safety show that the stability of WRSF and basins (BC1 and BC2) in the proposed configurations meets the design criteria specified in the *Ministère des Ressources naturelles et des Forêts* ("MRNF" formerly MERN) (2017), and Directive 019 (*Ministère du Développement Durable, de l'Environnement et des Parcs*(MDDEP), 2012) in the context of this study. However, it is worthy to mention that stage construction might be recommended in the next design phase, this, if clayey soils are identified later at the site from additional geotechnical investigations. It should also be noted that the validity of various assumptions needs to be addressed by more detailed geotechnical tests during the detailed engineering design.

The stability of the waste rock pile at Authier has been analyzed in this study, based on some assumptions regarding the geotechnical properties of the foundation soils and waste rock. In total, four critical sections were chosen around the waste rock pile (A-A, B-B, C-C, D-D) and stability analyses were performed under the static and pseudo-static conditions, for both short-term and long-term (Figure 18-3).

A geomembrane will be used in different structures to prevent pollutants from migrating to the groundwater. The groundwater table was analyzed in section A-A showing that the groundwater table stays close to the foundation of the pile. The obtained groundwater table was applied as the critical condition in other sections. The modelling and analysis were carried out with several hypotheses. Basin BC2 in section B-B is mostly excavated in bedrock.

Table 18-6: Factor of safety of slope stability analysis

Section	Estimated FoS			
	After excavation (local stability)	End of construction (Short-term)	Long-term	Pseudo-static
	FoS_{min} = 1.2	FoS_{min} = 1.3 to 1.5	FoS_{min} = 1.5	FoS_{min} = 1.1
Section A-A – Basin BC1 Excavation	1.2	1.7		1.5
Section A-A – Basin BC1 Dyke	1.2	2.2		1.9
Section A-A – WR Stockpile		1.7	1.7	1.6
Section B-B – Basin BC2 Dyke-downstream			1.5	1.3
Section B-B – Basin BC2 Dyke-upstream			1.6	1.5
Section B-B – WR Stockpile		1.8	1.7	1.5
Section C-C		1.8	1.8	1.6
Section D-D		1.9	1.9	1.6

18.1.5. Waste Rock Handling Methodology

Based on BBA's experience with projects of this size and the transportation distance of the waste, the handling of waste, overburden and organics is to be conducted using trucks from the pit to the WRSF.

18.2. Water Management

18.2.1. Water Management Strategy

The general water management strategy developed for the Project aims to:

- Divert all non-contaminated water off-site (clean water) from non-perturbed areas surrounding the site;
- Manage water by collecting, draining, conveying, and containing runoff from all sources including:
  - Surface infrastructure;
  - Waste rock storage area.
- Treat all contaminated water before releasing it into the environment.
- Minimize the waste rock footprint to reduce water storage basin requirements.

It is understood, at this stage of the Project, that TSS material and nickel leachate are the key contaminants in the water. Removal of these parameters can be achieved by using sedimentation of contact water in ponds for partial TSS removal and by conditioning of the water with the addition of chemicals in order to generate metal hydroxides and to precipitate out metal hydroxides and TSS in filters and/or clarifiers prior to release into the environment. Any other contaminant should be treated using appropriate water treatment processes.

18.2.2. Projected Infrastructure for Water Management

The Authier water management infrastructure is composed of two clean water diversion ditches; four contact water collection ditches that surround the waste rock disposal area and other mining areas; two water storage basins (“BC1” and “BC2”); pumping stations and conveyance pipelines and a water treatment plant (“WTP”). The main infrastructure is shown in Figure 18-5.

18.2.3. Design Criteria for Basins and Ditches

The environmental flood design criteria for basins are the following: The water management basins must be able to manage a 1,000 year- recurrence 24-h rainfall combined with a 100 -year recurrence snowmelt, as per Directive 019 (MDDEP), with the water from rainfall being stored and the snowmelt being treated simultaneously as it arrives at the basin. The criteria have been defined given that the waste rock is not acid-generating but considered metal-leachable.

Where retained structures are considered in the construction of basins, an emergency spillway and channel must be able to safely discharge the most severe flooding event, i.e., Inflow Design Flood ("IDF"). This is the Probable Maximum Flood ("PMF") as specified in the Directive 019; freeboard requirements are as stipulated by Directive 019 (section 2.9.3.1) and the Canadian Dam Association ("CDA") guidelines (section 6.4). At this stage of the Project, it is proposed that dykes be designed to have a freeboard of at least 1.0 m, measured between the impermeable dam crest (elevation of membrane anchor and not that of the running coarse) and the maximum water level during the design for Environmental Design Flood ("EDF").

The design criteria applying to the ditches of the WRSF are presented below and are based on a design rainfall of a 100-year recurrence as per Directive 019.

- Minimum depth 1.0 m;
- Minimum base width 1.0 m;
- Minimum freeboard m 0.3 m;
- Minimum longitudinal slope 0.001 m/m;
- Minimum velocity 0.5 m/s;
- Lateral slopes are defined according to the natural terrain;
- Riprap must be defined according to water velocities.

To take into account the risks and impacts related to climate change, precipitations used for the design were increased by 18% (see Section 18.2.10).

18.2.4. Watersheds

The watersheds have been delineated to perform the design of ditches and basins. Figure 18-4 and Figure 18-5 show the watersheds of the mine site in natural (undeveloped) and developed conditions. Topographic information was gathered from *Données Québec* which gives access to LiDAR information at a resolution of 1 m.

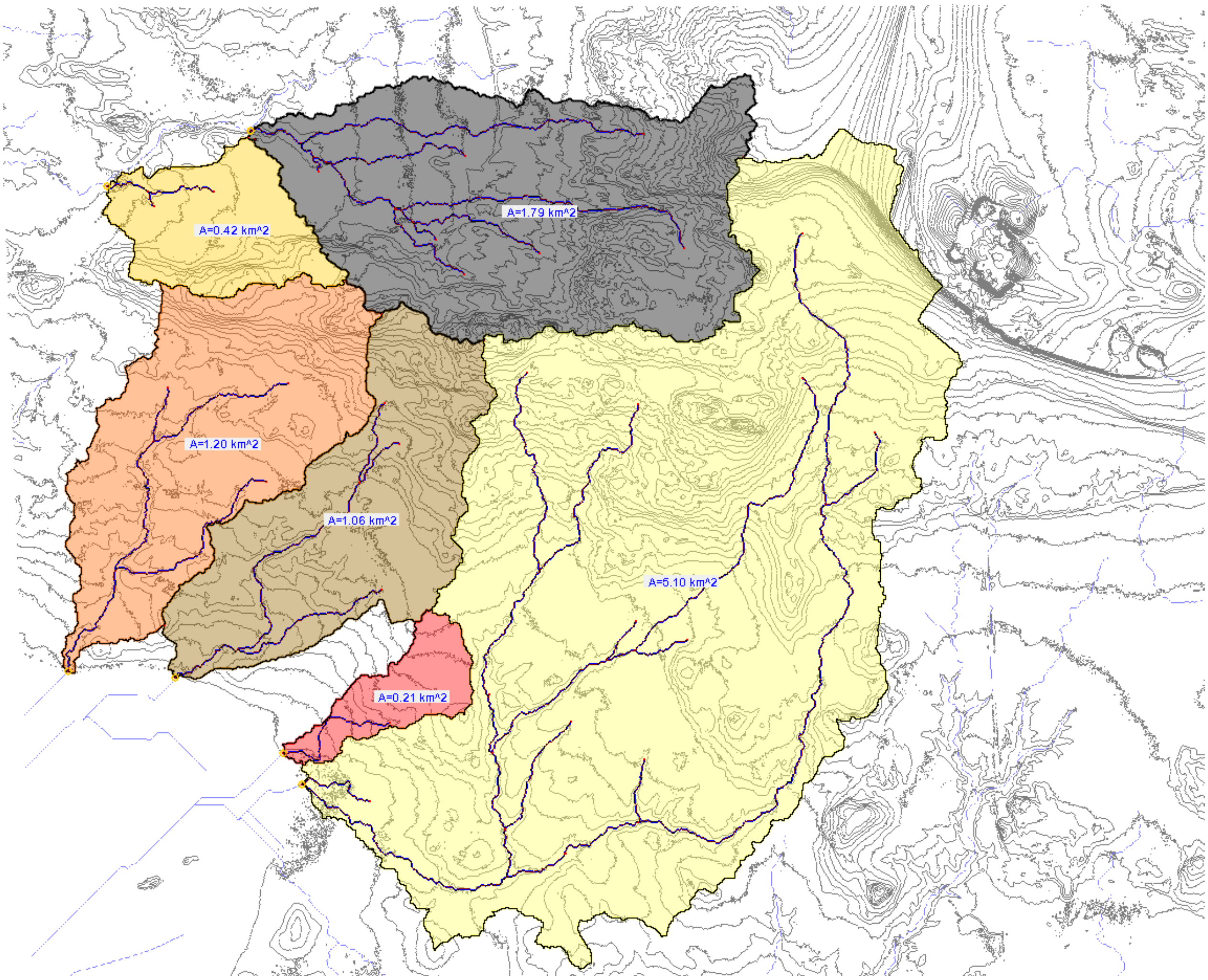


Figure 18-4: Watersheds in undeveloped conditions for the Project area

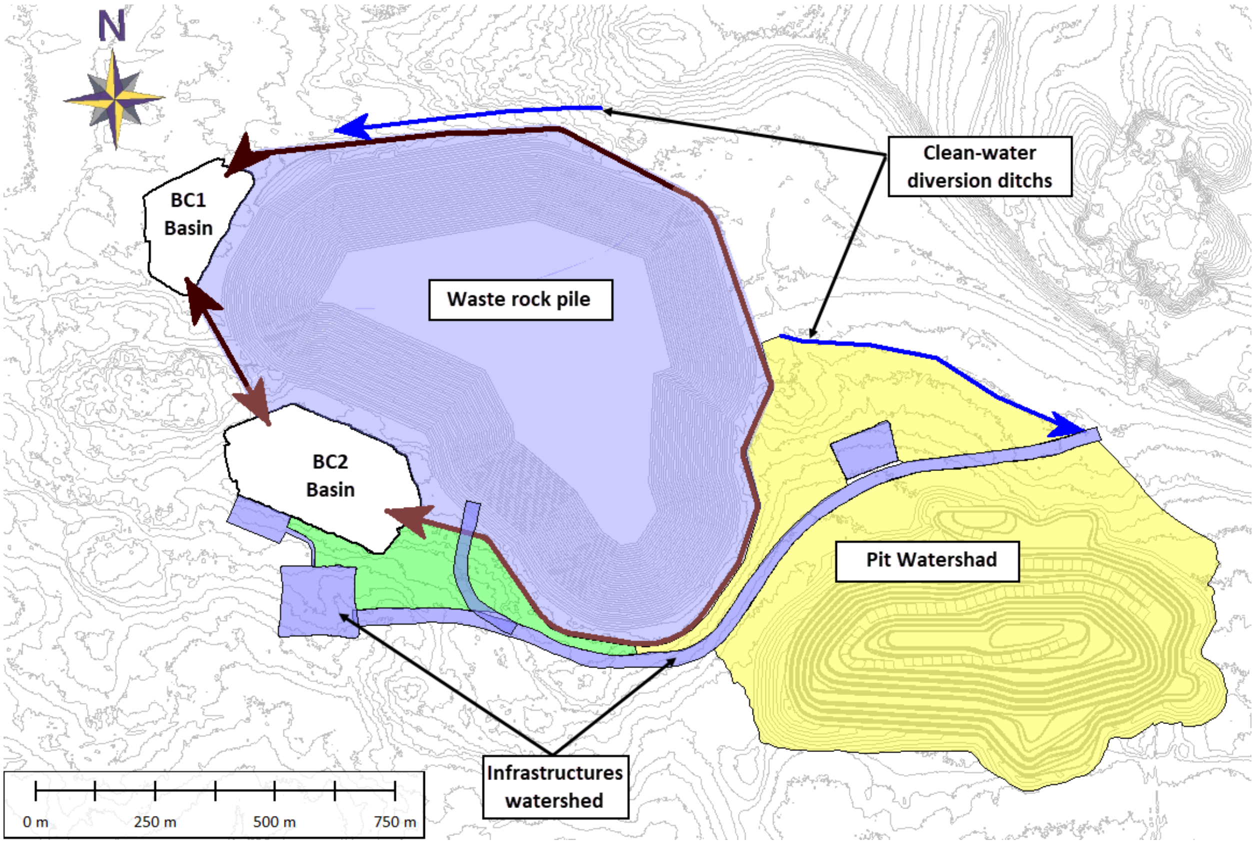


Figure 18-5: Watersheds in developed conditions

18.2.5. Operational Water Balance and Flux Diagrams

An operational water balance was performed for the different hydrological conditions. The following parameters were considered:

- Total annual precipitations are 903 mm with 651 mm of rainfall and 253 mm of snowfall (SNC-Lavalin, 2018);
- It is assumed that the snowmelt occurs from mid-April to mid-May;
- The total annual lake evaporation is 460 mm (SNC-Lavalin, 2018);
- The potential evapotranspiration ("ETP") is 364 mm (SNC-Lavalin, 2018). It is assumed that the stockpile and the mine pit have respective rates of 70% and 50% of the ETP;
- It is assumed that the ice cover of the basins is 1 m thick and forms from mid-December to mid-April;
- The groundwater infiltration rate into the mine pit is 108 m^3/h (SNC-Lavalin, 2018).

The resulting flow diagram and the main outcomes of the water balance are presented in Table 18-7 and Figure 18-6.

Table 18-7: Main outputs of the operational water balance

Parameter	Hydrological condition		
	Normal Value (m^3)	Dry Value (m^3)	Wet Value (m^3)
Input	1,610,476	1,312,966	1,746,761
Underground water	946,080	946,080	946,080
Hydrological losses	441,483	412,832	463,262
Yearly volume of water released to the effluent	2,115,073	1,846,213	2,229,579

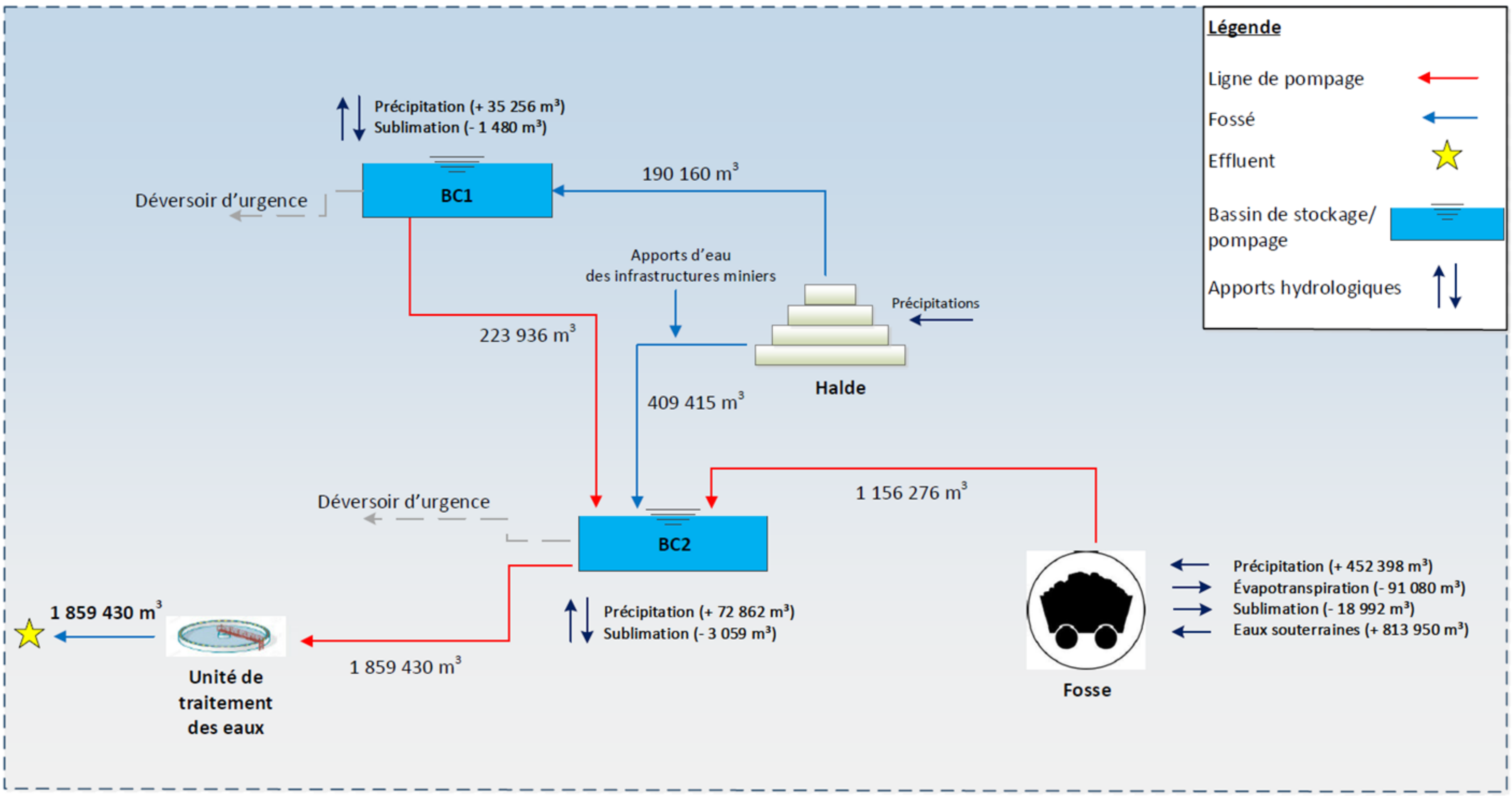


Figure 18-6: LOM water balance for normal precipitation

18.2.6. Basins Sizing and Design

Based on the design criteria (Directive 019), and the water management approach previously described, the environmental design flood was established.

Two basins, BC1 and BC2 will be required to manage Authier contact water. BC1 and BC2 require a storage capacity of 53,270 m³ and 114,034 m³ respectively. Both basins should be impervious. A geomembrane liner has been considered at this stage of the Project.

Basin capacity has taken into consideration the operation of a water treatment plant having a capacity of 0.18 m³/s.

Basin volumes will be attained partially through excavation and partially through the construction of dams. Dam height has been limited to roughly 4.0 m. Table 18-8 provides crest elevations for each basin as well as the elevations for each associated spillway.

Table 18-8: Crest elevations

Basin designation	Basin volume (m³)	Crest elevation (m)	Spillway elevation (m)	Freeboard (m)
BC1	53,270	330.00	328.00	1.5
BC2	114,034	338.50	337.00	1.0

18.2.7. Design of the Ditches

Four main ditches are designed to manage surface water from the waste rock stockpile facility. Two diches drain towards basin BC1 (BC1A, BC1B) and the other two towards BC2 (BC2A, BC2B). These ditches will also be lined with a geomembrane. Two deviation ditches are considered; they are located north and east of the WRSF. A trapezoidal transversal cross-section was considered for hydraulic calculations. Dimensions vary depending on the chainage station of each ditch section. Table 18-9 summarizes waste rock stockpile ditches dimensioning.

Table 18-9: Typical Cross-section to be used for the mine site ditches

Ditch ID	Length	Discharge	Roughness coefficient	Base width	Lateral slope	Water depth	Velocity	Total depth (1)
	[m]	[m³/s]	[s/m$^{1/3}$]	[m]	[H:1V]	[m]	[m/s]	[m]
BC1A	979.2	5.08	0.040	1.0	2	0.9	2.3	1.0 – 1.5
BC1B	228.4	1.16	0.040	1.0	2	0.4	2.3	1.0
BC2A	2,056.7	9.25	0.040	1.0 - 3.5	2	1.67	2.04	1.0 – 2.0
BC2B	77.5	1.06	0.040	1.0	2	0.41	1.42	1.0

(1) Including a 0.3 m freeboard

18.2.8. Pumping Systems

At least three major pumping stations are required over the life of the Project. One to transfer water from BC1 to BC2, one for pumping water from BC2 to the treatment plant, and a dewatering pumping system is to be installed in the pit to basin BC2. Detailed design of the pumping stations will be done in the next stage of the Project. Pumping lines and requirements are summarized in Table 18-10.

Table 18-10: Pumping system and lines

Pumping System	Pumping requirement (m³/s)	Pumping Line Length (m)
Pit	0.18*	1,610
BC1	0.18*	350
BC2	0.18*	60

** Pumping rate matched to the water treatment plant capacity*

18.2.9. Wastewater Treatment

Waste rock from the Authier mine is non-acid generating, but probably classified as metal-leaching; as such, in addition to conventional sedimentation within the designed ponds for TSS removal, a physico-chemical treatment approach will be required for treatment of metals. The cost estimates provided for the facility have been derived from wastewater treatment facilities from other similar projects. The required treatment capacity has been estimated to 0.18 m³/s (650 m³/h).

18.2.10. Assessment of the Risk of Climate Change

In general, consequences of climate change are a new risk that needs to be addressed in water management plans and for the design of the water management infrastructures, e.g., basins and ditches. Mitigation measures and adaptation measures must be considered.

For the Authier Lithium project, the risk was analyzed based on available scientific data including recommendations put forward by the OURANOS consortium for the province of Québec. According to the simulations performed by OURANOS (https://www.ouranos.ca/climate-portraits/#/) for the Abitibi region, assuming Val-d'Or as a reference station, the projections (2041-2070 horizons) of climate change in terms of temperature increase and precipitation are based on a 'high level of greenhouse gas emissions' scenario (50th percentile) and shown in Table 18-11.

Table 18-11: OURANOS Projections for temperature and precipitation

Seasons	Temperature		Precipitations		
	Actual average value (° C)	Projected Variation (°C)	Actual average value (mm)	Projected Variation (mm)	Projected Variation (%)
Annual	2,0	+3,2	900	+85	+9
Winter	-14,0	+3,8	161	+30	+19
Spring	1,4	+2,6	188	+32	+17
Summer	16,3	+3,1	295	-5	-17
Autumn	4,2	+2,9	261	+25	+10

For the Authier Lithium project, the design for water collecting ditches has assumed an increase by 18% of the Intensity Duration-Frequency values that are available for the Amos weather station (Environment Canada). Also, to manage the risk, the mine pit was considered as a buffer in case of an extreme precipitation event beyond the design criteria. It is understood that during extreme events the mining operations will be temporarily stopped.

