
# NI 43-101 Technical Report

## Preliminary Economic Assessment for the Shaakichiuwaanaan Project

James Bay Region, Québec, Canada

Prepared for:

Patriot Battery Metals Inc.

Effective Date: August 21, 2024
Signature Date: September 12, 2024

Prepared by the following Qualified Persons:

- Todd McCracken, P.Geo. — BBA Engineering Ltd.
- Hugo Latulippe, P.Eng. — BBA Engineering Ltd.
- Shane Ghouralal, P.Eng., MBA — BBA Engineering Ltd.
- Luciano Piciacchia, P.Eng., Ph.D — BBA Engineering Ltd.
- Ryan Cunningham, M.Eng., P.Eng. — Primero Group Americas Inc.
- Nathalie Fortin, P.Eng., M.Env. — WSP Canada Inc.

BBA WSP PRIMERO

# IMPORTANT NOTICE

This report was prepared as a National Instrument 43-101 Standards of Disclosure for Mineral Projects Technical Report for Patriot Battery Metals Inc. (“Patriot” or the “Company”) by BBA Engineering Ltd. ("BBA"), Primero Group Americas Inc. ("Primero"), and WSP Canada Inc. (“WSP”), known as the “Report Authors”. The quality of information, conclusions and estimates contained herein is consistent with the level of effort involved in the Report Authors’ services, based on i) information available at the time of preparation, ii) data supplied by outside sources, and iii) the assumptions, conditions and qualifications set forth in this report. This report is intended for use by Patriot subject to the terms and conditions of its contract with the report authors and relevant securities legislation. The contract permits Patriot to file this report as a Technical Report with Canadian Securities Regulatory Authorities pursuant to National Instrument 43-101. Except for the purposes legislated under provincial securities law, any other use of this report by any third party is at that party’s sole risk. The responsibility for this disclosure remains with Patriot. The user of this document should ensure that this is the most recent Technical Report for the property as it is not valid if a new Technical Report has been issued.

This report includes non-GAAP financial measures and non-GAAP financial ratios. The Company believes that these measures provide additional insight, but these measures are not standardized financial measures prescribed under GAAP and therefore should not be confused with, or used as an alternative for, performance measures calculated according to GAAP. Furthermore, these measures should not be compared with similarly titled measures provided or used by other issuers.

The non-GAAP financial measures and non-GAAP financial ratios used in this Report and common to the mining industry are defined below:

- **EBITDA**: EBITDA is a non-GAAP financial measure which is comprised of net income or loss from operations before income taxes, finance expense – net, depreciation and amortization. This measure is used by the Company to show anticipated operating performance, by eliminating the impact of non-operational or non-cash items.
- **Cash operating costs at site and cash operating costs at site per tonne**: Cash operating costs at site is a non-GAAP financial measure which includes mining, processing, and site administration. Cash operating costs at site per tonne is a non-GAAP financial ratio which is calculated as cash operating costs at site divided by anticipated production expressed in tonnes. These measures capture the important components of the Company’s anticipated production and related costs and are used to indicate anticipated cost performance of the Company’s operations.

- **Total cash operating costs (FOB Bécancour) and total cash operating costs per tonne (FOB Bécancour)**: Total cash operating costs (FOB Bécancour) is a non-GAAP financial measure which includes mining, processing, site administration, and product transportation to Bécancour. Total cash operating costs (FOB Bécancour) per tonne is a non-GAAP financial ratio which is calculated as total cash operating costs (FOB Bécancour) divided by anticipated production expressed in tonnes. These measures capture the important components of the Company's anticipated production and related costs and are used to indicate anticipated cost performance of the Company's operations.
- **All-in sustaining cost and all-in sustaining cost per tonne**: All-in sustaining cost is a non-GAAP financial measure that includes mining, processing, site administration, and product transportation to Bécancour and sustaining capital. All-in sustaining cost per tonne of spodumene concentrate is a non-GAAP financial ratio which is calculated as all-in sustaining cost divided by anticipated production expressed in tonnes. These measures capture the important components of the Company's anticipated production and related costs, and are used to indicate anticipated cost performance of the Company's operations.
- The Company does not currently have operations, and therefore does not have historical equivalent measures to compare and cannot perform a reconciliation with historical measures.

# Date and Signature Page

**This technical report is effective as of the 21st day of August 2024.**

| | |
|---|---|
| *Signed and sealed on file* | *September 12, 2024* |
| Todd McCracken, P.Geo.<br>BBA Engineering Ltd. | Date |
| *Signed and sealed on file* | *September 12, 2024* |
| Hugo Latulippe, P.Eng.<br>BBA Engineering Ltd. | Date |
| *Signed and sealed on file* | *September 12, 2024* |
| Shane Ghouralal, P.Eng., MBA<br>BBA Engineering Ltd. | Date |
| *Signed and sealed on file* | *September 12, 2024* |
| Luciano Piciacchia, P.Eng., Ph.D<br>BBA Engineering Ltd. | Date |

*Signed and sealed on file* | *September 12, 2024*

Ryan Cunningham, M.Eng., P.Eng.
Primero Group Americas Inc.

Date

*Signed and sealed on file* | *September 12, 2024*

Nathalie Fortin, P.Eng., M.Env.
WSP Canada Inc.

Date

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# CERTIFICATE OF QUALIFIED PERSON

## Todd McCracken, P.Geo.

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

I, Todd McCracken, P.Geo., as a co-author of the Technical Report, do hereby certify that:

1. I am Senior Geologist and Director of Mining and Geology at BBA Engineering Ltd., located at 144 Pine St., Unit 501, Sudbury, ON, P3C 1X3.
2. I am a graduate from University of Waterloo, Ontario, in 1992, with a bachelor's degree in Honors Applied Earth Sciences. I have practised my profession continuously since my graduation.
3. I am a member in good standing of Association of Professional Geoscientists of Ontario and License (PGO No. 0631) and *Ordre des Géologues du Québec* (OGQ No. 02371).
4. My relevant experience includes 30 years in exploration, operations and consulting, including resource estimation on pegmatite deposits. This also includes 10 years experience overseeing mining studies as department manager.
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 4 to 12, 14 and 23. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 3, 24.4, 25, 26 and 27 of the Technical Report.
8. I have visited the Shaakichiuwaanaan Property (previously known as Corvette) from June 4 to 7, 2024 as part of this current mandate, and previously from April 7 to 11, 2023.
9. I have prior involvement with the Property that is the subject of the Technical Report as I have participated as QP on the previous report titled "Mineral Resource Estimate for the CV5 Pegmatite, Corvette Property" and dated September 8, 2023.
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 12th day of September 2024.

*Signed and sealed on file*

Todd McCracken, P.Geo.

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# CERTIFICATE OF QUALIFIED PERSON

## Hugo Latulippe, P.Eng., B.Sc.A.

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

I, Hugo Latulippe, P.Eng., B.Sc.A., as a co-author of the Technical Report, do hereby certify that:

1. I am a Senior Engineer at BBA Engineering Ltd., located at 990 de l'Église Road, Office 590, Québec, QC, G1V 3V7.
2. I am a graduate of Mining and Mineralogy Engineering at Laval University, Québec, Québec, Canada, 2001.
3. I am a member of the *Ordre des ingénieurs du Québec* (OIQ 126558), Professional Engineers Ontario (PEO No. 100520994) and Engineers and Geoscientists British Columbia (No 209460).
4. I have been working in the mining industry since 2001. I began as a mining engineer in underground mines in Abitibi and then worked in open pit operations in James Bay and New-Caledonia. I acquired solid experience in mining operations before working on the development of three projects. I have been involved in mining studies since 2012.
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 1, 2, 3, 16, 21 (except Section 21.5), 25, 26 and 27, and Sections 18.1, 18.2.1 to 18.2.13, 18.2.21, 18.3, 20.7, 20.8, 24.1, 24.2, and 24.3.
8. I have visited the Shaakichiuwaanaan Property (previously known as Corvette) from September 3 to 10, 2024.
9. I have no prior involvement with the Property that is the subject of the Technical Report.
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 12th day of September 2024.

*Signed and sealed on file*

Hugo Latulippe, P.Eng., B.Sc.A.

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# CERTIFICATE OF QUALIFIED PERSON

## Shane Ghouralal, P.Eng., MBA

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

I, Shane Ghouralal, P.Eng., MBA, as a co-author of the Technical Report, do hereby certify that:

1. I am Senior Mining Consultant at the consulting firm BBA Engineering Ltd., located at 20 Carlson Court, Suite 100, Toronto, ON, M9W 7K6.
2. I am a graduate from the University of Waterloo of Ontario in 2011, with a Bachelor of Applied Science degree in Geological Engineering and a Master of Business Administration from Norwich University.
3. I am a member in good standing of the Professional Engineers Ontario (PEO Registration No. 100523537) and Professional Engineers and Geoscientist of Newfoundland and Labrador (PEGNL Registration No. 10197).
4. My relevant experience includes 14+ years of mining engineering and financial assessments. I am a "Qualified Person" for the purposes of National Instrument 43-101.
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 19, 22, and Section 21.5. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 25, 26 and 27 of the Technical Report.
8. I have not visited the Shaakichiuwaanaan Property (previously known as Corvette) that is the subject of the Technical Report, as it was not required for the purpose of this mandate.
9. I no prior involvement with the Property that is the subject of the Technical Report.
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 12th day of September 2024.

*Signed and sealed on file*

Shane Ghouralal, P.Eng., MBA

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# CERTIFICATE OF QUALIFIED PERSON

## Luciano Piciacchia, P.Eng., Ph.D.

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

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

1. I am currently employed as Engineer and Director of Earth and Infrastructure with the consulting firm BBA Engineering Ltd., 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 Order of Engineers of 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 Sections 18.2.14 to 18.2.20. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 3, 21, 25, 26 and 27 of the Technical Report.
8. I did not visit the Shaakichiuwaanaan Property (previously known as Corvette) that is the subject of the Technical Report.
9. I have no prior involvement with the Property that is the subject of the Technical Report.
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 12th day of September 2024.

*Signed and sealed on file*

Luciano Piciacchia, P.Eng., Ph.D.

PRIMERO

# CERTIFICATE OF QUALIFIED PERSON

## Ryan Cunningham, P.Eng., M.Eng.

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

I, Ryan Cunningham, P.Eng., M.Eng., as a co-author of the Technical Report, do hereby certify that:

1. I am an employee with the consulting firm Primero Group Americas Inc., located at 1801 McGill College, #1450, Montréal, Québec, H3A 2N4.
2. I am a graduate from McGill University in Montréal in 2006 with a B.Eng. in Metals and Materials Engineering, and in 2009 with a M.Eng. in Mineral Processing.
3. I am a member in good standing of the "Ordre des Ingénieurs du Québec" (OIQ No. 145792). I am a Member of the Canadian Institute of Mining, Metallurgy and Petroleum.
4. I have worked as a professional for a total of eighteen (18) years since graduating from university. My expertise was acquired while working as a process engineer in engineering consulting firms.
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 13 and 17. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 21, 25, 26 and 27 of the Technical Report.
8. I have not visited the Shaakichiuwaanaan Property that is the subject of the Technical Report.
9. I have visited SGS's Lakefield Ontario facility and while there, I have witnessed testwork being performed on material from the Shaakichiuwaanaan project.
10. I have had no prior involvement with the Property that is the subject of the Technical Report.
11. 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.
12. 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 12th day of September 2024.

*Signed and sealed on file*

Ryan Cunningham, P.Eng., M.Eng.

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# CERTIFICATE OF QUALIFIED PERSON

## Nathalie Fortin, P.Eng., M.Env.

This certificate applies to the NI 43-101 Technical Report titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project, James Bay Region, Québec, Canada*" (the "Technical Report"), prepared for Patriot Battery Metals Inc., dated September 12, 2024, with an effective date of August 21, 2024.

I, Nathalie Fortin, P.Eng., M.Env., as a co-author of the Technical Report, do hereby certify that:

1. I am a Business Unit Director - Environmental Management / Earth & Environment with the consulting firm WSP Canada Inc., located at 1600 boul. René-Lévesque W, Montréal (Québec), Canada, H3H 1P9.
2. I am a graduate engineer from University of Sherbrooke, in 1993, with a bachelor's degree in Chemical Engineering and a Master Degree in Environmental Management (1999).
3. I am a member in good standing of *Ordre des ingénieurs du Québec* (OIQ no. 112062).
4. My relevant experience includes environmental assessment and management.
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 Sections 20.1, 20.2, 20.3, 20.9, and 20.10. I am also co-author and responsible for the relevant portions of Chapters 1, 2, 3, 21, 25, 26 and 27 of the Technical Report.
8. I did not visit the Shaakichiuwaanaan Property (previously known as Corvette) that is the subject of the Technical Report.
9. I have no prior involvement with the Property that is the subject of the Technical Report.
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 12th day of September 2024.

*Signed and sealed on file*

Nathalie Fortin, P.Eng., M.Env.

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# List of Abbreviations and Units of Measurement

| Abbreviation | Description |
|---|---|
| $ or CA$ | Canadian dollar (examples of use: CA$2.5M / $2.5M) |
| $/t | dollars per tonne |
| % | percent |
| °C | degrees Celsius |
| 3D | three dimensional |
| a | annum (year) |
| AARQ | *Atlas des amphibiens et reptiles du Québec* |
| AAS | Atomic Absorption Spectroscopy |
| Actlabs | Activation Laboratories Ltd. |
| Ag | silver |
| AI | Artificial intelligence |
| ALS Canada | ALS Canada Ltd. |
| ANFO | ammonium nitrate fuel oil (explosive) |
| AR | augmented reality |
| ARD | Acid Rock Drainage |
| As | arsenic |
| ATV | acoustic televiewer |
| Au | gold |
| BBA | BBA Engineering Ltd. |
| BEV | battery electric vehicle |
| BWi | Bond Ball Work Index |
| Calc. | Calculation |
| Capex | Capital cost estimate |
| CBHSSJB | Cree Board of Health and Social Services of James Bay |
| CDA | Guidelines of the Canadian Dam Association |
| CDC | Map designated claim (from the French "*claim désigné sur carte*") |
| CDPNQ | *Centre de données sur le patrimoine naturel du Québec* |
| CIM | Canadian Institute of Mining, Metallurgy and Petroleum |
| cm | centimetre |
| CN | Canadian National Railway |
| CNG | Cree Nation Government |
| CNSC | Canadian Nuclear Safety Commission |
| Co | cobalt |
| COG | cut-off grade |
| Company | Lithium Innova Inc., a subsidiary of Patriot Battery Metals Inc. |
| CP | Competent Person |
| Cr | chromium |

| Abbreviation | Description |
|---|---|
| CRM | certified reference material |
| CRRNTBJ | *Commission Régionale sur les Ressources Naturelles et le Territoire de la Baies-James* |
| Cs | cesium |
| CS | cross-section |
| CTA | Cree Trappers' Association |
| Cu | copper |
| CWi | Crushing Work Index |
| d | day (24 hours) |
| DDH | diamond drill hole |
| DEF | diesel exhaust fluid |
| deg. or ° | angular degree |
| Deswick.SO | Deswik Stope Optimizer |
| DFO | Fisheries and Oceans Canada |
| DGPS | Differential Global Positioning Systems |
| DMS | dense media separation |
| ECCC | Environment and Climate Change Canada |
| EIJBRG | Eeyou Istchee James Bay Regional Government |
| EPCM | engineering, procurement and construction management |
| EPMA | Electron Probe Micro-Analysis |
| EQA | Environment Quality Act |
| EQA | *Environment Quality Act* |
| ESIA | Environmental and Social Impact Assessment |
| et al. | and others |
| EV | electric vehicles |
| FCI | Félicie – Corvette Ouest – Island Lake – properties |
| FEL | front-end loader |
| FeSi | ferrosilicon |
| FIFO | fly-in fly-out |
| FOB | free on board |
| g | gram |
| G&A | General and Administration |
| GAAP | Generally accepted accounting principles |
| GDP | gross domestic product |
| GESTIM | Québec Mineral Tenure System |
| GOH | gross operating hours |
| GSC | Geological Survey of Canada |
| H | height |
| h | hour (60 minutes) |
| ha | hectare |

| Abbreviation | Description |
|---|---|
| HDPE | High Density Polyethylene |
| HLS | heavy liquid separation |
| HQ | Hydro-Québec |
| IAA | Impact Assessment Act |
| IAAC | Impact Assessment Agency of Canada |
| ICP | Inductively Coupled Plasma |
| ICP-AES | Inductively Coupled Plasma Atomic Emission Spectrometry |
| ICP-MS | Inductively Coupled Plasma Mass Spectrometry |
| ICP-OES | Inductively Coupled Plasma Optical Emission Spectrometry |
| ID | identification |
| $ID^2$ | inverse distance square |
| IFRS | International Financial Reporting Standards |
| in. or " | inch |
| INAA | Instrumental Neutron Activation Analysis |
| IP-Resistivity | induced polarization and resistivity |
| IRA | *Inflation Reduction Act* |
| IRR | internal rate of return |
| ISAQ | *Inventaire des Sites Archéologiques du Québec* |
| ISQ | *Institut de la statistique du Québec* |
| ISRM | International Society for Rock Mechanics |
| JBNQA | James Bay and Northern Québec Agreement |
| K | potassium |
| K | thousand ($) |
| kg | kilogram |
| km | kilometre |
| $km^2$ | kilometre square |
| kN | kilonewton |
| kPa | kilopascal |
| kt | kilotonne |
| ktpa | kilotonne per annum (year) |
| kV | kilovolt |
| kWh | kilowatt per hour |
| L | litre |
| LA | Laser Ablation |
| LA by ICP-MS | Laser Ablation by Inductively Coupled Plasma Mass Spectrometry |
| LCE | lithium carbonate equivalent |
| LCT | Li-Cs-Ta (lithium-cesium-tantalum) |
| LEMVQ | *Liste des espèces désignées menacées ou vulnérables au Québec* |
| LG | Lerchs-Grossmann |

| Abbreviation | Description |
|---|---|
| LG-2 | *La Grande Rivière* Airport |
| LG-4 | *La Grande-4* |
| LGA | *La Grande Alliance* |
| LHD | load haul dump (loaders) |
| Li | lithium |
| $Li_2CO_3$ | lithium carbonate |
| $Li_2O$ | lithium oxide |
| LiDAR | light detection and ranging |
| LLDPE | Linear Low-Density Polyethylene |
| LOI | Letter of Intent |
| LOM | life of mine |
| m | metre |
| $m^2$ | square metre |
| $m^3$ | cubic metre |
| Ma | mega annum (million annum) |
| MAC | Mining Association of Canada |
| Max. | maximum |
| MCC | *Ministère de la Culture et des Communications du Québec* |
| MDDEP | *Ministère du Développement durable, de l'Environnement et des Parcs* |
| MDMER | Metal and Diamond Mines Effluent Regulation |
| MELCCFP | *Ministère de l'Environnement, de la Lutte contre les changements climatiques de la Faune et des Parcs (previously MDDEP)* |
| MERN | *Ministère de l'Énergie et des Ressources naturelles* |
| mesh | US mesh |
| MFFP | *Ministère des Forêts, de la Faune et des Parcs* |
| Mg | magnesium |
| mg | milligram |
| Min. | minimum |
| ML | metal leaching |
| mm | millimetre |
| MM | mineralized material |
| Mo | molybdenum |
| MOU | Memorandum of Understanding |
| MRE | Mineral Resource Estimate |
| MRNF | *Ministère des Ressources Naturelles et des Forêts* |
| Mt | million tonnes |
| MTC | Matagami Transshipment Centre |
| MTOs | material take offs |
| Mtpa | million tonne per annum (year) |

| Abbreviation | Description |
|---|---|
| MW | megawatt |
| Na | sodium |
| Ni | nickel |
| NI 43-101 | Canadian National Instrument |
| NN | nearest neighbor |
| No. | number |
| NOH | net operating hours |
| NOWC | net operating work capital |
| NPV | net present value |
| NQ | normal quality |
| NRCan | Natural Resources Canada |
| NSR | net smelter royalty |
| NTS | National Topographic System |
| OK | ordinary kriging |
| OP | open pit |
| Opex | Operating cost estimate |
| OTV | optical televiewer |
| OVB | overburden |
| oz | troy ounce |
| Pb | lead |
| PEA | preliminary economic assessment |
| PFS | pre-feasibility study |
| PGEs | platinum-group elements |
| PMF | Probable Maximum Flood |
| PMP | Probable Maximum Precipitation |
| ppm | parts per million |
| Primero | Primero Group Americas Inc. |
| PSD | particle size distribution |
| Q' | Rock Tunneling Quality Index |
| Q1 | first quarter |
| Q2 | second quarter |
| Q3 | third quarter |
| Q4 | fourth quarter |
| QA/QC | quality assurance / quality control |
| Q-Method | rock mass quality |
| QP | Qualified Person |
| Rb | rubidium |
| RBQ | *Régie du bâtiment du Québec* |
| RCM | regional country municipality |

| Abbreviation | Description |
|---|---|
| RF | revenue factor |
| RHR | |
| ROM | run of mine |
| RP | retention pond |
| RPEEE | Reasonable Prospects for Eventual Economic Extraction |
| RQD | rock quality designation |
| SARA | *Species at Risk Act* |
| SC | spodumene concentrate |
| SEDAR+ | System for Electronic Document Analysis and Retrieval |
| SG | specific gravity |
| SGS | SGS Canada Inc. |
| $SO_4$ | sulphate |
| SPD | Deswik Strategic Pit Design tool |
| SPLP | Synthetic Precipitation Leaching Procedure |
| SQ | *Sûreté du Québec* |
| st | short ton (2,000 lb) (ton) |
| Std Dev. | standard deviation |
| t | tonne (1,000 kg) (metric ton) |
| Ta | tantalum |
| $Ta_2O_5$ | tantalum oxide |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TCR | TCR |
| TMF | tailings management facility |
| tpa | tonnes per annum (year) |
| tpd | tonnes per day |
| tph | tonnes per hour |
| tpm | tonnes per metre (1,000 kg) (metric ton) |
| TSS | Total Suspended Solids |
| TY | Transfer Yard |
| UG | underground |
| UGAF | Fur-Bearing Animal Management Units (*unités de gestion des animaux à fourrure)* |
| US$ | United States dollar (examples of use: US$2.5M) |
| USMCA | USA-Mexico-Canada Trade Agreement |
| UTM | Universal Transverse Mercator |
| Var Comp | Variability Composite |
| Virginia | Virginia Gold Mines |
| W | width |
| WBS | work breakdown structure |
| WEC | work element coding |

| Abbreviation | Description |
|---|---|
| week | week |
| WSP | WSP Canada Inc. |
| XRD | X-ray diffraction |
| XRF | X-ray fluorescence |
| y | year |
| Zn | Zinc |

# 1. Summary

## 1.1 Introduction

BBA Engineering Ltd. ("BBA") has been retained by Patriot Battery Metals Inc ("Patriot" or the "Company") to lead and perform, with contributions from Primero Group Americas Inc. ("Primero") and WSP Canada Inc. ("WSP") an independent Preliminary Economic Assessment ("PEA") and technical report on the CV5 Pegmatite at 0the Shaakichiuwaanaan Property (the "Project"). This report, titled "Preliminary Economic Assessment for the Shaakichiuwaanaan Project" (the "Report"), was commissioned by Patriot to comply with regulatory disclosure and reporting requirements outlined in National Instrument 43-101 – Standards of Disclosure for Mineral Projects ("NI-43-101"), and Form 43-101F1 – Technical Report.

On October 5, 2023, Patriot Battery Metals Inc. established a wholly owned 100% Québec-based subsidiary Lithium Innova Inc. ("Innova"). Innova is the 100% registered title holder of the claims of Patriot's flagship Shaakichiuwaanaan Property (previously known as "Corvette") located in the Eeyou Istchee James Bay region of Québec, Canada. This submission is by Patriot as the owner of Innova.

It should be noted that unless otherwise indicated, all references to "$" or "CA$" in this Report are to Canadian dollars and references to "US$" are to US dollars. A foreign exchange conversation rate of US dollar of US$0.76/CA$1.00 has been used over the life of mine ("LOM").

## 1.2 Property Description and Location

The Shaakichiuwaanaan Property (the "Property") is located in the Eeyou Istchee James Bay region of Québec, Canada, centred on 53°32'00" N, 73°55'00" W, and is situated approximately 220 km east of Radisson, Québec, and 240 km north-northeast of Nemaska, Québec. The Property consists of 463 mineral claims that cover an area of approximately 23,710 ha over two primary claim groups. The principal and largest claim grouping extends dominantly east-west for approximately 51 km as a nearly continuous, single claim block.

The Property is situated on Category III Land within the Eeyou Istchee Cree Territory (Cree Nation of Chisasibi, and Cree Nation of Mistissini), as defined under the James Bay and Northern Québec Agreement ("JBNQA"). The Eeyou Istchee James Bay Regional Government ("EIJBRG") is the designated municipality for the region including the Property.

The claims that comprise the Property are registered under, and subject to, the *Mining Act* of the Province of Québec. Full claim details can be found on the *Ministère des Ressources naturelles et des Forêts* ("MRNF") mineral tenure system's online portal ("GESTIM") website (https://gestim.mines.gouv.qc.ca/). All 463 claims that comprise the Property are in good standing with term expiry dates ranging from February 20, 2025, to November 6, 2026. Through direct claim staking and various option agreements, which have all fully vested, the Company holds 100% interest in the Property and, through its subsidiary Lithium Innova Inc., is the sole registered title holder for all 463 claims, subject to underlying royalties.

The CV5 Spodumene Pegmatite Mineral Resource Estimate ("MRE") is subject to a 2% net smelter royalty ("NSR"). The CV13 Spodumene Pegmatite MRE, as is currently defined, is subject to a 2% royalty over the northern portions of its eastern and western limbs corresponding to approximately 40% (based on total tonnes) and 53% (based on contained lithium) of the total CV13 MRE. The CV4, CV8, CV9, CV10, CV12, and CV14 spodumene pegmatites are subject to a 2% royalty

The Company currently holds permits/authorizations from the *Ministère de l'Environnement, de la Lutte contre les changements climatiques de la Faune et des Parcs* ("MELCCFP"), MRNF, and Fisheries and Oceans Canada ("DFO") to carry-out surface and drill exploration on the Property. Additionally, the Company holds a lease from the MRNF on an area immediately south of KM-270 of the Trans-Taiga Road for an exploration camp including staging (i.e., laydown), core processing, and storage areas. The Company holds various permits from the MRNF, MELCCFP, and EIJBRG for the construction and operation of its camp at KM-270 (the "Shaakichiuwaanaan Camp"). Several authorizations from the MELCCFP have been obtained for drinking water and wastewater treatment for the permanent camp and future requests will be filed accordingly. The Company also holds various authorizations from the ministry for the construction and maintenance of an all-season road extending south from KM-270 of the Trans-Taiga Road to the southwest side of the CV5 Pegmatite.

The Company has submitted the required notifications to the applicable municipality and stakeholders outlining its 2024 mineral exploration plans for the Property.

Potential environmental liabilities at the Property include an exploration camp at KM-270 of the Trans-Taiga Road, an all-season road and associated borrow pits, and exploration access trails in certain drill areas. If the Project was to not move forward, this road and access trails may have to be reclaimed, and the exploration camp disassembled, and area reclaimed. The qualified persons ("QPs") are not aware of any additional environmental liabilities beyond the normal disturbance related to surface exploration.

## 1.3 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The Property consists of two primary claim groups – one straddling KM-270 of the Trans-Taiga Road, and the second with its northern border located directly south of KM-270, approximately 5.8 km from the Trans-Taiga Road and powerline infrastructure corridor. The La Grande-4 ("LG-4") hydroelectric dam complex is located approximately 30 km north-northeast of the Property. The CV5 Spodumene Pegmatite is located central to the Property, approximately 13 km south of KM-270 on the Trans-Taiga Road, 14 km south of the powerline, and 50 km south-southwest of the LG-4 dam complex.

The mineral exploration and development activities at the Property are supported by the Company's exploration camp and Mirage Lodge located at KM-270 and KM-358 of the Trans-Taiga Road, respectively.

The Trans-Taiga is an all-season gravel road that trends east-west through the region and connects approximately 210 km to the west of the Property to the Billy-Diamond Highway (Rte 109) at KM-541, which extends north to Radisson and south to Matagami, where it connects to Québec's regional road and railroad network. The Property, and specifically the CV5 Pegmatite, may be accessed directly by all-season road extending south from KM-270 of the all-season Trans-Taiga Road. Apart from the all-season road, Shaakichiuwaanaan Camp, and various exploration drill access trails, there is no infrastructure on the Property.

The Property is located in a sub-arctic climate region. Over the course of the year, the temperature typically varies from -27 °C to 20 °C, with rare extremes of -35 °C and 26 °C. Snow covers the ground from mid-October to late May, limiting field work in the winter period to drilling and geophysics. The Property topography consists of forested gently rolling hills, drainages, and muskeg swamps between approximately 260 m and 350 m elevation, typical of the James Bay Region.

## 1.4 History

Historical exploration of the Property area was initially focused on base and precious metal mineralization, beginning in the late 1950s. This early work resulted In the discovery of several Cu--Au-Ag showings including Tyrone T-9 (3.36% Cu, 0.82 g/t Au, 38.4 g/t Ag in outcrop and 1.15% Cu over 2.1 m in channel), and Lac Smokycat-SO (1.75% Cu, 1.47 g/t Au, and 40.5 g/t Ag in outcrop) located on the present-day FCI West claim block (Ekstrom, 1960 - GM10515).

From the 1950s through to 1997, the Property area was subject to only limited exploration work, including various regional mapping surveys by the federal and provincial governments as well as airborne magnetic and electromagnetic surveys.

In 1997, Virginia Gold Mines Inc. (Virginia) acquired an extensive land position in the area, which overlapped the present-day Property. Exploration between 1997 and 2000 included various geophysical surveys, surface mapping, and prospecting. Numerous base and precious metal showings were discovered during this period including Golden Gap (32.7 g/t Au in outcrop), Golden East (20.3 g/t Au), Deca-1 to Deca-4 (1.91 g/t Au over 5 m in channel, and 6.91 g/t Au in grab sample), Goose-1 (1.98 g/t Au), Goose-2 (3.74 g/t Au), and Sericite (1.89% Cu, 0.3 g/t Au, 150 g/t Ag, and 1.45% Zn). Continued surface exploration in subsequent years by Virginia (and various option partners) resulted in the discovery of several additional base and precious metal showings at the Property.

In 2001, the first diamond drill holes on the Property were completed, targeting the Golden Gap Showing, with drilling expanding in 2007 and 2013. Holes were completed at the Sericite Showing (302 m over two holes in 2013), the Lac Bruno boulder field (391 m over three holes in 2007), and Golden Gap (combined total of 5,267 m in 24 holes; between 2001 and 2013) and the Deca-Goose area (325 m over three holes in 2001). The best historical precious metals drill intercept is from Golden Gap with 10.48 g/t Au over 7 m, obtained in 2007 (drill hole FCI-07-003).

In 2016, the Company (then under the name of 92 Resources Inc.) acquired an initial claim position in the area (part of the present-day Corvette Main claim block). The claims were acquired, in part, because of the words "*cristaux de spodumène*" in pegmatite that was noted in an outcrop description (RO-IL-06-023) from a 2006 exploration program carried out by Virginia (Archer & Oswald, 2008b - GM63695). The description of the mineral spodumene indicated lithium pegmatite. Prior to 2016 and the acquisition by the Company, all mineral exploration at the Property had been focused on base and precious metals.

## 1.5 Geological Setting and Mineralization

The Property overlies a large portion of the Lac Guyer Greenstone Belt, considered part of the larger La Grande River Greenstone Belt, and is dominated by volcanic and sedimentary rocks metamorphosed up to amphibolite facies. The Property is dominantly host to rocks of the Guyer Group (amphibolite, iron formation, intermediate to mafic volcanics, peridotite, pyroxenite, komatiite, and felsic volcanic tuffs). The amphibolite and metasedimentary rocks that trend east-west (generally moderately to steeply south dipping) through this region is bordered to the north by the Magin Formation (conglomerate, wacke) and to the south by an assemblage of tonalite, granodiorite, and diorite, in addition to metasediments of the Marbot Group (conglomerate, wacke). Several regional-scale Proterozoic gabbroic dykes also cut through portions of the Property (Lac Spirt Dykes, Senneterre Dykes). The lithium pegmatites on the Property, including at CV5 and CV13, are hosted predominantly within amphibolites, metasediments, and lesser ultramafics.

The geological setting is primarily prospective for gold, silver, base metals, platinum group elements, and lithium over several different deposit styles including orogenic gold (Au), volcanogenic massive sulfide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and Li-Cs-Ta (“LCT”) pegmatite.

Exploration has outlined three primary mineral exploration trends, crossing dominantly east-west over large portions of the Property – Golden Trend (gold), Maven Trend (copper, gold, silver), and CV Trend (LCT pegmatite). The Golden Trend is focused over the northern areas of the Property, the Maven Trend in the southern areas, and the CV Trend “sandwiched” between. Historically, the Golden Trend has received the exploration focus followed by the Maven Trend. However, the identification of the CV Trend and the numerous LCT pegmatites discovered to date, represents a previously unknown lithium pegmatite district that was first recognized in 2016/2017 by Dahrouge Geological Consulting Ltd. and the Company.