18.3. Pads and Roads

18.3.1. Site Preparation and Pads

General site preparation will consist of clearing, grubbing, topsoil and overburden removal, rock excavation, backfilling and surface leveling for all site infrastructures. Access and hauling roads were designed based on project requirements and additional project constraints provided by Sayona.

Clearing and grubbing will be done in and around all infrastructure areas. Topsoil and overburden will be removed to provide a stable sub-base for roads and pads. A general overview of the Authier site can be found in the general arrangement plan in Figure 18-1. Site drainage will be achieved with the excavation of drainage ditches at the extremity of the infrastructure pads and on the side of the roads. A frost depth of 2.8 m is considered for building foundations not sitting on bedrock and for the underground piping networks.

The mine industrial area ("MIA") will consist of granular pads to accommodate the structures identified in Section 18.1.1. MIA Infrastructure.

The site entrance is located on Chemin des Pêcheurs to the east of the Property. The main access road has a total width of 20 m and is approximately 440 m long to the ROM loadout area. From this point to the mining infrastructure pad, the road transforms into a hauling road for about 1.300 m. For this portion of the road, an additional service road for regular vehicle transit is considered. The mine operations site access is controlled by an access gate located approximately at the intersection with the Chemin Preissac.

On-site roads consist primarily of heavy-duty traffic haul roads for access between the mine operations pad, the waste rock stockpile and the open-pit. The total width of the haul roads is 20 m. A 770 m long and 7 m wide light-vehicle traffic service road also goes from the mine operations pad to the explosives magazine.

Additional traffic gates could be installed at strategic points to control the circulation for safety issues. They will temporarily prevent traffic from entering the Property or leaving the industrial site. Traffic gates will be closed prior to blasting and standard operating procedures will be developed to sweep the road. Vehicular traffic is to be kept at least 300 m from the pit during blasting or otherwise managed.

All roads and circulation areas are defined based on standard engineering practices, and designed according to the subgrade conditions and the different vehicle load types. Factual geotechnical data indicate that roads and pads will be mainly built over soils composed by silt and sand and, in some areas, over rock outcrops.

18.3.2. Haul Roads

Heavy vehicle ("HV") haul roads will be laid out to provide access to the active pit, the waste rock stockpile area, the ore stockpile laydown pad and the MIA. These are two-way roads, 20 m wide, with a geometry accommodating mining haul trucks.

Light vehicles ("LV") provide access to the pit and ROM dump area and will share the HV haul roads along with the heavy vehicles. Driving and communication standard operating procedures will be developed to manage HV / LV interaction on HV haul roads.

18.3.3. Internal LV Roads and Car parking

Internal LV roads will be constructed prior to the commencement of operations. Two-way LV roads will be constructed with a 7 m wide gravel surface.

One LV car park, for 20 vehicles, will be provided adjacent to the administration building at the mine operations pad.

The explosive magazine storage area will only be accessible via the main hauling road, 770 m after the security gate. It consists of a single-lane road suitable for LV traffic.

18.4. Mine Associated Buildings and Services

18.4.1. Temporary Construction Management Facility

At early stages of the Project, an area of approximately 1 ha should be provided for the establishment of a construction management building and car park. Construction facilities will be a pre-engineered re-locatable type structure with temporary services (tank and pump for potable water delivered from off-site, self-contained wastewater collection facility for pump out and disposal off-site, temporary communications facility and temporary one-phase power line for construction power). Construction contractors for MIA buildings and services will be required to supply similar facilities for their management purposes and workforce requirements. At the completion of construction, these facilities will be reallocated to the operations and any disturbed area should be rehabilitated in accordance with the site environmental requirements.

18.4.2. General Earthworks

The ROM loadout area and mine operations pad (including ancillary buildings and car park) are approximately 0.86 ha and 1.94 ha in size, respectively. The water treatment plant area is approximately 0.74 ha. At the commencement of construction, these areas will be cleared of vegetation and topsoil and graded. Pad peripheral surface water management ditches, where required, will be built. Drain water will be directed to site collection ponds.

All trafficked areas (pads) will be designed with gravel pavements suitable for the foundation soils and the classes of vehicles using them. Sand and gravel backfill will be fabricated from rock excavations performed while building basins BC1 and BC2. This material will be placed and compacted to establish the required mine pads. Similarly, in-situ fabricated sand and gravel material will be used for construction of all site roads.

18.4.3. Administration Facility

The proposed administration building will be located within the mine industrial pad and will be a light construction modular building with steel cladding and roofing. This building will be sized for a workforce of ten persons and will include offices for the limited staff, first aid room, washrooms (M/F), communications and storeroom, dining room, and meeting rooms. The building will be compliant with the relevant Québec and Canadian Building Codes.

A dry room will be annexed to the administration building.

Part of the administration building could be built as part of the early works program and will serve as the construction office during the construction period.

18.4.4. Mine Security and Access Point

A guard house and gate will be erected at the entrance to the mine site, along the main access road. This area could also be the site of the weigh station, which will weigh incoming and outgoing ore transport trucks. The guard house will be a serviced, prefabricated building, similar in construction to a mobile home.

18.4.5. Fuel, Lube and Oil Storage Facility

An external bunded fuel facility is proposed to hold two 50,000 L diesel storage tanks, a 10,000 L gasoline storage tank as well as bulk lubricant and coolant supplies, which will be moved into the maintenance workshop as required. All tanks and piping will be of steel construction. The diesel supply will be fitted with high flow reticulation to the HV refuelling bay and both diesel and gasoline with low flow reticulation to a LV fuel dispenser. These quantities are deemed sufficient for more than a week of supply at peak operations. A dedicated, self-bunded, semi-trailer sized bay will be provided for fuel and bulk lube deliveries. A fuel truck will be used for fuelling track-mounted equipment.

18.5. Water Utilities

18.5.1. Raw Water

Raw water will be untreated and used for washrooms and emergency showers. It is proposed to be supplied either from site-treated effluent or from one or two well(s) located on-site. Raw water will be pumped directly to a reservoir and then distributed to the various buildings for use via underground PVC piping installed below frost depth.

Potable water will be distributed in bottles to the administrative building and the MIA.

18.5.2. Fire Water

Fire water for the mine site will be drawn, initially, from the freshwater tank located on the mine infrastructure pad; if more supply is needed then BC2 basin will be used. The fire water pumping system will consist of both an electric delivery pump, to supply firefighting water to buildings throughout the mine site at the required pressure and flows, and a diesel driven electric start pump that will start in the event that power is unavailable to the electric pump, or it fails to start within a set time of a fire demand being registered. An electric "jockey" pump will be used to maintain pressure in the fire mains. The maximum fire water requirement has been estimated at 268 m^3/h over a 2-hour period, with full replenishment required within 8 h. Water will be supplied to the freshwater tank from BC2 basin.

Fire water will be distributed from the tank to the administrative building and the MIA via underground PVC piping installed below frost depth.

18.5.3. Sewage

Sewage and domestic wastewater generated in the occupied areas of the MIA will be collected in underground PVC piping installed below frost depth and directed to a central collection tank located slightly to the west of the administration building. Effluent from the collection tank will be discharged into a buried disposal field. Solid waste from the collection tank will be collected on a regular basis by a local cartage contractor and disposed of at a local authority sewage treatment farm.

18.6. Electrical Power Supply and Distribution

The expected power demand for is approximately 3 MW. For this amount of power, the local utility company, Hydro-Québec, will deliver the power directly at 600 V.

Hydro-Québec will need to extend an existing 25 kV power line, located a few kilometres away, to the southeast of the site, and perform some upgrades on a portion of the existing line so it can deliver the required three-phase power.

At the Authier site, the 25 kV will be stepped down to 600 V through a pad-mount transformer. For such a 600 V service entrance, Hydro-Québec supplies and installs all that is required at 25 kV as well as the step-down transformer. The Project will provide and install the required civil infrastructures to install the transformer and cabling according to Hydro-Québec requirements.

On-site, near the step-down transformer, a prefabricated electrical room will house the 600 V switchboard which will be the source of all main 600 V feeders to the different site loads: truck shop, water treatment plant, offices, main gate, etc. This switchboard will be sized for more than the original expected power demand to simplify the addition of potential future loads.

The site power distribution will be done mainly using cables in trays or buried underground.

18.7. Communication Utilities

A factored allowance was made in this study for a site-wide communications system. No details have been developed around its components or implementation. Cell phone coverage is available at site.

A site-wide radio system will be installed for the mining operation and emergency response.

18.8. Explosives Magazine

One explosives magazine will be brought on-site by the explosives provider. The magazine will house priming explosives, such as caps and detonating cords. A small amount of explosives and boosters will be delivered direct to site as part of contract mining operations.

The magazine will be strategically located in a fenced and gated area on the southwest corner of the Property to meet provincial and federal explosives regulations. A gravel road from the MIA will be built to access this area. As the proposed main supplier of explosives is near the mine, the magazine capacity will be kept at a minimum.

18.9. General, Green and Regulated Waste

Mine site waste including general, green, and regulated waste will be collected, recycled where applicable and disposed of according to its type.

Domestic and general waste will be disposed of by licensed contractors, most likely at a local authority operated facility. Green waste will be recycled and utilized in regeneration works, where practicable and feasible.

Regulated waste will be disposed of by licensed contractors, as per statutory requirements.

18.10. Offsite Infrastructure

The site will be accessed starting from Road 109, then the Chemin de Preissac and finally the Chemin de la Sablière. A 170 m road will be constructed between Chemin de la Sablière and the entrance of the mine site on Route du Nickel. Route du Nickel will be closed from the entrance of the mine site to the junction of Chemin de Preissac because the road is located within the footprint of the open-pit mine.

18.11. Ore Transportation

The transport analysis was undertaken in 2022 by Craler. The ore will be transported from Authier to NAL by four-axle trucks and four-axle trailers with lateral. The transportation capacity will be 38 t. The use of four-axle trailers will respect the Ministry of Transportation and Sustainable Mobility regulations for transport during the thaw period.

19. MARKET STUDIES AND CONTRACTS

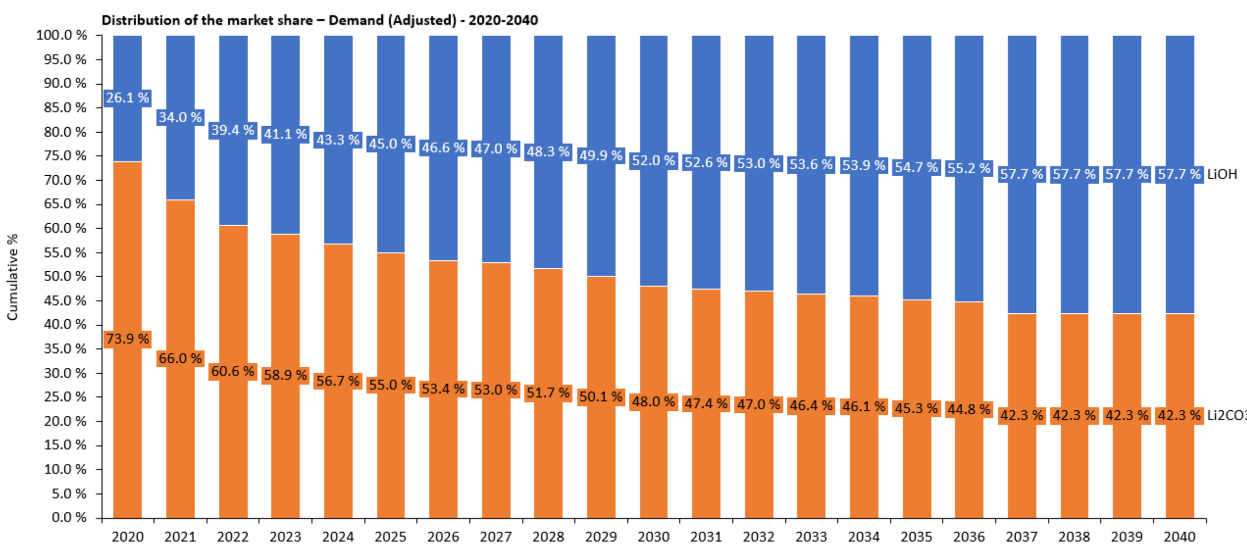
Portions of this section have been adapted from the "Lithium Market Study" prepared by PwC for Sayona dated March 2023.

19.1 Global Demand

19.1.1 Refined Lithium Demand by Product

According to Wood Mackenzie's analysis, changing consumer preferences, government policies facilitating lower emissions as well as EV manufacturers increasing the number of models which provides more options to consumers are the key drivers for this demand growth. Also, recent investments in battery recharge infrastructure support aggressive growth in demand for the different lithium products.

When observing demand for lithium by product, battery-grade lithium hydroxide (LiOH) and battery-grade lithium carbonate (Li_2CO_3) are the two most significant segments based on BMI's forecasts. Lithium hydroxide demand is expected to reach a 58% market share by 2040 compared to 42% for lithium carbonate (Figure 19-1).



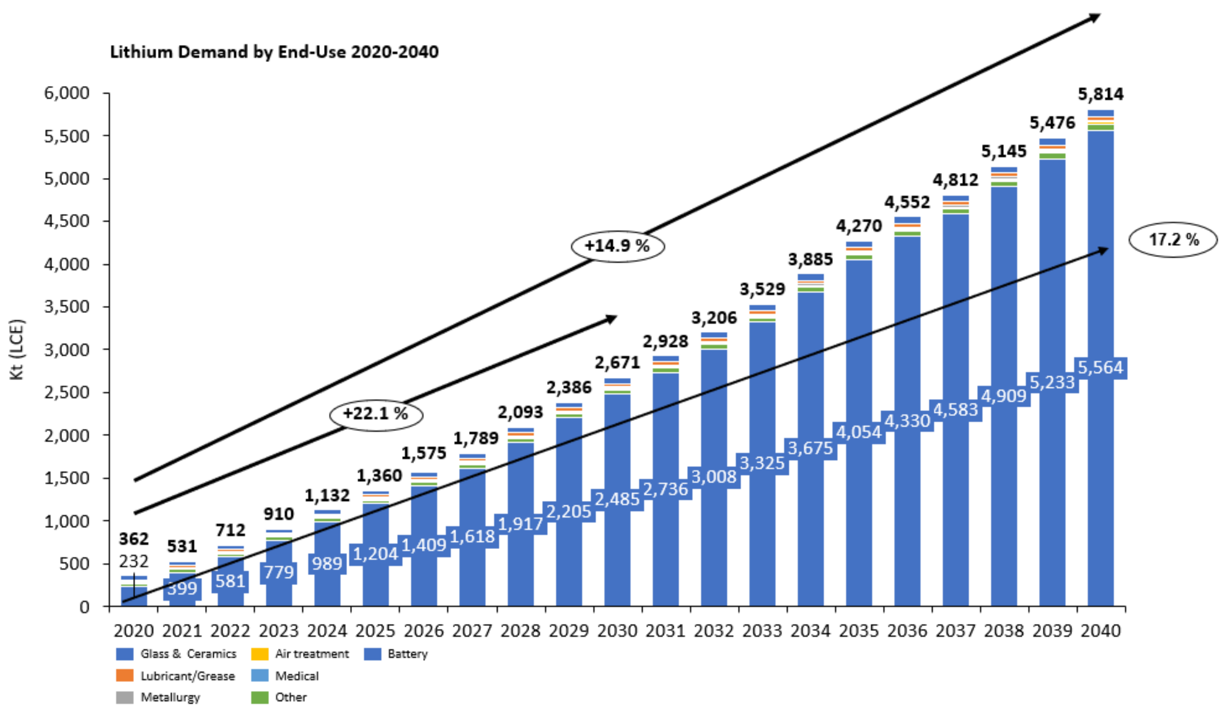
Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-1: Refined demand by product (2020-2040)

19.1.2 Refined Lithium Demand by End Use Segment

According to Benchmark Minerals Intelligence ("BMI"), market demand is expected to reach 5,814 thousand tons (short tons = 2,000 lb/ton) of lithium carbonate equivalent ("LCE") in 2040, which is 17.4 times higher than the demand for lithium in 2020, which was 362 thousand tons (short tons = 2,000 lb/ton) of LCE.

On that basis, aggregate lithium demand will grow at a compound annual growth rate ("CAGR") of 15% from 2020 to 2040. From 2020 to 2030, demand is expected to grow 1.5x faster than 2020-2040, with a CAGR of 22%. The rechargeable battery segment is the most important segment for lithium demand, making up more than 95% of total demand on a 20-year average and growing at a 17% CAGR over the period (Figure 19-2).

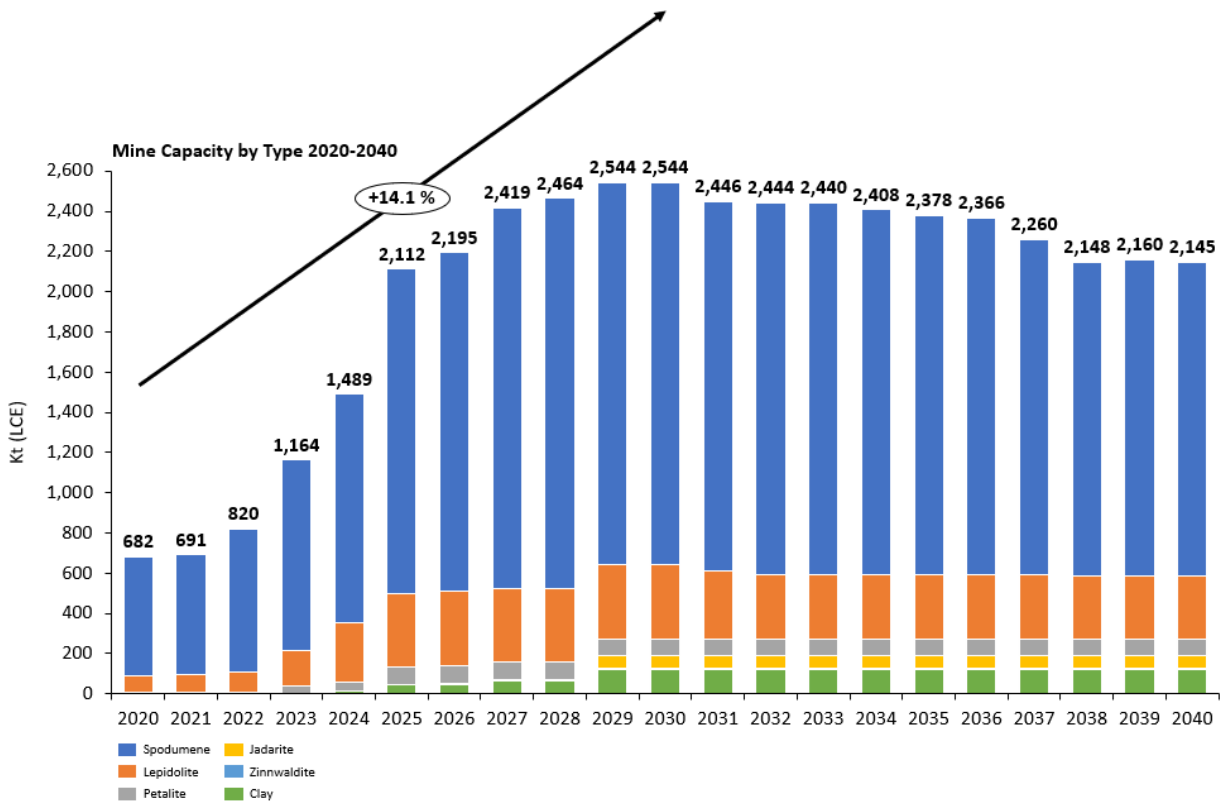


Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-2: Lithium demand by end use (2020-2040)

19.1.3 Type of Ore Processed from Fard Rock to Supply Lithium

According to Wood Mackenzie, the total supply is projected to grow at a CAGR of 14% from 2020 to 2030. Although lepidolite production will increase from 2020 to 2025 and new processes such as jadarite, clay and zinnwaldite will be introduced starting in 2023, spodumene concentrate will remain the dominant mineral concentrate output. Depending on the period, spodumene concentrate is expected to account for 73% to 87% of the total capacity of the mine. Significant exploration, necessary to support the growth of the demand, is underway to identify and then qualify resources and reserves to bring to production over the next years. Successful explorations and entry into service of new mines will be required to meet the growing lithium market demand by 2030, and more substantially by 2040, and replace mine capacity who reach end of life (Figure 19-3).

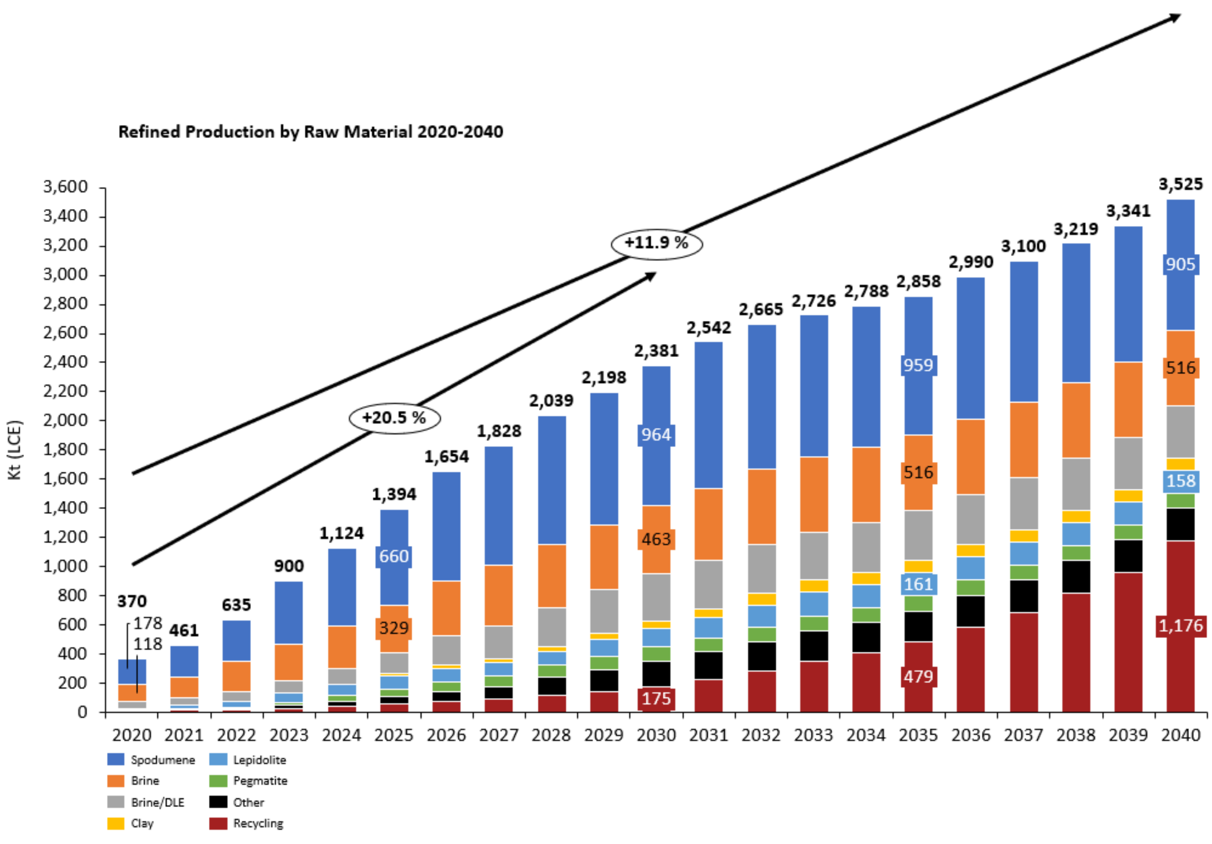


Sources: Wood Mackenzie, PwC Analysis

Figure 19-3: Mine capacity by type (2020-2040) (kt LCE)

19.1.4 Refined Production by Raw Materials

Based on the current spodumene operating plants and advanced projects by BMI, spodumene is projected to remain an important source of raw material from 2020 to 2040, and further projects will be required to meet market demand. From 2020 to 2030, the CAGR of spodumene is projected to grow at an 18% CAGR whereas over refined production is projected to grow at a 20% CAGR, supported strong brine growth and the acceleration of recycled lithium. Even when accounting for the recycled lithium volume, significant growth of refined production capacity is required to meet BMI's projected market demand, particularly from 2030 to 2040 (Figure 19-4).

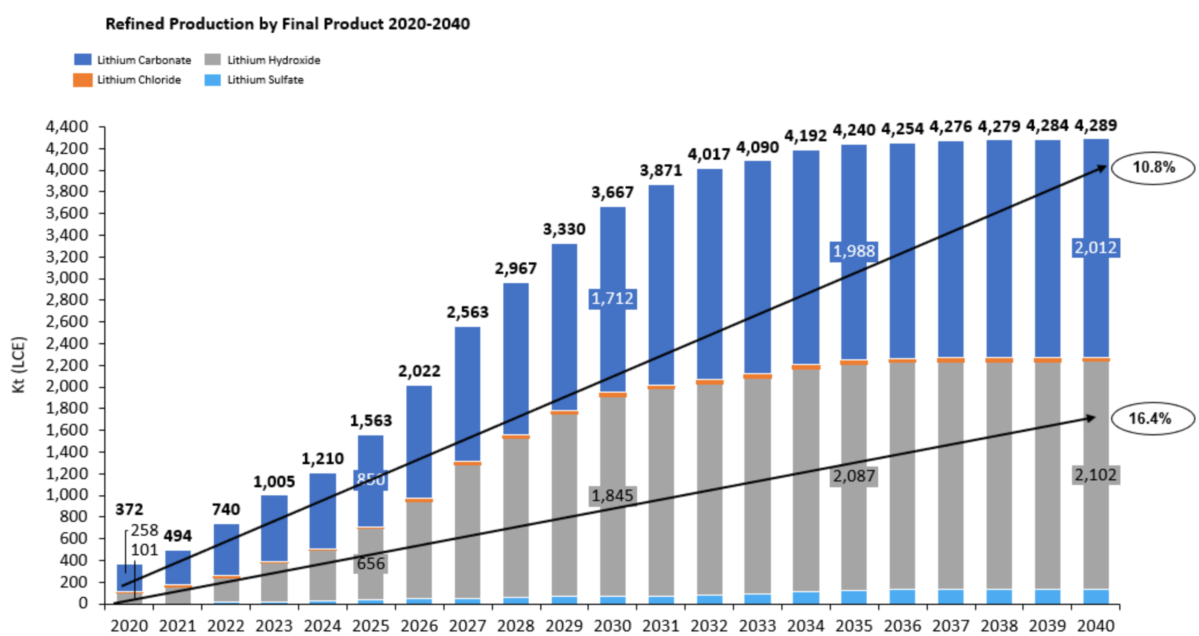


Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-4: Refined production by raw material (2020-2040) (kt LCE)

19.1.5 Refined Production Capacity by Final Product

Lithium carbonate and lithium hydroxide will dominate refined production for lithium products. From 2020 to 2040, lithium hydroxide and lithium carbonate are projected to grow at a CAGR of 16% and 11% respectively. The production, based on the current in production or planned projects per the BMI forecast, are insufficient to meet market demand by 2040 (Figure 19-5).



Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-5: Refined production capacity by product (2020-2040) (kt LCE)

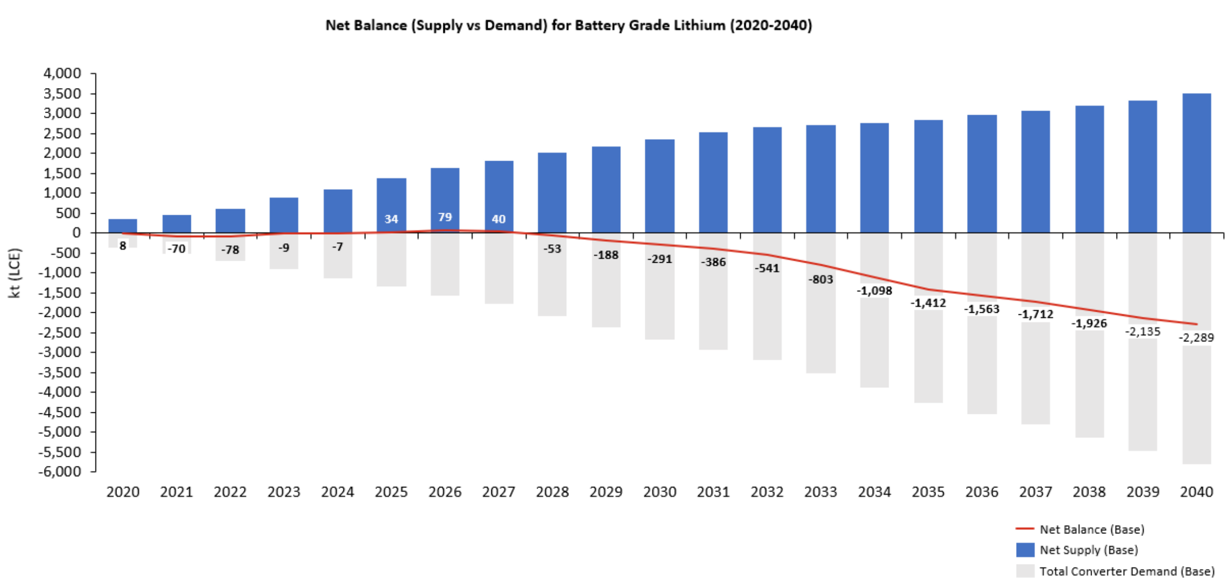
19.2 Market Balance

19.2.1 Market Balance for Battery Grade

According to BMI, the market balance for battery grade lithium chemicals is expected to be in a deficit from 2021 to 2024. From 2025 to 2027, a slight surplus is expected as new production is brought online more rapidly than demand. However, from 2028 to 2040, a growing deficit is projected and is expected to reach 2,289 thousand tons (short tons = 2,000 lb/ton) of LCE in 2040 as demand for electric vehicles ("EV") grows faster than supplier production.

Several new supply projects are expected to start in the next few years. These projects have been discounted based on the current stage of development. For example, an operating facility will be 100% captured in the supply forecast. The scenario includes theoretical brines and conversion projects that have not been discovered as of Q4 2022. In all cases, the lithium chemicals market enters a deficit in 2028, even when including all potential projects forecasted by BMI.

In May 2022, BMI projected that the industry would require more than 42 billion U.S. dollars of investment to meet market demand, a figure that has likely increased since then with the increasing demand projections (Figure 19-6).



Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-6: et balance (supply vs demand) for battery grade lithium (2020-2040)

19.3 Price Forecast

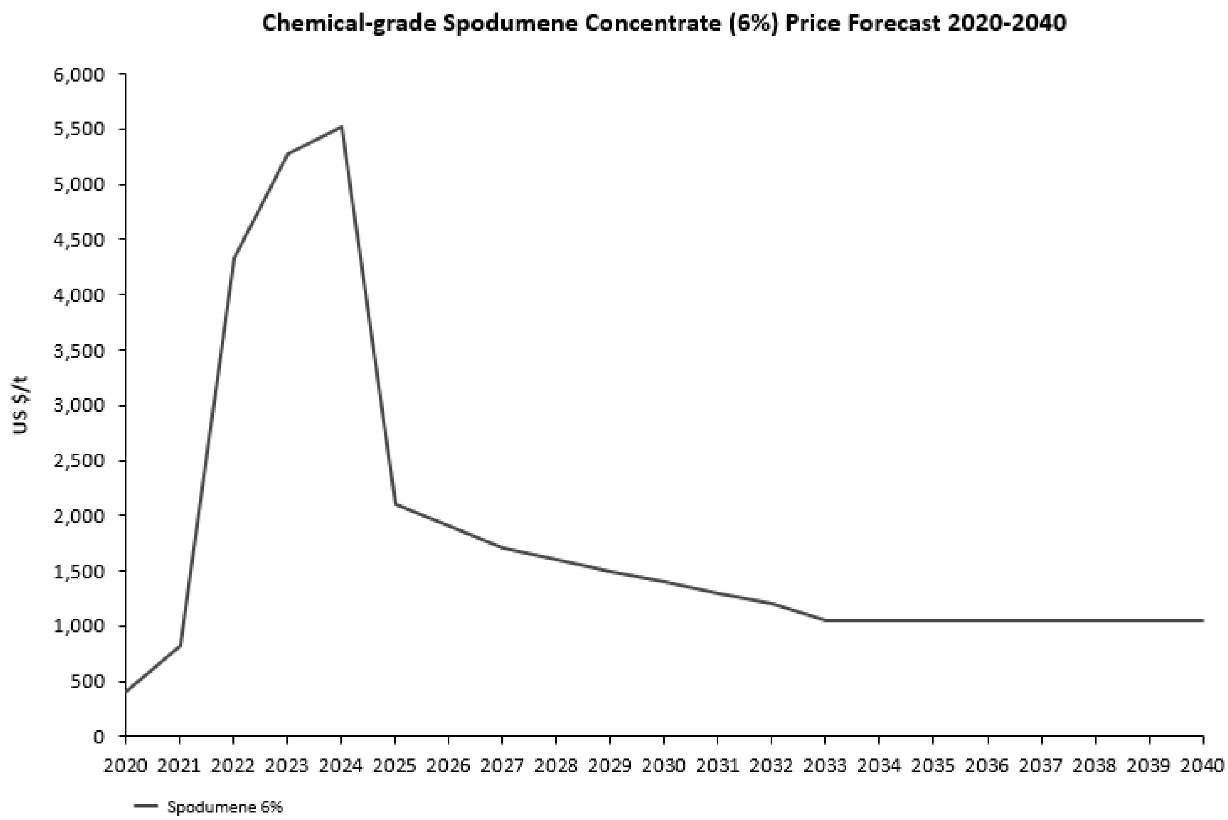
Sales from 2023 to 2026 are based on the greater of 113 kt of spodumene concentrate or 50% of spodumene concentrate sales at the Piedmont Lithium contract price and the remaining concentrate sales at BMI Q4 2022 spodumene market prices. From 2027 onwards, the entire concentrate sales are settled at BMI Q4 2022 spodumene market prices.

For the contracted volume to Piedmont Lithium Inc, a price of 810 USD/t (from the reference of 900 USD/t @ 6.0% Li_2O to adjusted value of 810 USD/t assuming 5.4% Li_2O and applied 10% price discount from 900 USD/T for lower grade) assumed over 2023-26, while the remainder of the concentrate production uses market prices. From 2027 and beyond, Sayona is reverting back to market prices for the entire production as it seeks to pursue a lithium transformation project on-site, leveraging prior investments, in line with its commitments with the Government of Québec related to its acquisition of NAL.

19.3.1 Spodumene Price Forecast

The prices for spodumene concentrate and battery-grade lithium are expected to remain high relative to historic prices, driven mainly by the demand for lithium for EV batteries.

According to BMI, the price of spodumene concentrate (6%) is expected to increase significantly from 2020 to 2024, reaching a peak of 5,525 USD/t. However, by 2026, the market price of spodumene is expected to decrease to below 2,000 USD/t, and gradually stabilize at a long-term price of 1,050 USD/t from 2033 onwards (Figure 19-7).

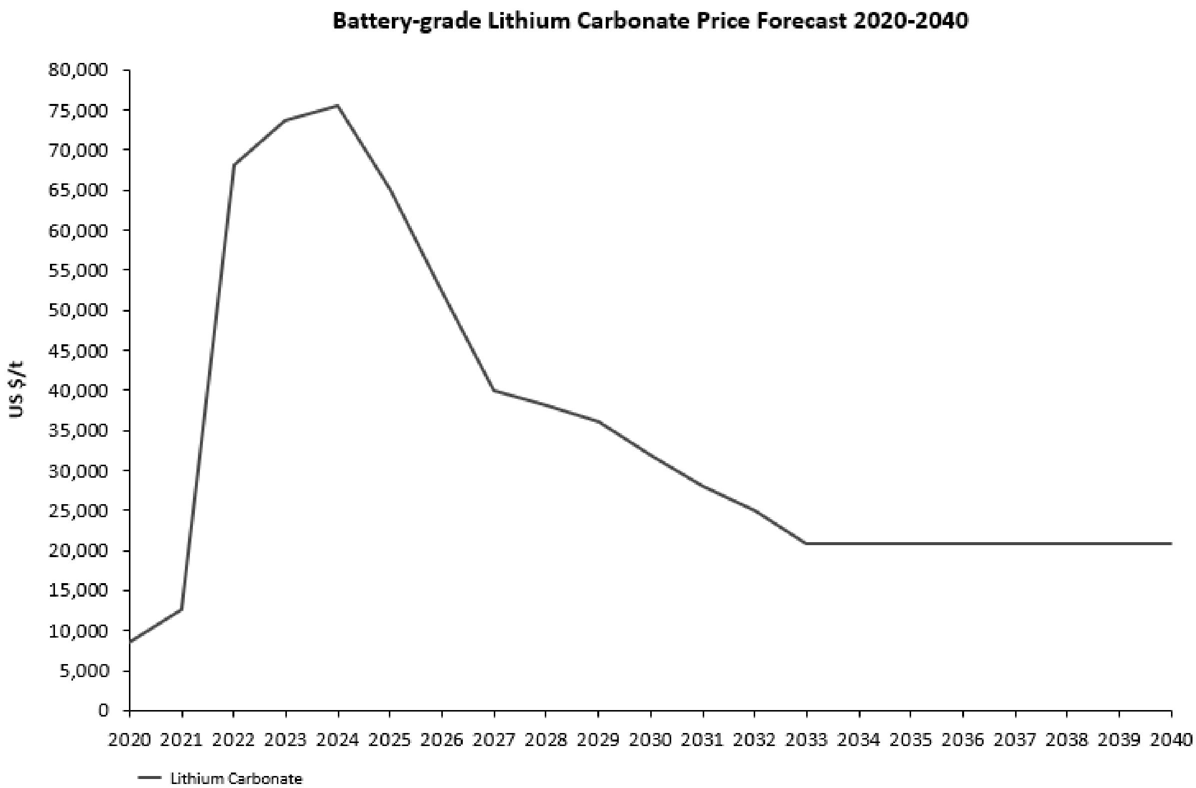


Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-7: Spodumene concentrate price forecast 2020-2040

19.3.2 Carbonate Price Forecast

According to BMI, the price for battery grade carbonate is expected to jump in 2023, driven by the fast growth of the EV industry. BMI price expectations imply a peak of 75,475 USD/t in 2024. After 2025, supply increase is projected to meet market demand, bringing down prices gradually through to 2032. From 2033 onwards, BMI projects an average carbonate price of 20,750 USD/t (Figure 19-8).

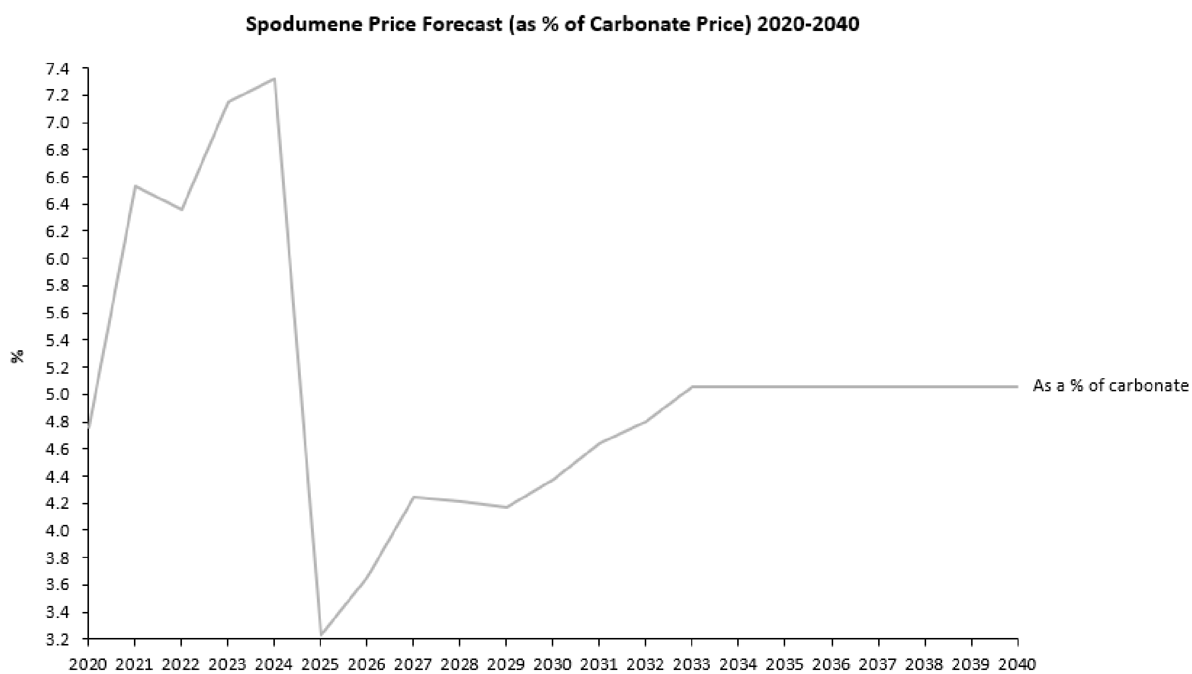


Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-8: Battery-grade lithium carbonate price forecast 2022-2040

19.3.3 Spodumene Price forecast – Relatively to carbonate price

When we analyse the variations in price for spodumene (6%) as a percentage of lithium carbonate, prices are observed to vary from 3.1% to 7.3% depending on the period. According to BMI, the price of spodumene is expected to ratio against lithium products in 2024. In the long-term, BMI projects the spodumene to lithium ratio to stabilize between 4% to 5% (Figure 19-9).



Sources: Lithium-Price-Forecast-Q4-2022-Benchmark-Mineral-Intelligence, PwC Analysis

Figure 19-9: Spodumene price forecast (as % of carbonate price) 2020-2040

19.4 Sales and Marketing Contracts

A memorandum of understanding ("MOU") was developed between Authier and NAL, whereby NAL agrees to buy 100% of the Authier ore material at a selling price of CAD120/tonne of ore, delivered to the NAL ore pad area. The MOU was developed based on a lithium grade of 0.80% Li_2O to 1.15% Li_2O.

20. ENVIRONMENTAL STUDIES, PERMITTING AND SOCIAL OR COMMUNITY IMPACT

20.1. Environmental and Social Studies

Environmental baseline studies including literature review, field works and laboratory analysis were conducted in 2012, and from 2017 to 2022. A summary of the results will be presented in the following sections.

20.1.1. Topography

The topography of the Authier Property is relatively flat. The average elevation is 350 m, varying from 320 m to 390 m. On a regional scale, the crest of the Esker of St-Mathieu-Berry overhangs the surrounding ground by approximately 50 m to 60 m, with a general down slope in a north direction except for its southern extension, just north of the mining property, which has a down slope in a south, southwest and southeast direction.

20.1.2. Local Geomorphology

The three main geological features are small and large bedrock outcrops, the Esker of St-Mathieu-Berry and glacial lacustrine sediments. Outcrops represent approximately 5% of the area. However, over this, the bedrock is only covered by a thin layer of soil in one third of the Northern claims.

The Esker of St-Mathieu-Berry is made up of glaciofluvial sand and gravel with a core of gravel and pebbles, deposited directly over the bedrock. It has a cross-section form of a bell and of a longitudinal crest extending over 25 km on a south-to-north orientation, with its southern limit starting in the northeast corner of the Property. The crest of the Esker of St-Mathieu-Berry overhangs the surrounding ground by 20 m to 30 m. Sand and gravel pits are exploited both in the northern and in the southern portions of the esker. The thick basal till, observed in the southwest corner of the Property, is described as continuous with an average thickness over 1 m and a content of less than 30% of fine particles (silt and clay).

A total of ten water wells are located in a radius of 5 km from the centre of the ultimate and the closest well is located at 3 km. The overburden thickness varies regionally (radius of 5 km) with an average of 8.8 m (Richelieu Hydrogéologie, 2018).

20.1.3. Soils Quality

Soils quality studies were carried out in 2017, 2018 and 2019. All samples did not show indication of potential contamination on the Property for polycyclic aromatic hydrocarbon ("PAH"), hydrocarbons, and metals.

20.1.4. Hydrology

The Authier Project is close to the water division of two important watersheds that divide the province of Québec: the Harricana River which reports to James Bay, and the Kinojevis River which reports to the St-Lawrence River. The Authier Project is located in the Kinojevis watershed. The Authier Property is located on Kapitagama Lake sub-watershed and Croteau Lake sub-watershed. There are no significant bodies of water or streams close to the future mine site, other than small streams and ponds.

20.1.5. Hydrogeology

A hydrogeological study, conducted by Richelieu Hydrogéologie Inc., started in December 2016 and currently includes the installation of 27 observation wells (piezometers), groundwater sampling campaigns, the achievement of variable head permeability tests and tracer profile testing as well as groundwater level surveys.