The CV Trend is currently recognized as an approximate 1-km wide and 25+ km long corridor, which is host to numerous distinct LCT pegmatite occurrences, and extends in a general east-west direction across the central portion of the Property’s primary claim group. The trend is interpreted to extend across the entire Property (~50 km); however, large areas remain to be explored for lithium pegmatite. The LCT pegmatites along this trend may outcrop as isolated high relief ‘whale-back’ landforms or relatively low-relief to flat landforms.

To date, eight distinct lithium pegmatite clusters have been discovered along the CV Trend at the Shaakichiuwaanaan Property – CV4, CV5, CV8, CV9, CV10, CV12, CV13, and CV14. Each of these clusters includes multiple lithium pegmatite outcrops in close proximity and oriented along the same local trend.

Spodumene ($LiAlSi_2O_6$) is the dominant lithium mineral identified at all the lithium occurrences documented to date at the Property. Spodumene crystals range in size from centimetre-scale to metre-scale and have approached 2 m in length in drill core at CV5. The colour of the spodumene crystals ranges from cream to light grey-green over the CV5 Pegmatite area, to a more whitish colour in the pegmatites to the west (CV8, CV9, CV10, and CV12). Spodumene mineralization is commonly associated with smoky quartz; however, may still occur as isolated crystals in feldspar-rich pegmatite.

The lithium mineralization discovered on the Property to date has thus far been confined to the CV Trend. The core area of the trend includes the approximate 4.6-km long CV5 Spodumene Pegmatite and 2.3 km long CV13 Spodumene Pegmatite, as defined by drilling, which are separated by approximately 2. 9 km of prospective trend yet to be drill tested. Both CV5 and CV13 remain open along strike at both ends and to depth.

At CV5, the vast majority of its Mineral Resource is hosted within a single, large, principal spodumene pegmatite dyke, ranging in true thickness from <10 m to >125 m, and which is flanked on both sides by multiple, subordinate, sub-parallel trending dykes. At CV13, the Mineral Resource is defined by a series of flat-lying to moderately dipping (northerly), sub-parallel trending spodumene pegmatite bodies. Both CV5 and CV13 hosts significant high-grade zones (Nova and Vega, respectively) each situated at the base of their respective pegmatite lenses, and traced over a significant distance with multiple drill hole intercepts (core length) ranging from 2 m to 25 m (CV5) and 2 m to 10 m (CV13) at >5% $Li_2O$, respectively, each within a significantly wider mineralized zone of >2% $Li_2O$.

## 1.6 Deposit Types

The primary target and deposit model for the Property are LCT pegmatites. Most LCT pegmatites are hosted by metamorphosed supracrustal rocks in the upper greenschist to lower amphibolite metamorphic grades. LCT pegmatite intrusions generally are emplaced late during orogeny, with emplacement being controlled by pre-existing structures. Typically, they are located near evolved, peraluminous granites (i.e., S-Type) and leucogranites from which they are inferred to be derived by fractional crystallization. In cases where a parental granite pluton is not exposed, one is inferred to lie at depth.

## 1.7 Exploration

The Company's non-drilling exploration activities (2017 through April 2024) at the Property include surface mapping and rock sampling, prospecting, channel sampling, ground and airborne geophysics, and remote sensing surveys. The focus has been predominantly for LCT pegmatite, although significant base and precious metal exploration has also been completed.

In 2017, the Company completed a short reconnaissance program, which confirmed the presence of coarse-grained spodumene in two sub-parallel trending pegmatite outcrops – CV1 (3.48% $Li_2O$) and CV2 (1.22% $Li_2O$) (Smith D. L., 2018). The Company expanded upon the work in 2018 with additional surface prospecting and rock sampling, which resulted in the discovery of two new pegmatite outcrops – CV3 (1.61% $Li_2O$) and CV4 (0.74% $Li_2O$) (Smith D. L., 2019). Channel sampling was also completed at the CV1 and CV2 Pegmatite outcrops. At CV1, forty samples collected from five channels averaged 1.35% $Li_2O$. Highlights from the channel sampling include 2.28% $Li_2O$ and 208 ppm $Ta_2O_5$ over 6 m (CV1-CH03) and 1.54% $Li_2O$ and 136 ppm $Ta_2O_5$ over 8 m (CV1-CH01).

In July 2019, the Company expanded its scope of exploration with a stronger focus on base and precious metals due to market conditions at the time. The field work included prospecting, rock sampling, and soil sampling and resulted in the discovery of new occurrences of gold (West Golden Gap, New Lac Bruno), copper-gold-silver (Elsass, Lorraine, Black Forrest, Hund), and lithium-tantalum (pegmatite outcrops CV5 through CV11), as well as further understanding of known targets (Smith D. L., 2020 - GM71564). Rock sample results ranged from nil to 11.9 g/t Au, nil to 171 ppm Ag, nil to 8.15% Cu, nil to 4.72 $Li_2O$, and nil to 1,011 ppm $Ta_2O_5$.

No field work was completed in 2020; however, a re-interpretation of historical induced polarization and resistivity surveys and airborne magnetic survey data was completed. The work indicates a significant potential for follow-up drilling at Golden Gap remains.

Exploration continued in 2021 and focused on the Maven and CV trends ahead of initial diamond drilling, which followed in the fall. Airborne and surface work included geological mapping and rock sampling, ground based induced-polarization and resistivity survey, airborne magnetic survey, and a remote sensing survey (Smith, Mickelson, & Blu, 2023 - GM73402). The most significant result of the 2021 mapping and rock sampling program was the recognition of the CV12 Spodumene Pegmatite cluster, where numerous lithium pegmatite outcrops were discovered. Analytical results at CV12 ranged from nil to 5.98% $Li_2O$ and 49 to 1,478 ppm $Ta_2O_5$, with an average of 2.83% $Li_2O$ and 438 ppm $Ta_2O_5$.

In 2022, the exploration campaign reoriented firmly towards LCT pegmatite with only minor base and precious metals work completed. Exploration included prospecting and rock sampling, surface outcrop mapping, channel sampling, and a LiDAR and orthophoto survey. The most significant result of the 2022 surface exploration was the discovery of the CV13 Spodumene Pegmatite cluster, situated between the CV8 and CV12, and CV5 Spodumene Pegmatite clusters. Of the 38 pegmatite samples collected at CV13, a total of 14 assayed >1% $Li_2O$ to a peak of 3.73% $Li_2O$. Outcrop channel sampling followed with results including 14.2 m at 1.17% $Li_2O$ and 13.1 m at 1.57% $Li_2O$. Outcrop channel sampling was also completed at other known lithium pegmatite clusters and returned 1.5 m at 1.12% $Li_2O$ (CV4), 5.6 m at 1.93% $Li_2O$ (CV8), 15.0 m at 0.46% $Li_2O$ (CV9), and 21.9 m at 0.80% $Li_2O$; 7.7 m at 1.46% $Li_2O$, 10.1 m at 1.09% $Li_2O$ (CV12).

Surface exploration in 2023 included an orientation IP-Resistivity geophysical survey over a large portion of the CV5 Spodumene Pegmatite, a ground magnetic survey over the CV5 to CV13 corridor, a ground gravity orientation survey, as well as geological mapping and rock sampling, prospecting, and channel sampling. Additionally, an airborne magnetic and radiometric survey was completed over the Corvette Main, FCI East, and Felix claim blocks.

Through 2024, as of the date of this Report, the Company has completed a surface exploration program which has included detailed geological mapping at the CV5 and CV13 pegmatites, channel sampling at multiple spodumene pegmatite clusters, and regional prospecting. Results have yet to be reported.

## 1.8 Drilling

The Company completed drilling at the Property in 2021 (Maven and CV trends), 2022 (CV Trend), 2023 (CV Trend, Camp), and 2024 (CV Trend). The Shaakichiuwaanaan database includes 537 diamond drill holes completed over the 2021, 2022, 2023, and 2024 (through the end of April – drill hole CV24-526) programs, for a collective total of 169,526 m, as well as 88 outcrop channels totalling 520 m. The Shaakichiuwaanaan MRE is supported by 344 holes (129,673 m) and 11 outcrop channels (63 m) at CV5, and 132 holes (29,059 m) and 54 outcrop channels (340 m) at CV13

At the Maven Trend (2021), the program returned anomalous to moderate grades over several drill holes, including individual sample highs comparable to prior surface results – 3.1 m of 0.34% Cu, 0.21 g/t Au, and 6.7 g/t Ag within a larger interval of 28.4 m of 0.12% Cu, 0.06 g/t Au, and 2.3 g/t Ag (CF21-013, Lorraine), and 0.2 m of 2.12% Cu, 0.26 g/t Au, and 25.4 g/t Ag (CF21-008A, Tyrone-T9). Mineralization consists of visible chalcopyrite present as stringers and disseminations.

The drill programs at the CV Trend (from September 2021 through April 2024), were very successful, returning wide and well-mineralized intervals of spodumene pegmatite in multiple holes at both the CV5 and CV13 pegmatites, for which Mineral Resources have been determined.

Highlights at CV5 include:

- 148.7 m at 0.92% $Li_2O$, including 73.0 m at 1.09% $Li_2O$ (CF21-001, the 'discovery hole');
- 152.8 m at 1.22% $Li_2O$, including 66.0 m at 1.51% $Li_2O$ (CV22-030);
- 156.9 m at 2.12% $Li_2O$, including 25.0 m at 5.04% $Li_2O$ or 5.0 m at 6.36% $Li_2O$ (CV22-083);
- 131.2 m at 1.96% $Li_2O$, including 57.0 m at 2.97% $Li_2O$ (CV22-100);
- 83.7 m at 3.13% $Li_2O$, including 19.8 m at 5.28% $Li_2O$ and 5.1 m at 5.17% $Li_2O$ (CV23-105);
- 172.4 m at 0.95% $Li_2O$, including 34.5 m at 1.85% $Li_2O$ (CV23-199);
- 123.3 m at 1.66% $Li_2O$, including 54.9 m at 2.50% $Li_2O$ (CV24-374).

Highlights at CV13 include:

- 22.6 m at 1.56% $Li_2O$, including 6.0 m at 3.19% $Li_2O$ (CV22-092);
- 28.7 m at 1.49% $Li_2O$, including 20.4 m at 2.03% $Li_2O$ (CV23-311);
- 51.7 m at 1.77% $Li_2O$, including 9.7 m at 5.16% $Li_2O$ (CV24-525);
- 34.4 m at 2.90% $Li_2O$, including 21.9 m at 3.58% $Li_2O$ (CV24-470).

## 1.9 Sample Preparation, Analyses and Security

Sample preparation and analysis of the surface and diamond drill program samples have been completed at various independent commercial laboratories in Canada. All laboratories used are properly certified and accredited.

It is the QP's opinion that the Company has utilized appropriate quality assurance / quality control ("QA/QC") protocols for all is mineral exploration programs. This includes the use of certified reference materials, blanks, duplicates, and check analysis at a secondary laboratory.

## 1.10 Data Verification

Data validations supporting the Mineral Resource estimation for the Shaakichiuwaanaan Project, including both the CV5 and CV13 pegmatites have been carried out by qualified persons. This includes site visits, check sampling of drill core, validation of multiple collar locations, and validation of the drill hole database.

It is the QP's opinion that the sampling practices of Patriot meet current industry standards. The QP also believes that the sample database provided by Patriot and validated by the QP is suitable to support the Mineral Resource estimation.

## 1.11 Mineral Processing and Metallurgical Testing

### 1.11.1 Metallurgical Test Work

The Company engaged Primero and SGS Canada in 2023 to assist with a metallurgical test work program for the CV5 Deposit. Test work was completed at the SGS Lakefield Ontario facility. The scope of the program included both mineralogical characterization and metallurgical test work. Both SGS and Primero are independent of the Company and are industry recognized in lithium pegmatite processing. The objectives of the metallurgical test work program being to confirm the dominant lithium bearing mineral species for CV5 and evaluate the beneficiation performance of the deposit using a conventional spodumene DMS flowsheet. Target concentrate specifications were set at >5.5% $Li_2O$ and <1.2% $Fe_2O_3$.

Mineralogical characterization consisted of TIMA-X (Quantitative SEM), Electron Probe Micro-Analysis ("EPMA"), Laser Ablation by Inductively Coupled Plasma Mass Spectrometry (LA by ICP-MS), X-ray diffraction ("XRD") analysis, and chemical assays. Metallurgical test work included Heavy Liquid Separation ("HLS") and DMS pilot scale test work. Preliminary flotation test work was completed on the DMS bypass fraction and DMS "middlings" (i.e., second stage DMS floats).

Test work completed to date indicates that the CV5 Pegmatite can be processed by DMS-only given the favourable metallurgical test work results. Test work revealed that a top size of 9.5 mm reporting to a gravity separation process provided relatively consistent results in terms of concentrate $Li_2O$ grade and $Li_2O$ recovery.

Testing of CV5 was done both in terms of variability across region, throughout the width of the dykes (i.e., at contact with host rock, in the centre of formation) as well as testing of the host rock separately (to properly gauge impacts of host rock dilution on metallurgical performance). The broad range of spatial locations with a range of gangue mineral assemblages, lithium and iron head provides thorough testing of the material. There is a strong indication that the positive HLS recoveries can be expected from other coarse spodumene samples taken from CV5.

Gravity test work included 24 pegmatite composites were generated from drill core from the CV5 Pegmatite, representing a combined comprising of 631 kg of quarter-core NQ and 707 kg half-core NQ (see Figure 1-1 for metallurgical results). Additionally, five composites were made of different host rock types identified around the CV5 material, corresponding to 345 kg half-core NQ.

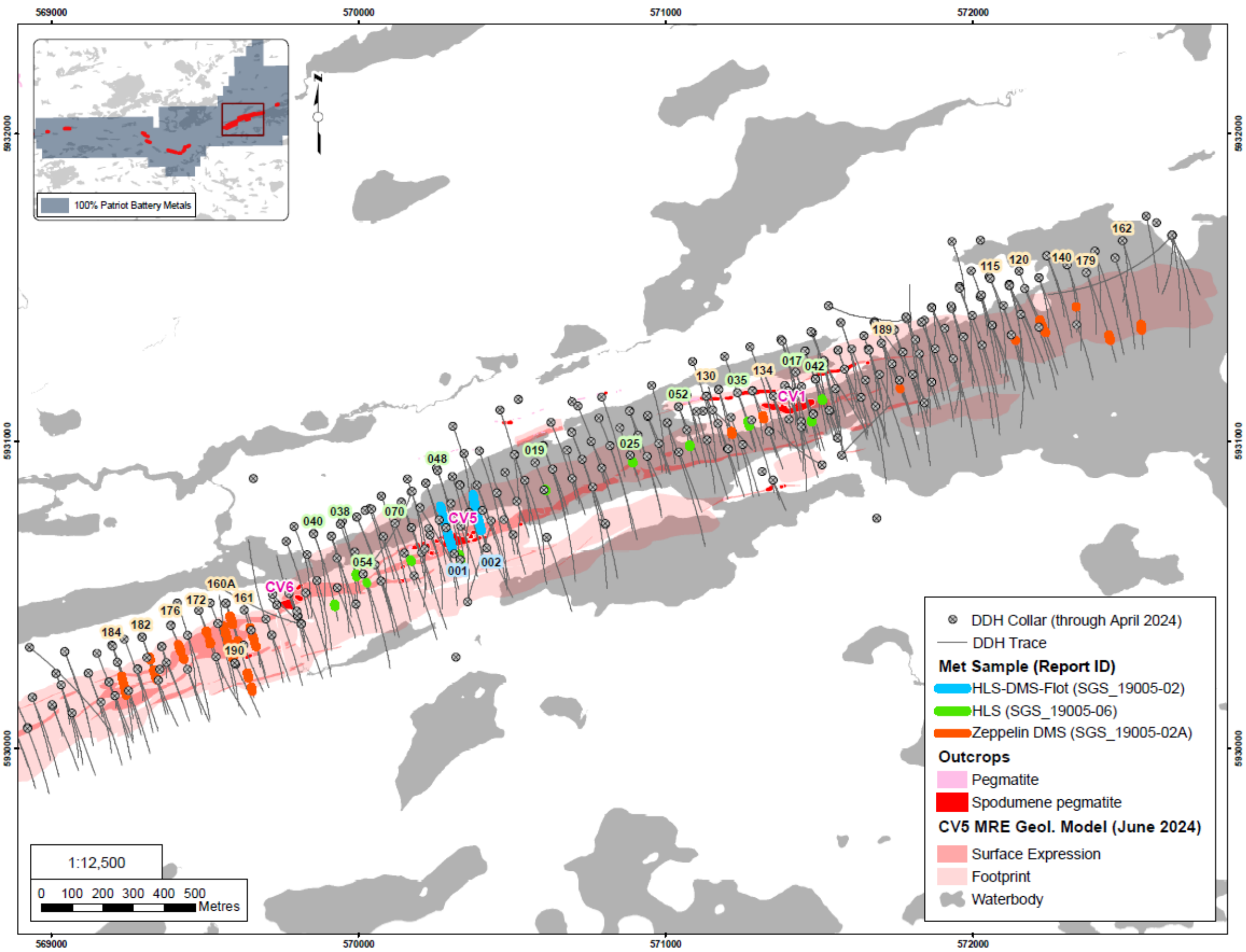



**Figure 1-1: Metallurgical Drill Core Map for CV5**

Although not considered in the CV5 region, five pegmatite composites were generated from drill core from the CV13 Pegmatite, representing a combined comprising of 42.7 kg of quarter-core NQ. Results were both promising and consistent with CV5 results, with global lithium recoveries of 75% to 80%. These preliminary results offer future exploration potential.

Summary of the test work and findings:

- Test work supports a DMS-only process flowsheet to produce a spodumene concentrate grade of >5.5% $Li_2O$ and <1.2% $Fe_2O_3$. Test work $Li_2O$ recoveries of 70% to 85% were achieved for HLS test work (for feed grade in the range 1.0% to 1.5% $Li_2O$ respectfully).
- Test work completed on CV5 includes three DMS tests and 24 Heavy Liquid Separation ("HLS") and magnetic separation tests. The HLS and magnetic separation tests were conducted using 24 composites from across the CV5 Deposit.

- Coarse spodumene was found to be the dominant lithium mineral species across all samples with minor quantities of lepidolite (values range between 0% to 4.3% with an average of 0.98%) and moderate quantities of mica (values range between 0% to 17.1% with an average of 6.50%) observed.
- Three pilot DMS tests (cyclone diameter of 250 mm) were completed. Table 1-1 summarises the global $Li_2O$ feed grades (before fines screening), global lithium recoveries and the $Li_2O$ and $Fe_2O_3$ grades of the concentrates achieved. These results strongly support adopting a DMS-only process flowsheet.

**Table 1-1: Pilot DMS Results**

| DMS Feed $Li_2O$ Grade (%) | Global DMS Lithium Recovery (%) | Concentrate $Li_2O$ Grade (%) | Concentrate $Fe_2O_3$ Grade (%) |
|---|---|---|---|
| 1.01 | 77.4 | 5.64 | 0.55 |
| 1.07 | 79.0 | 5.77 | 0.62 |
| 1.16 | 69.4 | 6.21 | 0.60 |

- $Fe_2O_3$ grades in HLS concentrates were in the range 0.52% – 1.79% and after magnetic separation was applied to 15 of the 24 composites, all concentrates were <1.2% $Fe_2O_3$.
- The 24 CV5 HLS variability test results were adjusted to more appropriately represent recoveries expected in an operating DMS plant. After fitting a trend to this data, it indicates:
  - Recoveries of 70% – 75% $Li_2O$ expected at feed grades above 1.4% $Li_2O$;
  - Recoveries of 60% – 70% $Li_2O$ expected at feed grades of 0.9% – 1.4% $Li_2O$;
  - Recoveries of 50% – 60% $Li_2O$ are possible at feed grades of 0.7% – 0.9% $Li_2O$.
- Flotation was performed on sample composed of DMS middlings (second stage DMS floats) combined with the DMS bypass fraction (i.e., -0.85 mm). The global $Li_2O$ recovery was improved from 79.0% (the DMS only recovery) to 89.1% (DMS followed by flotation). Flotation spodumene concentrate returned a grade of 5.49% $Li_2O$ and 0.40% $Fe_2O_3$. Flotation shows promise to potentially be added to a DMS only plant at some stage in the future once operational.
- Some samples assayed contained elevated grades of $Ta_2O_5$ (with values as high as 300 ppm). There is further work warranted to assesses if tantalum can be recovered from any of the non-product streams of the DMS plant.

The test work results for both HLS (from CV5 and CV13) and DMS (from CV5) are shown in Figure 1-2. The concentrate grades achieved are all greater than 5.5% $Li_2O$ and lower than 1.2% $Fe_2O_3$. All tests were performed on samples that had a 9.5-mm top size. Three pilot scale DMS tests were conducted in 2023 and 2024, which resulted in lithium recoveries of 77.4%, 79%, and 69.4% and concentrate $Li_2O$ grades of 5.64%, 5.77%, and 6.21% respectively, for feed $Li_2O$ grades of 1.01%, 1.07%, and 1.16% respectively. The diameter of the cyclone was 250 mm. The concentrate generated from one of the DMS tests is shown in Figure 1-2.

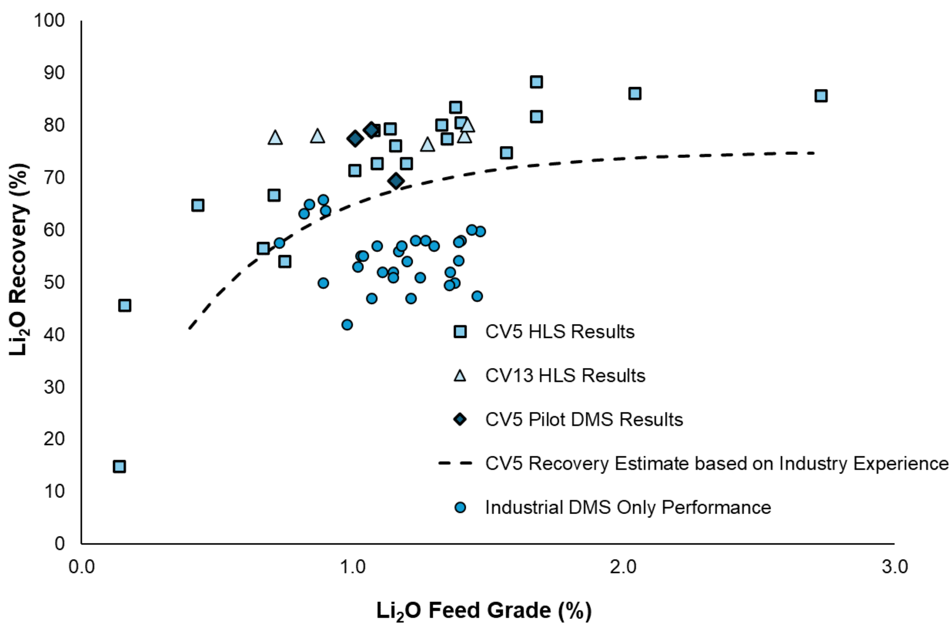



**Figure 1-2: Metallurgical test work recovery results & industry-based recovery estimates for 3x size range DMS process plant**

The lithium recovery expected from a three-size range, DMS concentrator treating material 9.5 mm to 0.65 mm is shown in Figure 1-3. The recovery is deemed to be a relationship to the concentrators $Li_2O$ feed grade. Expected concentrator recoveries are lower than test work results based on scale-up factors that are driven by the effects of both larger diameter cyclones and the crowding effect seen in the DMS sinks. This variation between laboratory test work results and those achieved in operating plants has, to date, been observed within the industry with respect to operating spodumene DMS concentrators. For reference, lithium recoveries achieved by other DMS-only concentrators are shown for reference ('Industrial DMS Only Performance' in Figure 1-2). The project's higher expected recovery is due both the quality of the material (large spodumene grains with a narrow grain size distribution) and the three size range DMS plant (which lessens the impact of particle size effect in the DMS process).


**Figure 1-3: Final concentrate product generated from the CV5 Pegmatite via DMS**

Recommendations for the next steps in the test work program are:

- Fines bypass processing can increase the recovery of the project (i.e., via flotation). Due to the high recovery of the DMS-only process, further assessment of the recovery improvement and its associated costs (i.e., Capex and Opex) would need to be assesses to ascertain the feasibility of this processing step. If determined to be attractive, the process step would be added after start-up of the DMS-only flowsheet as to not hinder the typically fast start-ups associated with DMS-only operations. Further flotation test work is planned within the next phase of study.
- Further work directed at the recovery of tantalite will be completed as part of the next phase of study work.
- Due to the width and orientation of the CV5 Pegmatite lenses, the expected dilution of the plant feed is expected to be relatively low. However, there may be opportunities to maximize the extraction of spodumene concentrate from the deposit if parts of the deposit with higher dilution are directed to an ore sorting processing solution. Ore sorting test work is planned for the next phase of test work.

## 1.12 Mineral Resource Estimate

The MRE has been completed for the Shaakichiuwaanaan Project, including both the CV5 and CV13 pegmatites, and does not include any of the other known spodumene pegmatite clusters at the Property.

The MRE for the CV5 Pegmatite area is supported by 344 diamond drill holes ("DDH") of NQ (predominant) or HQ size, totalling a collective 129,673 m, and 11 outcrop channels, totalling 63 m. At CV13, the MRE is supported by 132 DDH (29,059 m) and 54 outcrop channels (340 m). The drilling includes programs in 2021, 2022, 2023, and 2024 (through the end of April 2024; CV24-526).

The Mineral Resource reported is effective as of August 21, 2024, and has been tabulated in terms of a pit and underground mining shapes. Both underground and open pit conceptual mining shapes were applied as constraints to demonstrate reasonable prospects for eventual economic extraction.

| Pegmatite | Classification | Tonnes | $Li_2O$ (%) | $Ta_2O_5$ (ppm) | Contained $Li_2O$ (Mt) | Contained LCE (Mt) |
|---|---|---|---|---|---|---|
| CV5 & CV13 | Indicated | 80,130,000 | 1.44 | 163 | 1.15 | 2.85 |
| | Inferred | 62,470,000 | 1.31 | 147 | 0.82 | 2.03 |

- Mineral Resources were prepared in accordance with National Instrument 43-101 – Standards for Disclosure of Mineral Projects ("NI 43-101") and the CIM Definition Standards (2014). Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability. This estimate of Mineral Resources may be materially affected by environmental, permitting, legal, title, taxation, sociopolitical, marketing, economic, or other relevant issues.
- The independent Competent Person ("CP"), as defined under JORC, and Qualified Person ("QP"), as defined by NI 43-101 for this estimate is Todd McCracken, P.Geo., Director – Mining & Geology – Central Canada, BBA Engineering Ltd. The Effective Date of the estimate is June 27, 2024 (through drill hole CV24-526).
- Estimation was completed using a combination of ordinary kriging and inverse distance squared ($ID^2$) in Leapfrog Edge software with dynamic anisotropy search ellipse on specific domains.
- Drill hole composites at 1 m in length. Block size is 10 m x 5 m x 5 m with sub-blocking.
- Both underground and open pit conceptual mining shapes were applied as constraints to demonstrate reasonable prospects for eventual economic extraction. Cut-off grades for open pit constrained resources are 0.40% $Li_2O$ for both CV5 and CV13, and for underground constrained resources are 0.60% $Li_2O$ for CV5 and 0.80% $Li_2O$ for CV13. Open pit and underground Mineral Resource constraints are based on a spodumene concentrate price of US$1,500/tonne (6% basis FOB Bécancour) and an exchange rate of 0.76 US$/CA$.
- Rounding may result in apparent summation differences between tonnes, grade, and contained metal content.
- Tonnage and grade measurements are in metric units.
- Conversion factors used: $Li_2O$ = Li x 2.153; LCE (i.e., $Li_2CO_3$) = $Li_2O$ x 2.473, $Ta_2O_5$ = Ta x 1.221.
- Densities for pegmatite blocks (both CV5 & CV13) were estimated using a linear regression function (SG = 0.0688x $Li_2O$% + 2.625) derived from the specific gravity ("SG") field measurements and $Li_2O$ grade. Non-pegmatite blocks were assigned a fixed SG based on the field measurement median value of their respective lithology.

Presented by resource location/name, the Shaakichiuwaanaan MRE includes 78.6 Mt at 1.43% $Li_2O$ Indicated and 43.3 Mt at 1.25% $Li_2O$ Inferred at CV5, and 1.5 Mt at 1.62% $Li_2O$ Indicated and 19.1 Mt at 1.46% $Li_2O$ Inferred at CV13.

## 1.13 Mineral Reserve Estimate

No Mineral Reserve Estimate has been determined for the Shaakichiuwaanaan Project.

## 1.14 Mining Methods

The CV5 Pegmatite Deposit will be mined using both underground and open pit mining methods. The open pit portion will be mined by the conventional truck and shovel method. Two longhole underground mining methods will be used; transverse for the wider part of the body and longitudinal for the narrower dykes.

The pit optimization was completed using the Pseudoflow function in Deswik. The Revenue Factor 0.65 pit shell was used for the pit design. The selected pit contains 239 Mt of material, including 50.5 Mt of mineralized material, 172.5 Mt of waste rock and 16 Mt of overburden ("OVB") material, which equates to a strip ratio of 3.7. The pit is 2.8 km long, 425 m wide at its widest point and about 200 m deep at its deepest point. The mining truck size for the waste rock will be 200-ton class truck and 100-ton class for the Mineral Resource. All mining equipment for the open pit will be diesel fuel powered except for the production drills. The mine will be owner-operated except for the blasting supplies, which will come from a specialized supplier that will be built his own plant on site.

The underground mining method contains 46.4 Mt of material, including 39.8 Mt of mineralized material and 6.6 Mt of waste rock from the development. The mine is relatively shallow with the highest level being 100 m from the surface and the deepest levels located 500 m below surface. Levels are designed at 30 m intervals. The underground mine is comprised of 14 levels, 124 km of development and 1,965 longhole stopes. Access to the underground mine will be access by two ramps: one dedicated to hauling and the other for service access. The development and entire production of the underground mine will be completed by a specialized mining contractor. The mine's owners will only be responsible for the mine technical services, backfill production and distribution, ventilation infrastructure and providing fuel and electricity. Most of the underground mining equipment will be electrified to reduce ventilation demand, approved safety and reduce operating cost and GHG emissions.

The open pit will start with a pre-production year followed by 18 years of operation reaching its maximum production rate of 16 Mtpa (44,000 tpd) after 4 years. The production significantly decreases during the 13th year when the strip ratio plummets due to the stripping in Stage 4 being mostly completed. Once mining is complete, the remaining 4.5 Mt stockpile will be feed to the mill for 1.5 full years.

The development of the underground mine will start on Year 1 and will take approximately 16 months before the first stope is available for production. Approximately 25 km of tunnels will need to be developed during this period. During full production the development rate will average 7,700 m per year. Starting at Year 14 the development rate will decrease to 3,800 m. The mine will produce mineralized material for an estimated 22 years, starting production at Year 3 and ending at Year 24. The underground mine will be at full production between Year 5 until Year 19. The maximum production rate will reach 5,500 tpd, or 2 Mtpa.

The average grade of the Mineral Resources is approximately 1.31% $Li_2O$ after dilution and mining recovery where the mineralized material from the pit provides a grade of 1.11% $Li_2O$ and 1.54% $Li_2O$ from the underground. Figure 1-4 and Figure 1-5 show a summary of the mining schedules for both mines.