The hydrostratigraphic units identified at the Authier Property are the following:

- Bedrock, a regional aquifer of a standard to low permeability;
- Glacial till, an aquitard discontinuously covering the bedrock;
- Fluvio-glacial sand and gravel (esker), a highly permeable aquifer, covering the till;
- Glacio-lacustrine sand (aquifer) and silt (aquitard), covering the till unit and, partly, the fluvioglacial unit; and
- Organic layer, a thin and discontinuous aquitard.

Following the water level surveys that were done for all piezometers installed on the site property, the following observations could be made: the groundwater level in the area of the Property is in the order of 329 m and the general direction of flow is towards the southwest under a horizontal hydraulic gradient of 0.02.

During the mine life, the groundwater flow, from beneath the waste rock pile, will be directed towards the pit then, at natural flow, it will be directed towards the southwest. Water will be collected by the drainage ditch surrounding the waste rock pile and directed to the water basins.

The effects of mine dewatering on residential wells are deemed negligible. The effect of the Project on the environment would be, in the worst-case scenario, a reduced groundwater outflow to the local surface water network and to the wetlands. A reduced flow of brooks or drying of wetlands could then occur into the area of influence.

The southern part of the St-Mathieu-Berry Esker is enclosed into the area of influence of the mine. However, this part of the esker is not connected to the main part of the esker which is being tapped by the drinking facilities of the city of Amos and also by the Eska water bottling society. Both portions of the esker are separated by a bedrock lump.

In the esker, the groundwater generally flows towards the north, except in the Project area where it is heading south and southeast and to the Harricana River watershed. The southern portion of the esker, located in the Project area, is in a different watershed than the remainder of the esker. However, because it is located at a lower altitude than the esker and isolated from it by a bedrock, the Authier Project will not threaten, in any way and under any circumstances, the water quality of this esker.

20.1.6. Underground Water Quality

From 2017 to 2022, 14 to 27 wells were sampled. Samples collected were analyzed for a variety of parameters including metals, nutrients, major anions and cations, volatile compounds, polycyclic aromatic hydrocarbons and C_{10}-C_{50} petroleum hydrocarbons. Some aluminum, manganese and mercury concentrations exceeded drinking water standards. Criteria for the protection of aquatic life were also exceeded for copper, mercury and zinc.

20.1.7. Surface Water Quality

Surface water was sampled in 2017, 2018 and 2019. Sampling of the surface water was conducted in five locations, i.e., four stations in the core study area and one outside the extended study area, along the mainstream draining the core study area. Some exceedances of criteria for protection of aquatic life were observed for aluminum, iron, copper, manganese, lead and nickel.

20.1.8. Sediments

Sedimentation characterization was carried out in 2018 and 2019. Some exceedances of sediments quality criteria were observed for arsenic and chromium.

20.1.9. Vegetation and Wetlands

Field surveys were carried out in 2012, 2017 and 2019. Terrestrial vegetation consists mainly of mixed and coniferous forest stands. Hardwood stands are scarce. Together, forest areas cover more than 80% of the study area. It should be noted that a significant portion of the study area has been totally or partially cut.

Stands of fir and white spruce, mixed with white birch, dominate the forest landscape of the site. Other sites are occupied by black spruce, jack pine and larch, often in the company of white birch or trembling aspen.

Wetlands were characterized in 2017, 2018 and 2019. Bogs and swamps are the main wetland classes characterized during the field surveys. Only a few bogs were located near the Project area. These bogs did not reveal any major particularities. Some low ecological value wetlands are located inside the limit of the open-pit and the waste rock dump areas.

20.1.10. Terrestrial and Avian Fauna

Field inventory for snakes, salamanders and anurans was carried out in 2017 and 2018. Bird surveys were conducted in 2017 and 2019. A bat inventory was also completed in 2017. Finally, a small mammal and rodent inventory was conducted in 2017.

No herpetofauna and no small mammal species at risk were observed. Three of the four bat species observed are at risk and are described hereafter. A total of 66 bird species were observed during the inventories. Nesting was confirmed for two species (Sharp-tailed Grouse and Cedar Waxwing). Species at risk observed are described hereafter.

20.1.11. Fish and Fish Habitat

Fish and fish habitats surveys were carried out in 2017 and 2019 on nine streams. Fish habitats have been observed for streams located at the open-pit location, downstream from the open-pit location, northwest of the waste rock dump location and downstream from the expected effluent discharge point. Results indicated that spawning and nursery/foraging habitats are of low quality in streams of the core study area due to, among other things, physicochemical conditions. Only one fish species was captured (i.e., Brook Stickleback).

20.1.12. Benthic Community

The benthic community of the different stations sampled in 2012 is mostly composed of nematodes, annelids, insect larvae and mollusks. Results are showing between four and 34 different species with a variation of the number following the sampling stations.

20.1.13. Endangered Wildlife

The *Centre de Données sur le Patrimoine Naturel du Québec* ("CDPNQ") and Committee on the Status of Endangered Wildlife in Canada ("COSEWIC") databases were consulted to identify any endangered species potentially present on the Property. It is important to mention that the absence of a species from a database or a field survey does not mean that the species is absent from the area of interest.

Three at risk bat species were observed in the study area. The Hoary and Silver-haired bats are likely to be designated threatened or vulnerable in Québec (MFFP, 2019). They have no status at the federal level. The Little Brown bat is considered endangered and is listed in Appendix 1 of the Species at Risk Act in Canada.

20.1.14. Population

The Authier Project site is located in La Motte, in the administrative region of Abitibi-Témiscamingue. The Property is accessible by a rural road network (Preissac Road and Nickel Road) connecting to Route 109, located a few kilometres east of the site (approximately 5 km). Route 109 connects Rivière-Héva with Amos, then Matagami; then joins Route 117 at Rivière-Héva. The Project is located approximately 35 km south of the Abitibiwinni Community of Pikogan.

The Abitibiwinni (Community of Pikogan) are the Algonquins of northern Abitibi. Today, Abitibiwinni is one of nine Algonquin communities in Québec. The community of residence of Abitibiwinni is known as Pikogan, a reserve established in 1956, 3 km north of the city of Amos.

The Authier Project mine area is at the heart of the ancestral Abitibiwinni Aki territory, which the Abitibiwinni has never yielded. Community members continue to frequent this territory, including traditional hunting, fishing and picking activities. The community lives approximately 35 km north of the Authier Project mine site and 3 km north of Amos, on the west bank of the Harricana River. Municipalities near the Authier Project site include: La Motte, Saint-Mathieu d'Harricana, Rivière-Héva, Preissac, and Amos.

20.1.15. Stakeholder Mapping

Stakeholder identification was completed in 2017 using a mapping of the study area and a series of interviews with community stakeholders. The Project is located on the territory of the municipality of La Motte and on the territory recognized in the agreement signed between the Government of Québec and the Abitibiwinni First Nation. Thus, these two communities were targeted first for information and consultation meetings. The list of stakeholders was then completed by identifying the individuals or groups that could be directly or indirectly affected by the Authier Project.

The main Community/Regional Stakeholders (non-exhaustive list) are as follows:

- Abitibiwinni First Nation;
- Municipality of La Motte;
- Municipality of Saint-Mathieu-d'Harricana;
- City of Amos;
- Municipality of Rivière-Héva;
- Municipality of Preissac;
- Municipality of Saint-Marc-de-Figuery;
- Regional County Municipality of Abitibi;
- Comité citoyen pour le développement durable de La Motte;
- Société de l'eau souterraine d'Abitibi-Témiscamingue (SESAT);
- Groupe de recherche sur l'eau souterraine (GRES UQAT);
- Organisme de bassin versant du Témiscamingue (OBVT);
- Organisme de bassin versant Abitibi-Jamésie (OBVAJ);
- Eska Inc.

20.1.16. Land Uses

The proposed mine site is entirely located on a forestry sector of public tenure which is not regulated by agreement. The main authorized uses for this forested area are production and harvesting of trees, outdoor activities and agriculture.

In the Project area, the activities found are as follows:

- Lumbering;
- Mining activities;
- Exploitation of eskers and moraines;

- Agricultural production;
- Recreational (trails, campsites, ski resorts, etc.) and residential activities (residences, motels, cottages);
- Ecological reserves; and
- Hunting, fishing and trapping activities.

20.2. Decarbonization Plan

According to numerous scientists, to avoid the worst effects of climate change, global temperature rise must be limited to 1.5°C above pre-industrial levels. To tackle the issue, world leaders at the UN Climate Change Conference (COP21) signed the historic Paris agreement. One of its goals is to reduce global greenhouse gas emissions to limit the global temperature increase in this century to 2°C while pursuing efforts to limit the increase further to 1.5°C.

To align with the Paris agreement objectives, different governments are making commitments to reduce their country's greenhouse gas ("GHG") emissions. In Canada, the Net-Zero Emissions Accountability Act (2021), enshrines in legislation Canada's commitment to achieve net-zero emissions by 2050. For its part, the Québec government committed itself to reducing by 37.5% by 2030 its GHG emissions in relation to the 1990 level.

In a February 2023 report, governmental agency *Statistiques Canada* calculated that the mining sector in the province of Québec was responsible for 2.6% of the direct GHG emissions of the province (Statistiques Canada, 2021). Incidentally, many mining companies are stepping up to lower their emissions on a path towards carbon neutrality. As such, Sayona is engaged to play a role in global GHG emission reduction by extracting battery material that supports the transition to a low carbon energy economy and fight against climate change (United Nations, 2020) while respecting the environment by aiming a low carbon footprint of its activities and applying best practices.

With that in mind, the Company started developing a decarbonization plan for the Authier Lithium Project. The first steps of the plan's development consisted in research and workshop sessions, which resulted in a preliminary roadmap identifying strategies for reducing the Project's GHG emissions.

As the technologies develop regarding GHG emissions reduction, the Company's decarbonization plan will evolve and the related strategies will be adjusted.

20.2.1. Strategy

A preliminary GHG emission level assessment over the life of the Authier Project showed that nearly 80% of the Project's GHG emissions came from mining operations as well as ore transportation. In order to reduce its environmental impact by reducing its GHG emissions, the Project's decarbonization plan will address primarily those two emission factors.

It will focus on two initial approaches:

1. Deploying innovative technologies to reduce GHG emissions produced by vehicles.
2. Compensating for difficult-to-reduce emissions by investing in GHG offsets.

Innovative Technologies

Sayona will aim at implementing innovative technologies to reduce the GHG emissions for the Authier Project resulting from the Project related vehicles, both for the mining operation and the ore transportation.

Three specific initiatives will be studied as part of the company's decarbonization plan:

- **Alternative fuels**: Operating conventional vehicles with renewable diesel sourced through the local supply chain; Retrofitting vehicles to run on renewable natural gas RNG; Collaborating with an original equipment manufacturer (OEM) and hydrogen producer for a proof of concept.
- **Electrification**: Deploying battery powered trucks for ore transportation to LAN; Evaluating the best option to electrify mine operation with a mix of battery, trolley and plug-in equipment.
- **Vehicle design**: Working with an OEM to design more energy efficient equipment; Transitioning to an equipment fleet with structurally different energy consumption profile.

Sayona is looking at the different readily available 100% electric transportation truck and related infrastructures to implement a trial period.

GHG Emissions Compensation

Because a complete reduction of the Authier Project's GHG emission can not be foreseen with the current technology maturity, compensation investments will be considered in the decarbonization plan.

There are two compensation efforts that will be evaluated:

- **Indirect compensation**: Purchasing carbon credits from accredited/recognized organizations, with an emphasis on Québec based organizations; Invest in a local GHG reduction initiative. **Direct compensation**: Restoring natural habitats, such as wetland, impacted by previous mining activities or other with a high sequestration potential; Creating and running a tree planting program with a focus on the Abitibi region.

For Sayona, the decarbonization plan will be an opportunity for unifying venture for its team, its suppliers and its stakeholders going forward.

20.3. Impacts and Mitigation Measures

The Project will create temporary and permanent modifications to the mine site. During the environmental assessment process, project activities, that may directly or indirectly affect the environmental (physical and biological) and social (human) components, have been identified. These activities could be conducted during one or all of the three phases of the Project: construction, operation and closure (and restoration).

20.3.1. Air Quality

Air emission modelling has been conducted in 2022 and Sayona Québec ("Sayona") will put in place a dust management plan to limit most of the possible nuisance. Sayona will establish various mitigation measures, such as use of water to control dust on mining site roads and all gravel roads used for ore transportation to the North American Lithium ("NAL"), site as well as progressive revegetation of the waste rock pile.

Moreover, Sayona will implement a complaint management protocol to allow citizens to express their concerns if the mining activities generate dissatisfaction.

20.3.2. Noise

A noise modelling for the mining site was carried out in 2019 and updated in 2022. Given the size and remoteness of the Authier site, the soundscape should not be impacted and the citizens should remain unbothered. However, the soundscape will be locally altered and may disturb some territory users.

A noise modelling has also been produced in 2022 for the ore transportation to the NAL site. The study showed that with all mitigation measures in place the impact will be negligible.

In order to limit noise, Sayona will implement various mitigation measures, such as blasting activities prohibited during evenings, weekends and at night, as well as no ore transportation on weekends and speed reduction on the small portion of the Route du Lithium.

20.3.3. Soils

On-site activities may affect soil quality. Sayona will implement a procedure in the event of an oil, hazardous waste or hazardous material spill and carry out employee training.

20.3.4. Hydrology

Water flows will be affected by mining operations. Therefore, the Project has been designed so that it has the smallest possible footprint and to avoid, as much as possible, any infringement on permanent watercourse.

20.3.5. Surface Water Quality

To reduce unwanted effects on surface waters, Sayona will establish various mitigation measures including use of emulsion type explosives, placement of a geomembrane under the waste rock pile, the ditches and the water basins and installation of a treatment system capable of ensuring the discharge of effluents respecting Directive 019 norms and Metal and Diamond Mining Effluent Regulations ("MDMER") norms, as well as aiming to respect, as far as possible, the Effluent Discharge Objectives that will be fixed by the *Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs* ("MELCCFP"; formerly MELCC).

By applying all these mitigation measures, the water that will be discharged into the natural environment is expected to be harm-free for the environment.

20.3.6. Hydrogeology and Underground Water Quality

Dewatering the pit will cause localized groundwater drawdown during the mine operation period. This drawdown will not affect any water users, therefore no mitigation measures are required for this potential issue. However, a geomembrane will be installed under the waste rock pile, the ditches and the water basins in order to protect groundwater quality.

20.3.7. Terrestrial Vegetation

In order to reduce negative effects of activities on the terrestrial vegetation, Sayona will establish various mitigation measures, such as adequate delimitation of construction areas to minimize the size of terrestrial vegetation affected, revegetation of affected construction areas with indigenous species after the work is completed and progressive reclamation of the waste rock pile.

20.3.8. Wetlands

In order to reduce negative effects of activities on wetlands, Sayona will implement various mitigation measures, such as adequate delimitation of construction areas to minimize the wetlands surface affected and installation of culverts in areas where a road crosses wetlands to ensure that surface water circulates freely.

Finally, a compensation plan has been developed to offset losses of wetlands under the Act respecting the conservation of wetlands and bodies of water.

20.3.9. Ichthyofauna

In order to reduce negative effects of activities on ichthyofauna, Sayona will establish various mitigation measures, such as adequate delimitation of construction areas to minimize the fish habitats affected, location of infrastructure outside fish habitats where feasible, conservation of a riparian strip with a width of at least 30 m will be preserved on the banks of watercourses and waterbodies and treatment of potentially contaminated waters, if needed, before being sent back into the aquatic environment.

20.3.10. Species of Interest

Sayona will implement numerous mitigation measures in order to protect herpetofauna, chiropterofauna, avifauna and small mammals. Those mitigation measures will reduce negative effects of activities on species of interest according to their taxonomic group.

20.3.11. Cultural and Archaeological Heritage

No mitigation measures or specific maximization is planned for the cultural and archaeological heritage, except if, during mining activities, a cultural or archaeological site is discovered. In this case, the managers will have to report it to the site supervisor and, if necessary, work will cease at this site until an evaluation is completed by archaeologists. The public will be informed.

20.4. Monitoring Program

During the mine site future operations, a monitoring program will be implemented with some instrumentation (e.g., groundwater monitoring wells, surface water monitoring stations, etc.). The environmental monitoring program aims to ensure compliance with the environmental laws and regulations, conditions of the various permits and commitments that Sayona has made during the various meetings with stakeholders and public consultations. The monitoring program will be used to continue the environmental monitoring of the site after its rehabilitation and closure.

20.4.1. Groundwater Monitoring

Piezometers are already installed on the site and monitoring of groundwater quality has been done since 2017. Some piezometers are equipped with water level probes and measurements are done continuously. This monitoring will continue during construction, operation and after the closure of the site. Piezometers will be added before construction outside the affected areas, as many of the piezometers currently installed will have to be destroyed (i.e., footprint of the open-pit or the waste rock dump).

20.4.2. Effluent Monitoring

The monitoring of the final effluent will comply with the requirements of Directive 019 on the mining industry and the requirements of the Metal and Diamond Mining Effluent Regulation. Monitoring will be carried out as soon as the final effluent is discharged and will continue for five years after closure.

20.4.3. Environmental Effects Monitoring Program

Only the federal government requires monitoring of the biological environment, which is a requirement of the Metal and Diamond Mining Effluent Regulation (“MMER”). The Metal Mining Environmental Effects Monitoring Program includes characterization of effluents (including toxicity testing), and receiving environment (fish, fish tissues, benthos, sediments).

20.5. Waste Rock, Ore and Water Management

Waste rock, ore and water management are presented in Chapter 18 (Project Infrastructure). Only geochemical characterizations and their results are presented hereafter. Geochemical studies allow the classification of waste rock, ore and tailings according to provincial authority’s regulations standard for acid rock drainage potential (“ARD”) and metal leaching potential and identify any chemical that could potentially affect the surface or groundwater quality.

20.5.1. Preliminary Geochemical Characterization

Sayona conducted a preliminary geochemical characterization study of ore, waste rock and tailings samples in 2017 (Lamont, 2017). A total of three ore samples and 52 waste rock samples were collected and tested. These samples were selected based on geological cross-sections through the Deposit in order to select samples that will represent the vertical and spatial variability of the lithological rock units. A total of two samples of concentrator tailings have also been tested. Samples were collected from metallurgical testing and are representative of the final tailings.

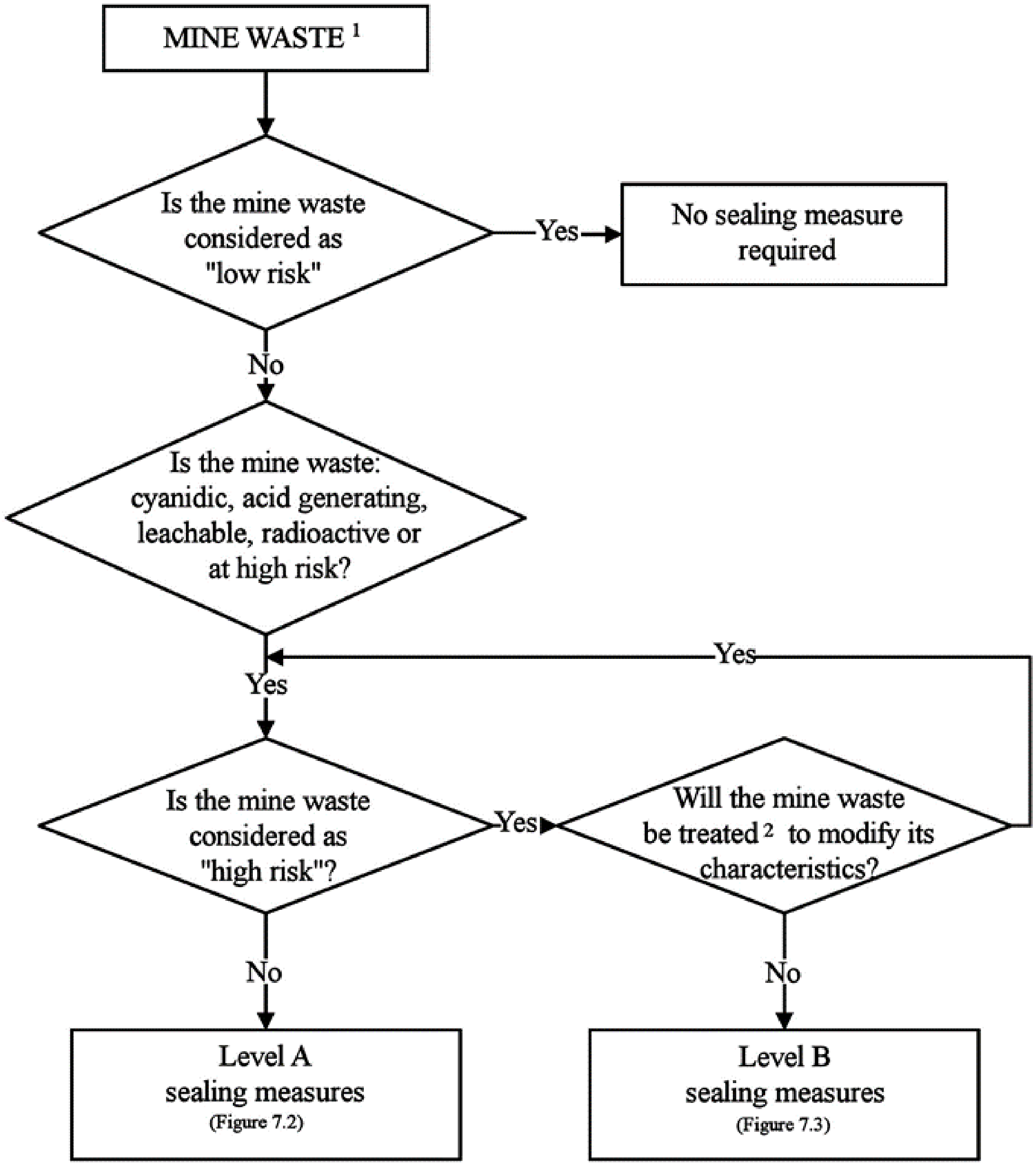
The main conclusions of the preliminary geochemical characterization were:

- All waste rock types, ore and tailings are not potentially ARD generating;
- Ore and tailings are not "leachable" as per Directive 019 classification;
- Main waste rock lithologies are "leachable" as per Directive 019 classification. Metal leaching is especially important for nickel.

20.5.2. Kinetic Geochemical Characterization

Kinetic testing was carried out by CTRI in 2019-2020. Kinetic testings have been carried out on four composite samples using humidity cells, columns and on-field barrels procedures.

The kinetic tests, especially the barrels, showed that waste rock are not ARD but nickel leaching is significant. Storage of leachable mining residues (including waste rock) require Level A sealing measures (e.g., geomembrane) for the protection of groundwater (Figure 20-1).



[1] Mine waste: includes both the tailings and the waste rock (as per Appendix II of the Directive).

[2] Treatment: process aiming at reducing the hazardousness of the mine waste.

Figure 20-1: Decision flowsheet to determine the level of required protective measures (translation of Figure 2.3 of Directive 019, March 2012 version)

20.5.3. Complementary Geochemical Studies

In order to document the feasibility of segregation of waste rock as "leachable" and "non-leachable", various studies have been carried out:

- Analysis of 611 waste rock samples for total metals and sulfur contents;
- 3 D modelling of the nickel and sulfur distribution in the orebody;
- Comprehensive mineralogical studies of ten samples with different characteristics (nickel content, sulfur content, etc.) targeting nickel speciation;
- Static leaching tests on comprehensive mineralogical samples.

The main conclusion of these studies was that segregation is not possible because:

- Nickel and sulfur in significant contents are not located in specific zones of the orebody;
- Nickel is contained in both silicates and sulfides;
- No relation has been observed between nickel leaching rates and nickel contents or sulfur contents.

20.5.4. Prediction of Water Quality

Based on results from preliminary geochemical study and kinetic testing geochemical study, (MDAG, 2021) has produced a modelling of the quality of the water percolating through the waste rock pile and the water from open-pit dewatering. The predicted values will be used for design of the wastewater treatment installations.

20.6. Permitting Requirements

20.6.1. Provincial Requirements

In accordance with Québec's Mining Act and Environmental Quality Act, permits are required in order to build and operate the mine. A mining lease is required from the *Ministère des Ressources naturelles et des Forêts* ("MRNF") (formerly MERN).

From a Federal point of view, no Environmental Impact Assessment ("EIA") is required as long as none of the physical activities (SOR/2012-147) would trigger the federal process.

Furthermore, some other permit and authorization will be required in connection with the mining activities.

20.6.1.1. Mining Lease

The mining lease is required to extract ore under the Mining Act. The application must be accompanied by, among other things, an approved closure and rehabilitation plan and a scoping and market study on processing in Québec.

The deliverance of the mining lease is conditional on obtaining the approbation of the closure plan. According to the Quality Environmental Act a certificate of authorization is also required for construction and operation of the mine. A public consultation must also be part of the legal obligation and should last at least two months and include public open doors in the municipality where the Project is located.

20.6.1.2. Certificate of Authorization (Governmental Decree)

The global certificate of authorization frames the environmental component of the Project, in respect to the Regulation respecting the environmental assessment and review of certain projects (CQLR, cQ2, r23.1). The projects listed in Schedule 1 are subject to the environmental impact assessment and review procedure under the Environment Quality Act (article 31.1). Therefore, Schedule 1 includes the establishment of a mine whose maximum daily capacity is equal to or greater than 2,000 metric tons.

In 2018, a project notification was sent to the MELCC for an 1,850-tpd project. Due to the nature of the Project, and potential environmental issues, the MELCC has decided to use his discretionary power to make the Project subjected to the environmental assessment and review procedure.

In May 2019, Sayona sent a revised Project notification for a 2,600-tpd project. In June 2019, the MELCC issued Guidelines for the EIA study of the Project. In January 2020, Sayona issued the EIA study. At the end of March 2020, the MELCC sent Sayona a first list of questions and commentaries. In December 2020, Sayona provided the MELCC with responses to the questions. In February 2021, the MELCC sent a second list of questions and commentaries to Sayona.

In August 2021, Sayona acquired the NAL site. This site has operated between 2013 and 2018. In addition to the mine, a spodumene concentrator and a lithium carbonate hydrometallurgical NAL site are present at this site. Therefore, Sayona has decided to modify the Authier Project in order the transport the ore to the NAL site for processing.

At the end of 2021, Sayona advised the MELCC that the Project has been modified in order to extract the ore at a 1,480-tpd rate for an extended life of mine ("LOM") of 22 years. Mixing of NAL and Authier ores increase the overall lithium recovery.

In November 2022, Sayona notified the MELCCFP that the company would like the Authier project to remain under the provincial environmental authorization procedure (BAPE) even if the production rate is lower than regulatory trigger. In November 2022, Sayona sent a new Project Notice to MELCCFP. In February 2023, MELCCFP notified Sayona that the Authier Lithium Project will be subjected to the BAPE procedure.

In terms of social acceptability of the Authier Lithium Project and relations with stakeholders, Sayona has put in place a monitoring committee in accordance with the Mining Law and discussions are underway for the establishment of an Impact and Benefit Agreement with Abitibiwinni (Pikogan) and Lac Simon First Nations. In the coming months, several initiatives are planned to maximize socioeconomic benefits for all stakeholders.

A revised ESIA will be produced in 2023. Following obtainment of the Governmental Decree, Sayona will have to obtain various permits for construction and operation of the mine.

20.6.1.3. Permits from MELCCFP Regional Office

Following obtainment of the Governmental Decree, permits (ministerial authorization) will have to be delivered by the MELCCFP regional office.

20.6.2. Federal Requirements

As per the Impact Assessment Act and the Physical Activities Regulations, a project is subject to the federal environmental impact assessment procedure if the mining or milling rates exceed 5,000 tpd. Therefore, the Authier Project is not subject to the federal procedure.

20.6.3. Other Authorizations

Other permits or leases will have to be obtained depending on planned development activities at the site. Also, depending on RCM or municipal legislation, some permits may also be required from the RCM or the municipality.

The Project is subject to a number of provincial, federal and, in some cases, municipal regulations. Main laws and regulations that are applicable are listed in Table 20-1.

Table 20-1: Provincial and federal acts and regulations

Acts and Regulations
Provincial
Environment Quality Act (c. Q-2)
Regulation respecting the application of section 32 of the Environmental Quality Act (Q-2, r. 2)
Regulation respecting the application of the Environment Quality Act (Q-2, r. 3)
Regulation respecting the regulatory scheme applying to activities on the basis of their environmental impact (Q-2, r.23.1)
Design code of a storm water management system eligible for a declaration of compliance (Q-2, r.9.01)
Clean Air Regulation (Q-2, r. 4.1)
Regulation respecting operation of industrial establishments (Q-2, r. 26.1)
Snow, road salt and abrasives management regulation (Q-2, r. 28.2)
Regulation respecting pits and quarries (Q-2, r. 7)
Regulation respecting the declaration of water withdrawals (Q-2, r. 14)
Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (Q-2, r. 15)
Regulation respecting halocarbons (Q-2, r. 29)
Regulation respecting hazardous materials (Q-2, r. 32)
Regulation respecting the reclamation of residual materials (Q-2, r.49)
Regulation respecting activities in wetlands, bodies of water and sensitive areas (Q-2, r.0.1)
Protection policy for lakeshores, riverbanks, littoral Zones and floodplains (Q-2, r. 35)
Water withdrawal and protection regulation (Q-2, r. 35.2)
Land protection and rehabilitation regulation (Q-2, r. 37)
Regulation respecting the charges payable for the use of water (Q-2, r. 42.1)
Directive 019 sur l'industrie minière (2012)
Protection and rehabilitation of contaminated sites policy (1998)
Mining Act (c. M-13.1)
Regulation respecting mineral substances other than petroleum, natural gas and brine (M-13.1, r. 2)
Threatened or Vulnerable Species Act (c. E-12.01)
Regulation respecting threatened or vulnerable wildlife species and their habitats (E-12.01, r. 2)
Regulation respecting threatened or vulnerable plant species and their habitats (E-12.01, r. 3)
Compensation Measures for the Carrying out of Projects Affecting Wetlands or Bodies of Water Act (M-11.4)
Act respecting the conservation of wetlands and bodies of water (2017, chapter 14; Bill 132)
Watercourses Act (c. R-13)
Regulation respecting the water property in the domain of the State (R-13, r. 1)

Acts and Regulations
Conservation and Development of Wildlife Act (c. C-61.1)
Regulation respecting wildlife habitats (C-61.1, r. 18)
Act respecting the lands in the domain of the state (chapter T-8.1)
Regulation respecting the sale, lease and granting of immovable rights on lands in the domain of the State (chapter T-8.1, r. 7)
Sustainable Forest Development Act (chapter A-18.1)
Regulation respecting the sustainable development of forests in the domain of the State (chapter A-18.1, r. 0.01)
Regulation respecting forestry permits (chapter A-18.1, r. 8.)
Building Act (c. B-1.1)
Safety Code (B-1.1, r. 3)
Construction Code (B-1.1, r. 2)
Explosives Act (c. E-22)
Regulation under the Act respecting explosives (E-22, r. 1)
Cultural Heritage Act (c. P-9.002)
Occupational Health and Safety Act (c. S-2.1)
Regulation respecting occupational health and safety in mines (S-2.1, r. 14)
Highway Safety Code (c. C-24.2)
Transportation of Dangerous Substances Regulation (C-24.2, r. 43)
Federal
Impact Assessment Act (S.C. 2019, c. 28, s. 1)
Physical Activities Regulations (SOR/2019-285)
Designated Classes of Projects Order (SOR/2019-323)
Information and Management of Time Limits Regulations (SOR/2019-283)
Fisheries Act (R.S.C., 1985, c. F-14)
Authorizations Concerning Fish and Fish Habitat Protection Regulations (SOR/2019-286);
Metal Mining Effluent Regulations (SOR/2002-222)
Canadian Environmental Protection Act (S.C. 1999, c. 33)
PCB Regulations (SOR/2008-273)
Environmental Emergency Regulations, 2019 (SOR/2019-51);
Federal Halocarbon Regulations (SOR/2003-289)
National Pollutant Release Inventory
Species at Risk Act (S.C. 2002, c. 29)
Canadian Wildlife Act (R.S.C., 1985, c. W-9)
Wildlife Area Regulations (C.R.C., c. 1609)

Acts and Regulations
Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22)
Migratory Birds Regulations (C.R.C., c. 1035)
Nuclear Safety and Control Act (S.C., 1997, c. 9)
General Nuclear Safety and Control Regulations (SOR/2000-202)
Nuclear Substances and Radiation Devices Regulations (SOR/2000-207)
Hazardous Products Act (R.S.C., 1985, c. H-3)
Explosives Act (R.S.C., 1985, c. E-17)
Transportation of Dangerous Goods Act (1992)
Transportation of Dangerous Goods Regulations (SOR/2001-286)

20.7. Potential Community Related Requirements and Status of Negotiations or Agreements

20.7.1. Community Relations Program

A Community Relations Program has been developed to approach and engage local stakeholders. This program included information sessions and consultations with municipalities, land users, First Nation community, non-governmental environmental organizations and recreational associations. Consultation and community engagement efforts that have been deployed throughout the Project development allowed Sayona to outline stakeholders' main preoccupations and expectations. The objective of this program is to provide baseline information to address some of the communities' concerns and take them into consideration in the permitting process and in the design of the operation phase. The involvement of stakeholders will continue throughout the various project stages.

20.7.2. Impacts and Benefits Agreement

An Impacts and Benefits Agreement ("IBA") will be signed with Abitibiwinni First Nation ("AFN"). The IBA will contain clauses concerning issues such as financial arrangements, business opportunities, hiring of AFN members living or not in Pikogan, adapted formation program, transportation, social worker, establishment of various committees, environmental clauses, etc.

The discussions between the AFN and Sayona are ongoing.

An Agreement in Principle was concluded with AFN in December 2019 for the exploration phase of the Project.

20.7.3. Environmental Monitoring Committee

The Environmental Monitoring Committee is composed of the following members:

- Sayona;
- AFN;
- La Motte Citizens;
- La Motte Senior Recreation Committee;
- Regional Environmental Council;
- Témiscamingue Watershed Organization;
- Community Organization;
- Centre-Abitibi Chamber of Commerce;
- Harricana SADC;
- Abitibi Local Centre for Development;
- Eska Inc.;
- Municipality of Preissac;
- Municipality of La Motte;
- Municipality of St-Matthieu d'Harricana;
- Ministry of Natural Resources and Forests;
- Abitibi MRC - Land Management;
- Cegep of Abitibi-Témiscamingue.

Meetings of this committee were held three times in 2019, three times in 2021 and twice in 2022.

Annual reports from this committee will include:

- A summary of the committee activities during the year;
- Numbers of employees from La Motte and Preissac municipalities, from Pikogan and from Abitibi and Vallée de l'Or MRC;
- Level of capital investments in Abitibi and in Québec province;
- Level of operating costs spent in AFN, in Abitibi-Temiscamingue and in Québec province.

Annual reports will be made public, and minutes of meetings will be made available on the Sayona internet site.

20.7.4. Sayona-Abitibiwinni First Nation Joint Committee

In 2021 and 2022, Sayona held numerous meetings with Abitibiwinni Band Council and with the AFN Liaison Agent in order to discuss the various aspects of the Project.

20.7.5. Economic Spinoffs Committee

Employment creation in this region is expected by the community; Sayona has committed to favor employing local population if qualifications are deemed equivalent to ensure direct social and economic benefits for the local population. Sayona also committed to giving subcontracting contracts to local companies, particularly for construction, deforestation or transport, which will further stimulate the economy and direct benefits to the local economy. This commitment was made before the La Motte Community as well as the Abitibiwinni First Nation.

For this purpose, Sayona initiated the creation of a local business register that also contains their contact information. This will facilitate local recruitment.

20.8. Closure and Reclamation Plan

A rehabilitation and closure plan is required as per the Mining Act. It must be approved before issuance of the mining lease, and a financial guarantee to fully implement the plan must be provided in three payments in the first two years following the approval of the plan. The closure plan was submitted in May 2018 and will be readjusted as Project changes needs.

Progressive reclamation would be encouraged during the mining operation and will involve activities to reclaim, where possible, some parts of the waste rock stacking areas, exhausted borrow pits, etc.

Rehabilitation would involve all activities after mining operations in accordance with the approved plan. Finally, monitoring would ensure that rehabilitation has been done successfully. Once all these steps are completed to the satisfaction of the MRNF, the land could be returned to the Crown.

20.8.1. Overview

In accordance with the Mining Act requirements, a detailed closure plan must be submitted to the MRNF. The closure plan includes the following activities:

- Rehabilitate the waste rock pile by covering slopes and flat areas with geotextiles, compacted inorganic overburden, organic overburden and vegetation;
- Remove from the site all surface and buried pipelines;
- Remove buildings and other structures;
- Rehabilitate and secure the open-pit;
- Reclaim any civil engineering works;
- Remove machinery, equipment and storage tanks; and,
- Complete any other work necessary for final rehabilitation and closure.

20.8.2. Post-Closure Monitoring

The detailed post-closure monitoring program will be conducted for at least five years after the final activities are completed. It will include the following aspects:

- Monitoring of final effluent and surface water quality;
- Status of revegetation;
- Inspection for slope of the open-pit, waste rock pile, ditches, etc.;
- Monitoring of groundwater quality.

20.8.3. Costs Estimation

A financial guarantee whose amount corresponds to the total anticipated cost of completing all the work set forth in its rehabilitation and restoration plan. The payment shall be provided in three installments constituting of 50%, 25% and 25% of the total restoration costs. The first payment shall be provided within 90 days of receiving the approval of the restoration plan. The second and third installments (25%) are due on the anniversary date of the restoration plan approval.

The total cost of closure and reclamation (and the guarantee) is estimated at $41.7M. This cost includes the direct and indirect costs of site rehabilitation as well as post-closure monitoring, engineering costs (30%) and the mandatory 15% contingency.

It is noteworthy that the construction of the cover (overburden and geomembrane) over the waste rock pile corresponds to 89% of the total cost estimate. Installation of the cover will be carried out progressively.

21. CAPITAL AND OPERATING COSTS

This chapter summarizes the capital and operating cost estimates related to the Project. All costs presented in this Report are in Canadian dollars, unless otherwise specified.

21.1 Capital Cost Estimate

The capital cost estimate prepared for this study meets AACE Class 3 criteria, usually prepared to establish a preliminary capital cost forecast and assess the economic viability of the Project. This allows management, and / or the Project sponsor, to obtain authorization for funds for the Project's next stages. As such, this estimate forms the initial control estimate against which subsequent phases will be measured and monitored.

There are two significant changes to the capital cost estimate with respect to the previous study:

1. There is no longer a concentrator at the Authier site; and
2. The waste piles and water management infrastructure require a geomembrane under their bases due to the metal leaching potential of the waste rock material.

The following table provides a summary by cost type for the initial capital costs.

Table 21-1: Initial capital costs summary

Item	Total (M CAD)
Mining (mining contractor, mining equipment and services)	$5.80
Infrastructure	$69.62
Wetland Compensation	$1.50
Royalty Buyback	$1.00
Total	**$77.92**

21.1.1 Estimate Overview and Qualifications

The capital cost estimate has been compiled by BBA and includes estimates from different sources and allocations from the Owner's team. The capital cost estimate includes all direct costs, indirect (Owner and other) costs, contingency and other allowances.

The estimate is based on the preliminary engineering and design completed to date. Budget quotations have been obtained for key equipment while materials and construction efforts are based on in-house data from similar projects and industry standard estimating factors.

21.1.1.1 Base Date

The estimate is expressed in constant Canadian dollars with a base date of Q1 2023.

21.1.1.2 Estimate Accuracy

The estimate accuracy is evaluated based on the level of scope definition and type of pricing obtained for each element. This estimate's accuracy level is expected to be between -20% to +20%.

Foreign exchange risk or new duties impact have not been included in the accuracy assessment.

This estimate of accuracy is also limited to the current scope. This accuracy level could be exceeded if the scope is varied by, for example, changing production rate, new environmental study results, or by major changes to assumptions regarding infrastructure.

21.1.1.3 Exclusions and Assumptions

The caveats, exclusions and assumptions relevant to the capital estimate include, but are not limited to:

- Limited geotechnical data was available for the feasibility study;
- Hydrogeological inputs to the FS were nominal only;
- No infrastructure geotechnical investigations have been undertaken;
- Cost of schedule delays caused by scope changes, labour disputes, or environmental permitting activities are excluded;
- Project financing cost is excluded;
- Additional study costs prior to Project implementation are excluded, e.g., water studies, sampling, ongoing testing, drilling and resource development;
- VAT, import duties, surcharges and any other statutory fees are excluded;
- Any provisions for Project risks, outside of those related to design and estimating confidence levels, have not yet been evaluated;
- Mineral rights, rental fees and the purchase or use of the land are excluded;
- Escalation and impact of currency fluctuations has been excluded;
- Risk from new duties on material such as steel and aluminum on bulk material (e.g., structural, rebar and embedded metal in concrete, equipment, pipe, wire, etc.) is not included.

21.1.2 Initial Capital Cost Estimate

Table 21-2 summarizes the initial capital cost estimate with the following sections providing further detail and relevant basis for the estimate.

Table 21-2: Project initial capital cost detailed summary

Item	Total (M CAD)
Mining	**$5.80**
Preproduction Mining	$3.39
Owner Equipment and Mine Services	$2.41
Infrastructure	**$69.62**
Waste Stockpile and Water Management	$44.85
Electrical Work	$0.84
On-site Roads	$2.53
Access Road	$0.65
Owner's Costs	$2.44
EPCM Services	$7.33
Commissioning	$0.28
Overhead	$0.22
Other	$1.37
Contingency	$9.08
Wetland Compensation	**$1.50**
Wetland Compensation	$1.50
Royalty Buyback	**$1.00**
1 claim	$1.00
Total	**$77.92**

21.1.2.1 Mining

The mining cost estimate includes all elements associated with mining activities, including mine preproduction, the ore rehandling wheel loader, and other services; dewatering, clearing, grubbing, surveying and spare parts. The mining operations will be performed by a mining contractor.

Table 21-3: Initial capital cost estimate for mining

Item	Total (M CAD)
Preproduction	3.39
Equipment	2.41
Total	**5.80**

The capital expenditure is based on budgetary quotes received from equipment suppliers and mining contractors.

21.1.2.2 Infrastructure

Infrastructure costs included in the capital cost estimate are summarized as follows:

- Waste stockpile foundation work;
- Water collection basins;
- Water treatment plant;
- Electrical work;
- On-site roads;
- Access road;
- Owner's costs;
- EPCM services;
- Commissioning;
- Overhead;
- Other;
- Contingency.

Table 21-4 provides the infrastructure capital cost estimate.

Table 21-4: Infrastructure capital cost estimate

Item	Total (M CAD)
Waste Stockpile and Water Management	44.85
Electrical Work	0.84
On-site Roads	2.53
Access Road	0.65
Owner's Costs	2.44
EPCM Services	7.33
Commissioning	0.28
Overhead	0.22
Other	1.37
Contingency	9.08
Total	**69.62**

Contingency is an integral part of the estimate and can best be described as an allowance for undefined items or cost elements that will be incurred, within the defined Project scope, but that cannot be explicitly foreseen due to a lack of detailed or accurate information.

Contingency analysis does not consider Owner's costs, Project risk, currency fluctuations, escalation, or costs due to potential scope changes or labour stoppages.

21.1.2.3 Wetlands Compensation

A CAD1.5M compensation measure is expected to offset losses of wetlands under the Act respecting the conservation of wetlands and bodies of water.

21.1.2.4 Royalty Buyback

A buyback of the 1% royalty on claim CDC2116146, for an amount of CAD1.0M, is planned.

21.1.2.5 Closure and Reclamation

In accordance with the Mining Act of Québec, closure and reclamation requirements have been developed to return the Authier Lithium Project site to an acceptable condition, ensuring that the site is safe, and the surrounding environment is protected.

The cost of restoring the Authier Lithium site is estimated to be CAD41.7M. As required by the *Ministère des Ressources naturelles et des Forêts* ("MRNF", formerly MERN), this cost estimate includes the cost of site restoration, the post-closure monitoring as well as engineering costs (30%) and a contingency of 15%. In accordance with the regulations, Sayona intends to post a bond as a guarantee against the site restoration cost.

21.1.3 Sustaining Capital

The total sustaining capital cost is estimated at CAD74.4M through the mine life. The sustaining capital cost is composed of the following items, presented in Table 21-5.

Table 21-5: Sustaining capital costs

Year	Unit	2026	2027	2028	2029	2030	2031 – 2035	2036 – 2040	2041 – 2047	Total
Mining	M CAD	$0.00	$0.00	$0.14	$0.14	$1.34	$1.48	$0.26	$0.41	$3.76
Infrastructure	M CAD	$29.84	$0.00	$9.12	$21.29	$0.00	$10.39	$0.00	$0.00	$70.64
Sustaining Capital Costs	**M CAD**	**$29.84**	**$0.00**	**$9.26**	**$21.43**	**$1.34**	**$11.88**	**$0.26**	**$0.41**	**$74.40**

21.1.3.1 Mining

The mine sustaining capital cost is attributable to the growing need for mine dewatering and clearing and grubbing as well as replacement for the ore-rehandling wheel loader.