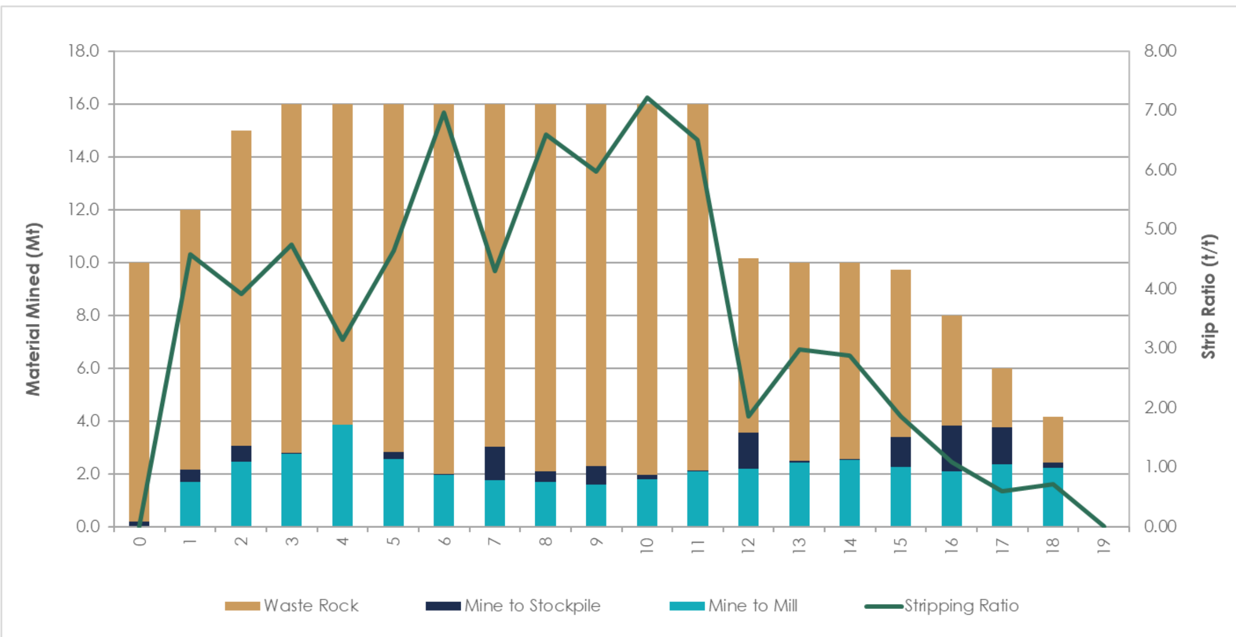



**Figure 1-4: CV5 Open Pit – Total material mined**

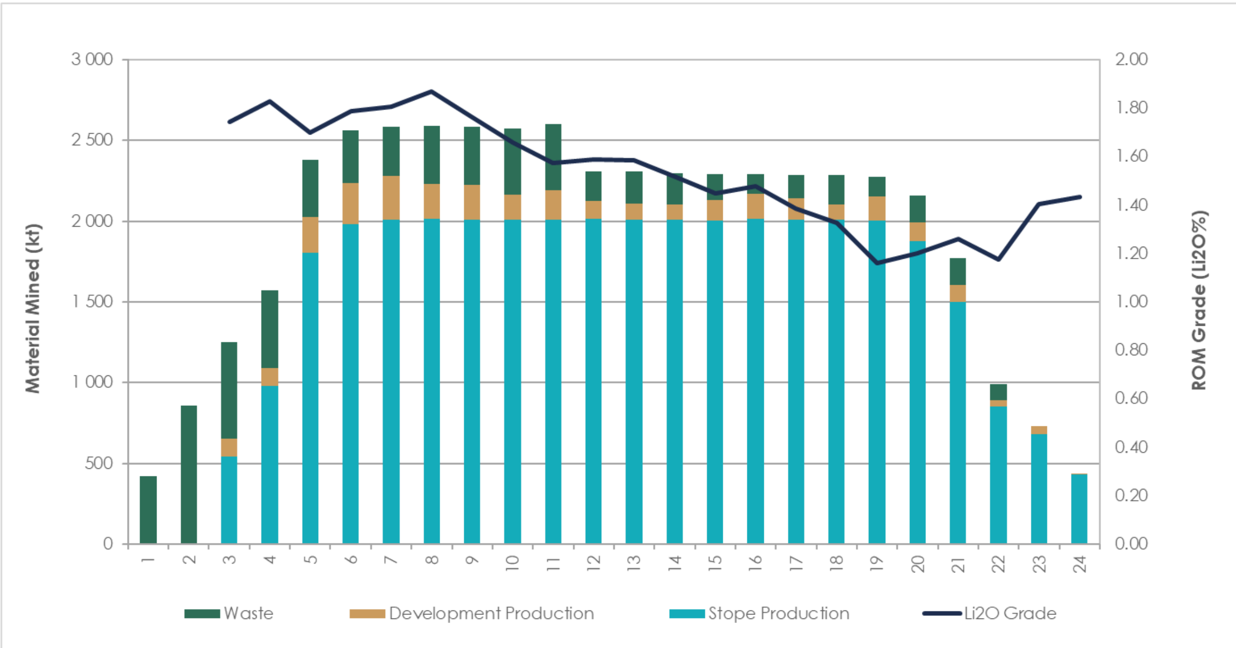



**Figure 1-5: CV5 UG Mine – Material mined**

The combination of the two mines has the benefit of accessing high grade from the underground while having access to plenty of resource from the surface at a low strip ratio. The two mines provide a more balance feed grade that could be modify at any time if market condition changes. The synergy of the two mines allows the site to produce a steady stream of concentrate at full production starting on Year 4 and lasting 16 years as seen on Figure 1-6. Concentrate output starts dropping on Year 20 as the pit's mineralized material is exhausted and the underground mine production decreases.

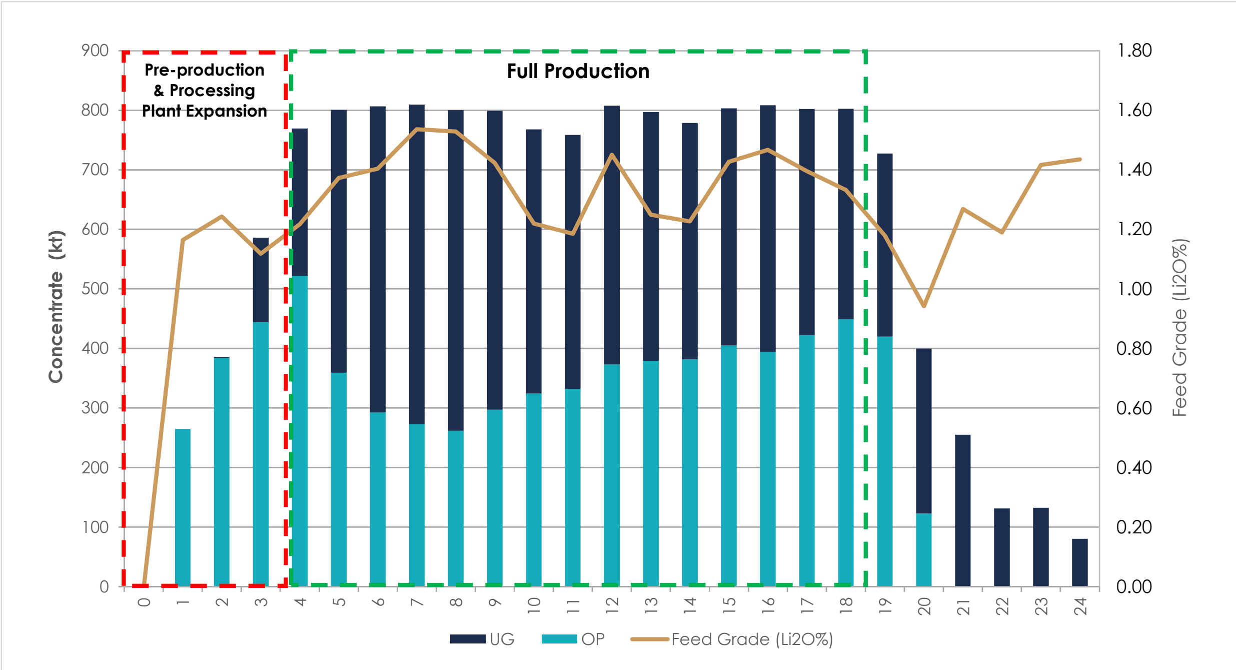



**Figure 1-6: Concentrate production schedule**

## 1.15 Recovery Methods

The mineral processing facility is designed to produce spodumene concentrate from run of mine ("ROM"). The facility will include ROM stockpiling, comminution, beneficiation, dewatering, and load-out areas. The processing facility employs a gravity-based beneficiation circuit, consisting of a two-stage Dense Media Separation (DMS) process for both coarse and fine size fractions. The design of the process will be executed utilizing two identical parallel process trains that could be operated independently of one another. Each process train will account for half (50%) of the crushing, beneficiation, and dewatering capacity.

The mineral processing facility has an overall availability and utilization of 81% and is designed to nominally process 5,000,000 dry tonnes per year ("tpa") of mineralized material. When processing feed grades of 1.31 wt.% $Li_2O$, the concentrator can produce up to 827,530 tpa of spodumene concentrate with a grade of 5.50 wt.% $Li_2O$ achieving 69.5% $Li_2O$ recovery.

The key process areas of the mineral processing facility are:

- ROM stockpiles;
- Crushing circuit (with primary, secondary, and tertiary crushing);
- Crushed feed stockpile;
- Coarse DMS circuit;
- Fine DMS circuit;
- Recrush DMS circuit;
- Magnetic separation and final product handling;
- Fines bypass + middlings dewatering and handling;
- Final reject handling.

## 1.16 Project Infrastructure

The Project is close to significant existing infrastructure, including all-season road and Hydro-Québec's power grid.

Main site facilities include the concentrator building, garages for mining fleets, light vehicles, and highway trucks, as well as administrative offices, dry rooms, warehouses, and auxiliary buildings.

In addition, the main site will include waste rock and rejects management systems, complete with ditching and pond systems for water management. Fresh water wells and water treatment plants are also included.

A new 69 kV transmission powerline will be constructed to connect the site to Hydro-Québec's power grid, located approximately 55 km away. Final access to power will be subject to both further engineering assessment and application and approvals to access the Hydro-Québec system.

Other facilities include an emulsion plant, explosive storage magazines, fuel storage pads, refueling stations, and a permanent workers camp to accommodate construction and operational personnel.

Highway trucks will transport spodumene concentrate approximately 834 km along the existing road network to the Transshipment Centre located in Matagami, QC. Once in Matagami, the product will be transferred to railcars for rail transport to Bécancour via Canadian National's Railway. The Matagami Transshipment Centre will be upgraded with storage infrastructure and material handling equipment.

## 1.17 The Project's Market Studies and Contracts

The lithium spodumene market is characterized by dynamic pricing, shaped by a confluence of multifaceted factors. While price volatility is expected to persist, a benchmark price in the range of $1,300–$1,500 per tonne for 5.5% spodumene concentrate is justifiable based on the recent market.

Based on the spodumene price assessment, it is recommended that Patriot uses a long-term price outlook of US$1,375/tonne (SC5.5%, FOB Bécancour basis) (Table 1-2).

**Table 1-2: Spodumene concentrate price recommendation**

| Product | Price (US$/t) |
|---|---|
| Spodumene concentrate at 5.5% $Li_2O$ | 1,375 |

## 1.18 Environmental Studies, Permitting and Social or Community Impact

### 1.18.1 Introduction

Patriot started collecting baseline environmental data on the Shaakichiuwaanaan Property in 2022 and has increased its efforts in 2023 with a full program designed to support an Environmental and Social Impact Assessment. The environmental data collected to date includes the following components:

- Surface water;
- Hydrology;
- Surficial deposits and hydrogeology;
- Geochemistry;
- Bathymetry;
- Terrestrial fauna, including herpetofauna, avian fauna, chiropterans small and large mammals;
- Vegetation and wetlands;
- Species at risk;
- Fish and fish habitat.

Baseline data collection will continue in 2024 and 2025 to support the environmental assessment processes to be completed for project authorization.

With a view to maintaining a strong and ongoing relationship with the Indigenous and non-Indigenous groups (front line regional players operating in the political, land use, geographic, social, financial, environmental, and technical spheres) potentially affected by the Shaakichiuwaanaan Project, Patriot wishes to set up adapted, concerted information and consultation processes, and establish mutual collaboration and partnership agreements. To this end, Patriot will work with the communities and stakeholders to develop a consultation, communication and mobilization plan that will include ongoing project updates. This plan will first aim to gather the concerns and interests of both Indigenous and non-Indigenous groups, particularly those relating to environmental issues, land use, employment, training opportunities, service provision, potential collaborations, etc. Through this approach, Patriot seeks to understand the opinions and concerns of Indigenous groups and stakeholders, and to openly discuss and record its activities. The Company will encourage open dialogue, both formally and informally, to give the involved communities the opportunity to express their opinions and concerns about the Project. The outcome of these discussions will enable the Project to address their concerns and interests and optimize its social acceptability.

The Project is subject to both the provincial environmental and social impact assessment ("ESIA") and review procedure of the JBNQA, and the federal Impact Assessment examination procedure. Numerous permits and authorizations will also be required in Québec and Canada to build and operate the proposed mine. Concerning the provincial procedure, a Preliminary Information Statement has been sent to MELCCPF in November 2023 to officially begin the process. On the federal side, the Supreme Court of Canada stated in October 2023 that the *Impact Assessment Act* is unconstitutional in some regards for examination of various types of projects, including mining projects. Amendments to the law are expected in 2024, which could change the scope of the Impact Assessment examination procedure applicable to this Project.

## 1.18.2 Geochemistry and Closure

### 1.18.2.1 Geochemistry

Kinetic and static geochemical characterization as well as geochemical modelling have been carried out and demonstrate that ultramafic waste rock lithology could leach arsenic and must be managed in order to protect surface water quality. This lithology represents less than 20% of the total waste rock of the current life of mine plan.

#### 1.18.2.2 Reclamation and Closure

The main measures for restoring the mining site will include:

- Carrying out a breach in the main dam, which will transform the pit into a body of water;
- Building a raised trench to prevent access to the pit;
- Revegetation of the accumulation sites, (i.e., DMS tailings, waste rock) by spreading a layer of overburden and then covering it with topsoil before hydroseeding and tree planting;
- Demolishing and removing-all buildings and other surface infrastructure, including power lines, water conduits, etc.;
- Levelling the process plant and camp areas, followed by spreading a layer of overburden, hydroseeding, and tree planting;
- Scarifying-the roads built by Patriot as part of the mining activities, restoring the natural drainage and hydroseeding;
- Dismantling the industrial wastewater treatment installations when they are deemed no longer necessary;
- Carrying out a breach in ponds, levelling the dams, covering the surface with topsoil before hydroseeding, and tree planting;
- Some of the restoration works will be carried out during the mining operations, while the remainder will be done at the end of the mine's life.

Lastly, the implementation of the proposed environmental monitoring program will demonstrate that the restoration works have achieved their goals.

## 1.19 Capital and Operating Costs

### 1.19.1 Capital Cost

Capital costs were divided into three categories: Stage 1 capital cost, expansion capital, and sustaining capital. The total Stage 1 capital cost for the Shaakichiuwaanaan Project is estimated to be $869.7M (including contingencies and indirect costs).

The expansion capital includes the costs related to the construction and development of the underground mine, the camp expansion, the expansion of the stockpiles, the second train of the processing plant and their related indirect costs and contingencies. The expansion capital will occur during the first 2 years of production (Years 1 and 2). All other capital expenses after Year 2 are included in the sustaining capital. The expansion capital cost was estimated to be $503.9M.

Sustaining capital costs include all expenditures necessary to sustain operations throughout the LOM. Sustaining costs start at Year 1 until the end of the mining operations and were estimated to amount to $651.4M over the LOM.

Cumulative LOM capital expenditure, including Stage 1 capital cost, expansion capital, and sustaining capital and sustaining costs, is estimated to be $2,024.9M. Table 1-3 provides an overview of the capital costs (Stage 1 capital cost, expansion capital, and sustaining capital) on a cumulative basis for the life of the Project.

**Table 1-3: Project LOM capital cost summary**

| Capital Expenditure | Stage 1 Capital Cost ($M) | Expansion Capital ($M) | Combined Phases ($M) | Sustaining Capital ($M) | Total Cost ($M) |
|---|---|---|---|---|---|
| General | 142.1 | 9.0 | 151.1 | - | 151.1 |
| Mine and Stockpiles | 148.4 | 29.8 | 178.2 | 256.4 | 434.6 |
| Process | 124.6 | 124.6 | 249.2 | 26.0 | 275.2 |
| Terminals (truck and train) | 8.5 | - | 8.5 | - | 8.5 |
| Other Services and Facilities | 14.3 | - | 14.3 | - | 14.3 |
| Underground Mine Lateral Development | - | 110.9 | 110.9 | 203.4 | 314.3 |
| Underground Mine Infrastructure & Paste Plant | - | 71.3 | 71.3 | 144.1 | 215.4 |
| Fish Habitat Compensation | 20.1 | - | 20.1 | - | 20.1 |
| Indirect Cost | 140.5 | 78.2 | 218.7 | - | 218.7 |
| **Subtotal** | **598.5** | **423.8** | **1,022.3** | **629.9** | **1,652.2** |
| Contingency | 162.9 | 80.0 | 242.9 | 21.5 | 264.4 |
| **Total Including Contingency** | **761.4** | **503.9** | **1,265.2** | **651.4** | **1,916.6** |
| Pre-production Cost | 108.3 | - | 108.3 | - | 108.3 |
| **Total** | **869.7** | **503.9** | **1,373.5** | **651.4** | **2,024.9** |

The overall capital cost estimate developed in this Preliminary Economic Assessment Study generally meets the AACE Class 5 requirements and has an accuracy range of between -25% and +55%. The capital cost estimate for this study forms the basis for the approval of further development of the Project by means of further technical studies.

### 1.19.2 Operating Cost

The operating cost estimate ("Opex") is based on a combination of experience, reference project, budgetary quotes, and factors as appropriate with a preliminary study. No cost escalation or contingency has been included within the operating cost estimate.

The total LOM operating cost for the Shaakichiuwaanaan mine site was estimated at $7,581M, as detailed in Table 1-4.

**Table 1-4 Total LOM operating cost at site**

| Parameters | Unit Cost ($/t conc) | Operating Cost ($M) |
|---|---|---|
| Open Pit Mining | 109.40 | 1,627.1 |
| DMS Tailings Handling | 11.59 | 172.4 |
| Underground Mining | 183.64 | 2,731.4 |
| Processing | 90.46 | 1,345.5 |
| G&A | 106.02 | 1,576.9 |
| Electrical Power & Propane(1) | 8.56 | 127.3 |
| **Total** | **509.67** | **7,580.7** |

(1) Excludes electrical and propane costs for the processing plant, OP/UG mining equipment and UG mine ventilation.

The concentrate transportation costs from site to Bécancour are estimated at $226.74/t dry.

Table 1-5 summarizes the unit operating costs per tonne of concentrate.

**Table 1-5 Unit operating cost**

| Operating Costs | Unit Cost ($/t conc) |
|---|---|
| Mining Cost | 304.63 |
| Site Administration | 106.02 |
| Processing Cost | 99.02 |
| **Cash Operating Cost at Site(1)** | **509.67** |
| Concentrate Transport | 226.74 |
| **Total Cash Operating Cost (FOB Bécancour)(2)** | **736.41** |
| Sustaining Capital | 43.79 |
| **All-in Sustaining Cost(3)** | **780.20** |

(1) Cash operating cost at site includes mining, processing and site administration expenses calculated on an SC5.5 basis. This is a non-GAAP financial measure, and when expressed per tonne, non-GAAP ratios. Refer to the "*Important Notice*" for further information on these measures.

(2) Total cash operating cost (FOB Bécancour) includes mining, processing, site administration, and product transportation to Bécancour calculated on an SC5.5 basis. This is a non-GAAP financial measure, and when expressed per tonne, non-GAAP ratios. Refer to the "*Important Notice*" for further information on these measures.

(3) All-in sustaining costs ("AISC") includes mining, processing, site administration, and product transportation costs to Bécancour and sustaining capital over the LOM per unit of concentrate produced during the LOM, and excludes Royalties. This is a non-GAAP measure, and when expressed per tonne, a non-GAAP ratio. Refer to the "*Important Notice*" for further information on these measures.

## 1.20 Economic Analysis

The pre-tax base case financial model results in an internal rate of return ("IRR") of 37.9% and a net present value ("NPV") of $4,699M with a discount rate of 8%. The simple pre-tax payback period is 3.6 years. On an after-tax basis, the base case financial model results in an internal rate of return of 33.8% and an NPV of $2,937M with a discount rate of 8%. The simple after-tax payback period is 3.6 years. Table 1-6 shows the financial analysis summary.

**Table 1-6: Financial analysis summary**

| Description | | CA$ M | US$ M |
|---|---|---|---|
| Pre-Tax | **Discount Rate** | | |
| | 0% | 13,299 | 10,107 |
| | 5% | 6,819 | 5,182 |
| | **8%** | **4,699** | **3,571** |
| | 10% | 3,698 | 2,811 |
| | 15% | 2,073 | 1,575 |
| | Pre-Tax IRR | 37.9% | |
| | Payback Period | 3.6 years | |
| After-Tax | **Discount Rate** | | |
| | 0% | 8,308 | 6,314 |
| | 5% | 4,270 | 3,245 |
| | **8%** | **2,937** | **2,232** |
| | 10% | 2,305 | 1,752 |
| | 15% | 1,269 | 964 |
| | After-Tax IRR | 33.8% | |
| | Payback Period | 3.6 years | |
| | Cumulative Effective Tax Rate | 37.5% | |

The Project is most sensitive to the exchange rate, grade, and spodumene concentrate price. Therefore, improving the geological model for definition and accuracy is recommended. The spodumene concentrate price and the exchange rate are based on market risks (supply and demand) and political risks, respectively.

The tornado graph in Figure 1-7 shows that the exchange rate, grade and spodumene concentrate price are the most sensitive elements to the Project.

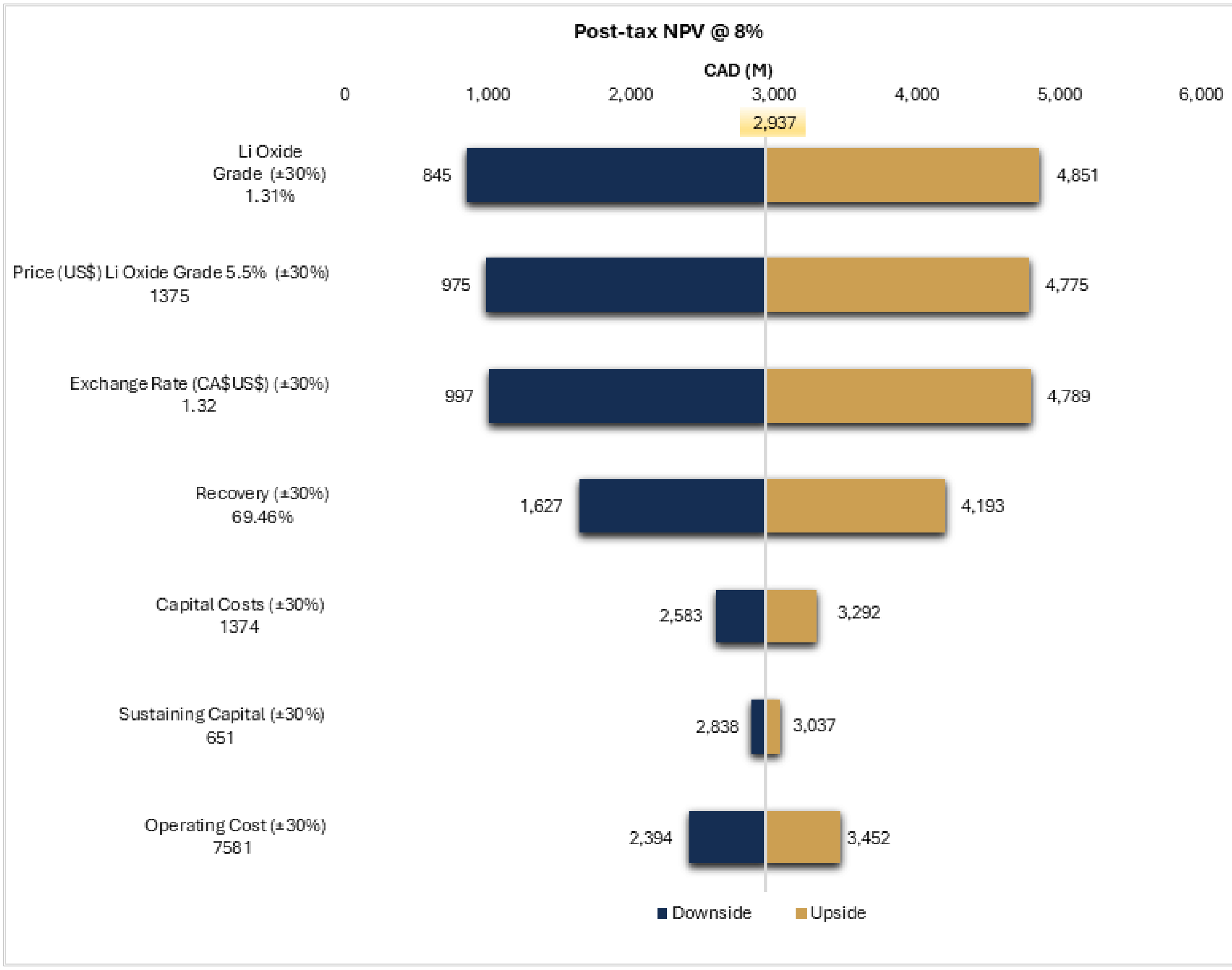



**Figure 1-7: Tornado graph showing that exchange rate, grade and price of spodumene concentrate are the most sensitive elements to the Project**

## 1.21 Adjacent Properties

The Company holds the dominant land position with respect to greenstone belt in the region; however, the Property is fully surrounded by other properties held over multiple mineral exploration companies targeting various mineral commodities.

## 1.22 Organization and Project Schedule

### 1.22.1 Organization

The Project is expected to proceed to the Feasibility Study phase. Once these front-end studies have been completed and a positive decision has been received from Patriot's board of directors, the Project will kick off the site's early works and engineering, procurement, construction and management activities.

Project financing will be led by Patriot's financial team.

Once the construction by the contractor is complete, the operation of the mine will be performed by Patriot.

### 1.22.2 Project Schedule

The Feasibility Study is expected to be complete in 2025. This timing aligns with preparation and submission of the environmental permit application. The current project execution schedule is based on an approval and start of construction in Q1 2028.

Start of load commissioning is targeted for the end of Q4 2028.

## 1.23 Interpretations and Conclusions

The consolidated MRE for the Shaakichiuwaanaan Project, including that of the CV5 Pegmatite on its own, reaffirms it – by a wide margin – as the largest lithium pegmatite Mineral Resource in the Americas and 8th largest globally as of its effective date of August 21, 2024. These metrics and context firmly reaffirm and entrench the Project as a Tier 1, world class lithium pegmatite asset.

The PEA was prepared by a group of independent consultants to demonstrate the technical and economic viability of the CV5 Spodumene Pegmatite's development based on a hybrid open pit and underground mining scenario and a process plant with a design capacity of 5 Mtpa of Mineral Resource in average over the LOM.

This PEA was prepared by experienced and competent independent consultants using recognized engineering standards and methods. The mutual conclusion is that the Project's PEA contains adequate details and information to support the positive economic outcome presented. The consultants recommend that the Company proceed to the next phase of project development for the Project, which is the initiation of a pre-feasibility study.

### 1.23.1 Project Risks and Opportunities

The most significant risks identified with the Project are delays in permit approval, labour availability, dam breach, and availability of electrical power from Hydro-Québec.

Many of the above-noted risks can be attenuated with adequate exploration, engineering, planning, and proactive management.

Risks which are beyond the control of the Project proponents are much more difficult to anticipate and mitigate. In some circumstances, it remains possible to reduce exposure. Such risks include possible instabilities related to the political situation in the Project region, metal prices, exchange rates and government legislation. These external risks are generally intrinsic to all mining projects. Negative variance to these items from the assumptions made in the economic model would reduce the profitability of the mine.

Opportunities remain to improve the economics, timing and/or permitting potential of the Project. These main opportunities, excluding those typical to all mining projects (e.g., improvements in metal prices, exchange rates, etc.), are:

- Reevaluate the limits between the open pit and underground mine.
- Improve logistics cost of concentrate transportation.

## 1.24 Recommendations

### 1.24.1 Exploration

Exploration for lithium to date at the Property has outlined a significate Mineral Resource at the CV5 and CV13 spodumene pegmatites, both of which remain open, as well as identified six other spodumene pegmatite clusters. Collectively, the exploration has outlined a significant potential for the Property to host additional sizable occurrences of lithium pegmatite. Significant and continued lithium pegmatite exploration, including a combination of surface work and drilling, is warranted and recommended.

These recommended activities would support advancing the Project to the completion of a Pre-feasibility Study ("PFS"). An exploration program focused on lithium pegmatite is proposed (single phase), which includes:

- Additional step-out and delineation drilling at the CV5, CV9, and CV13 pegmatites, which remain open along strike and at depth.
- At CV5, CV9, and CV13, there remains a strong potential for resource expansion through further testing along strike and to depth, as well as testing for sub-parallel trending veins.

- Drill testing of the other spodumene pegmatite clusters – namely CV4, CV8, CV12 – and corridors between.
- Continued surface mapping and channel sampling over the known spodumene pegmatite clusters.
- Continued prospecting and rock sampling over potential extensions of the CV Lithium Trend and other unexplored areas of the Property.
- Evaluation and potential application of relevant geophysical surveys.

### 1.24.2 Environmental and Infrastructure Considerations

**Environmental Work**: Environmental baseline studies must continue in order to properly document the baseline conditions of the project site and support the environmental and social impact assessment. Similarly, engineering studies must continue in order to minimize the project's footprint as much as possible, as well as the project's encroachment into wetlands, waterways and fish habitat. The footprint of the waste rock and tailings piles should avoid fish habitat, so as not to require the project to be listed in Schedule 2 of the Metal Mining and Diamond Mining Effluent Regulations. Changes to the federal environmental assessment process must be monitored to ensure compliance of the environmental and social impact assessment under preparation. Any changes to applicable environmental regulations will need to be taken into account in the future.

**Infrastructure**: Optimize site layout for minimal environmental impact, focusing on water management, waste disposal, and infrastructure placement.

### 1.24.3 Mining and Processing

**Mining Techniques:** Evaluate dilution and mineral loss to optimize recovery while minimizing contamination from host rock. Consider fleet standardization and autonomous trucks for efficiency. Review portals location and adjust surface layout for efficient operation.

**Processing:** As the Project advances, further test work will be required to develop a DMS only flowsheet. These tests are:

- Comminution test work for crushing (e.g., Bond Crushing Work Index "CWi"). This work serves to confirm the crusher sizing and provides an indication of the size distribution feeding the plant.
- Dewatering test work including vacuum filter test work and thickening test work. The feed stream of particular interest is the material that bypasses the DMS circuit.

- Further magnetic separation test work, particularly in the coarse concentrates. Testing the effectiveness of coarser particles in wet belts separators is required for estimating final iron specification.
- Testing alternative magnetic separation technologies for the coarse DMS concentrate (i.e., 9.5 mm to 3.3 mm size range) is recommended.
- Up flow (Teeter bed type) classification test work, in conjunction with DMS test work, on higher mica feed samples to determine the impact to the circuit if a mica removal step is implemented to the circuit.
- Due to the width and orientation of the CV5 Pegmatite lenses, the expected dilution of the plant feed is expected to be relatively low. However, there may be opportunities to maximize the extraction of spodumene concentrate from the deposit if parts of the deposit with higher dilution are directed to an ore sorting processing solution. Ore sorting test work is planned for the next phase of test work.

### 1.24.4 Economic and Strategic Considerations

**Funding**: Early application for government funding like the CMT-ITC to offset capital expenditures.

**Market Agreements**: Negotiate with lithium battery facilities for off-take agreements to secure pricing.

## 1.25 References

All references in this Report can be found in Chapter 27 - References).

# 2. Introduction

BBA Engineering Ltd. ("BBA") has been retained by Patriot Battery Metals Inc. ("Patriot" or the "Company") to lead and perform, with contributions from Primero Group Americas Inc. ("Primero") and WSP Canada Inc. ("WSP"), an independent Preliminary Economic Assessment ("PEA") and technical report on the CV5 Pegmatite at the Shaakichiuwaanaan Property (the "Property") – previously known as Corvette. This report, titled "*Preliminary Economic Assessment for the Shaakichiuwaanaan Project*" (the "Report"), was commissioned by Patriot.

## 2.1 Ownership

On October 5, 2023, Patriot Battery Metals Inc. established a wholly owned 100% Québec-based subsidiary, Lithium Innova Inc. ("Innova"). Innova is the sole registered owner of the claims of Patriot's flagship Shaakichiuwaanaan Property (previously known as "Corvette") located in the Eeyou Istchee James Bay region of Québec, Canada. This submission is by Patriot as the owner of Innova.

## 2.2 Basis of Technical Report

This Report presents the results of the PEA for the CV5 Spodumene Pegmatite at the Shaakichiuwaanaan Property. Patriot mandated engineering consulting group BBA to lead and complete the PEA, which included contributions from Primero and WSP.

As of the date of this Report, Patriot Battery Metals Inc. is a Canadian mineral exploration company trading on the TSX Venture Exchange under the trading symbol "PMET", with its head office situated at:

838 W. Hastings Street, Suite 700,
Vancouver, BC, Canada,
V6C 0A6

This Report was prepared by qualified persons ("QPs") in accordance with National Instrument 43-101 Standards of Disclosure for Mineral Projects ("NI 43-101") and the Canadian Institute of Mining, Metallurgy and Petroleum (CIM, 2014) Definition Standards for Mineral Resources and Reserves.

## 2.3 Report Responsibility

The following individuals (i.e., qualified persons in accordance with NI 43-101), by virtue of their education, experience, and professional association, are considered experts and are members in good standing of appropriate professional institutions.