21.1.3.2 Infrastructure

Infrastructure sustaining costs include the expansion of the waste pile foundation and drainage ditches.

Waste pile foundation has been sequenced in time for three reasons:

1. No need to prepare the whole area for Year 1;
2. Limit the amount of water to be treated with a larger area;
3. Delay capital expenditure.

21.1.3.3 Closure and Reclamation

The mine closure cost estimated is attributable to:

- The dismantling of the infrastructure, including restoration and the rehabilitation of the sector;
- The dismantling and demobilization of the water treatment system and the pumping station including restoration and rehabilitation of the area;
- Securing the site; and
- The management of residual materials.

21.2 Operating Cost Estimate

21.2.1 Summary

Table 21-6 summarizes the operating costs calculated for the life of mine ("LOM") of the Project.

Table 21-6: Summary LOM operating costs

Cost Area	LOM (M CAD)	Unit (CAD/t Ore)	Unit (USD/t Ore)
Mining	540.56	48.16	36.12
Water treatment management	58.73	5.23	3.92
General and Administration	20.97	1.87	1.40
Total operating costs	**620.27**	**55.26**	**41.44**
Reclamation bond insurance payment	7.65	0.68	0.51
Ore Transport and Logistics Costs	223.36	19.90	14.92
Total operating and other costs	**851.28**	**75.84**	**56.88**
Royalty deductions	28.96	2.58	1.94
First Nation royalties	27.04	2.41	1.81
Reclamation and closure costs	41.71	3.72	2.79
Total Operating, Royalties, Reclamation and Closure Costs	**948.99**	**84.54**	**63.41**

21.2.2 Mining Operating Cost

The operating costs have been estimated using parameters outlined in the previous sections of the Report. A mining contractor will carry out the majority of the mining and maintenance activities. Budgetary quotes were obtained from various mining contractors to estimate the operating costs.

The cost estimate was developed from first principles and was based on the following general inputs and assumptions:

- Diesel price of 1.160 CAD/L;
- Mining costs, excluding fuel, mine dewatering, supervision and technical services, and pre-split drilling and blasting:
  - Ore: 7.01 CAD/t mined;
  - Waste Rock: 5.28 CAD/t mined; and
  - Overburden: 3.80 CAD/t minds;
- The mine operations salaries were provided by Sayona. BBA has not revised the data of the analysis.

Table 21-7 presents the estimated mining operating costs over the LOM and Table 21-8 presents the unit costs per cost category.

Table 21-7: LOM mining operating costs

Description	Unit	2025	2026	2027	2028	2029	2030	2031–2035	2036–2040	2041–2046	LOM
Mining Contractor	M CAD	5.66	11.01	10.59	12.14	31.31	31.43	165.32	135.16	35.73	438.34
Owner Equipment	M CAD	0.07	0.14	0.14	0.14	0.14	0.14	0.71	0.71	0.80	2.99
Fuel	M CAD	0.80	1.57	1.93	2.08	3.22	3.27	18.28	17.93	9.95	59.04
Salaries	M CAD	0.46	0.92	0.92	0.92	0.92	0.92	4.59	4.59	4.28	18.51
Services	M CAD	0.53	1.08	1.08	1.09	1.09	1.11	5.51	5.59	4.60	21.69
Total Cost	**M CAD**	**7.53**	**14.73**	**14.66**	**16.36**	**36.68**	**36.86**	**194.41**	**163.98**	**55.35**	**540.56**
Total Unit Cost	**CAD/t mined**	**6.92**	**7.82**	**7.74**	**6.56**	**6.13**	**6.17**	**6.48**	**6.76**	**9.79**	**6.79**

Table 21-8: LOM mining operating cost breakdown

Cost Category	LOM (CAD/t mined)	% of Total
Mining Contractor	5.51	81%
Owner Equipment	0.04	1%
Fuel	0.74	11%
Salaries	0.23	3%
Services	0.27	4%
Total	**6.79**	**100%**

21.2.3 General and Administration

The total general and administration ("G&A") costs are estimated at CAD20.97M for the life of the Project, for an average of 1.87 CAD/t of ore. The G&A costs are relatively low due to the synergies with the North American Lithium ("NAL") mine.

The G&A costs include:

- Contract services (janitor, security, garbage disposal);
- Infirmary and safety equipment;
- Site communications;
- Training expenses;
- Taxes & municipality support;
- Additional environmental services;
- Insurances;
- Other general costs.

21.2.4 Labour

The total mine labour force is only six employees. Most management, technical services and other labour force are taken on by the NAL operation (e.g., mine manager, HSE coordinator, etc.). The rest of the workforce will be provided by the mining contractor and other contract service providers.

22. ECONOMIC ANALYSIS

22.1 Introduction and Methodology

The economic assessment of the Project was carried out using a discounted cash flow ("DCF") approach on a pre-tax and after-tax basis, based on the procurement contract between Authier Lithium and North American Lithium ("NAL"). No provision was made for the effects of inflation as real prices and costs were used in the financial projections. Current Canadian tax regulations were applied to assess the corporate tax liabilities, while the most recent provincial regulations were applied to assess the Québec mining tax liabilities.

Cash inflows consist of annual revenue projections. Cash outflows consist of capital expenditures including sustaining capital costs, operating costs and taxes. These are subtracted from the inflows to arrive at the annual cash flow projections. To reflect the time value of money, annual net cash flow projections are discounted back to the Project valuation date using a discount rate. For this evaluation, a base case discount rate of 8% has been assumed. The discounted present values of the cash flows are summed to arrive at the Project's net present value ("NPV").

The internal rate of return ("IRR") on total investment was calculated based on 100% equity financing. The IRR is defined as the discount rate that results in a NPV equal to zero. The Project's payback period has been calculated as the time required to achieve cumulative positive cash flow. Furthermore, an after-tax sensitivity analysis has been performed to assess the impact of variations in ore price, operating costs, project capital costs and sustaining capital costs on IRR and NPV at different discount rates (0%, 5%, 8%, 10%, 12%).

The economic analysis presented in this section contains forward-looking information with regard to the Mineral Resource Estimates, commodity prices, exchange rates, proposed mine production plan, projected recovery rates, operating costs, construction costs and the Project schedule. The results of the economic analysis are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

22.2 Assumptions and Basis

The economic analysis was performed using the following assumptions and basis:

- The economic analysis has been done on a Project basis and does not take into consideration the timing of capital outlays that have been completed prior to the date of this Report;
- The financial analysis was based on the Mineral Reserve Estimate presented in Chapter 15, the mine plan and assumptions detailed in Chapter 16, the marketing assumptions in Chapter 19, the capital and operating costs estimated in Chapter 21 and by taking into consideration key Project milestones as detailed in Chapter 24;
- Production of ore is scheduled to begin in the third quarter ("Q3") of 2025 model Year 1. Mine operations are estimated to span a period of approximately 22 years;
- A discount rate of 8% has been applied for the NPV calculation;
- The ore price of 120 CAD/t is established by a contractual procurement agreement between NAL and Authier Lithium and will last for the whole production period of Authier Lithium. Furthermore, to confirm that this price is justifiable, a transfer pricing analysis was performed which provides a feasible price range for Authier Lithium's ore of 96 CAD/t (based on return of capital employed methodology) and 137 CAD/t (based on return of total costs methodology);
- All products are assumed sold in the same year they are produced;
- Class-specific capital cost allowance rates are used for the purpose of determining the allowable taxable income;
- The economic analysis was performed on Proven and Probable Mineral Reserves as outlined in this Report;
- Tonnes of mined ore are presented as dry tonnes;
- Discounting starts in January 2025;
- Cash inflows and outflows start in March 2025 and are presented in constant Q1 2023 CAD, with no inflation or escalation factors considered;
- The accuracy levels ranged from -10% to +15%.

This financial analysis was performed on both a pre-tax and after-tax basis with the assistance of an external tax consultant. The general assumptions used for this financial model, are summarized in Table 22-1.

Table 22-1: Authier Lithium operation - Financial analysis summary

Item	Unit	Value	Unit	Value
Mine Life	year	22	year	22
Strip Ratio	t:t	6.1	t:t	6.1
Total Mill Feed Tonnage	Mt	11.2	Mt	11.2
Revenue				
Ore Selling Price	CAD/t ore	120	USD/t ore	90
Exchange Rate			USD:CAD	0.75
Project Costs				
Open Pit Mining	CAD/t ore	48.16	USD/t ore	36.12
Water Treatment and Management	CAD/t ore	5.23	USD/t ore	3.92
General and Administration (G&A)	CAD/t ore	1.87	USD/t ore	1.40
Reclamation Bond Insurance Payment	CAD/t ore	0.67	USD/t ore	0.50
Ore transport and logistic costs	CAD/t ore	19.90	USD/t ore	14.92
Project Economics				
Gross Revenue	CAD M	1,347.0	USD M	1,010.3
Total Operating Cost Estimate	CAD M	627.9	USD M	470.9
Reclamation Bond Insurance Payment	CAD M	7.6	USD M	5.7
Transportation and Logistics Cost	CAD M	223.4	USD M	167.5
Total Capital Cost Estimate	CAD M	77.9	USD M	58.4
Total Sustaining Capital Cost Estimate	CAD M	74.4	USD M	55.8
Reclamation and Closure Costs	CAD M	41.7	USD M	31.3
Royalty Deduction	CAD M	29.0	USD M	21.7
First Nation Royalties	CAD M	27.0	USD M	20.3
Non-discounted Cash Flow (Pre-Tax)	CAD M	280.4	USD M	210.3
Discount Rate	%	8%	%	8%
PRE-TAX NPV @ 8%	**CAD M**	**58.1**	**USD M**	**43.5**
Pre-Tax Internal Rate of Return (IRR)	%	14.6%	%	14.6%

Table 22-2 shows all project costs for the life of the Project.

Table 22-2: Authier Lithium total project costs

All Project Costs	CAD (M)	CAD/t Ore	USD (M)	USD/t Ore
Total Operating Cost Estimate	628	55.94	471	41.95
Transportation and Logistics Cost	223	19.90	168	14.92
Total Sustaining Capital Cost Estimate	74	6.63	56	4.97
Total Capital Cost Estimate	78	6.94	58	5.21
Reclamation and Closure Costs	42	3.72	31	2.79
Royalty Deduction	29	2.58	22	1.94
First Nation Royalties	27	2.41	20	1.81
Total Project Costs	**1,101**	**98.11**	**826**	**73.58**

22.3 Royalties

The Project is subject to paying royalties to several parties. Furthermore, Sayona is engaging with First Nations with the consideration of paying both fixed and variable royalties based on project cash flows. Preliminary assumptions have been included in the financial projections for the Project.

22.4 Working Capital

The change in working capital is included in the calculation of both the pre-tax and after-tax cashflows. The major categories of working capital are:

- Accounts receivable;
- Accounts payable;
- Deferred revenue;
- Inventory.

22.5 Taxation

The Project is subject to three (3) levels of taxation: federal corporate income tax, provincial corporate income tax, and provincial mining taxes. The taxation calculations for the Project were completed by PricewaterhouseCoopers ("PwC").

The current Canadian tax system applicable to Mineral Resource income was used to assess the annual tax liabilities for the Project. This consists of federal and provincial corporate income taxes, as well as provincial mining taxes. The federal and provincial (Québec) corporate income tax rates currently applicable over the operating life of the Project are 15.0% and 11.5% of taxable corporate income, respectively. The marginal tax rates applicable under the Mining Tax Act in

Québec are 16%, 22% and 28% of taxable income and are dependent on the profit margin. It has been assumed that the 20% processing allowance rate associated with transformation of the mine product to a more advanced stage within the province would be applicable in this instance.

The tax calculations are based on the following key assumptions:

- The Project is held 100% by a corporate entity carrying on its activities solely in La Motte, Québec, and the after-tax analysis does not attempt to reflect any future changes in corporate structure or property ownership;
- Financing with 100% equity and, therefore, does not consider interest and financing expenses;
- Tax legislation, i.e., federal, provincial and mining, will apply up to the end of the period covered by the calculations as currently enacted and considering currently proposed legislation;
- It is anticipated, based on the Project assumptions that Authier will pay approximately CAD133.7M of taxes over the life of the Project.

22.6 Financial Analysis Summary

The financial evaluation results for the base case of the Project are presented in Table 22-3.

Table 22-3: Financial analysis summary (pre-tax and after-tax)

Description		Base Case	Unit
Pre-Tax	Non-Discounted Cashflow	280.4	CAD (M)
	Net Present Value (8% disc.)	58.1	CAD (M)
	Internal Rate of Return (IRR)	14.6	%
After-Tax	Non-Discounted Free Cashflow	144.7	CAD (M)
	Net Present Value (8% disc.)	10.6	CAD (M)
	Internal Rate of Return (IRR)	9.4	%

The pre-tax base case financial model resulted in an IRR of 14.6% and a NPV of CAD58.1M with a discount rate of 8%. On an after-tax basis, the base case financial model resulted in an IRR of 9.4% and a NPV of CAD10.6M, with a discount rate of 8%.

The summary of the Project DCF financial model, pre-tax and after-tax, is presented in Table 22-4.

Table 22-4: Project cash flows on an annualized basis (CAD)

Detailed Period/Fiscal Year Financials	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	LOM Total
Authier Mine Production Summary																								
Waste Rock (Mt)	0.1	1.1	1.2	0.7	2.4	4.3	4.9	5.4	5.2	5.2	5.4	5.5	5.2	5.0	4.6	3.0	1.4	0.7	0.5	0.4	0.3	0.2	0.1	63.0
Overburden (Mt)	0.3	0.4	0.2	0.9	1.3	1.1	0.6	0.0	0.2	0.3	0.0	0.0	-	-	-	-	-	-	-	-	-	-	-	5.4
ROM Ore to Plant (Mt)	-	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.2	11.2
Stripping Ratio	-	2.9	2.5	3.1	6.9	10.1	10.1	10.2	10.4	10.4	10.4	10.4	9.8	9.4	8.7	5.8	2.7	1.3	0.9	0.8	0.6	0.5	0.5	6.1
Revenues																								
Ore Sales ($M)	-	63.2	64.0	64.4	64.7	64.6	64.7	64.2	63.2	63.2	63.4	63.0	64.0	64.3	63.2	63.0	62.9	63.2	63.5	63.1	63.3	52.9	21.0	1,347.0
Royalty Deduction ($M)	-	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.4)	(1.1)	(0.5)	(29.0)
Total Revenue ($M)	**-**	**61.9**	**62.6**	**63.0**	**63.3**	**63.2**	**63.3**	**62.8**	**61.9**	**61.8**	**62.0**	**61.7**	**62.7**	**62.9**	**61.8**	**61.6**	**61.6**	**61.8**	**62.1**	**61.8**	**62.0**	**51.8**	**20.5**	**1,318.1**
Operating Expenditures																								
Open Pit Mining ($M) - OWNER	-	3.7	3.9	4.2	4.8	5.4	5.5	5.6	5.7	6.0	6.0	6.0	6.0	6.1	5.9	5.3	4.5	4.1	4.0	3.9	3.0	1.8	0.7	102.2
Open Pit Mining ($M) - CONTRACT	-	11.2	10.8	11.4	21.7	31.4	32.3	33.1	32.7	32.7	33.4	33.4	31.8	31.0	28.6	19.9	11.4	7.5	6.4	6.0	5.5	4.4	1.7	438.3
Water Treatment/Management ($M)	0.5	1.5	1.5	1.5	2.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.5	1.0	58.7
General and Administration ($M)	0.3	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	21.0
Reclamation Bond Insurance Payment ($M)	-	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	7.5
Total Onsite Operating Costs ($M)	**0.8**	**17.7**	**17.5**	**18.3**	**30.1**	**41.1**	**42.1**	**43.0**	**42.7**	**43.0**	**43.7**	**43.7**	**42.2**	**41.5**	**38.9**	**29.5**	**20.3**	**16.0**	**14.7**	**14.1**	**12.8**	**10.0**	**4.0**	**627.7**
Ore Transport and Logistics Costs ($M)	-	10.5	10.6	10.7	10.7	10.7	10.7	10.6	10.5	10.5	10.5	10.5	10.6	10.7	10.5	10.4	10.4	10.5	10.5	10.5	10.5	8.8	3.5	223.4
Total Operating and Shipping Costs ($M)	**0.8**	**28.2**	**28.1**	**29.0**	**40.8**	**51.8**	**52.8**	**53.6**	**53.2**	**53.5**	**54.2**	**54.2**	**52.8**	**52.1**	**49.3**	**40.0**	**30.7**	**26.5**	**25.3**	**24.6**	**23.3**	**18.7**	**7.5**	**851.1**
Capital Expenditures																								
Pre-production ($M)	67.9	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	77.9
Sustaining ($M)	-	14.9	14.9	4.6	15.3	11.4	0.7	-	1.7	5.4	4.2	0.7	0.1	-	-	-	0.1	0.2	0.1	-	-	-	-	74.4
Mine Closure Plan Financial Guarantee ($M)	-	20.9	10.4	10.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	41.7
Total Capital Costs ($M)	**67.9**	**45.8**	**25.3**	**15.1**	**15.3**	**11.4**	**0.7**	**-**	**1.7**	**5.4**	**4.2**	**0.7**	**0.1**	**-**	**-**	**-**	**0.1**	**0.2**	**0.1**	**-**	**-**	**-**	**-**	**194.0**
First Nation Royalties																								
First Nation Royalties ($M)	0.1	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.1	0.4	27.0
Cumulative First Nation Royalties ($M)	**0.1**	**1.4**	**2.6**	**3.9**	**5.2**	**6.5**	**7.8**	**9.1**	**10.4**	**11.6**	**12.9**	**14.2**	**15.4**	**16.7**	**18.0**	**19.2**	**20.5**	**21.8**	**23.0**	**24.3**	**25.6**	**26.6**	**27.0**	**27.0**
Pre-Tax Cash Flow																								
Pre-Tax Cash Flow ($M)	(57.4)	(7.9)	7.0	20.1	9.2	(1.3)	10.1	9.6	7.6	3.6	3.4	7.1	9.9	11.3	12.6	21.6	31.0	35.4	37.1	37.5	38.9	33.9	0.2	280.4
Cumulative Pre-Tax Cash Flow ($M)	**(57.4)**	**(65.3)**	**(58.3)**	**(38.2)**	**(28.9)**	**(30.2)**	**(20.2)**	**(10.6)**	**(3.0)**	**0.6**	**4.0**	**11.1**	**21.0**	**32.2**	**44.8**	**66.4**	**97.4**	**132.8**	**169.9**	**207.4**	**246.3**	**280.2**	**280.4**	**280.4**

Detailed Period/Fiscal Year Financials	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	LOM Total
Taxes																								
Federal Corporate Income Tax ($M)	-	2.0	1.9	2.2	1.0	-	-	-	-	-	-	-	0.1	1.0	1.2	2.4	3.6	4.0	4.1	4.2	4.3	3.7	1.5	37.2
Provincial Corporate Income Tax ($M)	-	1.5	1.5	1.7	0.8	-	-	-	-	-	-	-	0.1	0.7	0.9	1.9	2.8	3.1	3.2	3.2	3.3	2.8	1.1	28.5
Québec Mining Tax ($M)	-	1.0	1.8	2.7	1.0	0.4	0.4	0.4	0.6	0.5	0.5	0.7	0.8	1.1	1.9	3.4	5.5	7.6	8.4	8.6	9.4	8.2	3.2	68.1
Total Taxes ($M)	**-**	**4.5**	**5.1**	**6.6**	**2.7**	**0.4**	**0.4**	**0.4**	**0.6**	**0.5**	**0.5**	**0.7**	**1.0**	**2.9**	**4.0**	**7.8**	**11.8**	**14.7**	**15.7**	**16.0**	**17.0**	**14.7**	**5.8**	**133.7**
Post-Tax Cash Flow																								
Post-Tax Cash Flow ($M)	(57.4)	(12.5)	1.8	13.4	6.4	(1.8)	9.6	9.0	7.0	3.0	2.8	6.3	8.8	8.3	8.5	13.7	19.0	20.7	21.3	21.4	21.8	19.1	(5.6)	144.7
Cumulative Post-Tax Cash Flow ($M)	**(57.4)**	**(69.9)**	**(68.1)**	**(54.7)**	**(48.2)**	**(50.0)**	**(40.4)**	**(31.4)**	**(24.5)**	**(21.5)**	**(18.7)**	**(12.4)**	**(3.6)**	**4.7**	**13.2**	**26.9**	**46.0**	**66.7**	**87.9**	**109.3**	**131.2**	**150.3**	**144.7**	**144.7**

22.7 Sensitivity Analysis

A financial sensitivity analysis was conducted on the base case after-tax cash flow NPV and IRR of the Project. The after-tax results for the Project IRR and NPV, based on the sensitivity analysis, are summarized in Table 22-5 through Table 22-8.

The sensitivity of the after-tax NPV was evaluated for changes in key variables and parameters such as:

- Capital costs;
- Sustaining capital costs;
- Operating costs;
- Price of ore sold to NAL.

After-tax NPV sensitivities are from -30% to +30% to show the impact of NPV outputs at 8% discount rate. To complement after-tax NPV sensitivities is the after-tax IRR graph, which shows the overall project impact at these various sensitivities.

The after-tax sensitivity analyses show that changes in the price of ore sent to NAL and the Project operating costs create the largest NPV variations.

Table 22-5: Ore price sensitivities on after-tax NPV

Ore Price % Variation	-30%	-20%	-10%	0%	10%	20%	30%
Ore Price (CAD/t)	$84	$96	$108	$120	$132	$144	$156
Discount rate 0%	($138)	($25)	$65	$145	$221	$297	$372
Discount rate 5%	($144)	($71)	($11)	$43	$91	$139	$186
Discount rate 8%	($140)	($82)	($33)	$11	$49	$87	$125
Discount rate 10%	($136)	($86)	($43)	($4)	$30	$63	$95
Discount rate 12%	($133)	($88)	($50)	($15)	$15	$44	$73
IRR	0%	0%	4%	9%	15%	20%	25%

Table 22-6: Operating costs sensitivities on after-tax NPV

Operating Costs % Variation	30%	20%	10%	0%	-10%	-20%	-30%
Operating Costs (CAD M))	$806	$744	$682	$620	$558	$496	$434
Discount rate 0%	$24	$67	$107	$145	$181	$216	$252
Discount rate 5%	($43)	($12)	$16	$43	$67	$90	$113
Discount rate 8%	($60)	($35)	($11)	$11	$30	$48	$67
Discount rate 10%	($66)	($44)	($23)	($4)	$13	$29	$45
Discount rate 12%	($70)	($51)	($33)	($15)	($0)	$14	$28
IRR	1%	4%	7%	9%	12%	14%	17%

Table 22-7:Capital costs sensitivities on after-tax NPV

Capital Costs % Variation	30%	20%	10%	0%	-10%	-20%	-30%
Capital Costs (CAD M))	$101	$94	$86	$78	$70	$62	$55
Discount rate 0%	$130	$135	$140	$145	$150	$154	$159
Discount rate 5%	$26	$32	$37	$43	$48	$53	$59
Discount rate 8%	($6)	($1)	$5	$11	$16	$22	$27
Discount rate 10%	($21)	($16)	($10)	($4)	$2	$7	$13
Discount rate 12%	($33)	($27)	($21)	($15)	($10)	($4)	$2
IRR	7%	8%	9%	9%	10%	11%	12%

Table 22-8: Sustaining capital costs sensitivities on after-tax NPV

Sustaining Capital Costs % Variation	30%	20%	10%	0%	-10%	-20%	-30%
Sustaining Capital Costs (CAD M))	$97	$89	$82	$74	$67	$60	$52
Discount rate 0%	$130	$135	$140	$145	$149	$154	$159
Discount rate 5%	$29	$34	$38	$43	$47	$52	$56
Discount rate 8%	($2)	$2	$6	$11	$15	$19	$23
Discount rate 10%	($17)	($12)	($8)	($4)	($0)	$4	$8
Discount rate 12%	($27)	($23)	($19)	($15)	($11)	($7)	($4)
IRR	8%	8%	9%	9%	10%	11%	11%

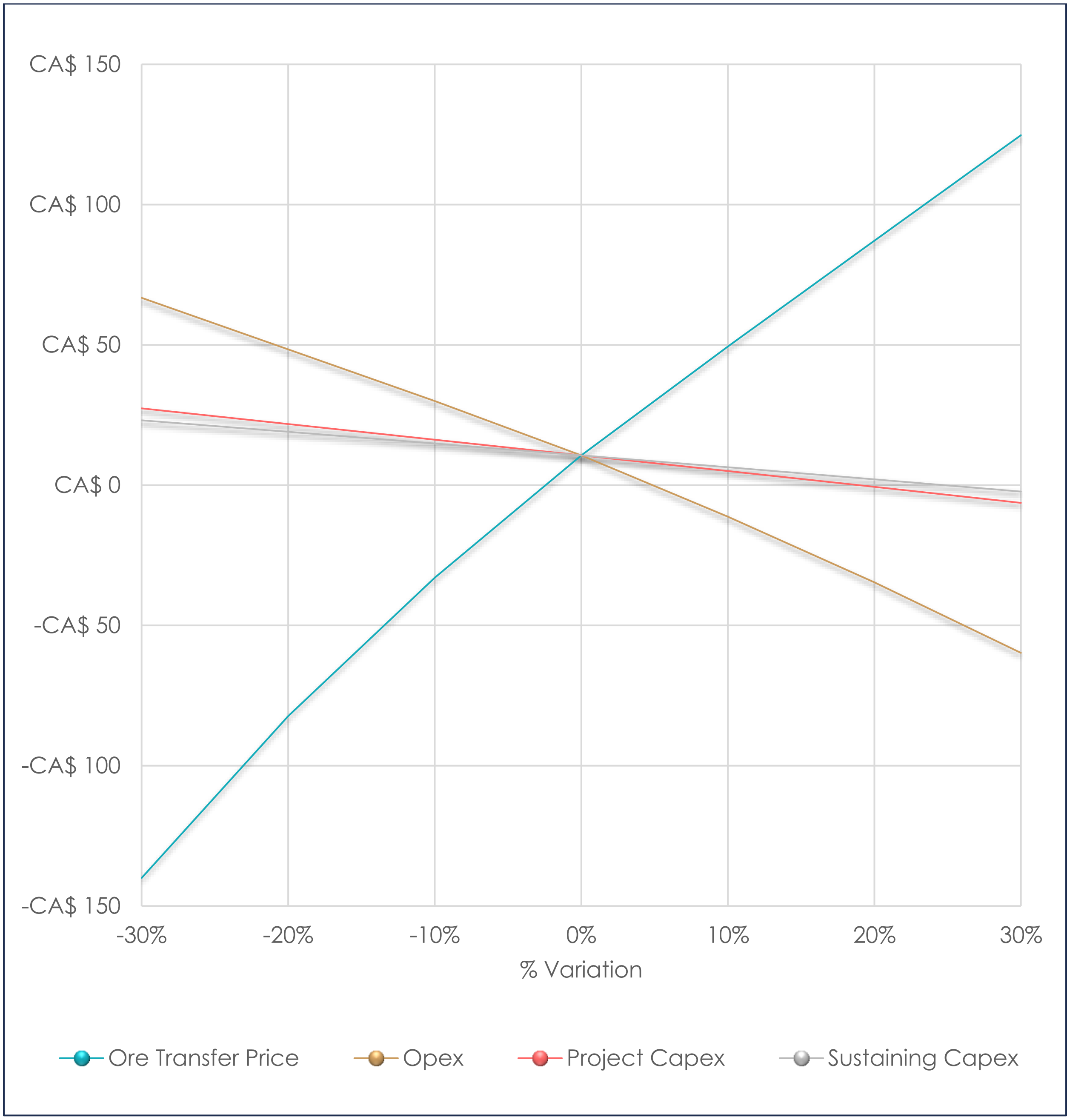


Figure 22-1: After-Tax NPV at 8% discount rate for different sensitivity scenarios

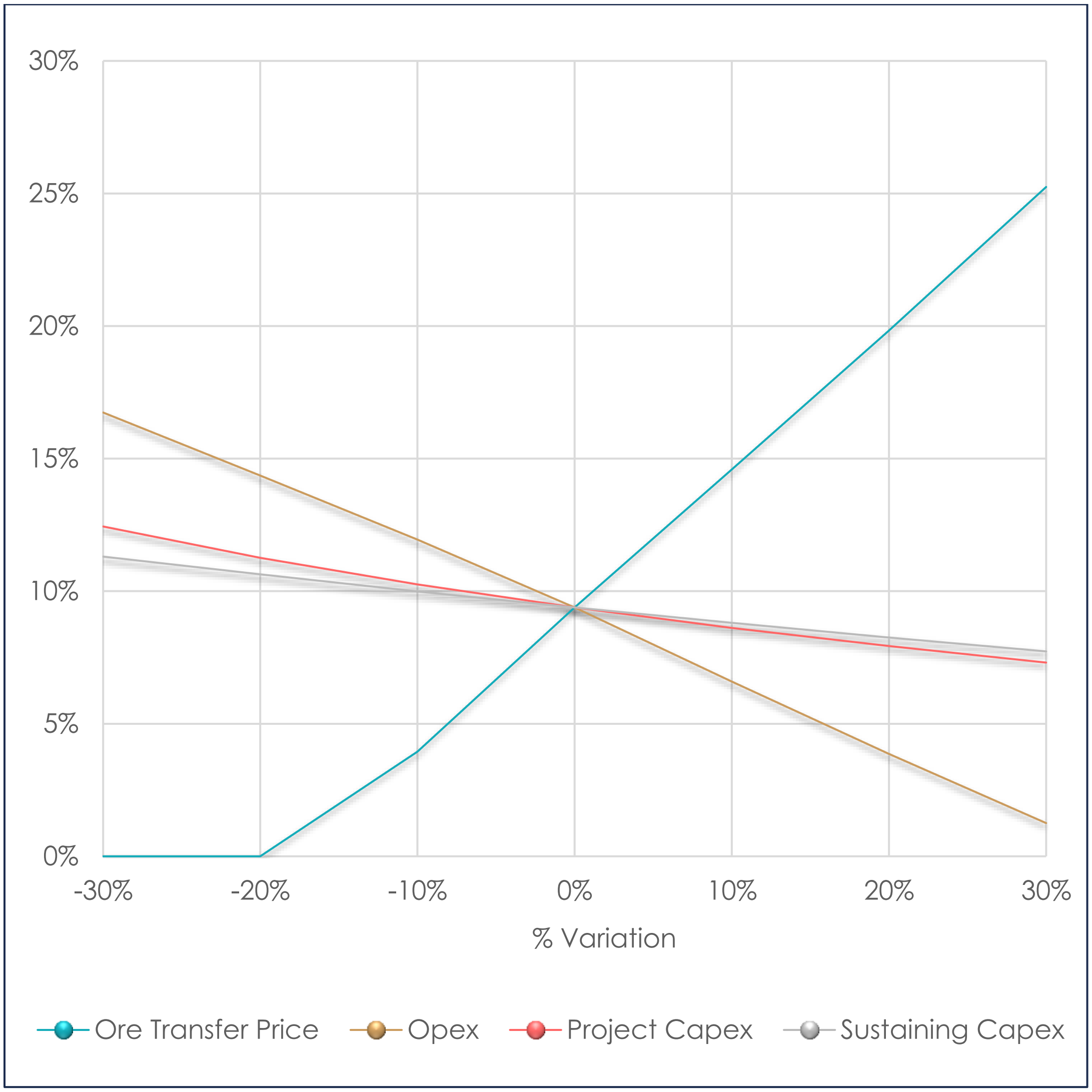


Figure 22-2: After-Tax IRR for different sensitivity scenarios

23. ADJACENT PROPERTIES

The area surrounding the Property, which is located between Val-d'Or, Amos and Malartic, is well known for mineral exploration activity, especially for gold, copper and zinc. The Authier Property is surrounded by several exploration properties owned by various companies.

Figure 23-1 shows the location of metallic deposits and showings in the area. The light green dots are occurrences of lithium in the area (from the Québec MRNF Sigeom Interactive database, 2012). It should be noted that the following information is not necessarily indicative of the mineralization on the Property that is the subject of this Technical Report.

The most relevant mineral property in proximity (27 km east) to the Project (Figure 23-1) is Sayona Québec's North American Lithium ("NAL") property. NAL hosts a lithium deposit occurring in a series of spodumene-bearing pegmatite dykes. In recent history, NAL operated between 2013-2014 and 2017-2019. The project was put into care and maintenance in 2019 due to poor spodumene market conditions. Sayona Québec acquired NAL on August 30, 2021. Sayona Québec restarted mining operations at NAL in late 2022 and commenced concentrator operations in February 2023.

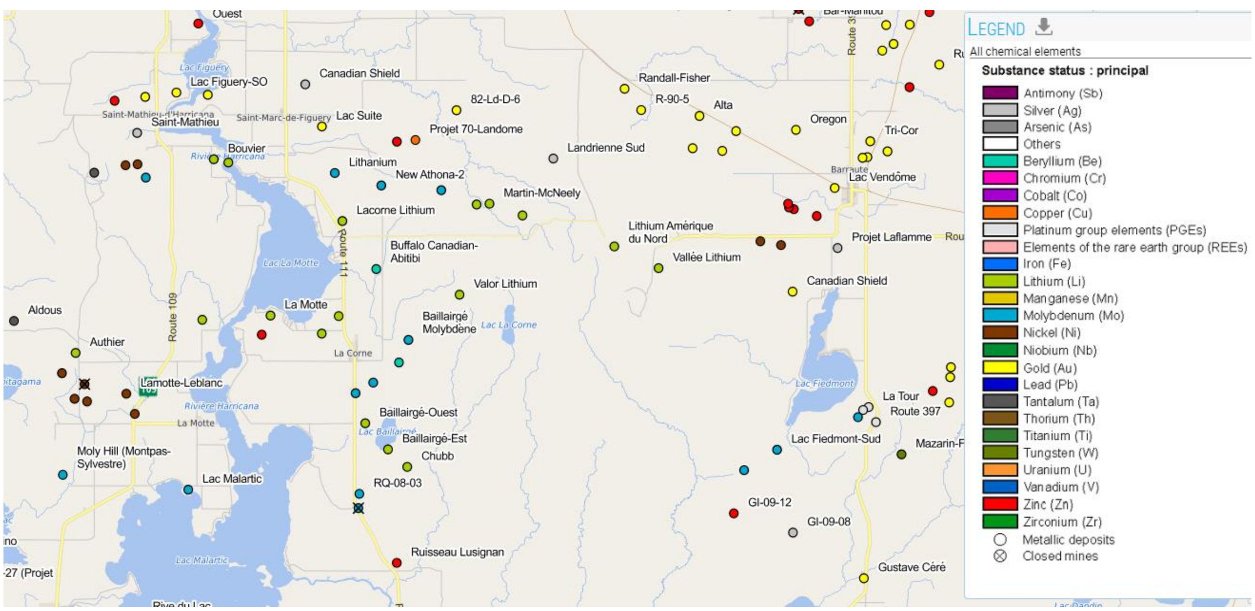


Figure 23-1: Local metallic deposits and showings

Figure 23-2 shows a map of adjacent claims to the Authier Project. As of April 6, 2023, owners of adjacent properties included 2814250 Ontario Inc., First Energy Metals Limited, Olivier Lemieux, Eagle Ridge Mining Ltd., 9219-8845 Québec Inc., Lisa Daigle, and Ressources Jourdan Inc.

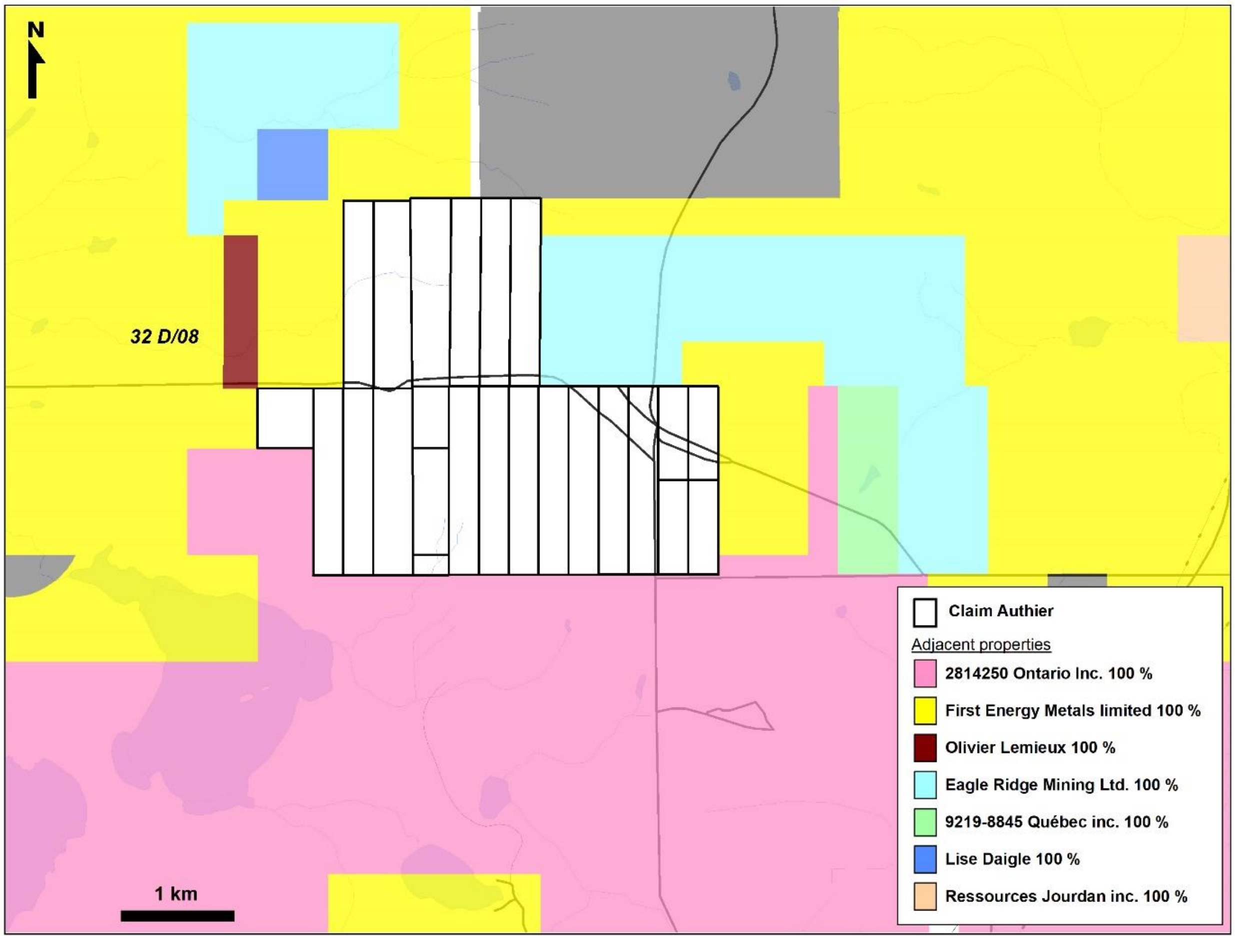


Figure 23-2: Adjacent properties map

24. OTHER RELEVANT DATA AND INFORMATION

Sayona was in the process of developing the Authier Property as a mine and concentrator facility until the acquisition of the former North American Lithium ("NAL") Project. Since then, Sayona has reoriented the Authier Project to a spodumene ore producer selling its ore to NAL. This chapter describes how the Authier Project will be implemented.

24.1. Project Execution Plan

This execution plan is conceptual in nature and will be adjusted and refined during the next phases of the Project. Upon completion of this FS, Sayona plans to award the detailed engineering mandate with a targeted completion date of July 2024 to be executed in parallel with the certificate of authorization approval process. Construction is expected to begin soon after reception of the certificate of authorization with a target readiness for mining operations to start in March 2025.

The critical path to ore production goes through obtaining the certificate of authorization, mobilizing the mining contractor, and building the main access roads and the stockpile pads.

In parallel with this work, the permanent facilities will continue to be built during the mining operation with the construction of the ancillary facilities. The following will be completed in 2024.

- Administration building;
- Mine security and access point;
- Fuel, lube and oil storage facility.

The permanent water treatment plant ("WTP") will be completed in 2025 due to a long delivery lead time, specifically for the thickener, of 12 months. Until the permanent WTP is operating, temporary treatment solutions will be implemented.

24.2. Project Organization

24.2.1. Engineering and Procurement

All Project phases including detailed engineering, procurement, preproduction and construction activities will be under the direction of the Sayona project manager.

Permitting will be supported by Sayona's environmental team.

Sayona has hired complementary expertise in project and construction management to increase its project delivery ability. The result is a team of experienced individuals with knowledge of the Abitibi local construction conditions and contractors. They have managed projects in similar environments for the engineering and planning stages through construction to commissioning and transfer to operations.

During the completion of the FS phase, the request for proposal for engineering services has already been sent out.

The engineering firms will be responsible for the following procurement functions:

- Technical specification and scope of work documents;
- Technical and economical evaluations;
- Short list meetings;
- Purchase order requisition preparation;
- Drawing management and approval;
- Reception and coordination of vendor maintenance and operational documents.

The Sayona team is responsible for the following procurement functions:

- Bid request;
- Addenda;
- Reception of bids;
- Final negotiation;
- Contract award;
- Purchase order release;
- Progressive payment;
- Shop visits;
- Site logistics.

24.2.2. Construction Management

Sayona will provide Project construction management services under the direction of the Construction Manager. The Construction Management Team ("CMT") will include the following services:

- Site supervision;
- Project cost control;
- Scheduling;
- Reporting;
- Health and safety;
- Site procurement and logistics.

It is recognized that an effective health and safety program during the Project is a necessity. The success of the construction safety program is contingent upon its enforcement at all stages of the Project including design, construction planning, construction execution, and start-up and commissioning.

The CMT will also follow the Sayona procedures and work methods to ensure the protection of the environment. Furthermore, the CMT will work closely with each department of the operations group to ensure proper installation and functional results.

25. INTERPRETATION AND CONCLUSIONS

This Report was prepared and compiled by BBA under the supervision of the authors at the request of Sayona. This Report provides a summary of the results and findings from each major area of investigation to a level that is equivalent and normally expected for a Feasibility Study of a resource development project.

25.1. Key Outcomes

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

25.1.1. Geology

Highlights of the Authier Lithium deposit Mineral Resource Estimate ("MRE") Update are as follows:

- The MRE was reported at a cut-off of 0.55% Li_2O and totals 6.04 Mt, with an average grade of 0.99% Li_2O in the Measured category, 8.10 Mt, with an average grade of 1.03% Li_2O in the Indicated category, for a combined total of 14.1 Mt at an average of 1.01% Li_2O in the Measured and Indicated categories. An additional 3.00 Mt, with an average grade of 1.00% Li_2O in the Inferred category is also present at Authier Lithium;
- The effective date of the MRE is October 6, 2021.

25.1.2. Mining

Key mining outcomes include:

- Conversion of a portion of the Mineral Resources into Proven and Probable Mineral Reserves of 11.2 Mt at an average grade of 0.96% Li_2O. Of this total, 6.2 Mt are Proven Reserves at 0.93% Li_2O and 5.1 Mt are Probable Reserves at 1.00% Li_2O;
- Development of a mine plan that provides sufficient ore to support an annual feed rate of approximately 530,000 tonnes at the North American Lithium ("NAL") crusher;
- Updated detailed mine designs, including pit phasing;
- Development of a dilution model to ensure that the ore sold to NAL and fed to the crusher respects final product specifications;
- Development of a life of mine ("LOM") plan that results in a positive cash flow for the Project, which permits conversion of resources to reserves.

25.1.3. Infrastructure and Water Management

Key Infrastructure outcomes include:

- Site has been optimized through the reduction in the overall footprint;
- The number of basins has been reduced from the original concepts;
- New geochemical data has been considered and the use of membranes in ditches and below the waste rock facility are now required;
- A progressive reclamation plan has been put in place as part of the overall facility sequencing.

25.1.4. Marketing and Sales

A supply agreement was signed between Authier and NAL for the purchase of 100% of the ore mined at 120 CAD/t delivered (Li_2O content of 0.80% to 1.15%).