- Todd McCracken, P.Geo. — BBA Engineering Ltd.
- Hugo Latulippe, P.Eng. — BBA Engineering Ltd.
- Shane Ghouralal, P.Eng., MBA — BBA Engineering Ltd.
- Luciano Piciacchia, P.Eng., Ph.D. — BBA Engineering Ltd.
- Ryan Cunningham, M.Eng., P.Eng. — Primero Group Americas Inc.
- Nathalie Fortin, P.Eng., M.Env. — WSP Canada Inc.

The preceding QPs have contributed to the writing of this Report and have provided QP certificates, included at the beginning of this Report. The information contained in the certificates outlines the sections in this Report for which each QP is responsible. Each QP has also contributed figures, tables and portions of Chapters 1 (Summary), 2 (Introduction), 21 (Capital and Operating Costs), 25 (Interpretation and Conclusions), 26 (Recommendations), and 27 (References). Table 2-1 outlines the responsibilities for the various sections of the Report and the name of the corresponding qualified person.

**Table 2-1: Qualified persons and areas of report responsibility**

| Chapter | Description | Qualified Person | Company | Comments and exceptions |
|---|---|---|---|---|
| 1. | Summary | H. Latulippe | BBA | All QPs contributed based on their respective scope of work and the chapters/sections under their responsibility. |
| 2. | Introduction | H. Latulippe | BBA | All QPs contributed based on their respective scope of work and the chapters/sections under their responsibility. |
| 3. | Reliance on Other Experts | H. Latulippe | BBA | |
| 4. | Project Property Description and Location | T. McCracken | BBA | |
| 5. | Accessibility, Climate, Local Resource, Infrastructure and Physiography | T. McCracken | BBA | |
| 6. | History | T. McCracken | BBA | |
| 7. | Geological Setting and Mineralization | T. McCracken | BBA | |
| 8. | Deposit Types | T. McCracken | BBA | |
| 9. | Exploration | T. McCracken | BBA | |
| 10. | Drilling | T. McCracken | BBA | |

| Chapter | Description | Qualified Person | Company | Comments and exceptions |
|---|---|---|---|---|
| 11. | Sample Preparation, Analyses and Security | T. McCracken | BBA | |
| 12. | Data Verification | T. McCracken | BBA | |
| 13. | Mineral Processing and Metallurgical Testing | R. Cunningham | Primero | |
| 14. | Mineral Resource Estimate | T. McCracken | BBA | |
| 15. | Mineral Reserve Estimate | N/A | | |
| 16. | Mining Methods | H. Latulippe | BBA | |
| 17. | Recovery Methods | R. Cunningham | Primero | |
| 18. | Project Infrastructure | H. Latulippe | BBA | Sections 18.1, 18.2.1 to 18.2.13, 18.2.21, 18.3 |
| | | L. Piciacchia | WSP | Sections 18.2.14 to 18.2.20 |
| 19. | Market Studies and Contracts | S. Ghouralal | BBA | |
| 20. | Environmental Studies, Permitting, and Social or Community Impact | L. Piciacchia | BBA | Sections 20.4, 20.5, 20.6 |
| | | N. Fortin | WSP | Sections 20.1, 20.2, 20.3, 20.9, 20.10 |
| | | H. Latulippe | BBA | Sections 20.7, 20.8 |
| 21. | Capital and Operating Costs | H. Latulippe | BBA | All except Section 21.5 |
| | | S. Ghouralal | | Section 21.5 |
| 22. | Economic Analysis | S. Ghouralal | BBA | |
| 23. | Adjacent Properties | T. McCracken | BBA | |
| 24. | Other Relevant Data and Information | T. McCracken | BBA | Sections 24.4 |
| | | H. Latulippe | BBA | Sections 24.1, 24.2, 24.3 |
| 25. | Interpretation and Conclusions | H. Latulippe | BBA | All QPs contributed based on their respective scope of work and the chapters/sections under their responsibility. |
| 26. | Recommendations | H. Latulippe | BBA | All QPs contributed based on their respective scope of work and the chapters/sections under their responsibility. |
| 27. | References | H. Latulippe | BBA | All QPs contributed based on their respective scope of work and the chapters/sections under their responsibility. |

## 2.4 Effective Dates and Declaration

This technical report is in support of the Company's press release dated August 21, 2024, titled "PEA Highlights Shaakichiuwaanaan Project as a Potential North American Lithium Raw Materials Supply Base". The Effective Date of this Report is August 21, 2024.

## 2.5 Sources of Information

This Report is based in part on internal company reports, maps, published government reports, company letters and memoranda, and public information, as listed in Chapter 27 (References). Sections from reports authored by other consultants may have been directly quoted or summarized in this Report and are so indicated, where appropriate.

The QPs have no known reason to believe that any of the information used to prepare this Report and evaluate the Mineral Resources presented herein is invalid or contains misrepresentations. The QPs have sourced the information for this Report from the collection of documents listed in Chapter 27 (References).

## 2.6 Site Visits

Information, conclusions, and recommendations contained within this Report are based on field observations as well as published and unpublished data (Chapter 27 - References) available to the QPs at the time of preparing this Report.

The following list describes the QPs' visits to the Project site, including the date and general objective of the visit:

- Mr. Todd McCracken, P.Geo., visited the Property from June 4 to 7, 2024 as part of this mandate, and previously from April 7 to 11, 2023, the latter of which overlapped with an active diamond drill program on the Property (Chapter 12 - Data Verification). The purpose of the visit was to examine the Project setting and outcrops, review drill collar sites, channel sample sites, and active drilling sites. Inspection of the geology, drilling, logging, and sampling procedure was also carried out while on site.
- Hugo Latulippe visited the Property from September 3 to 10, 2024. A tour of the CV5 area was carried out to examine mainly the pit location, potential location of the portal, infrastructure area, and waste rock stockpile.

As of the effective date of this Report, the following QPs did not visit the property as it was not required for the purpose of this mandate:

- Ryan Cunningham, Primero;
- Shane Ghouralal, BBA;
- Luciano Piciacchia, BBA;
- Nathalie Fortin, WSP.

## 2.7 Currency, Units of Measure, and Calculations

Unless otherwise specified or noted, the units used in this Report are metric. Every effort has been made to clearly display the appropriate units being used throughout this Report.

- Currency is in Canadian dollars ("CA$" or "$"), unless otherwise stated;
- Unless otherwise indicated, all references to "$" or "CA$" in this Report are to Canadian dollars and references to "US$" are to US dollars. A foreign exchange conversation rate of US dollar of US$0.76/CA$1.00 has been used over the LOM;
- This Report may include 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 QPs consider them immaterial.

# 3. Reliance on Other Experts

The qualified persons have reviewed and analyzed data and reports provided by Patriot together with publicly available data, drawing its own conclusions augmented by direct field examination.

The QPs who prepared this Report relied on information provided by experts who are not QPs. The QPs believe that it is reasonable to rely on these experts, based on the assumption that the experts have the necessary education, professional designations, and relevant experience on matters relevant to the technical report.

Todd McCracken, P.Geo., relied on Darren Smith, P.Geo., Vice President Exploration for Patriot for matters pertaining to mineral concessions, surface rights, and mining leases as disclosed in Chapter 4. For the purpose of this Report, specifically Section 4.2 (Mineral Disposition), the QP has relied on registered title information available on the *Ministère des Ressources naturelles et des Forêts* (MRNF, 2023). This information was last accessed on August 14, 2023. While the title documents were reviewed for this Report, this Report does not constitute, nor is it intended to represent a legal, or any other opinion as to title.

Shane Ghouralal, P.Eng., relied on Natacha Garoute, CPA., Chief Financial Officer for Patriot for matters pertaining to royalties and taxes as disclosed in Chapter 22.

QPs 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 QPs reviewed all the available documents, the QPs cannot guarantee its accuracy and completeness. The QPs 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.

# 4. Property Description and Location

## 4.1 Location

The Shaakichiuwaanaan Property (previously known as Corvette) is located in the Eeyou Istchee James Bay region of Québec, Canada, and is centred on 53°32’00’’N, 73°55’00’’W, within NTS Sheets 33G08, 33G09, 33H05, and 33H12. The Property is situated approximately 220 km east of Radisson, Québec, and 240 km north-northeast of Nemaska, Québec. The Property consists of two primary claim groups – one straddling KM-270 of the Trans-Taiga Road, and the second with its northern border located directly south of KM-270, approximately 5.8 km from the Trans-Taiga Road and powerline infrastructure corridor (Figure 4-1). The La Grande-4 ("LG-4") hydroelectric dam complex is located approximately 30 km north-northeast of the Property. The CV5 Spodumene Pegmatite is located central to the Property, approximately 13 km south of KM-270 on the Trans-Taiga Road, 14 km south of the powerline, and 50 km southwest of the LG-4 dam complex.

The Property is situated on Category III Land within the Eeyou Istchee Cree Territory (Cree Nation of Chisasibi, and Cree Nation of Mistissini), as defined under the JBNQA. The Eeyou Istchee James Bay Regional Government is the designated municipality for the region including the Property.

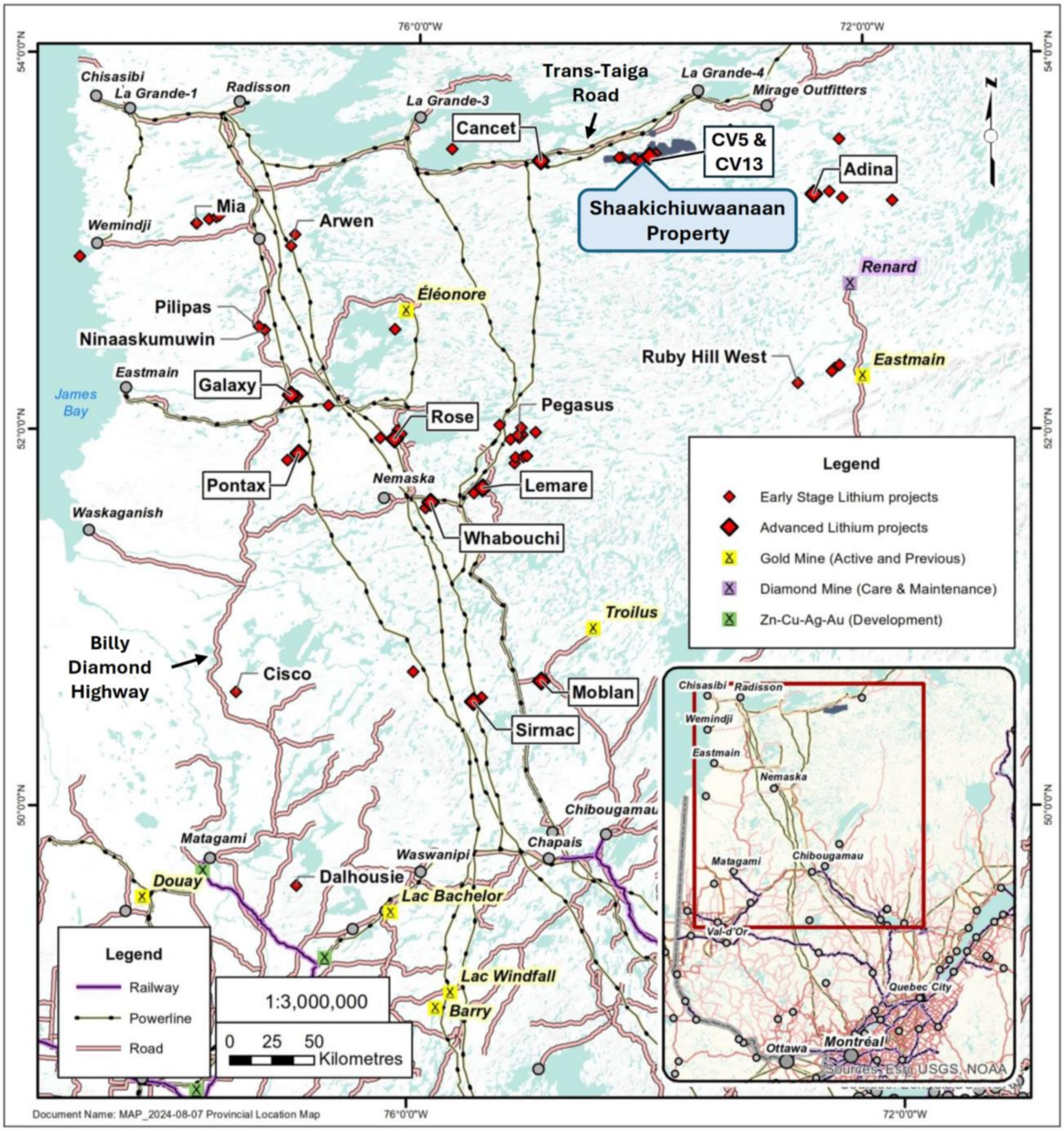



Figure 4-1: Property location

## 4.2 Mineral Disposition

The Property is comprised of 463 CDC (*claim désigné sur carte*, meaning map-designated claim) mineral claims that cover an area of approximately 23,710 ha (Figure 4-2 to Figure 4-6). The Property is further divided into claim blocks that reflect the various claim acquisitions by the Company – Corvette Main (172 claims), Corvette East (83 claims), FCI East (28 claims), FCI West (83 claims), Deca-Goose (31 claims), Felix (20 claims), KCG (7 claims), JBN-57 (39 claims) – and collectively form two distinct claim groupings (Figure 4-7).

The principal and largest claim grouping of the Shaakichiuwaanaan Property extends dominantly east-west for approximately 51 km and includes the Corvette Main, Corvette East, FCI East, FCI West, Deca-Goose, Felix, and JBN-57 claim blocks. The second and smallest claim grouping includes the KCG claim block and straddles the Trans-Taiga Road at KM-270. A detailed claim listing is presented in Appendix A.

## 4.3 Tenure Rights

In the province of Québec, the *Mining Act* governs the management of Mineral Resources and the granting of exploration rights for mineral substances during the exploration phase. It also deals with the granting of rights pertaining to the use of these substances during the mining phase. Finally, the act establishes the rights and obligations of the holders of mining rights to ensure maximum development of Québec's Mineral Resources.

The Québec mineral tenure system ("GESTIM") allows individuals and corporations to acquire mineral rights situated on crown and private land. Once a mineral claim is registered through GESTIM's online map designation portal (i.e., online staking), the claim is in good standing for an initial 3-year period, followed by 2-year periods thereafter. Upon the end of each claim period, known as the 'Expiry Date', the claims may be renewed indefinitely subject to applicable fee payments and work expenditure requirements being completed and filed.

The Property claim status was verified using GESTIM (https://gestim.mines.gouv.qc.ca/) by the QP. As of August 19, 2024, the Shaakichiuwaanaan Property consists of 463 mineral titles that cover an area of approximately 23,710 ha and extends dominantly east-west for approximately 51 km as a nearly continuous, single claim block (Figure 4-2). All 463 claims that comprise the Property are registered 100% in the name of Lithium Innova Inc., a wholly owned subsidiary of Patriot Battery Metals Inc., with the *Ministère des Ressources naturelles et des Forêts* ("MRNF"). A detailed list of the Shaakichiuwaanaan claims is presented in Appendix A. The QP has not verified the legal titles to the Property or any underlying agreement(s) that may exist concerning the licenses or other agreement(s) between third parties and is not aware of any potential restriction to the Company's legal title.

The 463 claims that comprise the Property were acquired between July 2016 and the effective date of this technical report through a combination of option agreements (i.e., claim acquisition agreements) for the initial Corvette block (DG Resource Management and three individuals), FCI (O3 Mining), Deca-Goose (Canadian Mining House, and one individual), Felix (Canadian Mining House), KCG (Canadian Mining House) and JBN-57 (Azimut Exploration) claims, as well as directly through online map designation (akin to staking). All option agreements for the claim groups that comprise the Property have fully vested with the Company holding 100% interest, through its 100% owned Lithium Innova Inc. subsidiary, subject to underlying royalties as described in Section 4.4.

All 463 claims that comprise the Shaakichiuwaanaan Property are in good standing with term expiry dates ranging from February 20, 2025, to November 6, 2026. As of August 19, 2024, claim expiry dates, work expenditure credits on file, work expenditure requirements, and renewal fees, for each claim's respective current term, are presented in Appendix A. The QP makes no further assertion regarding the legal status of the Property. The Property has not been legally surveyed to date and, to the QP's knowledge, no requirement to do so exists.

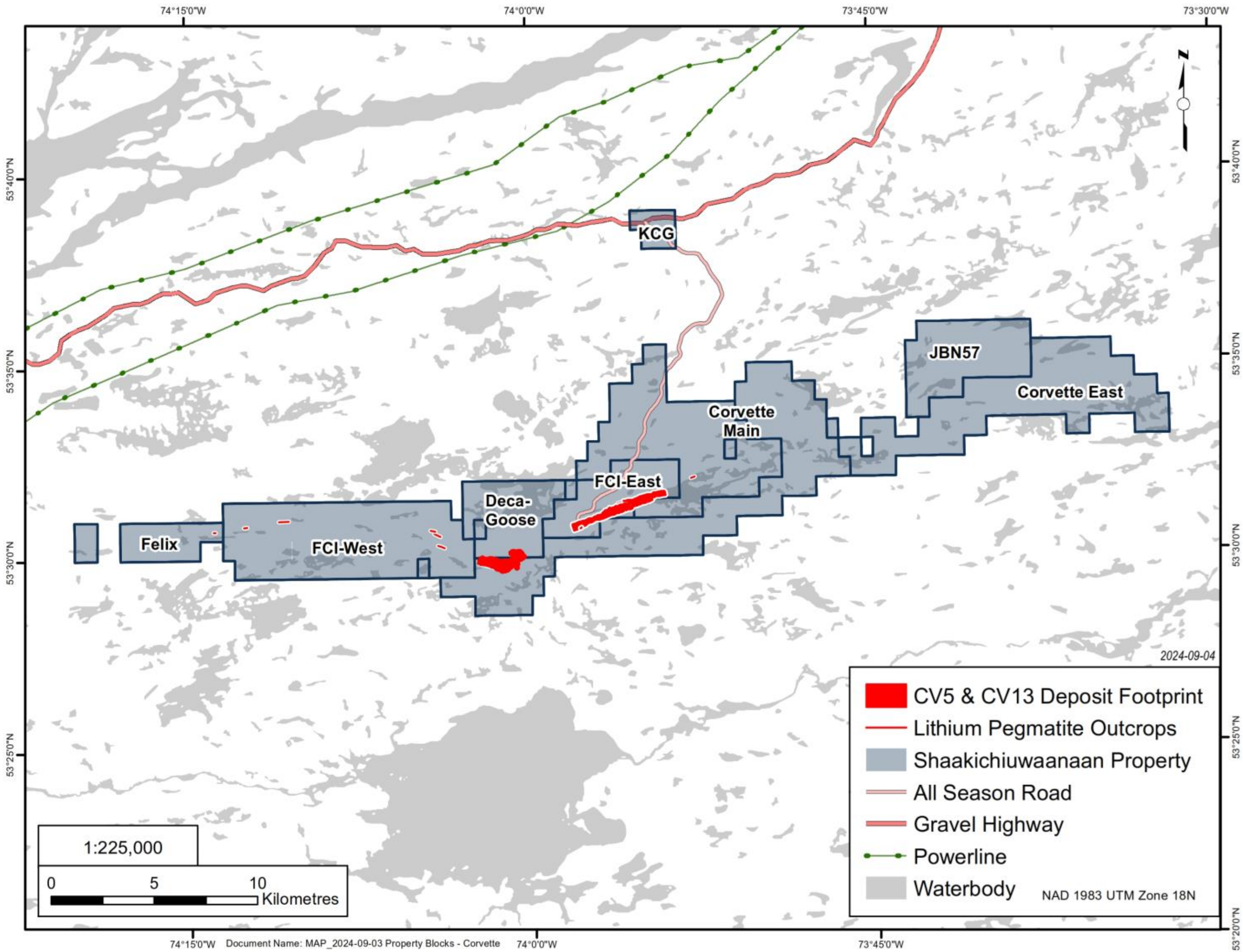



**Figure 4-2: Property claim blocks**

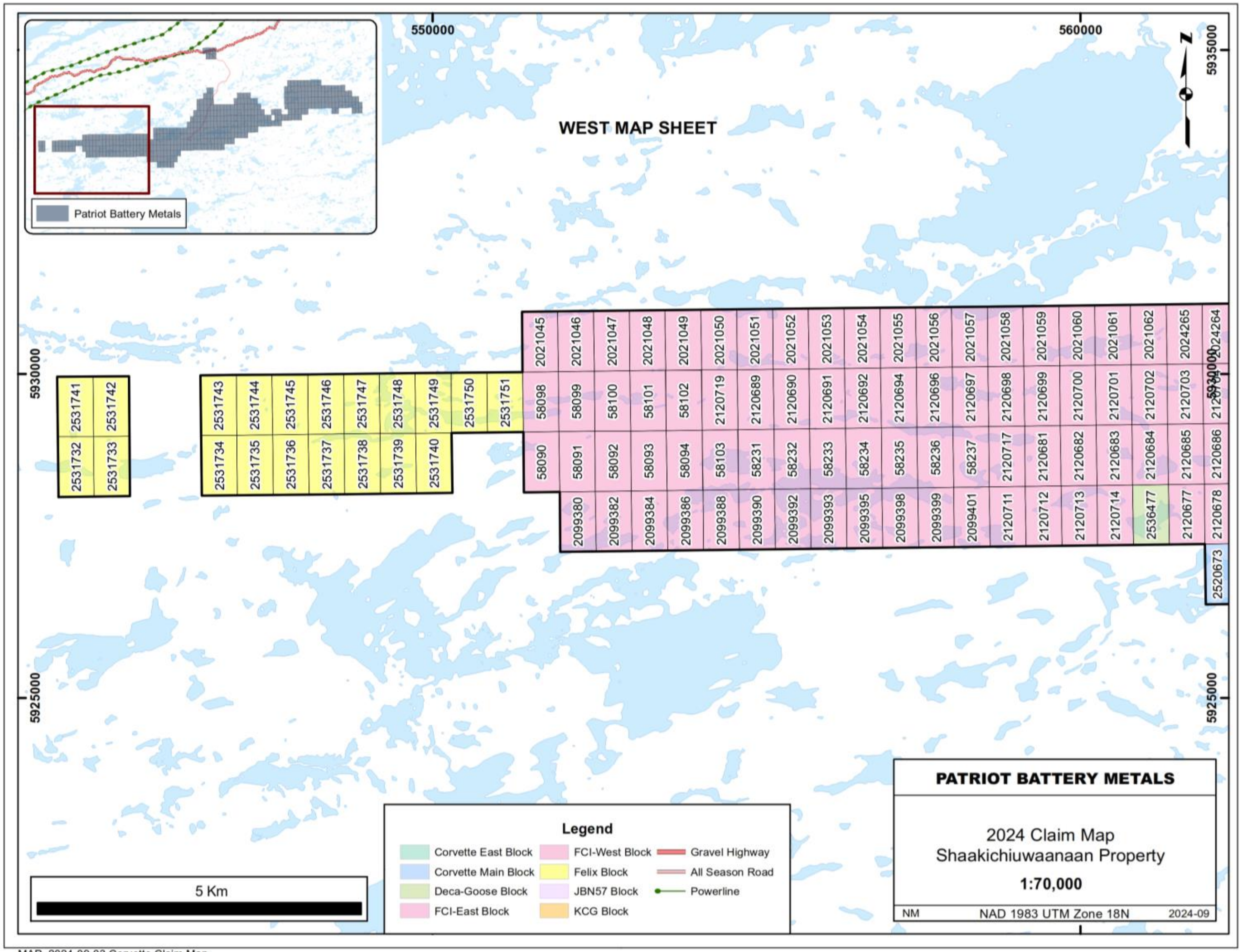



Figure 4-3: Property claims (west)

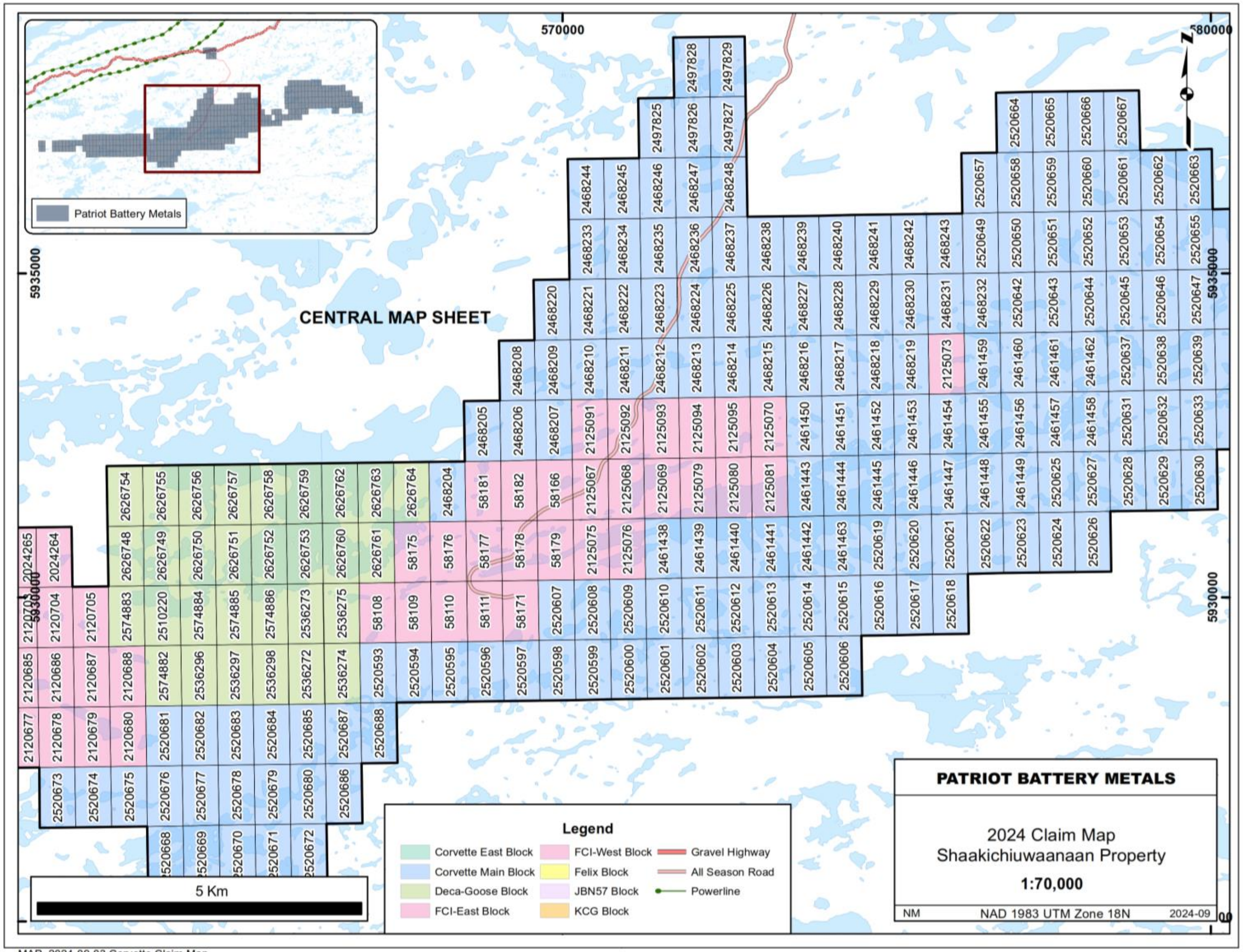



Figure 4-4: Property claims (central)

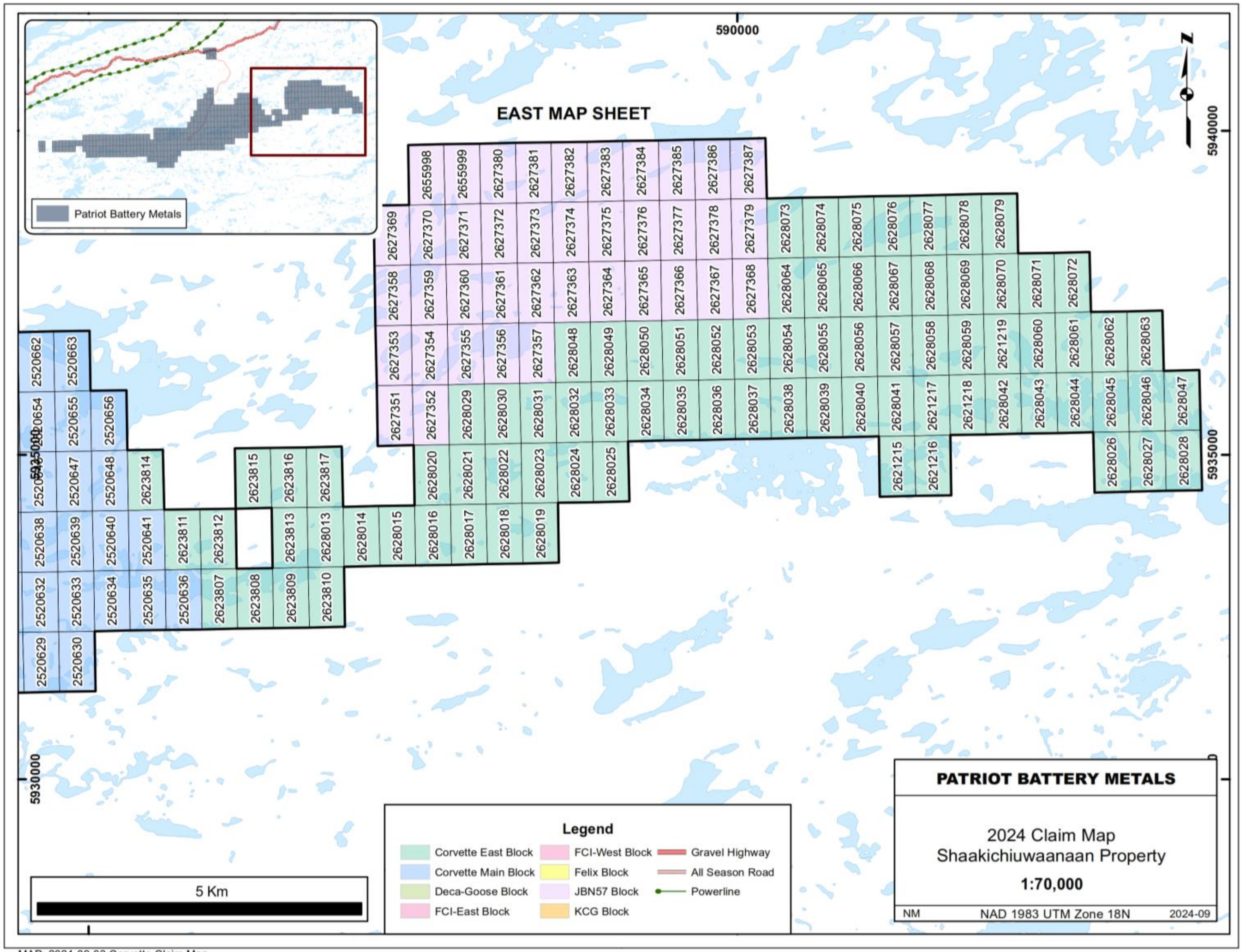



**Figure 4-5: Property claims (east)**

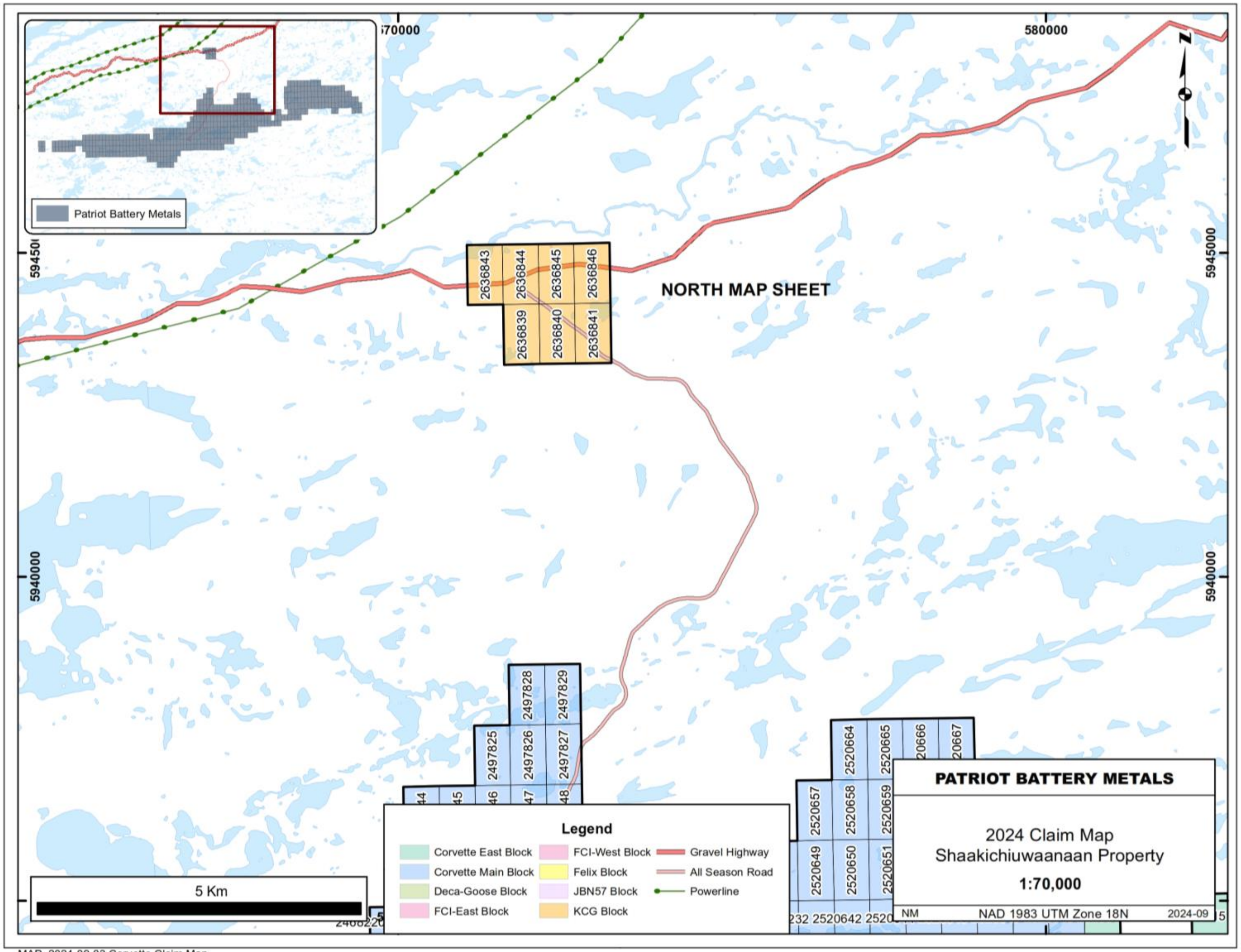



**Figure 4-6: Property claims (north)**

## 4.4 Royalties and Related Information

The Property is subject to various royalty obligations pursuant to the claim acquisition agreement for each respective claim block that comprises the Property (Figure 4-7). Of the 424 claims that comprise the Property, 237 are subject to a net smelter royalty. All NSRs include lithium and tantalum, unless otherwise stated; specifically:

- **Corvette Main claim block:** 76 of 172 claims are subject to a 2% NSR held by DG Resource Management Ltd., a private company. There is no buy-back provision.
- **FCI East and West claim blocks:** all 111 claims are subject to an NSR held by Osisko Gold Royalties Inc., which is dependent on commodity type and level of production. With respect to the production of precious metals, the claim block is subject to a 1.5% to 3.5% sliding scale NSR. This royalty is primarily based on amount of production: 1.5% on the first 1 M oz; 2.5% on the next 1 M oz; and 3.0% on the next 1 M oz and above. The remaining 0.5% royalty is based on the spot gold price starting at US$1,000/oz and reaches the maximum at US$2,000/oz.
  - A 2.0% NSR royalty is present on all other products; provided, however, that if there is an existing royalty applicable on any portion of the claim block, then the percentages noted above (i.e., the sliding scale NSR) shall, as applicable, be adjusted so that the aggregate maximum royalty percentage on a claim shall not exceed, and therefore be capped, to 3.5% at any time. There is no buy-back provision for the NSR on the FCI East and West claim blocks.
- **Deca-Goose and Felix claim blocks:** 50 of 51 claims are subject to a 2% NSR held by 9219-8845 Québec Inc. (d.b.a. Canadian Mining House), a private Québec-based company, of which the Company retains the option of buying back one-half of the NSR for $2,000,000.
- **JBN-57 claim block:** all 39 claims are subject to a 2% NSR held by Azimut Exploration Inc. There is no buy-back provision.

The CV5 Spodumene Pegmatite MRE straddles the Corvette Main and FCI East claim blocks and, therefore, is subject to a 2% NSR split between DG Resource Management Ltd. and Osisko Gold Royalties Inc. The CV13 Spodumene Pegmatite MRE, as is currently defined, is subject to a 2% royalty (held by d.b.a. Canadian Mining House) over the northern portions of its eastern and western limbs corresponding to approximately 40% (based on total tonnes) and 53% (based on contained lithium) of the total CV13 MRE. The CV4, CV8, CV9, CV10, CV12, and CV14 spodumene pegmatites are subject to a 2% royalty (Figure 4-7).

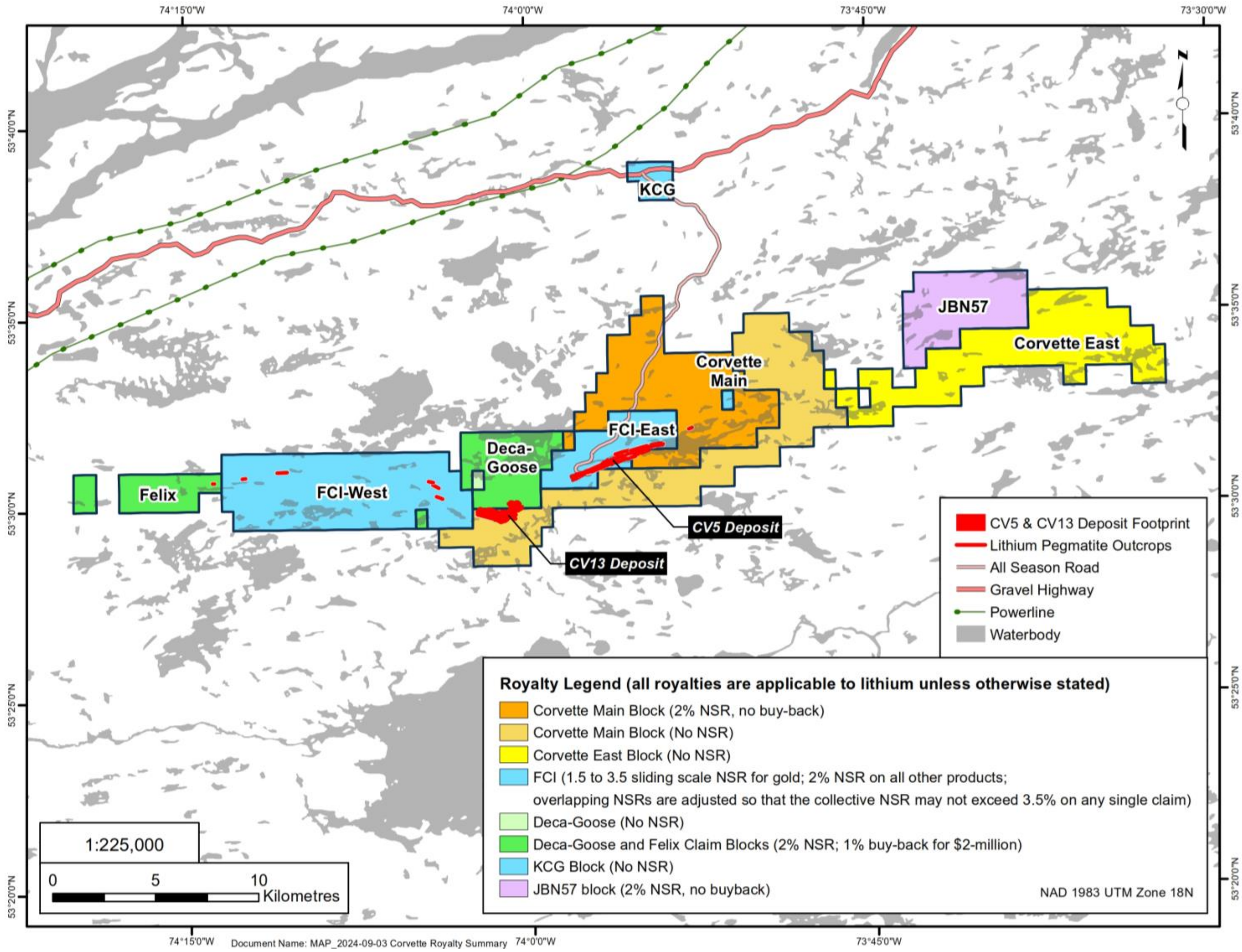



Figure 4-7: Net smelter royalty (NSR) per claim block

## 4.5 Permits

The provincial ministries through which permits and authorizations are issued for normal exploration activities are the *Ministère de l'Environnement, de la Lutte contre les changements climatiques de la Faune et des Parcs* ("MELCCFP") and the MRNF. Normal exploration activities such as prospecting, rock sampling, channel sampling, and soil sampling do not require specific authorizations from the ministries, as they are effectively granted when the claim is acquired. Authorizations for activities such as ground geophysical surveys (if line-cutting is required), trenching, and drilling are obtained from the MRNF due to the deforestation typically required. Additionally, as of May 6, 2024, an *Autorisation pour travaux d'exploration à impacts* ("ATI") is required to carry out exploration work utilizing hydraulic powered machinery. This includes trenching/stripping, bulk sampling, and exploration drilling (excluding civil engineering, hydrology, and geotechnical). As part of the ATI process, the Company must detail engagement with local communities, with respect to its planned activities, in its submission to the MRNF. The ATI, which takes approximately 2 to 6 weeks to process by the MRNF, covers a 2-year period and may be extended or reapplied for.

Activities such as drilling being completed over lake ice, lake water, or in wetlands require a Declaration of Conformity from the MELCCFP, which is typically a 30-day process. A Request for Review from Fisheries and Oceans Canada ("DFO") is also required for any drilling activities completed within a water body. Authorizations from the various ministries are also required for construction of temporary or permanent camps. In addition, for certain activities such as camp construction, a permit from the EIJBRG may also be required.

The Company currently holds permits/authorizations from the MELCCFP, MRNF, and DFO to carry-out surface and drill exploration on the Property. Additionally, the Company holds a lease from the MRNF on an area immediately south of KM-270 of the Trans-Taiga Road for an exploration camp including staging (i.e., laydown), core processing, and storage areas. The Company holds various permits from the MRNF, MELCCFP, and EIJBRG for the construction and operation of its camp at KM-270 (the "Shaakichiuwaanaan Camp"). Several authorizations from the MELCCFP have been obtained for drinking water and wastewater treatment for the permanent camp and future requests will be filed accordingly. The Company also holds various authorizations from the ministry for the construction and maintenance of an all-season road extending south from KM-270 of the Trans-Taiga Road to the southwest side of the CV5 Pegmatite.

A formal notification is required to be submitted to the local municipality and landowner(s) at least 30 days prior to the commencement of exploration activities. Industry best practice also demands a notification be submitted to the local Cree Nation and Tally-Person(s) to ensure they are informed of pending activities and presented with the appropriate contact information. The Property is situated on Category III Land within the Eeyou Istchee Cree Territory (Cree Nation of

Chisasibi, and Cree Nation of Mistissini), as defined under the JBNQA. The EIJBRG is the designated municipality for the region including the Property. The Company has submitted notifications to the applicable municipality and stakeholders outlining its 2024 mineral exploration plans for the Property and also meets regularly in Chisasibi, QC, with representatives of the Cree Nation of Chisasibi including the local Tally Person's family.

The Cree Nations have requested that exploration activities in the region be paused for goose harvesting season, typically between mid-April and mid-May each year. However, with road access from the Trans-Taiga Road directly to CV5, drilling operations may be able to continue throughout this period with the approval of the local Tally-Person.

## 4.6 Environmental Liabilities

Potential environmental liabilities at the Property include an exploration camp at KM-270 of the Trans-Taiga Road, an all-season road and associated borrow pits, and exploration access trails in certain drill areas. If the Project was to not move forward, this road and access trails may have to be reclaimed, and the exploration camp disassembled, and area reclaimed.

The QPs are not aware of any additional environmental liabilities beyond the normal disturbance related to surface exploration.

## 4.7 Other Relevant Factors

The QP is not aware of any additional significant factors or risks that may affect access, title, or the right or ability to perform work on the Shaakichiuwaanaan Property. The Property does not overlap any atypically sensitive environmental areas or parks, or historical sites, to the knowledge of the Company. There are no known hinderances to operating at the Property, apart from the goose harvesting season (typically mid-April to mid-May) when the communities request helicopter flying not be completed, and, potentially, wildfires depending on the season, scale, and location.

The Property lies within Category III lands of the Eeyou Istchee Cree Territory, which are open to exploration subject to the notifications mentioned above. The territory falls under the JBNQA, which is a modern land claims agreement that sets out a structured process and mechanisms for resource management and development, as well as indigenous peoples' consultation. The James Bay region of Québec currently has one active mine, the Éléonore Gold Mine held by Newmont Corporation, as well as the Renard Diamond Mine held by Stornoway Diamonds (Canada) Inc., which was put on care and maintenance in October 2023.

# 5. Accessibility, Climate, Local Resources, Infrastructure and Physiography

## 5.1 Access

The Trans-Taiga all-season gravel road and Hydro-Québec's 735-kV powerline trends east-west through the region, within approximately 6 km of the northern border of the Company's largest claim grouping (Figure 5-1). The Trans Taiga- Road connects approximately 210 km to the west of the Shaakichiuwaanaan Property to Billy-Diamond Highway (Route 109) at KM-541, also known as the James Bay Road, which extends north to Radisson and south to Matagami, where it connects to Québec's regional road and railroad network.

The CV5 Spodumene Pegmatite at the Property is accessible year-round by all-season road – recently constructed by the Company – which extends south from KM-270 of the Trans-Taiga Road and, therefore, is connected to the regional provincial road network. Additionally, the Property may be accessed by float plane or helicopter, and by snowmobile in the winter months.

Continued development of the transportation network in the James Bay Region of Québec is under active consideration as the area continues to attract significant mineral exploration and development interest. For example, *La Grande Alliance* ("LGA") is a memorandum of understanding between the Cree Nation Government and the government of Québec *"to plan and execute a 30-year infrastructure program that aims to facilitate the transportation of people and goods and increase the value of natural resources by lowering their transportation costs. La Grande Alliance will act as a hub organizing and overseeing the development of infrastructure, in the common interest of communities, First Nations, and public and private enterprises seeking to establish, consolidate or harmonize their presence in the territory"* (LGA, 2022a).

Part of this regional infrastructure program includes a potential railroad extension running north from Matagami, Québec, to KM-541 of the Billy Diamond Highway at the turn-off of the Trans-Taiga Road. Additionally, the programs include plans for an extension of Highway 167, north from the Renard Diamond Mine -4 Hydroelectric complex. Both of these development projects have a projected timeline of 6 to 15 years, (LGA, 2022b).

The James Bay Region and area of the Property is also covered by the mandate of the Société du Plan Nord. The Société du Plan Nord is an arm of the Québec Government which is mandated to support sustainable development of Québec's territory north of the 49th parallel and includes infrastructure and mineral development (Government of Québec, 2022).

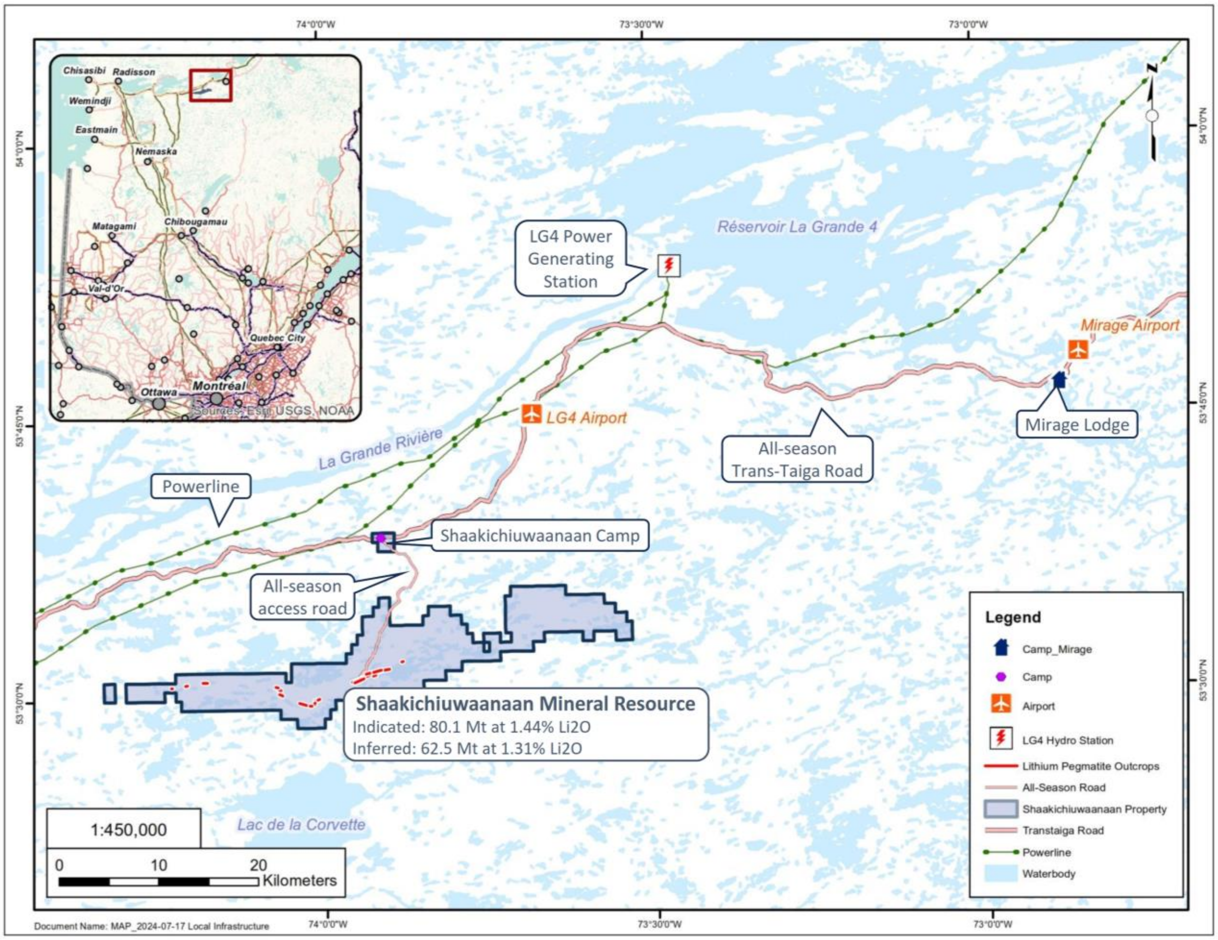
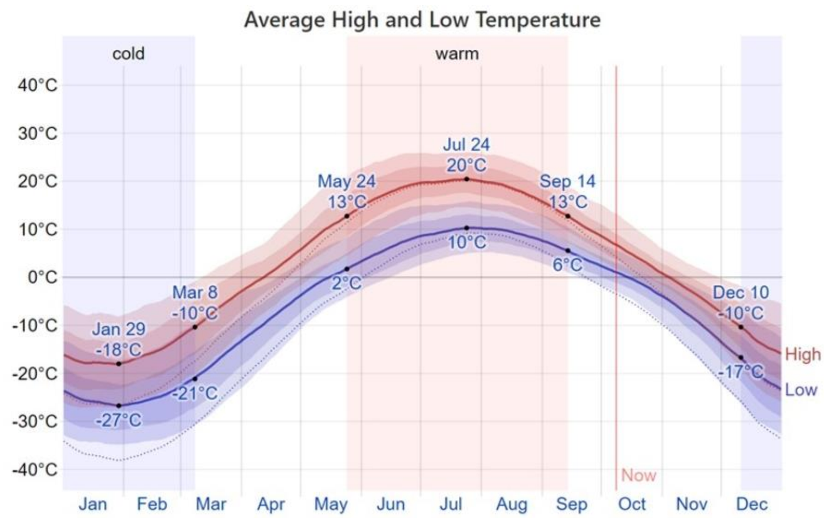


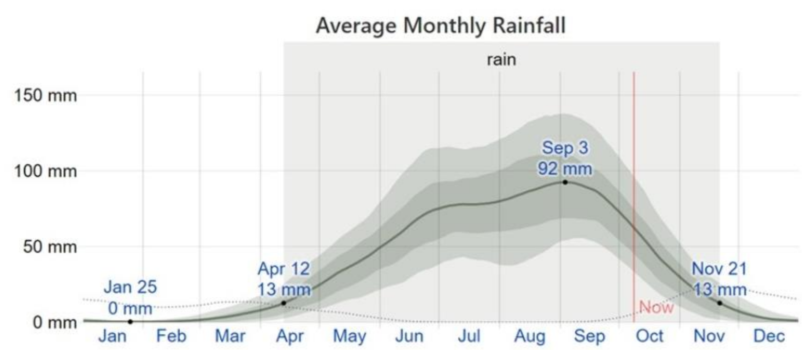

**Figure 5-1: Local infrastructure**

## 5.2 Climate

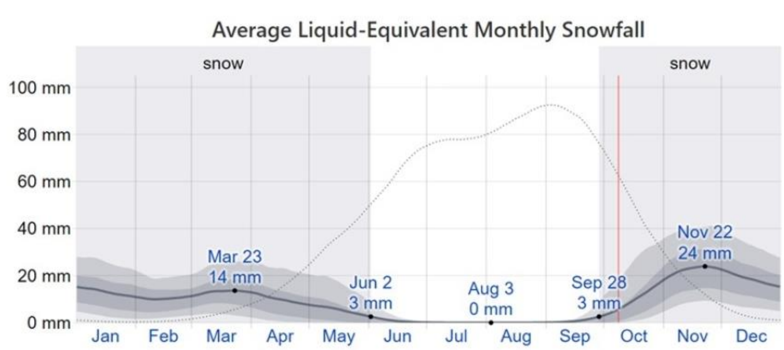
The Property is located in a sub-arctic climate region. Average annual temperatures, precipitation, and snowfall are presented in Figure 5-2 (Weather Spark, 2020), as recorded at the *La Grande Rivière* Airport (also referred to as "LG-2"), near Radisson, Québec, located approximately 220 km west of the Property, within the James Bay Region (Government of Canada, 2022). Over the course of the year, the temperature typically varies from -27 °C to 20 °C, with rare extremes of -35 °C and 26 °C. Snow covers the ground from mid-October to late May, typically limiting field work in the winter period to drilling and geophysics.




*The daily average high (red line) and low (blue line) temperature, with 25th to 75th and 10th to 90th percentile bands. The thin dotted lines are the corresponding average perceived temperatures.*




*The average rainfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average liquid-equivalent snowfall.*




*The average liquid-equivalent snowfall (solid line) accumulated over the course of a sliding 31-day period centered on the day in question, with 25th to 75th and 10th to 90th percentile bands. The thin dotted line is the corresponding average rainfall.*

**Figure 5-2: Average temperature, rainfall, and snowfall of region (Weather Spark, 2020)**

## 5.3 Local Resources

Exploration of the Property has been based out of Mirage Adventure Lodge located at KM-358 on the Trans-Taiga Road as well as Shaakichiuwaanaan Camp, located on the Company's KCG claim block at KM-270 of the Trans-Taiga Road (Figure 5-1).

Mirage Lodge is situated approximately 50 km to the east-northeast of the Property, and 75 km east-northeast of the CV5 Spodumene Pegmatite. The lodge provides accommodations, meals, bulk fuel (gas, diesel, Jet A), a local airstrip, as well as internet access. A regional ground transportation service provider, Kepa Transport, provides weekly ground shipping services direct from Val-d'Or to Mirage and vice versa.

The Shaakichiuwaanaan Camp is located within the Property's most northern claim block (KCG), approximately 13 km directly north of the CV5 Spodumene Pegmatite. The camp was constructed by the Company to support ongoing exploration and development activities at the Property with operation beginning in January 2024. The camp has a current capacity of 80 persons with an expansion of up to 150 persons planned for later in 2024 as permits are obtained. The Company also holds a lease covering the area of the camp, which provides additional space for storage, core processing, exploration laydown/staging, helicopter pads, and equipment maintenance. Once the expanded capacity is in place, the Company intends to consolidate its exploration activities to be based solely out of the Shaakichiuwaanaan Camp.

Radisson, with a population of ~470 people, is the closest community accessible by road from Mirage, and is located approximately 220 km west of the Property and 310 km west of Mirage. Radisson is serviced regularly by scheduled flights through the adjacent LG-2 Airport and is the closest airport to the Property with regularly scheduled flights. The Cree communities of Wemindji and Chisasibi are each located approximately 325 km west of the Property. Both Wemindji and Chisasibi host a larger array of service providers to the region and are serviced by regularly scheduled flights. Radisson, Wemindji, and Chisasibi, as well as Mirage, are accessible by road with connection to the main provincial network. Therefore, any supplies not available from these locations may be obtained by road from Val-d'Or, located to the south. Val-d'Or, and the entire Abitibi region, has a long active mining history with significant labour experience to support the Project.

In addition to access by road from nearby communities, charter aircraft may be used to access the La Grande-3 (KM-100) and La Grande-4 (KM-292) airstrips located along the Trans-Taiga Road. Although these airstrips were constructed primarily to service Hydro-Québec, they are under active transition to allow for consistent public use. The Company expects to have initial access to the La Grande-4 airstrip for regularly scheduled charters to support exploration and development activities beginning in Q4 2024.

## 5.4 Infrastructure

At the Property, infrastructure currently consists of a temporary camp (Shaakichiuwaanaan Camp) owned by Patriot at KM-270 of the Trans-Taiga Road (south side) within the KCG claim block. The camp has been constructed to support continued all-season mineral exploration at the Property. Additionally, the Company has completed construction of an approximately 20 km long all-season road extending south from KM-270 of the Trans-Taiga Road to the CV5 Spodumene Pegmatite at the Property (Figure 5-1). Various exploration access trails have also been constructed at the Property to support ground-based drilling activities.

The CV5 Spodumene Pegmatite is located approximately 13 km to the south of the regional and all-season Trans-Taiga Road, approximately 14 km south of a regional 735-kV powerline, and approximately 50 km south-southwest of the La Grande-4 hydroelectric generating station, owned and operated by Hydro-Québec. The LG-4 complex (KM-292 of the Trans-Taiga Road) has an installed capacity of 2,779 MW (Hydro-Québec, 2022). The majority of Québec's power is produced from a series of hydroelectric generating stations located along this east-west trending infrastructure corridor. Therefore, the infrastructure is well-maintained, bridges rated for high-tonnage traffic, and the Trans-Taiga Road accessible year-round. This power infrastructure allows Québec to have electricity costs 49% lower than in the G7 countries on average (Investissement Québec, 2023).

## 5.5 Physiography

The Property topography consists of forested gently rolling hills, drainages, and muskeg swamps between approximately 260 m and 350 m elevation, typical of the James Bay Region. Snow cover typically occurs from mid-October to late May. Vegetation is characteristic of the Boreal Vegetation Zone in Québec and consists mainly of black spruce, and lesser alder, poplar, birch, and various shrubs. This region is typically inhabited by moose, woodland caribou, and black bears, as well as numerous smaller mammals.

# 6. History

Unless otherwise noted, the mineral exploration history discussed herein pertains to the principal claim group of the Shaakichiuwaanaan Property, consisting of the Corvette Main, Corvette East, FCI West, FCI East, Deca-Goose, Felix, and JBN-57 claim blocks. No significant or focused mineral exploration, mineral showings, or drill holes have been documented on the KCG claim block, which was primarily acquired for ease of access and use for a mineral exploration camp.

## 6.1 Prior Ownership

The Shaakichiuwaanaan Property is extensive, with the principal claim block covering a general east-west trend of more than 50 km. For this reason, differing areas of the Property have been assessed by numerous companies since the 1950s. The following is a summary of the more pertinent historical ownership documented for the Property based on field work completed.

The earliest documented mineral exploration work in the area dates back to the late 1950's. Tyrone Mines Ltd. (a subsidiary of Phelps Dodge Corporation) prospected for base metals in 1959 and dug five trenches. Their work led to the discovery of a copper showing (1.15% Cu over 2.1 m in channel) in trench TR-9.

In 1997, Virginia Gold Mines Inc. (Virginia) acquired an extensive land position in the region (Félicie – Corvette Ouest – Island Lake – properties, collectively "FCI"), which overlapped a large portion of the present-day Property. The property was optioned several times in subsequent years; however, the ownership of the claim group was retained by Virginia.

In 2015, Virginia merged with Osisko Gold Royalties. During a subsequent restructuring, the FCI claims were transferred to a newly established entity called Osisko Exploration James Bay, held by Osisko Mining Inc. Several claims within the FCI claim group subsequently lapsed in the years that followed. In 2019, Osisko Mining Inc. spun out some of its assets into a new company called O3 Mining Inc., which, at that time, held the mineral rights to the FCI claims. In late 2018, the FCI East block (28 claims) was optioned to 92 Resources Corp (subsequently restructured to Gaia Metals Corp. on October 17, 2019, and again to Patriot Battery Metals Inc. on June 10, 2021) for up to 75% interest, subject to certain terms and conditions. The agreement was later amended in early 2019 to also include the FCI West block (83 claims) and, subsequently, in early 2022 where the Company acquired/purchased the remaining 25% interest in both the FCI East and West claim blocks.

The initial 76 claims of the present-day Corvette Property (part of the Corvette Main block) were staked in 2016, via map designation, for their lithium potential. The claims were staked by DG Resource Management Ltd., and a 100% interest subsequently vended to 92 Resources Corp (subsequently restructured to Gaia Metals Corp. on October 17, 2019, and again to Patriot Battery Metals Inc. on June 10, 2021). The claim position was subsequently expanded by the Company via map designation in summer 2018 (96 claims, part of the Corvette Main claim block), and again in fall 2021 (83 claims, the 'Corvette East' claim block).

In early 2022, the Property was further expanded through two option agreements with Canadian Mining House for the Deca-Goose (31 claims) and Felix (20 claims) claim blocks. In May 2023, the Company acquired the KCG claim block (7 claims) situated along the Trans-Taiga Road, directly north of the other claim blocks that comprise the Property. The KCG claims were acquired from Canadian Mining House to allow for ease of access and use for the purposes of a camp to support mineral exploration of the Property. Finally, in May 2024, the Company acquired the JBN-57 claim block from Azimut Exploration Inc.

The present-day Shaakichiuwaanaan Property is comprised of 463 claims, totalling 23,710 ha, with Lithium Innova Inc., a wholly owned subsidiary of Patriot Battery Metals Inc., recorded as the 100% registered title holder with the MRNF.

## 6.2 Previous Exploration and Development

The following section discusses the historical mineral exploration that has overlapped the present-day Shaakichiuwaanaan Property. The QP notes that surface rock sample assays (i.e., grab, and often chip), as historically documented, are selective by nature and represent a point location and, therefore, may not necessarily be fully representative of the mineralized horizon sampled. Further, not all historical documentation provides a complete data set of sampling results (surface or drill), nor details of sampling approach, for a particular program and, therefore, any interpretation of the data should be understood within this context. Where stated, the values presented herein for the historical work are those that define the formal mineral showing/prospect locality and additional information is provided as practical/available.

In the late 1950s, Tyrone Mines Ltd. completed a work program that overlapped the present-day Property that included reconnaissance prospecting and trenching (pit blasting). This work resulted in the discovery of several Cu-Au-Ag showings including the Tyrone T-9 Showing with 3.19% Cu, 0.82 g/t Au, 38.4 g/t Ag in outcrop and 1.15% Cu over 2.1 m in channel, and the Lac Smokycat-SO Showing with sample grades including 1.75% Cu, 1.47 g/t Au, and 40.5 g/t Ag, and 0.76% Cu, 0.20 g/t Au, and 97.7 g/t Ag, located on the present-day FCI West claim block (Ekstrom, 1960 - GM10515).

From the 1950s through to 1997, the Property area was subject to only limited exploration work, including various regional mapping surveys by the federal and provincial governments as well as airborne magnetic and electromagnetic surveys. A NI 43-101 technical report completed in 2014 by Virginia and their option partner at the time, Komet Resources Inc., provides a good summary of the exploration over the area through 2013 (Quellette & Vachon, 2014 - GM68359). A NI 43-101 technical report completed by the Company in 2022 provides additional summary information on historical exploration through April 2022 (Knox, 2022). The following is a brief summary of exploration over the last few decades, which includes excerpts, and paraphrases from these two technical reports.

In 1974, a regional lake bottom sediment survey was completed with multiple samples collected over the present-day Property; however, determining exact locations is challenging (Pride, 1978 - GM34044).

In 1996, Phelps Dodge Corporation completed a helicopter-borne magnetic and electromagnetic survey north of Corvette Lake followed by a short program of geological mapping (Jagodits, 1996 - GM54133) and (Johnson, 1996 - GM56869).