25.1.5. Capital Costs

- The Project no longer considers a concentrator on site. All ore material will be sold to NAL and treated at the NAL concentrator;
- Given that all waste rock material must be considered as metal leaching, the waste rock storage facility and water collection infrastructure must be built with a geomembrane as a foundation;
- The total initial capital expenditure for the Project is estimated at CAD77.9M. This estimate qualifies as Class 3, as per AACE recommended practice R.P.47R-11. The accuracy of this estimate has been assessed at -20% to +20%;
- The estimate includes all the direct and indirect project costs, complete with the associated contingency. The estimating methods include quotations from vendors and suppliers specifically sought for this Project, approximate quantities and unit rates sourced from quotations and historic projects and allowances based on past projects. A summary of the capital expenditure distribution and sustaining capital expenditures are shown in Table 25-1 and Table 25-2.

Table 25-1: Project initial capital cost detailed summary

Item	Total (M CAD)
Mining	**$5.80**
Preproduction Mining	$3.39
Owner Equipment and Mine Services	$2.41
Infrastructure	**$69.62**
Waste Stockpile and Water Management	$44.85
Electrical Work	$0.84
On-site Roads	$2.53
Access Road	$0.65
Owner's Costs	$2.44
EPCM Services	$7.33
Commissioning	$0.28
Overhead	$0.22
Other	$1.37
Contingency	$9.08
Wetland Compensation	**$1.50**
Wetland Compensation	$1.50
Royalty Buyback	**$1.00**
CDC2116146	$1.00
Total	**$77.92**

Table 25-2: Project sustaining capital cost detailed summary

Year	Total (M CAD)
Mining	$3.76
Infrastructure	$70.64
Sustaining Capital Costs	**$74.40**

25.1.6. Operating Costs

The operating and other costs for the Project are CAD949M or 84.54 CAD/t ore for the LOM. The detailed operating costs are presented in Table 25-3.

Table 25-3: Summary LOM operating costs

Cost Area	LOM (M CAD)	Unit (CAD/t Ore)	Unit (USD/t Ore)
Mining	540.56	48.16	36.12
Water treatment management	58.73	5.23	3.92
General and Administration	20.97	1.87	1.40
Total operating costs	**620.27**	**55.26**	**41.44**
Reclamation bond insurance payment	7.65	0.68	0.51
Ore Transport and Logistics Costs	223.36	19.90	14.92
Total operating and other costs	**851.28**	**75.84**	**56.88**
Royalty deductions	28.96	2.58	1.94
First Nation royalties	27.04	2.41	1.81
Reclamation and closure costs	41.71	3.72	2.79
Total Operating, Royalties, Reclamation and Closure Costs	**948.99**	**84.54**	**63.41**

25.1.7. Financial Analysis

The UDFS NPV and IRR were calculated based on the sale of ore to the NAL operation. Table 25-4 provides a summary of the financial analysis, which demonstrates that the NAL Project is economically viable.

Key outcomes of the UDFS include:

- An estimated pre-tax NPV of CAD58.1M at an 8% discount rate and a pre-tax IRR of 14.6%;
- An estimated after-tax NPV of CAD10.6M at an 8% discount rate and an after-tax IRR of 9.4%.

The LOM has been extended to 22 years, based on estimated Proven and Probable Mineral Reserves of 11.2 Mt @ 0.96% Li_2O.

Table 25-4: Financial analysis summary

Item	Unit	Value (CAD)	Unit	Value (USD)
Production				
Mine Life	year	22	year	22
Strip Ratio	t:t	6.1	t:t	6.1
Total Ore Production	Mt	11.2	Mt	11.2
Revenue				
Ore Selling Price	CAD/t	120.00	USD/t	90.00
Exchange Rate	CAD:CAD	1.00	USD:CAD	0.75
Project Costs				
Open Pit Mining	CAD/t ore	48.16	USD/t ore	36.12
Water Treatment and Management	CAD/t ore	5.23	USD/t ore	3.92
General and Administration (G&A)	CAD/t ore	1.87	USD/t ore	1.40
Reclamation Bond Insurance Payment	CAD/t ore	0.67	USD/t ore	0.50
Ore Transport and Logistic Costs	CAD/t ore	19.90	USD/t ore	14.92
Project Economics				
Gross Revenue	CAD M	1,347.0	USD M	1,010.3
Total Operating Cost Estimate	CAD M	627.9	USD M	470.9
Transportation and Logistics Cost	CAD M	223.4	USD M	167.5
Total Capital Cost Estimate	CAD M	77.9	USD M	58.4
Total Sustaining Capital Cost Estimate	CAD M	74.4	USD M	55.8
Reclamation and closure costs	CAD M	41.7	USD M	31.3
Royalty Deduction	CAD M	29.0	USD M	21.7
First Nation Royalties	CAD M	27.0	USD M	20.3
Undiscounted Pre-tax Cash Flow	CAD M	280.4	USD M	210.3
Discount Rate	%	8%	%	8%
Pre-tax NPV @ 8%	**CAD M**	**58.1**	**USD M**	**43.5**
Internal Rate of Return (IRR)	%	14.6%	%	14.6%
After-tax NPV @ 8%	**CAD M**	**10.6**	**USD M**	**8.0**
Internal Rate of Return (IRR)	%	9.4%	%	9.4%

25.2. Risk and Opportunity

There are a number of risks and uncertainties identifiable to any new project that usually cover the mineralization, process, financial, environment and permitting aspects. This project faces the same challenges, and an evaluation of the possible risks was undertaken; the highlights of which are summarized in this section. The resulting register identifies risks, impact categories, the severity and probability ratings as well as potential risk mitigation measures.

Risks in the register have been grouped into the following categories:

- Financial;
- Organizational;
- Geology – Resources & Reserves;
- Mining;
- Design/Engineering;
- Procurement;
- Construction;
- Infrastructure;
- Environmental & Permitting;
- Legal;
- Community;
- Technological;
- Operations;
- Sales;
- Fabrication;
- Logistics.

The severity/impact and likelihood ratings were identified as shown in Table 25-5.

Table 25-5: Risks

Rating	Likelihood (Risk probability)	Impact
1	Rare: <1%	1 (Minor)
2	Unlikely 1-10%	2 (Moderate)
3	Possible 10-20%	3 (Serious)
4	Likely 20-50%	4 (Major)
5	Almost Certain: >50%	5 (Critical)

A high-level project risk assessment has been completed. The risk assessment identifies risks, impact category and a mitigation plan. The likelihood, impact, controls and measures were developed for the identified risks. The assessment is necessarily subjective and qualitative.

Table 25-6 and Table 25-7 show the top risks of the Project; the whole register can be found in Table 25-8.

The risk and opportunities registers should be reviewed and updated at each stage of the Project to reduce uncertainties and de-risk the Project.

Table 25-6: Main project risks

Risks Details			
Category	**Description**	**Rating category**	**Mitigation Measures**
Logistics	Worldwide crisis on freight forwarding	Schedule	Dedicate resources for expediting & logistics
Health & Safety	Mining traffic uses segments of roads common to ore transport and employee traffic. Berm separates the mining traffic from the others	Safety	Road to be widened and berm separating mining and other traffic. Add secondary access road to remove crossings
Operation	Start-up during wintertime	Operation	Implement temporary WTP during initial mining development
Operation	NAL will process with new ore from Authier after about six months of operation	Production	Support from external engineering staff during NAL transition to the blended ore processing
Engineering	Consultant engineers are very busy	Schedule	Frequent follow-up
Construction	Local contractors are very busy	Schedule	Reach out to province-wide contractors
Environment	Delays in obtaining mining and construction permits	Schedule	Frequent follow-up and pro-active approach of permitting authorities

Table 25-7: Main project opportunities

Opportunity Details	
Category	**Item**
Financial	Assess the impacts of various financing scenarios
Organization	Begin planning to build a strong Owner's team for the detailed engineering phase
Resource	Potentially increase the size of the Mineral Resource by testing extensions of known mineralization along strike at both of the Authier pegmatites, as well as by conversion of Inferred Mineral Resources to Reserves
Geology	Infill definition drilling within the main resource zone where the mineralization is not well defined and is currently treated as waste
Geology	Increase the size of the Mineral Resource at depth by testing the deep extensions of the known mineralization, especially those located on the west portion of the deposit
Mining	Assess the impact of high-grading during the first three years of operation
Mining	Assess the option of varying the number of cutbacks
Mining	Perform a cost trade-off to assess the used and/or larger mining equipment
Environment	Optimize water management and design/construct basins and treatment facilities
Construction	Continue focusing on delivery of turn-key packages from local contractors
Construction	Optimize excavation/backfill by using existing
Construction	Develop strategies to maximize use of waste rock as construction materials
Community	Continue to increase visibility of Sayona in the local community
Transport	Explore various transportation options

Table 25-8: Project risk register

Risk Details						Mitigation					
Category	Item	Likelihood	Impact	Principal Impact Category	Risk Score	Actions	Status	Likelihood	Impact	Principal Impact Category	Risk Score
Logistics	Worldwide crisis on freight forwarding.	5	5	Project delay/ cost	25	Shipments from China need to be identified and should be rigorously followed. Different suppliers should be approached if this is the case and dedicate a resource for expediting and logistics.	Open	3	5	Project delay and cost	15
Health & Safety	Mining traffic uses segments of roads common to ore transport and employee traffic. Berm separates the mining traffic from the others.	4	5	Safety	20	Road to be widened and berm separating mining and other traffic. Add secondary access road to remove crossings.	Open	2	5	Safety	10
Operation	Start Up during winter time.	5	4	Operation	20	Implement temporary WTP during initial mine development.	Open	4	3	Operation	12
Processing	Process at NAL with new ore from Authier after about 6 months.	5	4	Processing	20	Support from external engineering staff during NAL transition to the blended ore processing (NAL+Authier).	Open	4	3	Processing	12
Employment	Consultants' engineers and mining contractors are very busy.	4	4	Schedule	16	Frequent follow up.	Open	2	2	Schedule	4
Construction	Availability of local resources in Val 'D'Or for the construction activities.	5	3	Project Delay	15	Reach out to a variety of contractors (province-wide) and express Sayona's interest in working with them.	Open	3	3	Project Delay	9
Environmental	Delays in obtaining mining & construction permits.	5	3	Project Delay	15		Open	3	3	Project Delay	9
Financial	Any suspension of NAL operations will remove sole buyer of Authier Ore.	3	5	Financial	15		Open	3	5		15
Organization	Hiring key employees	5	3	Management	15	Hiring external support.	open	3	3	Management	9
Community	Social acceptability of mining project and ore transport from Authier to NAL	3	4	Social	12	Regular communication with the communities and local surveillance committee. Public hearings (impact assessment). Company's social and financial commitment to community projects.	Open	2	2	Social	4
Environmental	Dust generation above limits (Wind erosion of TSF and roads. Dust from mining operations and processing)	4	3	Environment	12	Reduce speed limit to 25-30 km/h+H21 in dry condition. Water spraying on hauling roads during dry condition. Water spraying during blasting, ore and rock loading and crushing. Keep tailings and waste moisture or flooded. Progressive TSF revegetation.	Open	2	2	Environment	4

Risk Details						Mitigation					
Category	Item	Likelihood	Impact	Principal Impact Category	Risk Score	Actions	Status	Likelihood	Impact	Principal Impact Category	Risk Score
Financial	Contract Mining OPEX higher than expected	3	4	Financial	12	Select contract mining expert to counsel during proposal request and contractual documents Incorporate lessons learned from NAL mining procurement process.	Open	2	2	Financial	4
General	Limitations for electronic material supplies (the difficulty of receiving components from Asia in this time of COVID and port delays)	3	4	Schedule	12	Manufacturing control at the supplier's site. Constant follow-up from suppliers.	Open	2	2	Schedule	4
Logistics	Roadblocks for construction or maintenance between NAL and Authier forcing rerouting	3	4	Financial	12	Prepare permit requests for alternate routings	Open	3	3		9
Logistics	Maintenance cost of Preissac Road to be assumed by Sayona, current assumption is road maintenance by municipality.	4	3	Financial	12	Open discussions with municipality	Open	3	3		9
Procurement	Equipment availability delays due to Covid impact of fabrication resource availability (Mining, lifting, treatment ...)	4	3	Schedule	12	This factor has and will affect fabrication of equipment. The mitigation plan can be not to use sole source, not to have common spare parts and to accept to pay a premium to receive the equipment on site earlier.	Open	2	3	Cost/ Operation	6
General	Covid delays and costs	5	2	Project Delay/ Cost	10	Anticipate delays and additional costs since the impacts are not fully known. The market still volatile.	Open	4	2	Project Delay/ Cost	8
Community	Issues related to Indigenous relations.	2	4	Social	8	Continuous discussions, meeting with communities and signing of agreement.	Open	2	3	Social	6
Geology	Reserves lower than expected.	2	4	Financial	8	Ongoing R&R update	Open	2	3	Financial	6
Community	Social acceptability aggregate transport during construction.	3	2	Social	6	Regular communication with the communities and local surveillance committee. Public hearings (impact assessment). Company's social and financial commitment to community projects.	Open	2	1	Social	2
Environmental	Spring freshet requires temporary water storage in the pit and may affect productivity.	2	3	Environment	6		Open	2	3	Environment	6
Environmental	Costs increase in waste rock storage facility closure plan and other assets retirement obligations. Final guarantee. Lack of a recent mine closure plan update.	2	3	financial	6	Closure plan currently under development	Open	1	2	financial	2
Financial	CAPEX higher than expected.	3	2	Financial	6	CAPEX update	Open	2	2	Financial	4

Risk Details						Mitigation					
Category	Item	Likelihood	Impact	Principal Impact Category	Risk Score	Actions	Status	Likelihood	Impact	Principal Impact Category	Risk Score
Environmental	Existing geochemical characterization has been carried out for waste rock samples. Based on results, geomembrane has been required. MELCC could require more comprehensive geochemical characterization targeting waste rock. Recent results expected based on existing SPLP results from 2017-2018. Causing a significant capital cost increase.	1	5	CAPEX	5	- Future demonstration that waste rock stockpile water contamination is within acceptable levels would allow for reduction / elimination of future bentonite membrane installation.	Open	2	5	CAPEX	10
Environmental	Other contaminants in the mine water over discharge limit due to explosives (ammonium nitrate) Potential surface water contamination. Non-compliance of water quality at the final effluent. Loss of control of the water treatment.	2	2	Environment	4	Appropriate explosive management and best practice in blasting and appropriate water treatment. Monitoring program of the final effluent. Everything in place and function.	Closed	0	0	Environment	0
Environmental	Failure in environmental impact assessment, surveillance and management.	2	2	Operation	4	Internal auditing. Periodic performance review.	Open	1	2	Operation	2
Infrastructure	Overflow of untreated water due to water treatment plant shutdown.	2	2	Environment	4	Preventative maintenance program and available spare parts, training.	Open	1	2	Environment	2
Design/ Engineering	Availability of qualified technical personnel dedicated to the project.	3	1	Design	3	Engineering firm needs to be secured early	Open	2	2	Design	4
Environmental	Seismic activities above limit disturb community.	1	2	Social	2	Review and improvement of blasting method and design.	Open	1	2	Social	2
Environmental	Spill or unauthorized discharge of contaminants, chemical or petroleum products.	2	1	Environment	2	Employee's awareness and SOPs review. Implementation of SOPs. Internal auditing. Periodic performance review. Daily inspection of operations and infrastructures (Refer to OMS manual). Employee tasks observation/assessment. Preventive maintenance of equipment. Spill kits available in all equipment and in strategic locations on site.	Open	2	1	Environment	2
Procurement	Adequate supply and storage of reagents for water treatment of the final effluent (May result in non-compliance of discharged water quality and in the stopping of dewatering of mine pit and of process water pumping).	1	2	Environment	2	Timely discussions with distributors / manufacturers and testing reagents from various sources.	Open	1	2	-	2

26. RECOMMENDATIONS

26.1 General

The Updated Definitive Feasibility Study ("UDFS") includes the Mineral Resource estimate completed by SGS in 2022, a smaller overall footprint of the site, results from a number of technical optimization programs, results from the waste rock geochemical characterization, a new strategy to transport ore material to the NAL concentrator and realignment of revenue based on the sale of run-of-mine ore. The UDFS confirms the technical and financial viability of constructing a simple open-cut mining operation, waste rock storage facility and water treatment plant at the Authier site. The positive study demonstrates the opportunity to create substantial long-term sustainable shareholder value at a low capital cost.

Given the technical feasibility and positive economic results of the UDFS, it is recommended to continue the work necessary to support a decision to fund and develop the project.

26.2 Recommendations

Based on the results of the UDFS, the following conclusions and recommendations were made:

26.2.1 Exploration and Geology

The Author considers that the Authier Lithium deposit contains a significant open-pit Mineral Resource that is associated with a well-defined mineralized trend and model. The current Mineral Resource Estimate ("MRE") update has shown that the Deposit can likely be mined by conventional open-pit mining methods with a scenario of off-site custom milling ore rather than constructing and using an on-site mill. Drillhole results highlighted mineralization at depth and demonstrates that the Property has the potential for an underground resource. Further drilling is recommended to ascertain this potential.

The Author considers the Property to have significant potential for delineation of additional Mineral Resources and that further exploration is warranted. Sayona's intentions are to continue to drill the Deposit in 2023 and plan to direct their exploration efforts towards resource growth, with a focus on extending the limits of known mineralization along strike and at depth, as well as infill drill of the existing deposit in order to convert portions of Inferred Mineral Resources to Indicated or Measured Mineral Resources.

Given the prospective nature of the Property, it is the Author's opinion that the Property merits further exploration and that a proposed plan for further work is justified. A proposed work program by SGS will help improve the Deposit development stage and will improve key inputs required to evaluate the economic viability of a mining project (open-pit and underground) at a feasibility study level.

SGS is recommending that Sayona conduct further exploration, subject to funding and any other matters which may cause the proposed exploration program to be altered in the normal course of its business activities or alterations which may affect the program as a result of exploration activities themselves. For 2023, a total of 30,000 m of drilling is proposed to continue to focus on updating, expanding, and extending Mineral Resources, upgrading existing Indicated and Inferred Resources as well as exploring the Deposit at depth.

The total cost of the recommended work program is estimated at CAD5,625,000 (Table 26-1).

Table 26-1: Recommended work program for the Authier Lithium Deposit

Item	Cost in CAD
Surface mapping, outcrop detailed description, channelling, and sampling	$100,000
Soil sampling of prospective areas	$50,000
Resource classification drilling; 10,000 m	$1,500,000
Underground potential drilling; 20,000 m	$3,000,000
Assays/Geochemistry	$900,000
Updated Resource Estimate	$75,000
Total	**$5,625,000**

26.2.2 Mining

- Perform a surveying campaign to confirm bedrock surface, focusing on Phase 1 and Phase 2 of the pit, as well as the water basins locations;
- Assess the impact of high-grading during the first three years of operation;
- Assess the option of varying the numbers of mining phases;
- Perform pit optimization sensitivity on overall pit slopes, metallurgical recovery and dilution/ore loss;
- Perform pit optimization using Inferred Mineral Resources to provide guidance for in-fill drilling;

- Conduct an additional geotechnical assessment to confirm the recommended pit slopes prior to advancing to the next stage of the project;
- Produce a 2-year detailed mine plan, including a pre-production plan;
- Confirm haul road and pit ramp designs based on the mining contractor haulage equipment fleet.

26.2.3 Waste Dumps Management

- Complete geochemical characterization for the waste rock is to be confirmed to determine whether they are acceptable as off-site civil construction materials;
- Optimization of the water management plan and design/construction of the water basins and treatment plant;
- Initiate and complete geochemical characterization of rock excavated from the proposed basins to confirm if this material can be reused for site construction purposes.

26.2.4 Environment and Social

- Inform and involve stakeholders as the project advances;
- Continue evaluating the impacts of the project on the environment;
- Design of mitigation measures, if required, to control dust, noise, etc.;
- Increase visibility of Sayona in the region with a local office in La Motte.

26.2.5 Decarbonization

Continue developing Sayona's decarbonization plan:

- Complete a detailed assessment of greenhouse gas ("GHG") emissions for the Project;
- Develop a holistic decarbonization strategy for Sayona, aligned with broader environmental, social and governance ("ESG") goals; and
- Determine the feasibility and viability of the selected options and continue technological monitoring.

26.2.6 Infrastructure

During the UDFS, the following elements have been modified or relocated:

- Wasterock piles were modified and relocated further from the Saint-Mathieu-Berry Esker;
- The main access road was changed and enters the site from the northwest of the property in the municipality of Preissac.

The company has committed not to displace any material from the adjacent esker for construction. A conceptual site layout plan was developed which includes water management and treatment facilities, traffic management, and infrastructure. All major buildings were located on existing out-crops easily visible from the LiDAR surveys. Preliminary geotechnical studies were undertaken in 2018 after completion of the Definitive Feasibility Study ("DFS"). Final plant lay-out and water management basin dimensions will be optimized during detailed engineering.

The following recommendations are made related to project infrastructure:

1. Site layout:
   a) Further work is recommended to optimize the site layout and footprint;
   b) Review roads configurations to ensure efficient traffic flow and safety of personnel;
   c) All road and pad construction can be appropriately scheduled to maximize the use of mine waste rock from the pit. There is a possibility of using crushing equipment to produce aggregate for the civil construction to lower costs;
   d) Examine extending the industrial site by back-filling with waste rock;
   e) Examine a strategy for waste pile management and perimeter ditch construction to be performed by mining operations;
   f) Optimization of the use of waste rock for construction of internal roads and infrastructure areas.
2. Geotechnical:
   a) Additional geotechnical investigations are recommended to characterize and define the soils on the site.
3. Survey:
   a) Further ground-feature surveys are needed for the proposed infrastructure areas including off-site roads and proposed intersection locations.
4. Water management:
   a) Water management (e.g., location of ditches, catchment basin size and water treatment plant location and size) will be optimized during the detailed engineering phase. Basin size must be appropriately dimensioned to include fire water reserve.

5. General infrastructure:
    a) All recommended service infrastructure work should be focused on developing turn-key packages from local contractors to reduce the overall cost. UDFS costs are based on preliminary proposals from local contractors. Further negotiations during the detailed engineering phase with local contractors will allow for cost optimization.
6. Off-site infrastructure:
    a) If sections of roads must be enlarged, or culverts should be replaced, it is recommended to discuss the financial aspects with the La Motte and La Corne municipalities.

26.2.7 Project Execution

A project execution strategy has been included in the UDFS with a clear separation between detailed engineering and an owner-driven Project Construction Management ("PCM") team. The flexibility of a small owner-driven construction team fits well with the size and scope of the Project. Implementing this approach, typically, is more adaptable in a short timeline, such as this one, and simplifies the construction contract administration process.

26.2.8 Financial

- Assess impacts of different financing scenarios;
- Begin tender and negotiation processes for mining contractor and ore transport contractor.

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