In 1997, Virginia acquired an extensive land position in the region, which overlapped a large portion of the present-day Property. The focus was base and precious metals and exploration (211 rock samples collected) led to the discovery of the Golden Gap Showing (32.7 g/t Au in outcrop, and 14.3 g/t Au over 2 m in channel) as well as two copper-zinc showings (Bambic, 1997) (Chavingny, 1999 - GM56091). As part of the field work in 1997 and 1998, Virginia resampled the historical Tyrone Mines' trenches, as well as completed geological mapping, prospecting, and rock-till-soil sampling on the property. In 1998, Virginia discovered the Golden East Showing (20.3 g/t Au in grab sample), the Felix Showing (three samples ranging from 0.11% to 1.20% Cu and up to 0.35 g/t Au and 9.9 g/t Ag), in addition to completing regional mapping on portions of the present-day Felix claim block (de Chavigny, 1999 - GM 56161). Follow-up work in 1999 led to additional gold discoveries near Golden East with Deca-1 to Deca-4 (1.91 g/t Au over 5 m in channel and 6.91 g/t Au in grab sample), Goose-1 (1.98 g/t Au), and Goose-2 (3.74 g/t Au) showings, which overlap the Company's Deca-Goose claim block (Archer & Oswald, 2008a - GM63675). Further sampling at the Golden Gap Showing returned 5.76 g/t Au over 3 m. In 2000, the Sericite Showing was discovered (1.89% Cu, 0.3 g/t Au, 150 g/t Ag, and 1.45% Zn) and in 2001, the first drill holes on the Property were completed, targeting the Golden Gap Showing. Circa 1,400 surface rock samples were collected across the present-day Property over the 1997 through 2000 exploration programs.

The property was optioned several times in subsequent years with additional groundwork completed each time, including further drilling, prospecting, mapping, soil sampling, as well as ground magnetic and IP surveys, which overlapped the Property to various extents (Archer & Oswald, 2008a - GM63675), (Archer & Oswald, 2008b - GM63695), (Roy & Archer, 2010 - GM65536) and (Quellette & Vachon, 2014 - GM68359). In 2005, the Félicie Showing was re-discovered (formerly the Lac Magin-Sud Showing, initially discovered in 1959) characterized by a sulphide bearing quartz-feldspar dyke with a grab sample assay of 5.54 g/t Au, >100 g/t Ag, 1.86% Cu, 1.56% Pb, and 4.94% Zn (Archer & Oswald, 2008b - GM63695).

The drill programs completed included holes at the Sericite Showing (302 m over two holes in 2013), the Lac Bruno boulder field (391 m over three holes in 2007), Golden Gap (combined total of 5,267 m in 24 holes; between 2001 and 2013) and the Deca-Goose area (325 m over three holes in 2001). The best historical precious metals drill intercept is from Golden Gap with 10.48 g/t Au over 7 m, obtained in 2007 (drill hole FCI-07-003). In addition to drill hole FCI-07-003, numerous other holes at Golden Gap returned nil to moderate precious metals mineralization, including 1.62 g/t Au over 2.5 m (IL-01-01), 0.27 g/t Au over 15 m and 1.35 g/t Au over 4 m (IL-01-02), and 0.59 g/t Au over 11.4 m (IL-01-03). At Golden East, a single drill hole was completed (IL-01-04) and returned 0.46 g/t Au over 1.0 m. Two drill holes were completed at the Deca-1 area and returned 1.10 g/t Au over 1.0 m (IL-01-05), and 0.72 g/t Au over 1.0 m (IL-01-06).

Between 1997 and 2013, the dominant focus was precious metals, with a secondary focus on base metals. No exploration for lithium pegmatite was completed.

Some of the main surface mineral occurrences documented historically on the Property are summarized in Table 6-1 below, as well as Figure 6-1, Figure 6-2 and Figure 6-3.

**Table 6-1: Surface showing highlights from historical work on the Property**

| Showing/Prospect | Year Discovered | Source | Cu (%) | Au (g/t) | Ag (g/t) | Zn (%) |
|---|---|---|---|---|---|---|
| Lac SmokyCat-SO | 1957 | Outcrop | 1.75 | 1.47 | 40.5 | |
| Lac de la Corvette | 1959 | Outcrop | 0.70 | 0.02 | 19.1 | |
| Tyrone-T9 | 1959 | Outcrop | 3.19 | 0.82 | 38.4 | |
| Golden Gap | 1997 | Outcrop | | 108.90 | | |
| Golden East | 1998 | Outcrop | | 21.20 | | |
| Lac Long | 1998 | Outcrop | 1.37 | n/a | 15.2 | |
| Felix | 1998 | Outcrop | 1.20 | 0.35 | 9 | |
| Deca-1 to Deca-4 | 1999 | Outcrop | | 6.91 | | |
| Goose-1 | 1999 | Outcrop | | 1.98 | | |
| Goose-2 | 1999 | Outcrop | | 3.74 | | |
| Sericite | 2000 | Outcrop | 1.89 | 0.30 | 150 | 1.45 |
| Bonoeil | 2009 | Outcrop | 1.40 | n/a | n/a | |
| Smith-Lac Magin | 2010 | Outcrop | 0.65 | 0.64 | 25 | |

Note: Surface rock sample assays (i.e., grab/chip), as historically documented, are selective by nature and represent a point location and, therefore, may not necessarily be fully representative of the mineralized horizon sampled. The sample assays presented are those most commonly associated with the showing.

In 2008 and 2009, the Property was flown with high-resolution magnetics by the *Ministère de l'Énergie et des Ressources naturelles* (MERN, now the MRNF) over the course of a multi-year campaign, covering a large area of the James Bay Region (D'Amours, 2011 - DP 2011-08) and (Goldak Airborne Surveys, 2009 - DP 2009-01). The surveys were flown at a spacing of 250 m with tie lines at 2.5 km and provides a base data set of magnetics over the entire Property.

In 2016, the Company (then under the name of 92 Resources Inc.) acquired an initial claim position in the area (part of the present-day Corvette Main claim block). The claims were acquired, in part, because of the words "*cristaux de spodumène*" in pegmatite that was noted in an outcrop description (RO-IL-06-023) from a 2006 exploration program carried out by Virginia Mines (Archer & Oswald, 2008b - GM63695). The description of the mineral spodumene indicated lithium pegmatite.

In recent years, the area has seen a renewed focus of exploration including geological mapping (Goutier, et al., 2021 - RP 2020-01), base metals sampling (Romain & Larivière, 2021 - GM 72626) and lithium sampling (Azimut Exploration, 2024 - Pending), some of which overlapped with the eastern half of the Property (Corvette Main, Corvette East, and JBN-57 claim blocks).

Mineral exploration by the Company began in 2017 and is summarized in Chapter 9 of this Report. In June 2023, the Company completed a maiden Mineral Resource Estimate for the CV5 Spodumene Pegmatite (McCracken & Cunningham, 2023), which, at the time, established it as the largest lithium pegmatite in the Americas and 8th largest globally. An updated Mineral Resource Estimate for the Shaakichiuwaanaan Property, including the CV5 Spodumene Pegmatite, was announced in August 2024 and is detailed in this Report.

## 6.3 Historical Mineral Resources

There are no known historical Mineral Resources or Reserves on the Property.

## 6.4 Production

There is no known historical production on the Property.

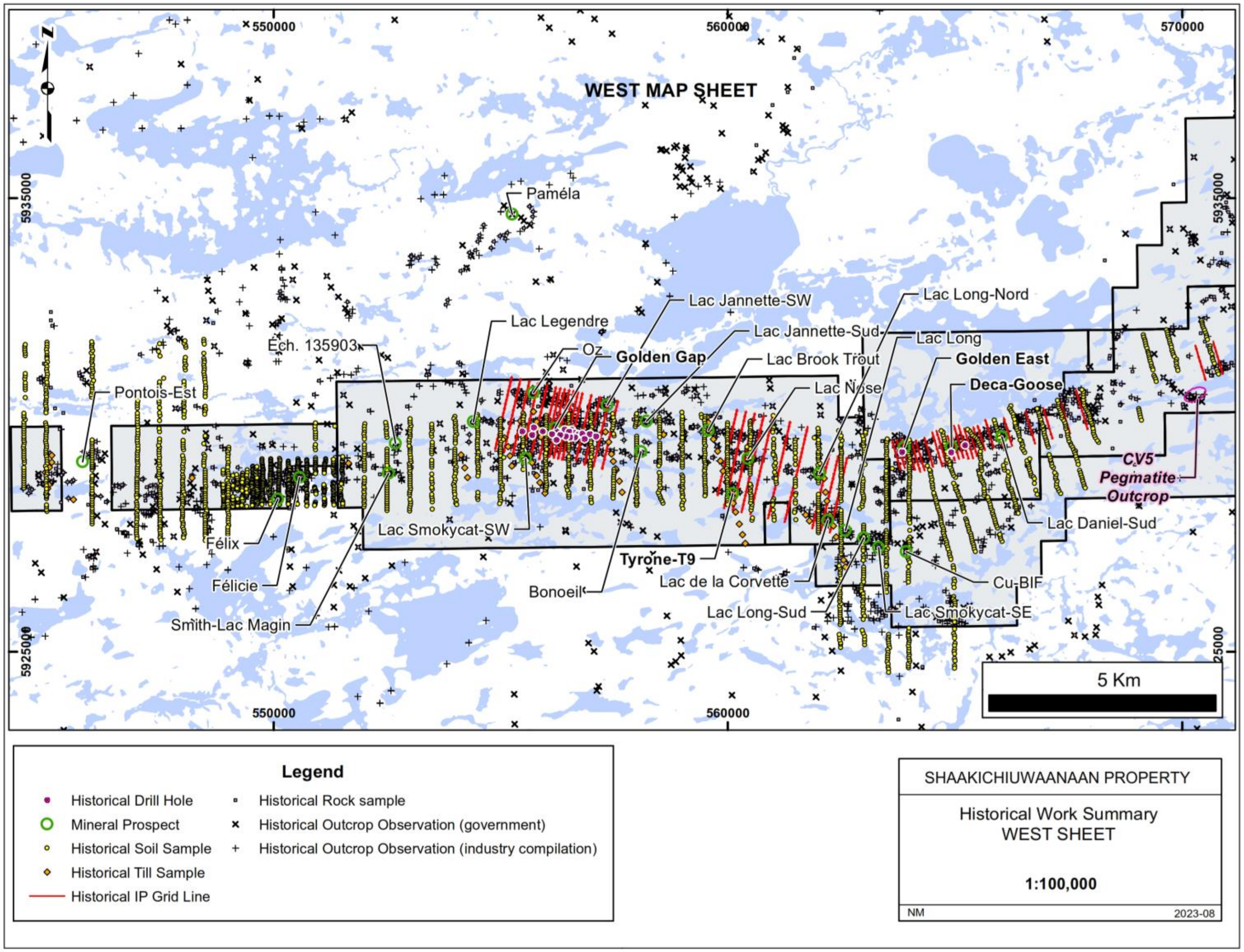



**Figure 6-1: Historical work summary (west)**

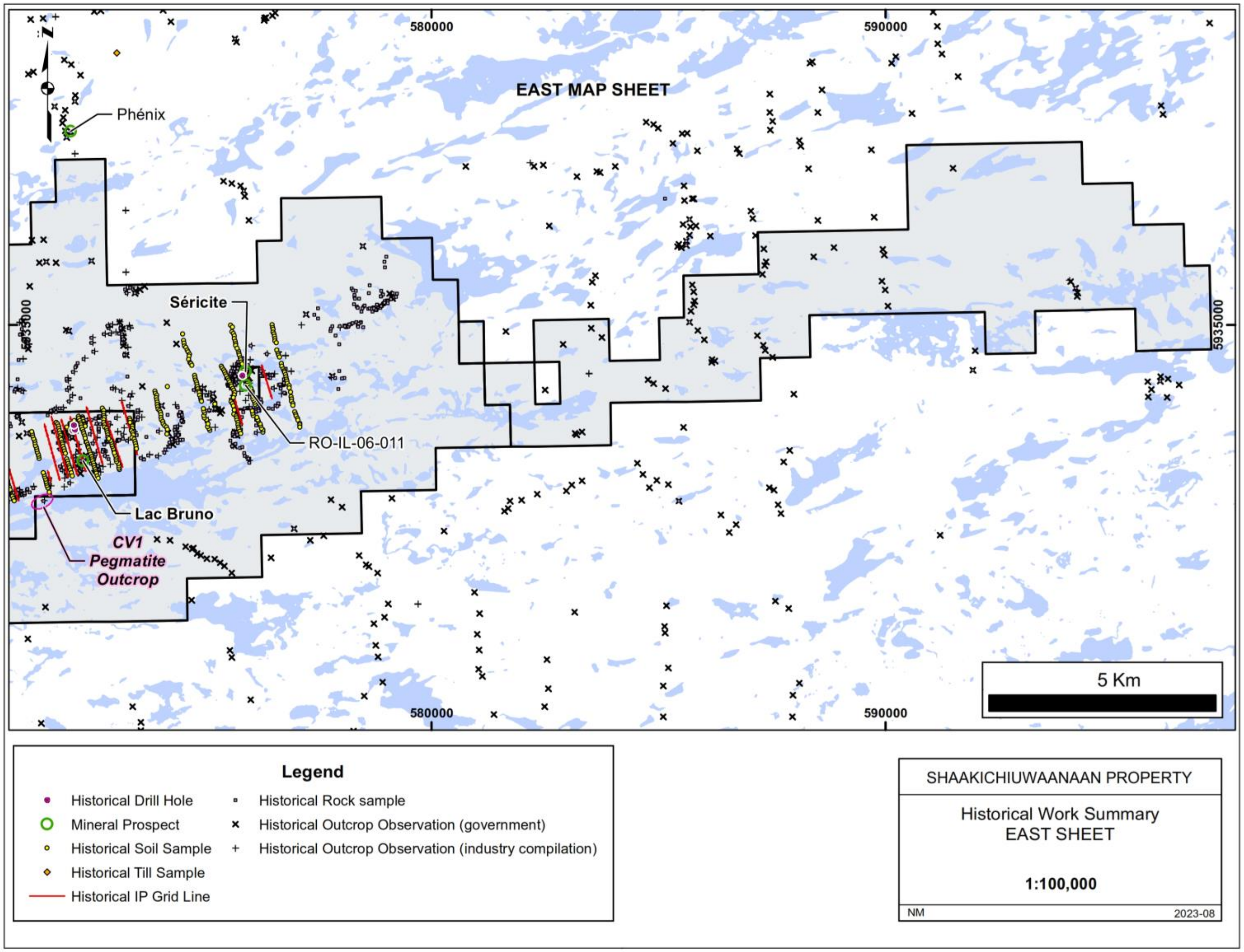



**Figure 6-2: Historical work summary (east)**

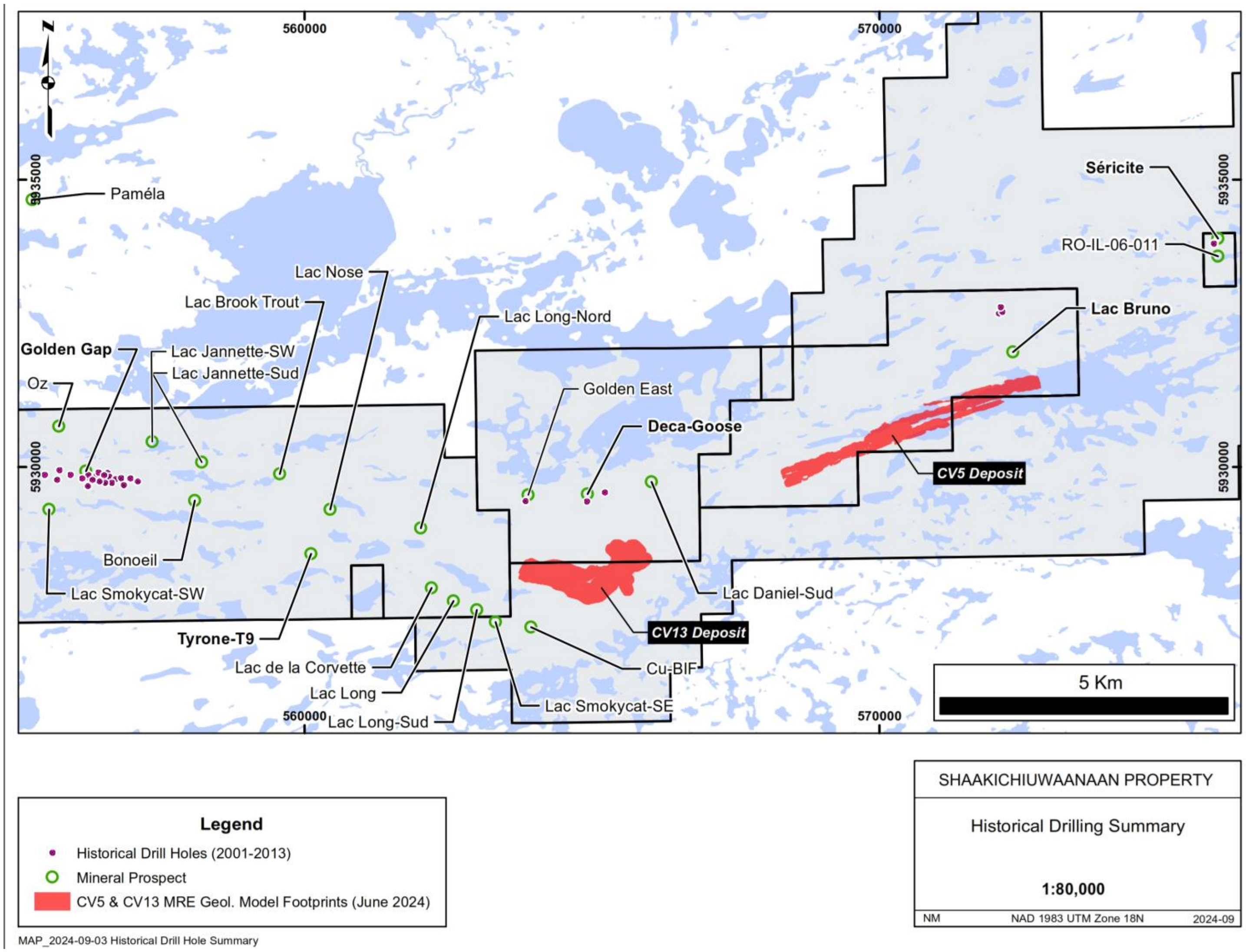



**Figure 6-3: Historical drill hole summary**

# 7. Geological Setting and Mineralization

## 7.1 Regional Geology

The Shaakichiuwaanaan Property is situated within the Archean Superior Province of the Canadian Shield, which extends from Manitoba to Québec and covers approximately 750,000 km$^2$ of Québec. Within the region, the Superior Province is divided into four distinct sub-provinces based on their lithological, metamorphic, geophysical, and structural characteristics; Opatica, Nemiscau, Opinaca, and La Grande (Figure 7-1). The Property is situated within the central portions of the volcano-plutonic La Grande sub-province, proximal to the Opinaca sub-province to the south. The region is considered to have strong exploration potential for a variety of commodities including base and precious metals, and lithium (LCT pegmatite).

The La Grande sub-province is a volcano-plutonic assemblage oriented parallel to the Wemindji-Caniapiscau structural corridor (Houle, 2004). It consists of two main domains (Percival, et al., 2012); the Eastmain River Belt (Upper and Lower) and the La Grande River Belt. The Property is situated within the La Grande River (Greenstone) Belt, characterized by a volcano-sedimentary sequence. This belt occupies the older, more evolved, northern domain (Houle, 2004; Percival, et al., 2012) and is comprised of two supracrustal volcanic sequences (2750-2730 Ma) and interstratified metasediments. The lower basalt sequence sits unconformably atop the Mesoarchean basement (3360-2790 Ma) and locally overlies U-bearing pebble conglomerate, quartz arenite and minor carbonate (Roscoe & Donaldson, 1988; Goutier & Dion, 2004). The upper sequence is a result of crustal assimilation by komatiitic liquids. It is made up of felsic to intermediate volcanics, komatiite, volcanoclastic rocks, and iron formation capped by basalt and high-Mg andesite. This is a typical assemblage, especially in the Guyer-LG-4 sector (St-Seymour & Francis, 1988; Lucas & St-Onge, 1998).

The La Grande sub-province borders the plutonic Bienville sub-province to the north and is bounded to the south by the metasedimentary and plutonic Opinaca sub-province (Lucas & St-Onge, 1998; Houle, 2004; Percival, 2007). Collectively, the La Grande and Opinaca sub-provinces host a significant number of the known spodumene pegmatite occurrences in Québec.

Regional metamorphism increases from greenschist facies in the centre of La Grande outwards to amphibolite facies in the north and southeast (Card, 1986; Houle, 2004). Steeply dipping structural trends transition from E-W in the southwest to NE-SW within northern La Grande, most of which developed between 2700 Ma and 2680 Ma (Percival, et al., 2012). A series of Proterozoic dykes, 2740-2680 Ma plutonic rocks, and the Paleoproterozoic Sakami Formation (siliciclastic infilled grabens) punctuates the Archean rocks (Houle, 2004; Percival, et al., 2012). Rich Ni-Cu occurrences, often with associated PGE and Cr, have also been found in komatiitic flows and ultramafic intrusions in the region (Houle, 2004).

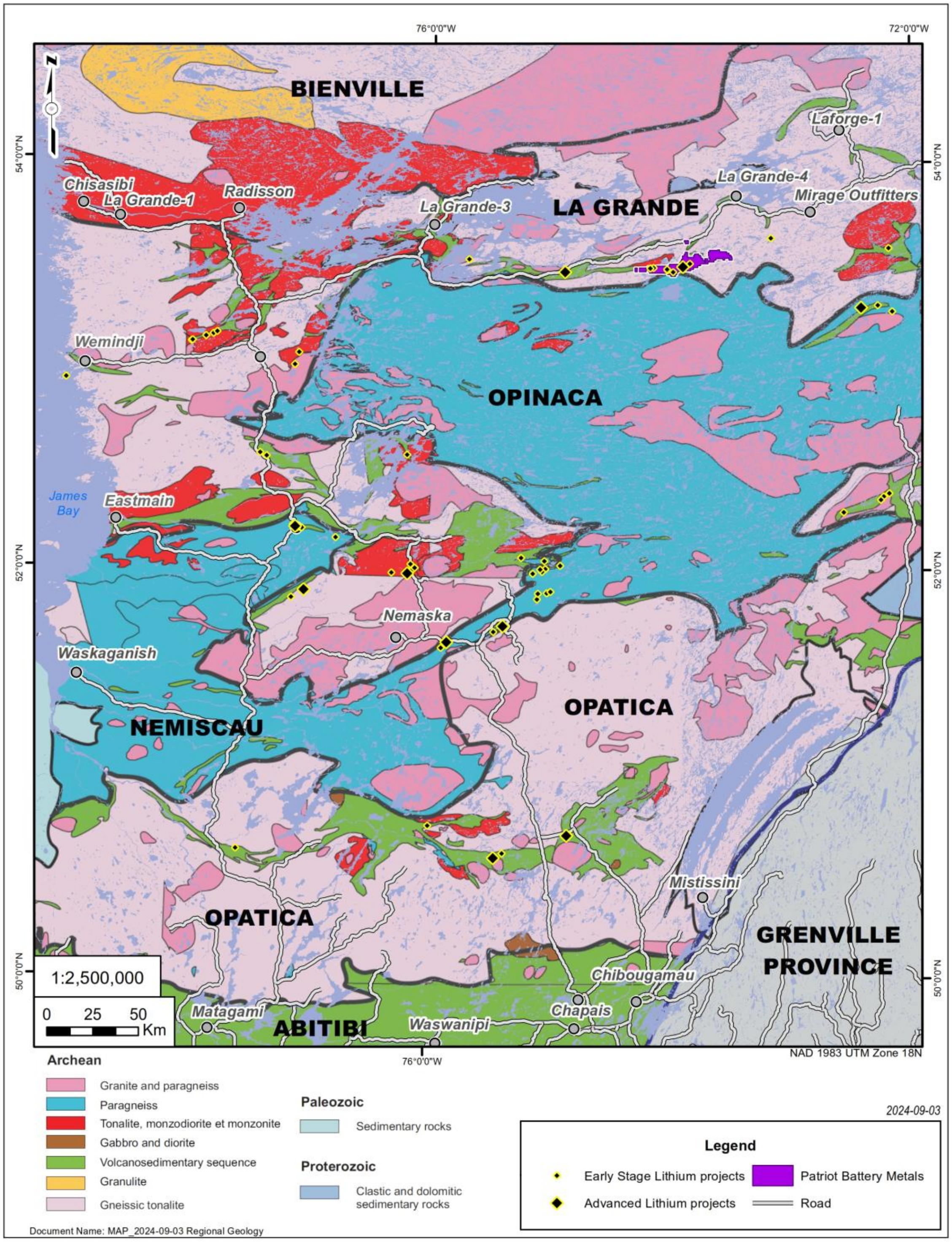



**Figure 7-1: Regional geology**

## 7.2 Property Geology

The Property overlies a large portion of the Lac Guyer Greenstone Belt, considered part of the larger La Grande River Greenstone Belt, and is dominated by volcanic and sedimentary rocks metamorphosed up to amphibolite facies (Figure 7-2). The Property's principal claim group is dominantly host to rocks of the Guyer Group (amphibolite, iron formation, intermediate to mafic volcanics, peridotite, pyroxenite, komatiite, as well as felsic volcanic tuffs). The amphibolite and metasedimentary rocks that trend east-west (generally moderately to steeply south dipping) through this region are bordered to the north by the Magin Formation (conglomerate and wacke) and to the south by an assemblage of tonalite, granodiorite, and diorite, in addition to metasediments of the Marbot Group (conglomerate, wacke). Several regional-scale Proterozoic gabbroic dykes also cut through portions of the Property (Lac Spirt Dykes, Senneterre Dykes). The KCG claim block, located to the north of the principal claim group, is situated within the Bezier Suite (monzodiorite and granodiorite), and outside the Guyer Group.

The lithium pegmatites on the Property, including those at CV5 and CV13, are hosted predominantly within amphibolites, metasediments, and lesser ultramafics of the Guyer Group within the principal claim group.

The geological setting is primarily prospective for gold, silver, base metals, platinum group elements, and lithium over several different deposit styles including orogenic gold (Au), volcanogenic massive sulphide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and Li-Cs-Ta ("LCT") pegmatite.

Exploration of the Property has outlined three primary mineral exploration trends (Figure 7-2), crossing dominantly east-west over large portions of the Property's principal claim group – Golden Trend (gold), Maven Trend (copper, gold, silver), and CV Trend (Li-Cs-Ta Pegmatite). The Golden Trend is focused over the northern areas of the Property, the Maven Trend in the southern areas, and the CV Trend "sandwiched" between. Historically, the Golden Trend has received the exploration focus followed by the Maven Trend. However, the identification of the CV Trend and the numerous lithium-tantalum pegmatites discovered to date, represents a previously unknown lithium pegmatite district that was first recognized in 2016/2017 by Dahrouge Geological Consulting Ltd. and the Company.

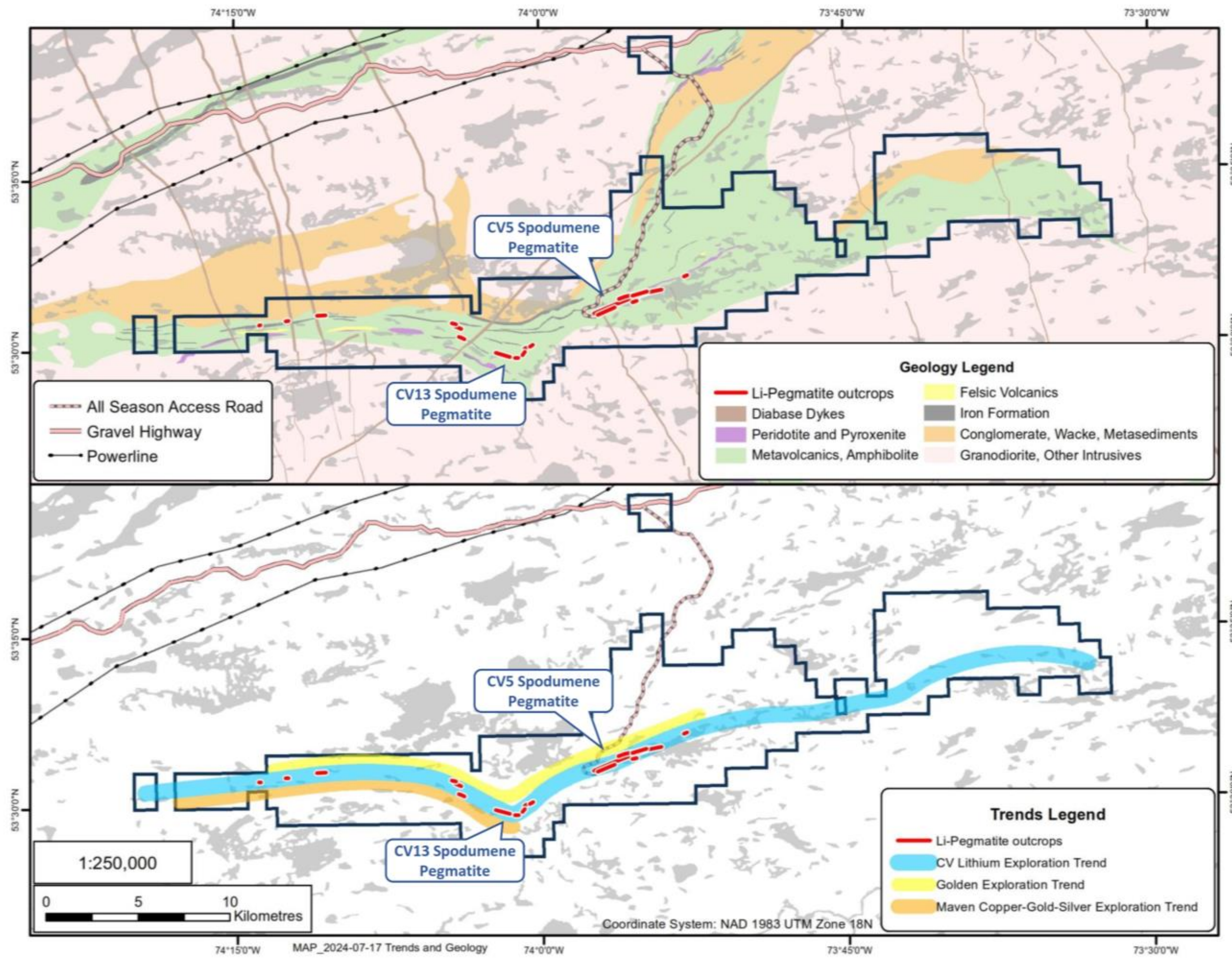



**Figure 7-2: Property geology and mineral exploration trends**

The CV Lithium Pegmatite Trend is currently recognized as an approximate 1-km wide and 25+ km long corridor, which is host to numerous distinct LCT pegmatite occurrences, and extends in a general east-west direction across the central portions of the Felix, FCI West, Deca-Goose, FCI East, and Corvette Main claim blocks. The trend is interpreted to extend across the entire principal claim group of the Property (~50 km); however, large areas remain to be explored for lithium pegmatite. The LCT pegmatites along this trend may outcrop as isolated high relief 'whale-back' landforms or relatively low-relief to flat landforms (Figure 7-3 and Figure 7-4).

To date, eight distinct lithium pegmatite clusters have been discovered along this trend at the Property – CV4, CV5, CV8, CV9, CV10, CV12, CV13, and CV14. Each of these clusters includes multiple lithium pegmatite outcrops in close proximity and oriented along the same local trend and have been grouped to simplify exploration approach and discussion. Given the proximity of some lithium pegmatite outcrops to each other at these various clusters, as well as the shallow till cover, it is probable that some of the outcrops may reflect a discontinuous surface exposure of a single, larger pegmatite 'outcrop' subsurface. Further, the high number of well-mineralized pegmatites along the trend at these clusters indicate a strong potential for a series of relatively closely spaced/stacked, sub-parallel, and sizable spodumene-bearing pegmatite bodies, with significant lateral and depth extent, to be present.

The lithium mineralization discovered on the Property to date has thus far been confined to the CV Trend. The core area of the trend includes the approximate 4.6-km long CV5 Spodumene Pegmatite and 2.3 km long CV13 Spodumene Pegmatite, as defined by drilling, which are separated by approximately 2.9 km of prospective trend yet to be drill tested.

The local geology and mineralization of each known spodumene pegmatite cluster at the Property is further discussed in Section 7.4 (Mineralization).

**Figure 7-3: 'Whale-back' spodumene pegmatite landform at CV13**

**Figure 7-4: 'Whale-back' spodumene pegmatite landform at CV5**

## 7.3 Structural Geology

The Property overlies a large portion of the Lac Guyer Greenstone Belt, which is considered part of the larger La Grande Greenstone Belt within the La Grande sub-province and is dominated by volcanic rocks metamorphosed up to amphibolite facies. The La Grande sub-province underwent multiple tectonic deformation events, which are responsible for the formation of kilometre-scale thrust faults and folds within the volcano-sedimentary units and basement. The deformation included three Archean episodes of ductile deformation and several Neoarchean to Paleoproterozoic episodes of brittle deformation (Goutier, et al., 2002); (Bandyayera, Burniaux, & Morfin, 2011); (Bandyayera, Burniaux, & Chapon, 2013)).

Within the Property, the Guyer Group domain is bound by two shear zones which, in general, have an east-west extension – the Pontois-Sud Fault, a reverse shear zone in the north, and the Nochet Shear Zone in the south. The apparent fabric of the Guyer Group rocks is generally parallel to the shear zone contacts (west-east) and moderately to steeply south dipping (50-89 degrees). No major folds are known on the property to this date and only small-scale folding in outcrop and drilling have been documented.

The CV5 and CV13 lithium pegmatites are non-concordant to the regional fabric and dip steeply northerly (CV5) or dip moderately northerly to flat-lying (CV13). The CV13 Pegmatite is coincident with a large-scale regional flexure and is evident in airborne magnetic data. The CV9 Pegmatite is currently interpreted to have a steep northerly dip and a moderate plunge to the east-southeast. There are no apparent indications that the CV5, CV13, and CV9 lithium pegmatites have undergone any significant deformation. No other pegmatite clusters have been drill tested at the Property apart from a single, short hole at CV12.

## 7.4 Mineralization

The Property's geological setting is prospective for orogenic gold (Au), volcanogenic massive sulphide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and Li-Cs-Ta (LCT) pegmatite. The following includes a discussion of the LCT pegmatite occurrences and mineralization at the Property.

### 7.4.1 CV Trend (LCT Pegmatite)

Lithium mineralization at the Property is observed to occur within quartz-feldspar LCT pegmatites, which may outcrop as high relief 'whale-back' landforms as well as low-relief landforms. The pegmatite is often very coarse-grained and off-white in appearance, with darker sections commonly composed of muscovite ($(KAl_2(AlSi_3O_{10})(F,OH)_2$) and smoky quartz (impure $SiO_2$), and occasionally tourmaline (dravite/schorl, $NaFe_3Al_6(BO_3)_3Si_6O_{18}(OH)_4$), and lighter sections composed of dominantly feldspars (albite and microcline, $Na,K,AlSi_3O_8$). Minor accessory and trace minerals may include beryl ($Be_3Al_2Si_6O_{18}$), chlorite ($(Fe,(Mg,Mn)_5,Al)(Si_3Al)O_{10}(OH)_8$), tantalite ($(Fe,Mn)(Ta,Nb)_2O_6$), lepidolite ($K(Li, Al)_3(Al, Si, Rb)_4O_{10}(F,OH)_2$), and phosphate minerals.

Spodumene ($LiAlSi_2O_6$) is the dominant lithium mineral identified at all the lithium occurrences documented to date at the Property. Spodumene crystals range in size from centimetre-scale to metre-scale and have approached 2 m in length in drill core at CV5 and CV13. The colour of the spodumene crystals ranges from cream to light grey-green over the CV5 and CV13 Pegmatite area, to a more whitish colour in the pegmatites to the west (CV8, CV9, CV10, and CV12). In rare cases a purple variety has been identified at several clusters. Spodumene mineralization is commonly associated with smoky quartz and is most evident in drill core (Figure 7-10, Figure 7-11, and Figure 7-12); however, may still occur as isolated crystals in feldspar-rich pegmatite. Therefore, lithium (i.e., spodumene) content tends to be highest with higher contents of quartz and, correspondingly, lower with higher contents of feldspar. These two mineral assemblages manifest as a 'high-grade' versus 'low-grade' zonation within the pegmatite at CV5.

Minor localized lepidolite ($K(Li, Al)_3(Al, Si, Rb)_4O_{10}(F, OH)_2$) has been observed in a small number of lithium pegmatite outcrops as well as in drill hole. No significant occurrences of lithium phosphate minerals ($Li_2PO_4$), petalite ($LiAlSi_4O_{10}$), or pollucite ($(Cs, Na)_2Al_2Si_4O_{12} \cdot 2H_2O$) have been documented to date in the pegmatites at the Property. However, based on Cs assays returned from several drill holes, some minor occurrences of pollucite are likely present. Variably altered spodumene, typically identified as cookeite ($LiAl_5Si_3O_{10}(OH)_8$), has been described occasionally in drill core, mostly commonly associated with fracture zones. Holmquistite—lithium-bearing mineral of the amphibole group with the formula ($Li_2(Mg,Fe)_3(Al,Fe^{3+})_2Si_8O_{22}(OH)_2$)—has been observed in the immediately adjacent host amphibolite, thus indicating a metasomatic replacement event involving lithium mobilized from the pegmatite syn/post emplacement.

In addition to lithium, the pegmatites at Shaakichiuwaanaan typically carry a significant tantalum component, present in the form of columbite-tantalite.

Geochemically, the lithium pegmatites at the Property commonly contain elevated levels of rubidium (“Rb”) and cesium (“Cs”) compared to less differentiated granites, confirming their strongly differentiated signature that is typical for LCT pegmatites. Whole rock rubidium contents are commonly 1,000 ppm to 4,000 ppm Rb and may exceed 1%, while cesium levels are commonly 500 ppm to 1,500 ppm Cs with only distinct zones exceeding the analytical upper detection limit of 1% Cs. Most of the rubidium and cesium occur within the feldspars and micas in the pegmatites and, therefore, are not considered recoverable.

To date, eight distinct lithium pegmatite clusters have been discovered along the CV Lithium Trend at the Property – CV4, CV5, CV8, CV9, CV10, CV12, CV13, and CV14 (Figure 7-5). Each of these clusters includes multiple lithium pegmatite outcrops in close proximity and oriented along the same local trend and have been grouped and denoted as ‘clusters’ or wholistically as a single ‘pegmatite’ to simplify exploration approach and discussion.

A maiden Mineral Resource Estimate was completed in June 2023, herein referred to as the "June 2023 MRE", for the CV5 Spodumene Pegmatite (McCracken & Cunningham, 2023) – 109.2 Mt at 1.42% $Li_2O$ and 160 ppm $Ta_2O_5$, Inferred, at a 0.40% $Li_2O$% cut-off grade. An updated Consolidated MRE for the Shaakichiuwaanaan Project was announced August 5, 2024, (Patriot, 2024a), by the Company and includes both the CV5 and CV13 spodumene pegmatites for a total of 80.1 Mt at 1.44% $Li_2O$ Indicated and 62.5 Mt at 1.31% $Li_2O$ Inferred, for 4.88 Mt contained lithium carbonate equivalent (“LCE”). Presented by resource location/name, this MRE includes 78.6 Mt at 1.43% $Li_2O$ Indicated and 43.3 Mt at 1.25% $Li_2O$ Inferred at CV5, and 1.5 Mt at 1.62% $Li_2O$ Indicated and 19.1 Mt at 1.46% $Li_2O$ Inferred at CV13. The cut-off grade is variable depending on the mining method and pegmatite. Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability. No Mineral Resources have been estimated for the other spodumene pegmatite clusters on the Property.

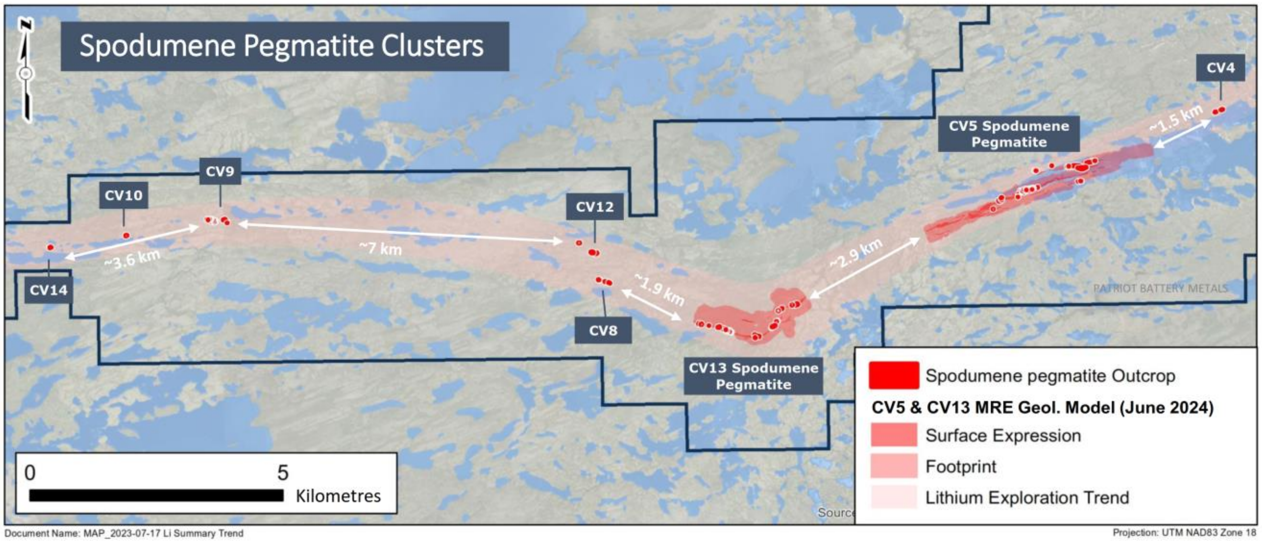



**Figure 7-5: Lithium pegmatite clusters at the Property**

The QP notes that surface rock sample assays (i.e., grab) are selective by nature and represent a point location and, therefore, are not necessarily representative of the mineralized horizon sampled. Further, pegmatites are typically heterogeneous and their mineralization very coarse grained and, therefore, surface sampling results should be understood within this context.

#### 7.4.1.1 CV5 Spodumene Pegmatite

The CV5 Spodumene Pegmatite is the largest single occurrence of LCT pegmatite at the Property identified to date. It is located central to the Property, approximately 13 km south of KM-270 on the Trans-Taiga Road (Figure 5-1). As of the Effective Date of this Report, it had been delineated to within approximately 1.5 km of the CV4 Spodumene Pegmatite cluster to the east, and to within approximately 2.9 km of the CV13 Spodumene Pegmatite cluster to the west (Figure 7-5, Figure 7-13).

At surface, CV5 is exposed as a series of discontinuous spodumene pegmatite outcrops spanning a corridor of approximately 2.25 km long x 0.5 km wide. Outcrops range in size from ~1-3 m in size to ~175 m long x ~15 m to 30 m wide (CV1 outcrop) and ~220 m long x 20 m to 40 m wide (CV5 outcrop) (Figure 7-6 and Figure 7-7). Spodumene mineralization at CV5 is comprised of decimetre to metre scale crystals, typically off-white to grey in appearance (Figure 7-8 through Figure 7-12).

Figure 7-6: Main outcrop at the CV5 Pegmatite (looking westerly)

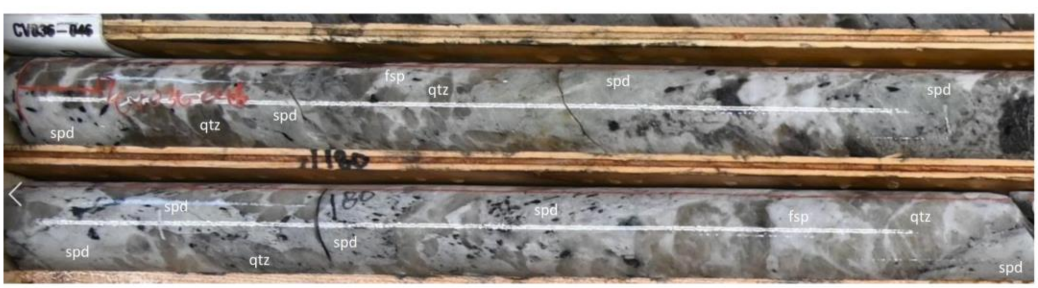
Figure 7-7: Main outcrop at the CV5 Pegmatite (looking northerly)


**Figure 7-8: Spodumene crystal at the CV5 Pegmatite**

**Figure 7-9: Strongly fractured, pinkish weathered spodumene crystals in matrix of white feldspar and grey quartz at the CV5 Pegmatite**


Blow-up of green box below illustrating coarse grained spodumene crystals

High-grade lithium mineralized drill intersection in CV22-035 – **3.29% $Li_2O$** and 177 ppm $Ta_2O_5$ **over 10.0 m** (202.5 m to 212.5 m – red box) within a wider zone of **1.25% $Li_2O$** and 118 ppm $Ta_2O_5$ **over 96.9 m** (126.1 m to 223.0 m)




Course grained spodumene (spd) in quartz (qtz) feldspar (fsp) pegmatite in drill hole CV22-036

**Figure 7-10: Coarse-grained spodumene mineralization in drill holes CV22-035 and 036**

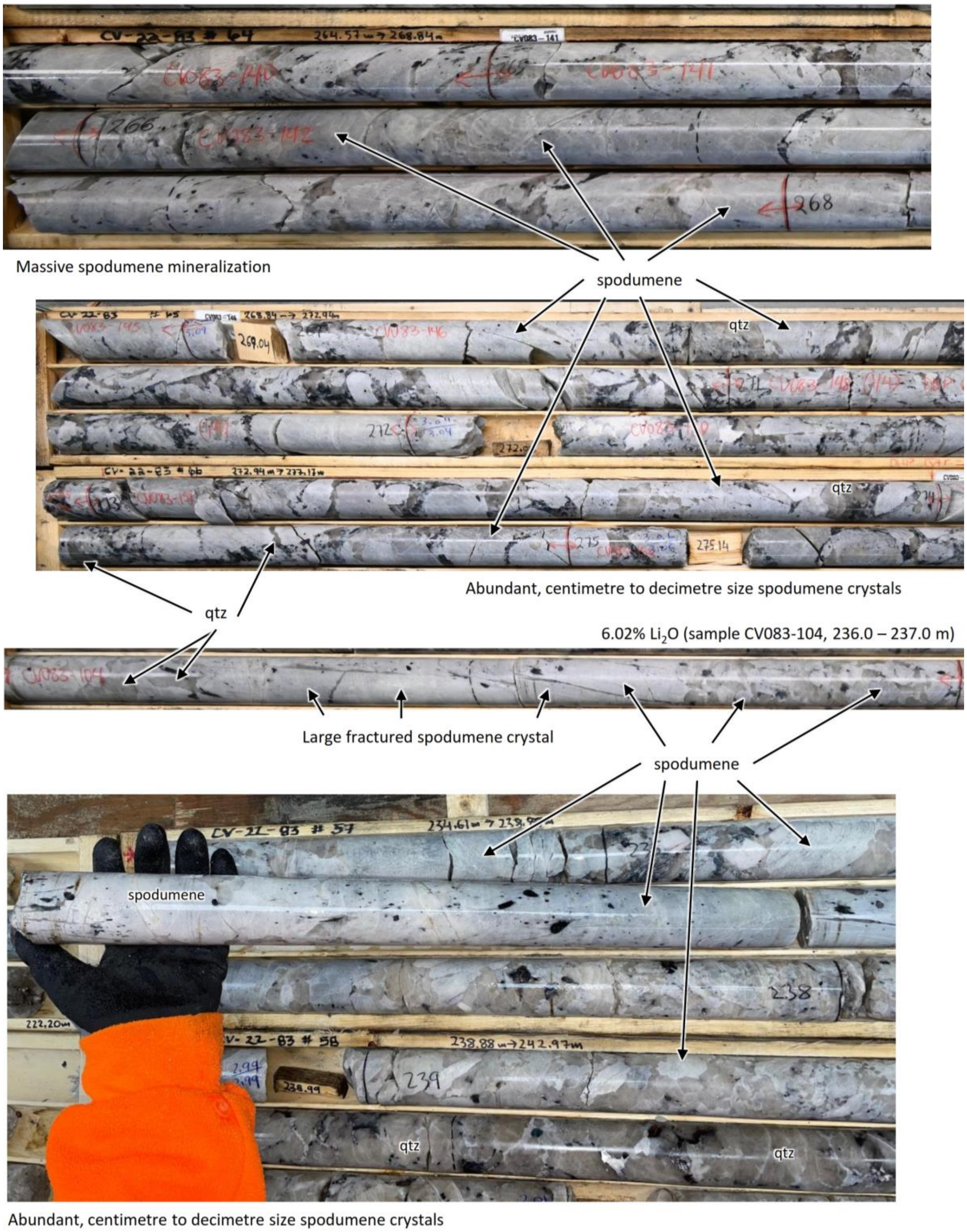



**Figure 7-11: Coarse-grained spodumene mineralization from the Nova Zone in drill hole CV22-083**


**Figure 7-12: Coarse-grained spodumene mineralization in drill hole CV22-083**

A portion of the known CV5 Spodumene Pegmatite is situated beneath an unnamed shallow glacial lake. This lake is typically <3-10 m deep with a maximum lake depth of ~18 m to 20 m at the very eastern areas of CV5. Standard geological interpretation in greenstone belts dictates that pegmatites should not be expected to be present under topographic lows (e.g., lakes). This is because they are resistive to chemical erosion by nature of their mineralogy and igneous formation and, therefore, should preferentially form topographic highs relative to their host amphibolite, metasediment, and ultramafic rocks. However, the Company's exploration approach interprets a process by which the coarse grain size and well-developed cleavage of spodumene (and to a lesser extent feldspars) offer small cracks that may be exploited by overlying glaciers to fracture at larger scale and 'pluck' out and move large pegmatite blocks as the glacier advances. The result is a pegmatite topographic low, which was later infilled with water as the glacier receded, leaving behind what we find today at CV5. This interpretation is supported by several kilometre-long dispersion trains of up to car-sized pegmatite boulders in the down-ice direction.

To date, at the CV5 Spodumene Pegmatite, multiple individual spodumene pegmatite dykes have been geologically modelled. However, a vast majority of the CV5 Mineral Resource is hosted within a single, large, principal spodumene pegmatite dyke, which is flanked on both sides by multiple, subordinate, sub-parallel trending dykes (Figure 7-14, Figure 7-15, and Figure 7-16). The CV5 Spodumene Pegmatite, including the principal dyke, is modelled to extend continuously over a lateral distance of at least 4.6 km and remains open along strike at both ends and to depth along a large portion of its length. The width of the currently known mineralized corridor at CV5 is approximately ~500 m, with spodumene pegmatite intersected at depths of more than 450 m in some locations (vertical depth from surface). The pegmatite dykes at CV5 trend west-southwest (approximately 250°/070° RHR), and therefore dip northerly, which is different than the host amphibolites, metasediments, and ultramafics which dip moderately in a southerly direction.

The principal spodumene pegmatite dyke at CV5 ranges from <10 m to more than 125 m in true width, and may pinch and swell aggressively along strike, as well as up and down dip. It is primarily the thickest at near-surface to moderate depths (<225 m), forming a relatively bulbous, elongated shape, which may flair to surface and to depth variably along its length – see simplified geological cross-sections in Figure 7-17 through Figure 7-19, as well as those presented in the June 2023 MRE (McCracken & Cunningham, 2023) for additional context. As drilling has focused over the principal dyke, the immediate CV5 corridor has not been adequately drill tested and it is interpreted that additional subordinate pegmatite lenses are situated proximal, especially in the southcentral areas of the deposit. The pegmatites that define CV5 are relatively undeformed and very competent, although likely have some meaningful structural control.

The CV5 Spodumene Pegmatite displays internal fractionation along strike and up/down dip, which is evidence by variation in mineral abundance including felspar, quartz, spodumene, and tantalite. This is highlighted by the high-grade Nova Zone, which has been traced over a strike length of at least 1.1 km and includes multiple drill intersections ranging from 2 m to 25 m (core length) at >5% $Li_2O$, within a significantly wider mineralized zone of >2% $Li_2O$ (Figure 7-11 and Figure 7-16).

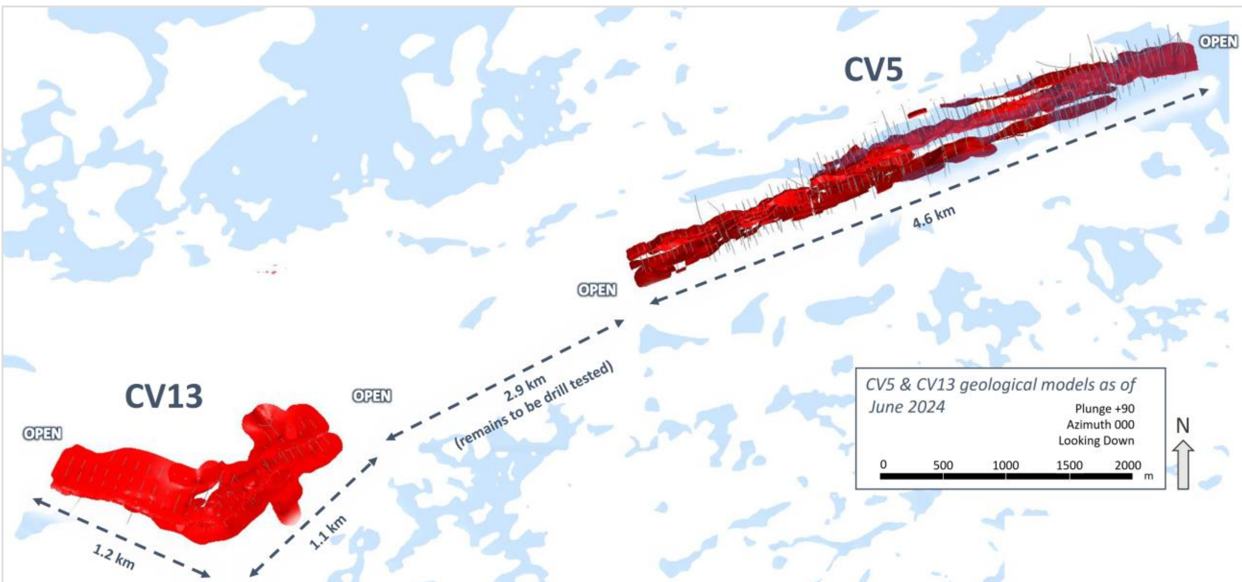



**Figure 7-13: Plan view of CV5 and CV13 spodumene pegmatite geological models – all lenses**

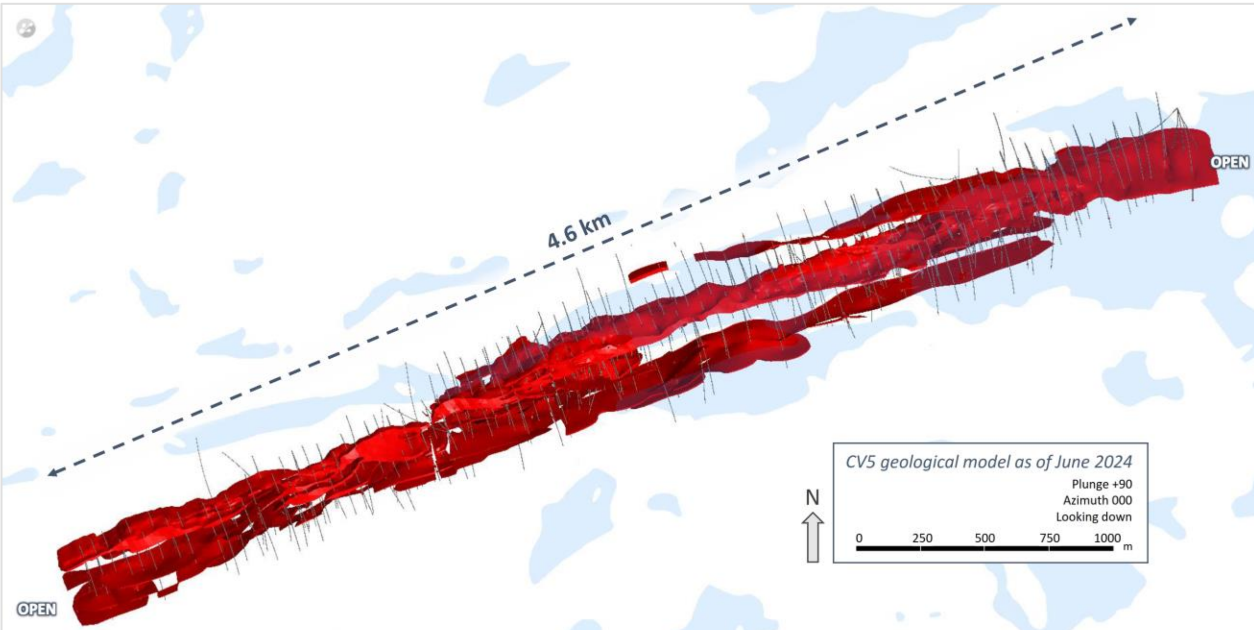



**Figure 7-14: Plan view of CV5 Spodumene Pegmatite geological – all lenses**

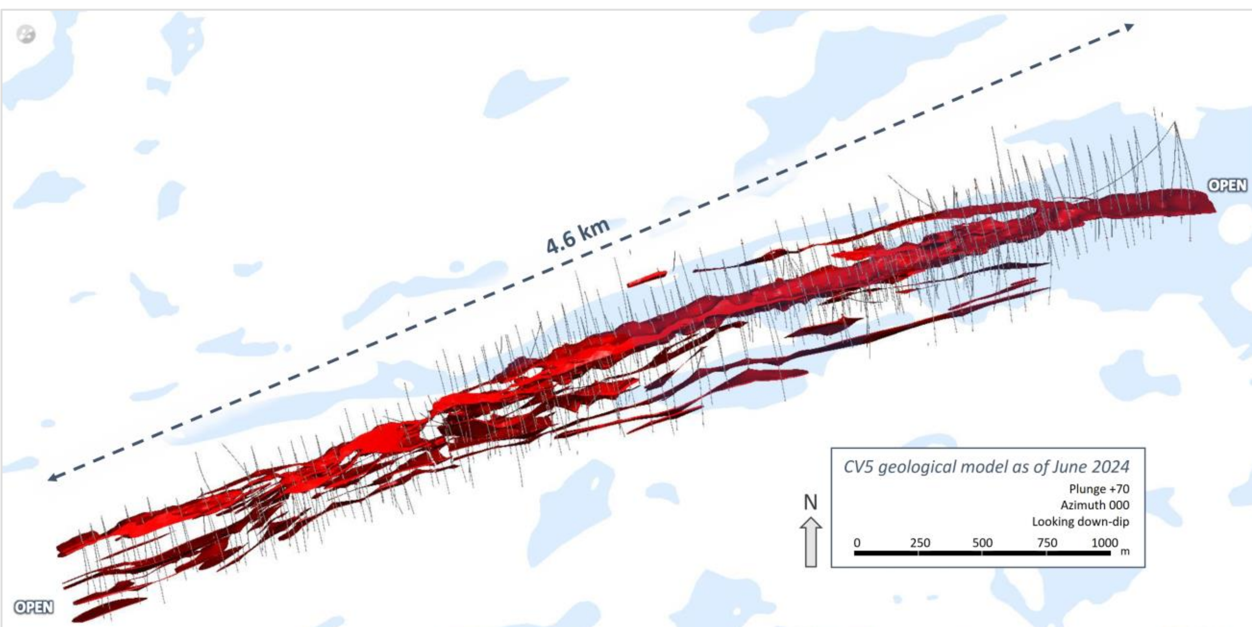



**Figure 7-15: Inclined view of CV5 Spodumene Pegmatite geological model looking down dip (70°) – all lenses (not to scale)**

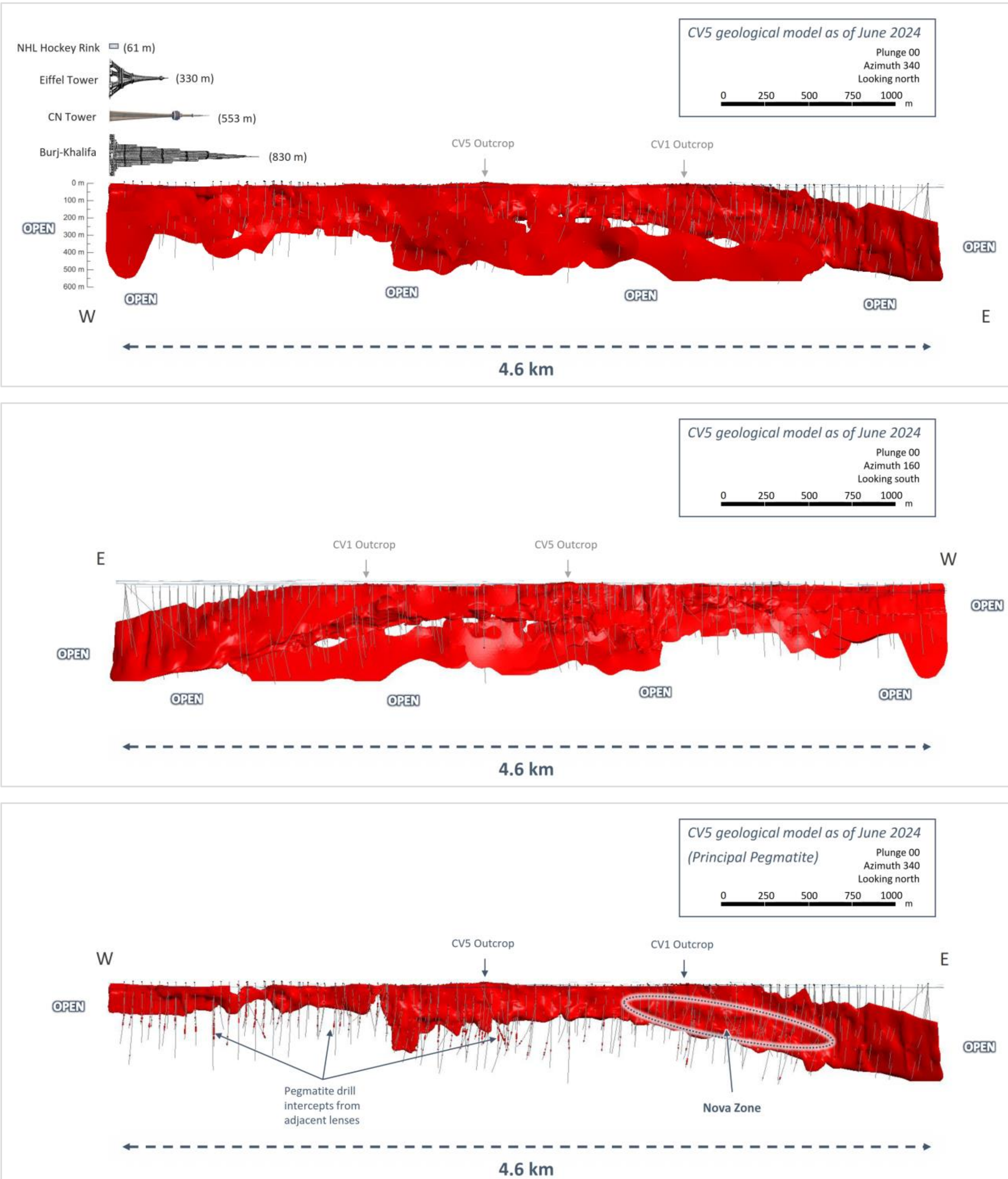



**Figure 7-16: Side view of CV5 geological model looking north (340°), all lenses (top); looking south (160°), all lenses (middle); looking north (340°), principal pegmatite only (bottom)**

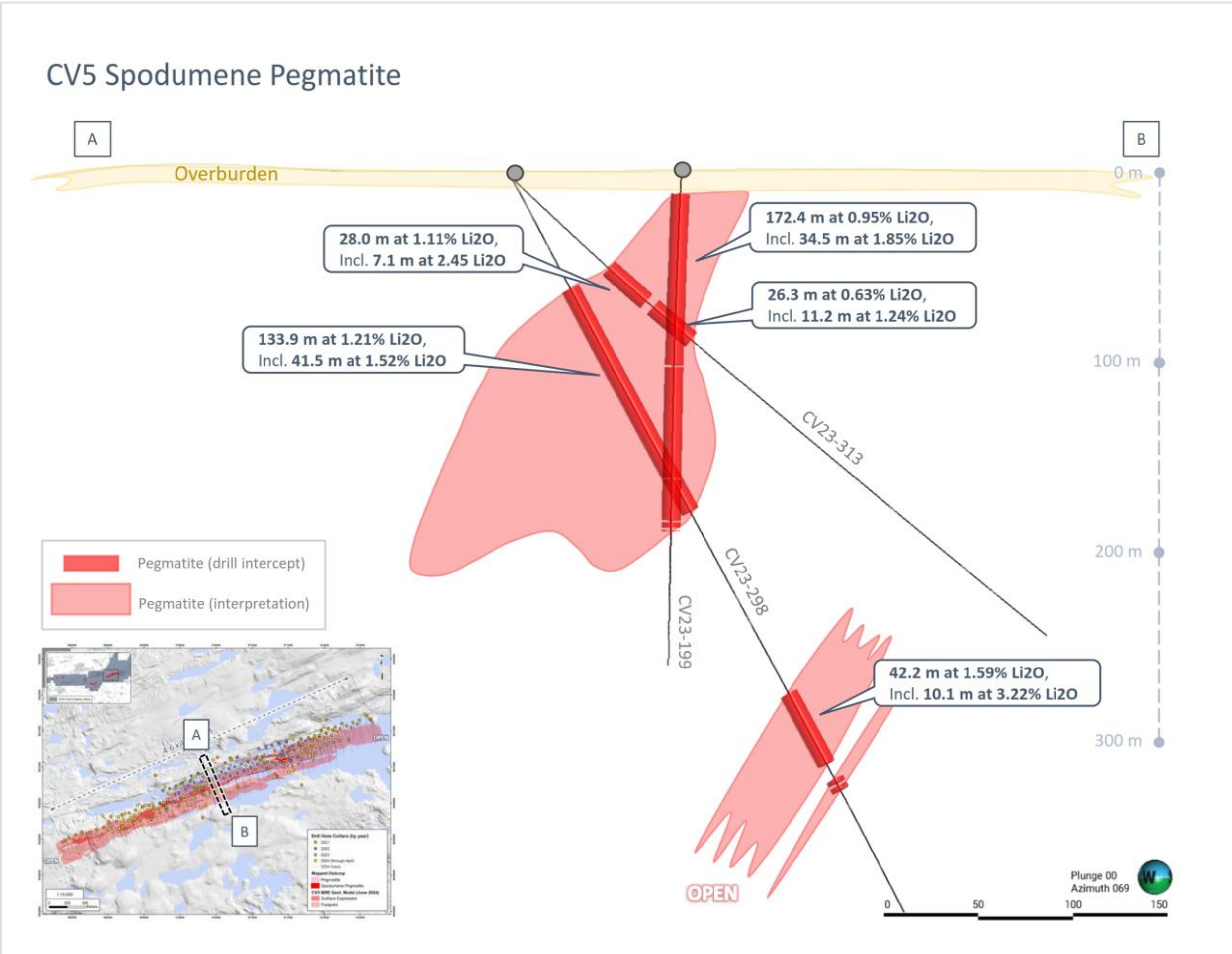



Figure 7-17: Simplified cross-section of the CV5 Spodumene Pegmatite geological model

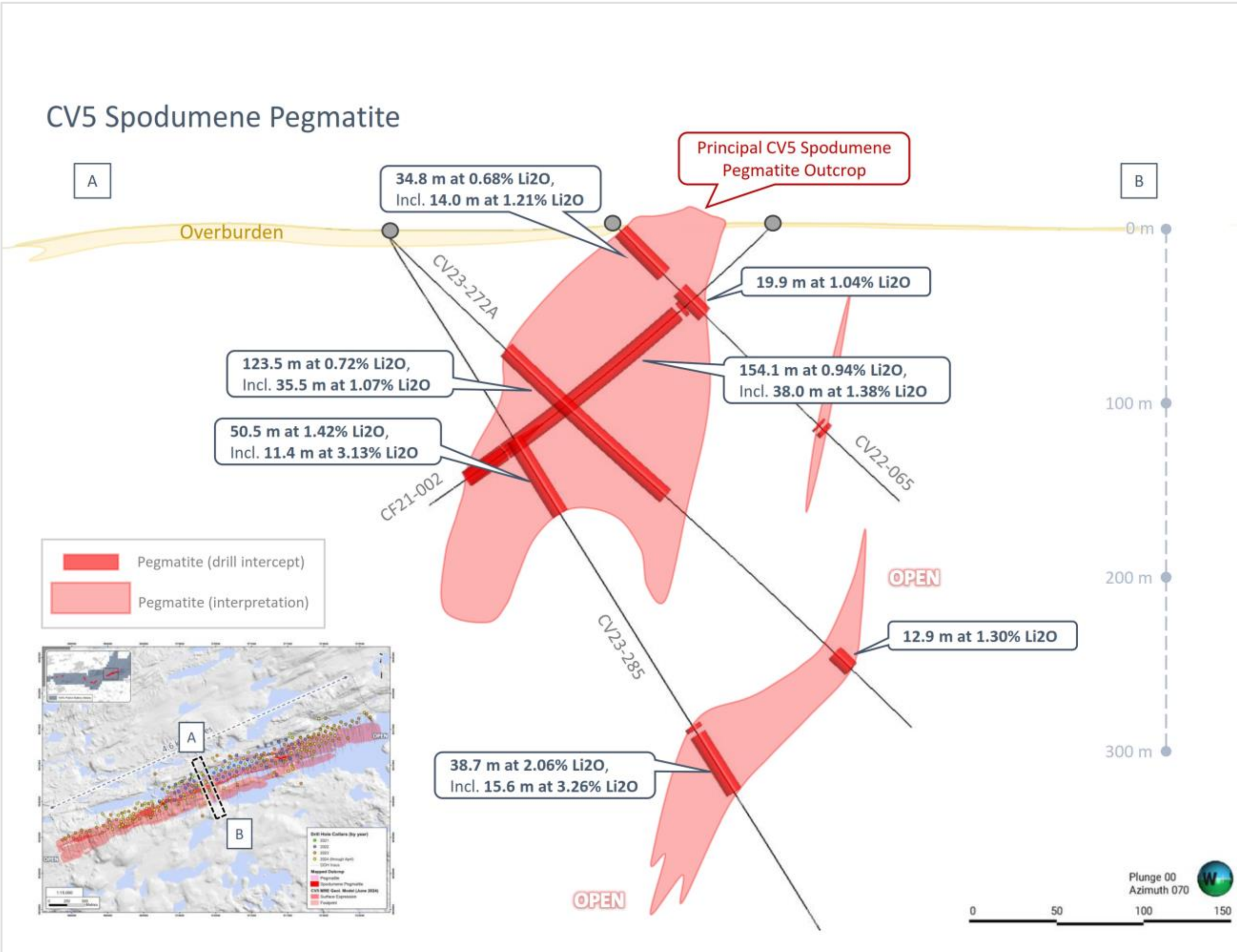



**Figure 7-18: Simplified cross-section of the CV5 Spodumene Pegmatite geological model**

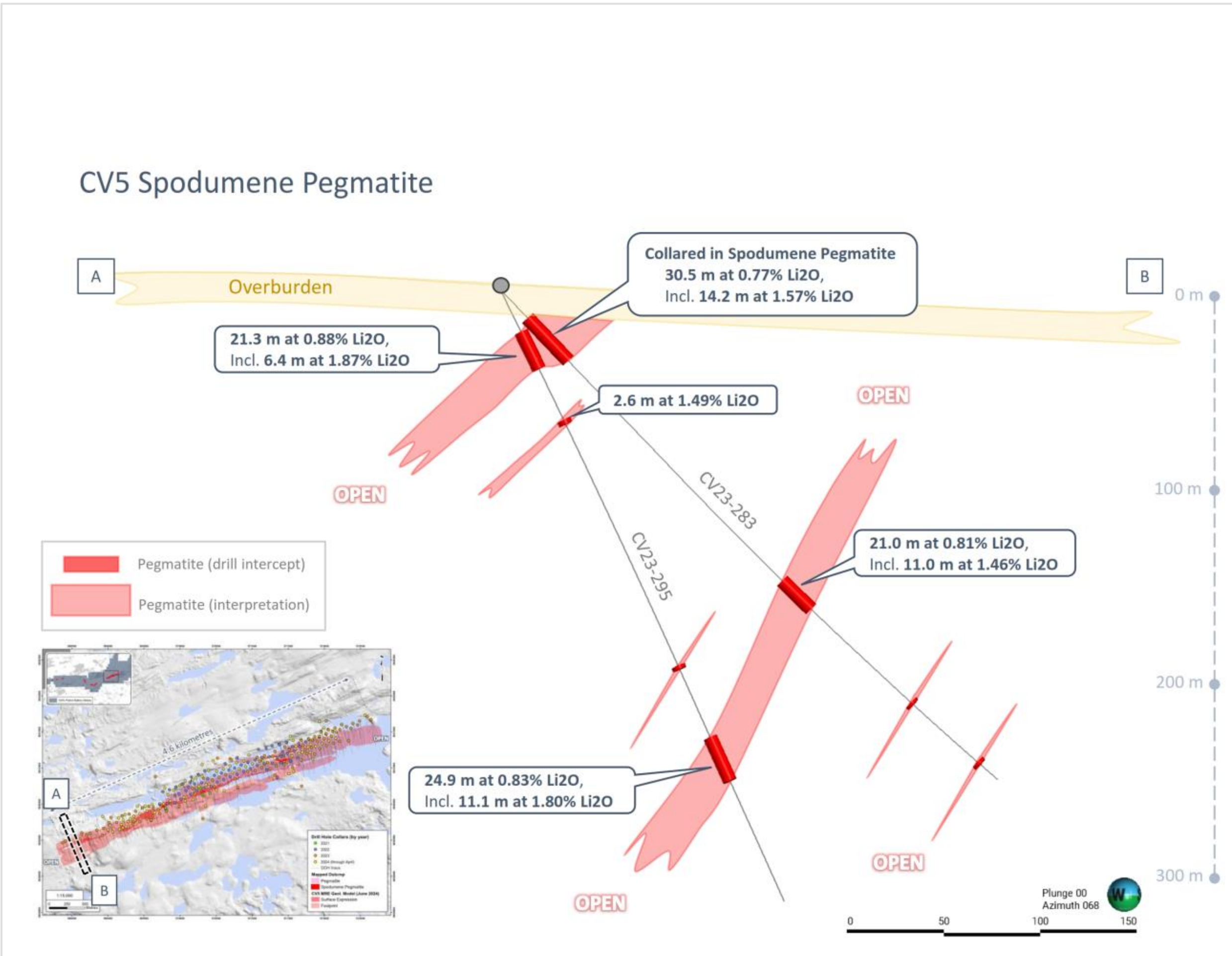



**Figure 7-19: Simplified cross-section of the CV5 Spodumene Pegmatite geological model**

### 7.4.1.2 CV13 Spodumene Pegmatite

The CV13 Spodumene Pegmatite, discovered in 2022, is located near the centre of the Property at the apex of an interpreted regional structural flexure. It is situated approximately 2.9 km from the CV5 Spodumene Pegmatite to the northeast and approximately 1.9 km and 2.4 km, respectively, from the CV8 and CV12 Spodumene Pegmatites to the northwest (Figure 7-5).

The cluster is comprised of over 50 individual pegmatite outcrops, of which approximately half have been mapped as spodumene pegmatite (>5% spodumene) (Figure 7-3 and Figure 7-20). The two largest outcrops are approximately 70 m long by 12 m wide and 100 m long by 15 m wide, situated approximately 300 m apart, with the largest outcrop coincident with the apex of the regional structural flexure (Figure 7-3). The pegmatite outcrops define two contiguous trends, totalling approximately 2.3 km in combined strike length. The pegmatite contacts are poorly exposed on the northern and southern edges, although, where exposed, are often in contact dominantly with amphibolite, followed by ultramafic (undifferentiated), and/or wacke lithologies of the Guyer Group.

At the CV13 Spodumene Pegmatite, surface mapping and drilling completed to date interprets a series of flat-lying to moderately dipping (northerly), sub-parallel trending spodumene pegmatite bodies, of which three appear to dominate (Figure 7-13 and Figure 7-23). The pegmatite bodies are coincident with the apex of a regional structural flexure whereby the pegmatite manifests a west arm trending ~290° and an east arm trending ~230°. Drilling to date indicates the east arm includes significantly more pegmatite stacking compared to the west, and also carries a significant amount of the overall CV13 Pegmatite tonnage and grade, highlighted by the high-grade Vega Zone.

The CV13 Pegmatite ranges in true thickness from <5 m to more than 40 m and extends continuously over a collective strike length of approximately 2.3 km, along its west and east arms (see simplified geological cross-sections in Figure 7-24 and Figure 7-25). The CV13 Spodumene Pegmatite, which includes all proximal pegmatite lenses, remains open along strike at both ends and to depth along a significant portion of its length. Spodumene mineralization has been traced more than 400 m down-dip; however, due to the typically shallow dips of the pegmatite bodies, is only ~200 m vertical depth from surface.

Spodumene at CV13 is commonly centimetre to decimetre scale with rare metre size crystals, with crystals becoming most evident on freshly cut faces (Figure 7-21 and Figure 7-22). Variable grain sizes are observed in several outcrops. The spodumene is generally white to light-grey with common light-green, weakly chlorite altered crystals. At CV13 the spodumene is comparably recessive in nature, resulting in surface pockets where grains have been eroded and/or plucked, which are then infilled by lichen. Using rock saws to cut fresh faces often reveal spodumene crystals that would otherwise not have been observed in outcrop.

The CV13 Spodumene Pegmatite displays internal fractionation along strike and up/down dip, similar to CV5. This is highlighted at CV5 by the high-grade Nova Zone and at CV13 by the high-grade Vega Zone, each situated at the base of their respective pegmatite lenses, and traced over a significant distance with multiple drill hole intercepts (core length) ranging from 2 m to 25 m (CV5) and 2 m to 10 m (CV13) at >5% $Li_2O$, respectively, each within a significantly wider mineralized zone of >2% $Li_2O$. The Vega Zone is situated approximately 6 km south-west and along geological trend of the Nova Zone. Both zones share several similarities including lithium grades and very coarse decimetre to metre size spodumene crystals. However, both pegmatite zones have distinct orientations whereby the Vega Zone is relatively flat-lying to shallow dipping, covering an area of approximately 380 m by 220 m, while the Nova Zone is steeply dipping to vertical with a strike length of at least 1.1 km.

Based on the local geological trends as supported by geophysics, the CV13 Spodumene Pegmatite is interpreted to be part of a much larger LCT pegmatite system at the Property, potentially extending from the most easterly identified CV4 Cluster, and continuing westerly through the CV5 and CV8-12 clusters. Collectively, this area of the CV Lithium Pegmatite trend extends nearly 15 km, of which 6.9 km is confirmed by drilling to be continuous spodumene pegmatite hosting defined Mineral Resources, with ~8 km of this highly prospective trend remaining to be drill tested. The scale of LCT pegmatite present along this trend suggests a deeply rooted and common 'plumbing' system and source of the lithium mineralized bodies discovered to date.

**Figure 7-20: Aerial view of the spodumene pegmatite outcrop at CV13 (looking northeasterly)**

**Figure 7-21: Coarse-grained spodumene crystals in saw-cut grab sample from CV13**


**Figure 7-22: Coarse-grained spodumene crystals in drill core from CV13**

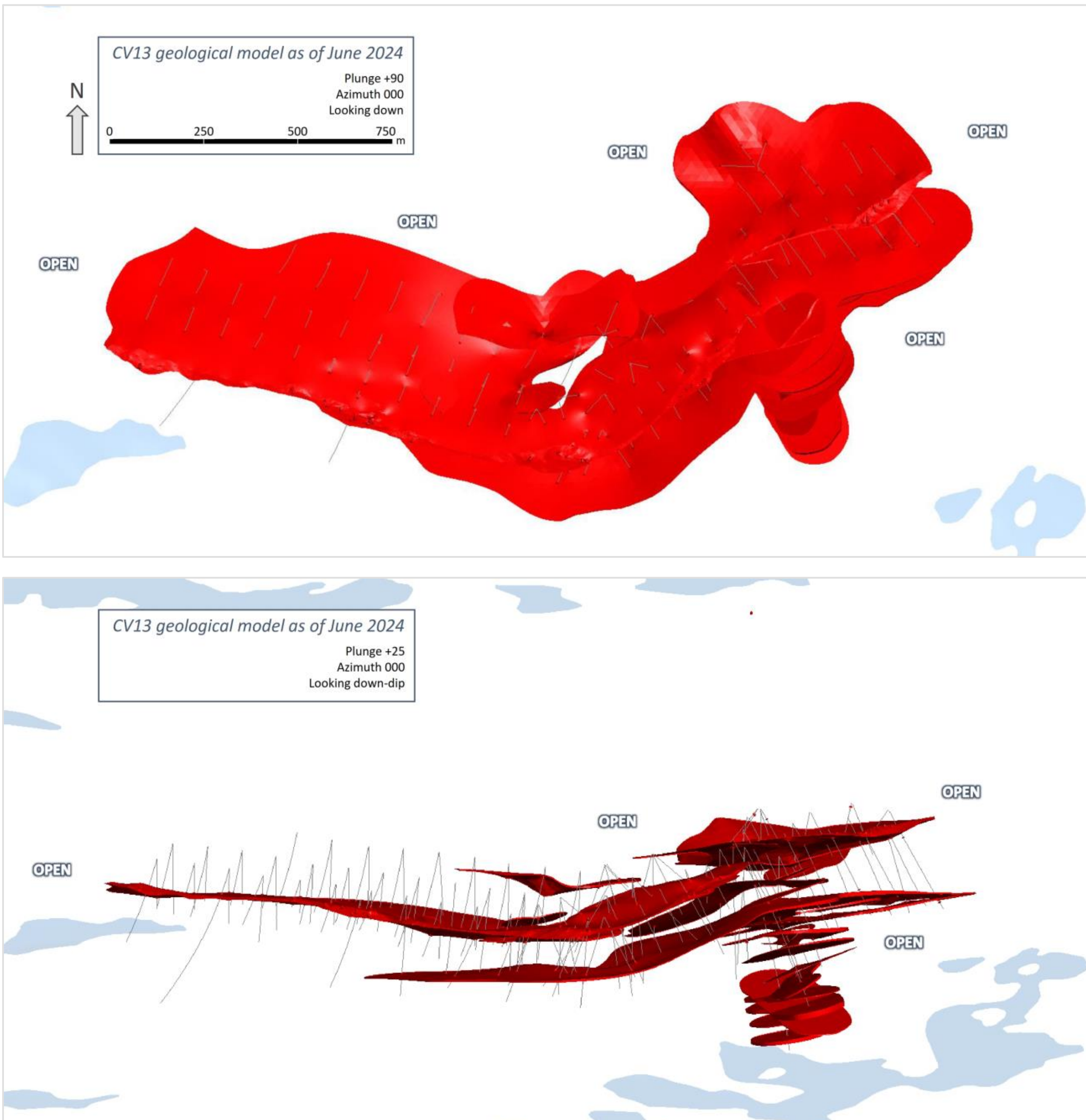



**Figure 7-23: Plan view of CV13 Spodumene Pegmatite geological – all lenses (Top); Inclined view of CV13 Spodumene Pegmatite geological model looking down dip (25°) – all lenses (not to scale)**

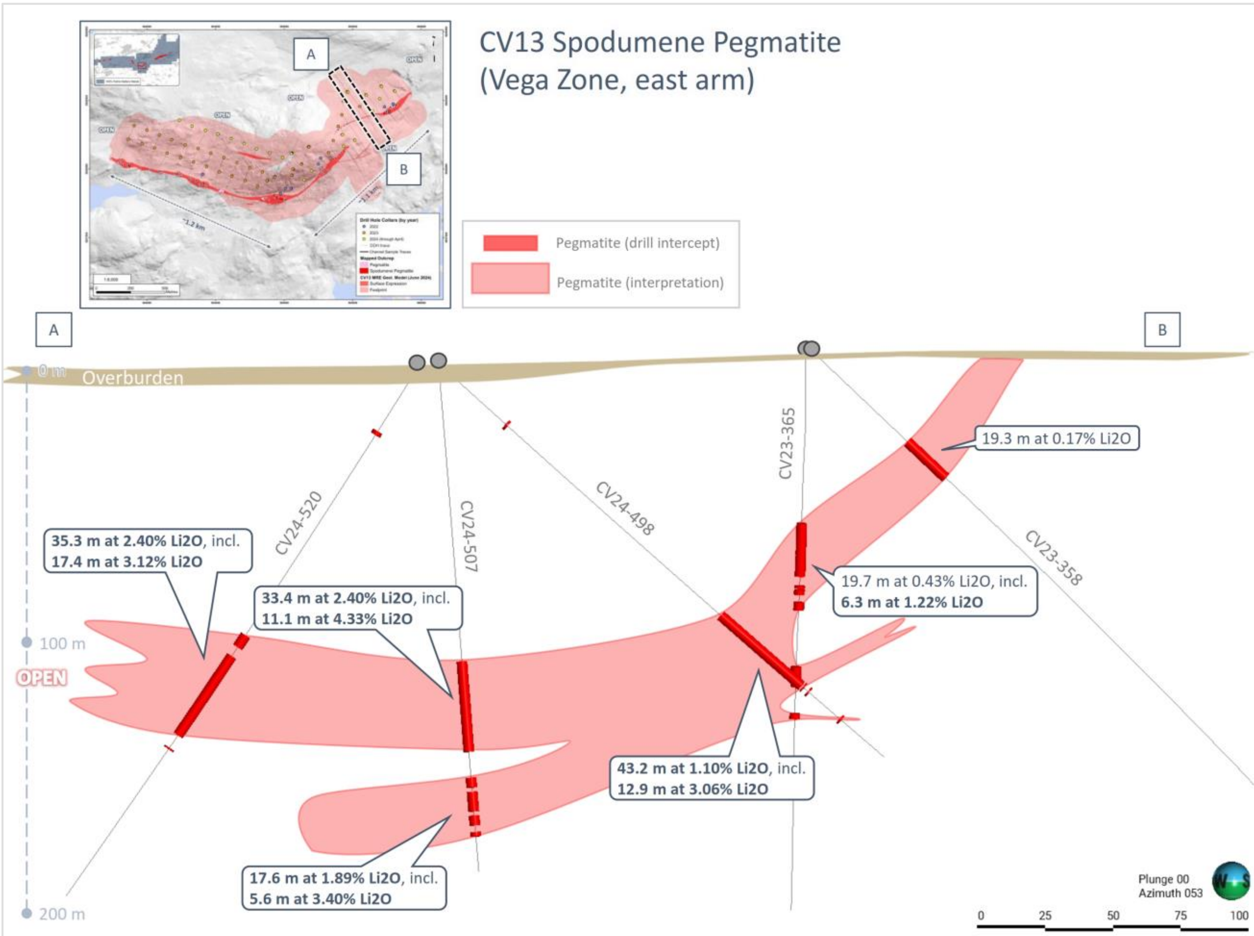



**Figure 7-24: Simplified cross-section of the CV13 Spodumene Pegmatite geological model**

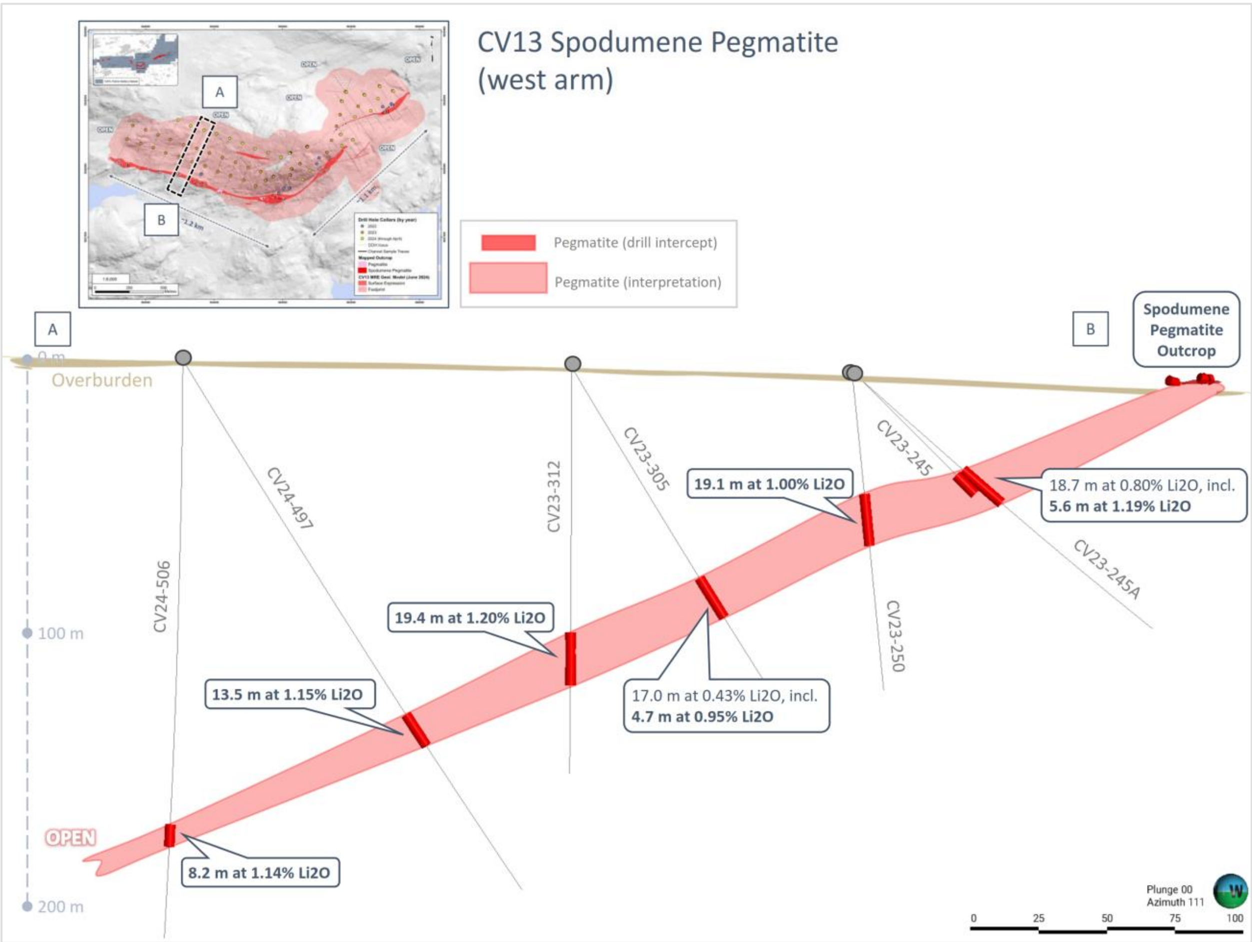



**Figure 7-25: Simplified cross-section of the CV13 Spodumene Pegmatite geological model**

### 7.4.1.3 CV4 Spodumene Pegmatite Cluster

The CV4 Spodumene Pegmatite cluster is located approximately 1.5 km along geological trend northeast of the CV5 Spodumene Pegmatite (Figure 7-5). It is interpreted that the CV4 Spodumene Pegmatite outcrops may potentially form an eastern section of the proximal CV5 Spodumene Pegmatite and, therefore, the CV4 outcrops may represent the discontinuous surface expressions of a continuous, sub-surface CV5-CV4 pegmatite body. The CV4 Spodumene Pegmatite cluster remains to be drill tested.

Surface exploration to date at CV4 has identified five individual pegmatite outcrops spanning a strike length of approximately 500 m, of which two have been mapped as spodumene pegmatite (>5% spodumene). Four of the outcrops, including the two identified as spodumene pegmatites, are grouped in close proximity to each other, spanning a strike length of approximately 200 m. The largest outcrop is approximately 2 m wide and up to 35 m long.

Modal spodumene contents of up to 25% locally have been documented in the pegmatite at CV4, with crystals described as pale to medium green at sizes from 5 cm to 30 cm on average.

#### 7.4.1.4 CV8 Spodumene Pegmatite Cluster

The CV8 Spodumene Pegmatite cluster was discovered in 2019 proximal to the historical Lac Long Nord Au-Mo Showing (2.95 g/t Au, 3.75% Mo). It is situated on the FCI West claim block approximately 8 km west-southwest of the CV5 Spodumene Pegmatite, approximately 1.9 km northwest of the CV13 Spodumene Pegmatite cluster, and approximately 500 m to 600 m south of the CV12 Spodumene Pegmatite cluster (Figure 7-5 and Figure 7-27). The CV8 Spodumene Pegmatite cluster remains to be drill tested.

The CV8 cluster consists of six pegmatite outcrops, of which five are spodumene pegmatite (>5% spodumene) and has a currently mapped strike length of approximately 250 m long by 10 m wide. The largest outcrop is estimated at 30 m long by 10 m wide. Spodumene at CV8 generally consists of coarse to very coarse crystals in a quartz-muscovite rich matrix, with spodumene crystals displaying weak to moderate sericite alteration and a light to dull-grey appearance (Figure 7-26). Modal spodumene content of the CV8 outcrops is estimated at 10-15% and locally up to 30%.

In addition, two lithium-tantalum mineralized boulder samples have been discovered east-southeast of the CV12 and CV8 Spodumene Pegmatite clusters with grab sample assays of 2.69% $Li_2O$ and 198 ppm $Ta_2O_5$ (sample 124336), and 2.20% $Li_2O$ and 265 ppm $Ta_2O_5$ (sample 124337), respectively (see Figure 9-5). Based on glacial ice movement in the region, the discovery indicates additional yet to be discovered pegmatite outcrop is present to the northeast, and on strike with the Company's Deca-Goose claim block.

**Figure 7-26: Very coarse, grey spodumene in the easternmost outcrop at CV8 (6.72% $Li_2O$, sample 124302)**

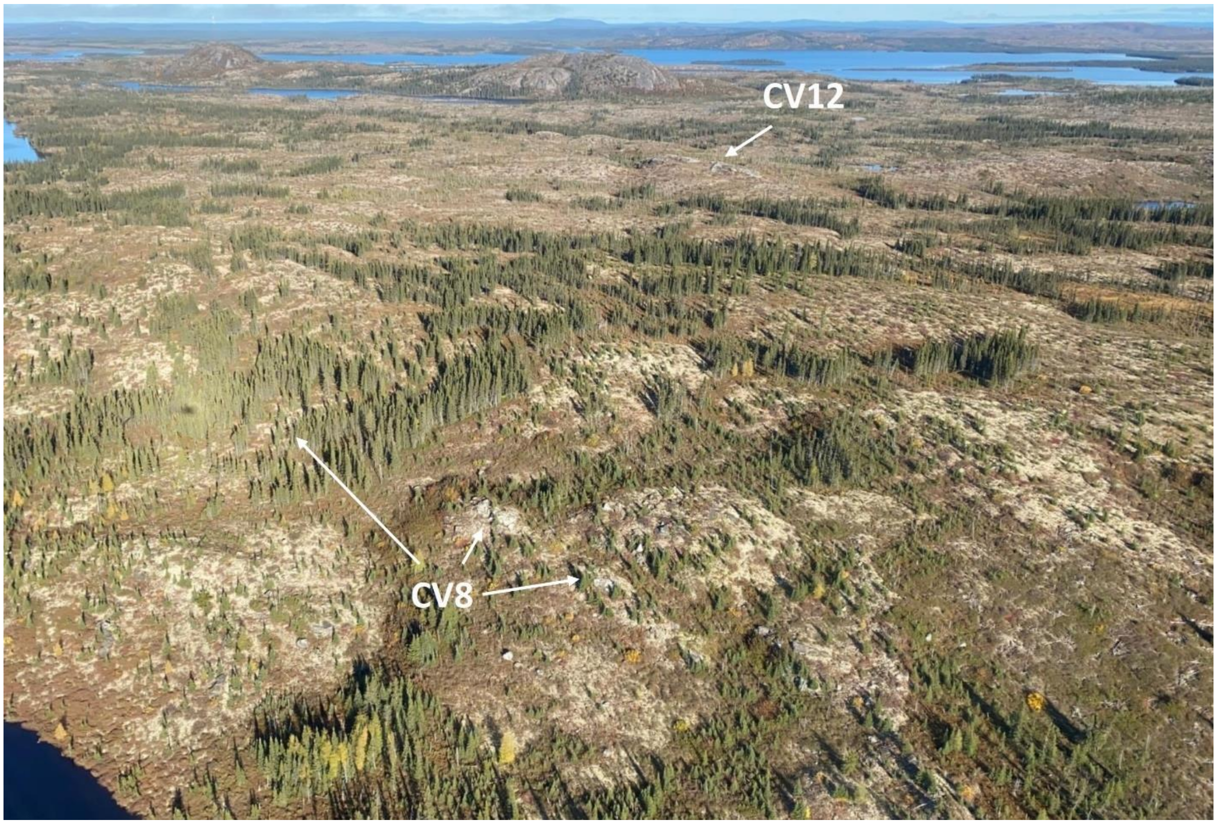



**Figure 7-27: Aerial view of the CV8 and CV12 Pegmatite clusters (looking northwesterly)**

#### 7.4.1.5 CV9 Spodumene Pegmatite Cluster

The CV9 Spodumene Pegmatite Cluster was discovered in 2019 in the northwest area of the FCI West claim block near the historical Lac Legendre Showing (0.57% Cu), approximately 7 km west of the CV12 Pegmatite cluster (Figure 7-5). The CV9 cluster is comprised of 21 pegmatite outcrops, of which 13 are categorized as spodumene pegmatite (>5% spodumene). The outcrops form two distinct groupings of spodumene pegmatite (eastern and western), and collectively form a generally east-west trend of approximately 425 m, with the largest outcrop approximately 50 m x 25 m in size (Figure 7-28).

Based on initial drill testing completed in late 2023 (see Section 10.1: Drilling Campaigns), the CV9 Pegmatite is interpreted to be a single principal dyke, which outcrops at surface, has a steep northerly dip, and is moderately plunging to the east-southeast (Figure 7-30). A strike length of approximately 450 m has been defined to date by drilling and outcrop, which remains open. The width of the dyke is variable; however, preliminary geological modelling indicates the CV9 Pegmatite significantly thickens to at least 80 m in width at one location and remains open in multiple directions.

Spodumene mineralization in outcrop varies greatly at CV9 (up to 25% locally) as several phases of emplacement are interpreted. Coarse, altered dark grey crystals can be found throughout the eastern grouping; however, they appear less common in the western grouping, while medium to light grey-white crystals (Figure 7-29) are more common in the western grouping. Spodumene pegmatite dykes cross-cut both the east and west groupings and consist of medium-grained, light-medium pistachio green coloured spodumene that form weak comb textures along the late-stage pegmatite dyke margins.

**Figure 7-28: Pegmatite outcrop at the CV9 Spodumene Pegmatite cluster**

**Figure 7-29: Spodumene crystal at the CV9 Spodumene Pegmatite**

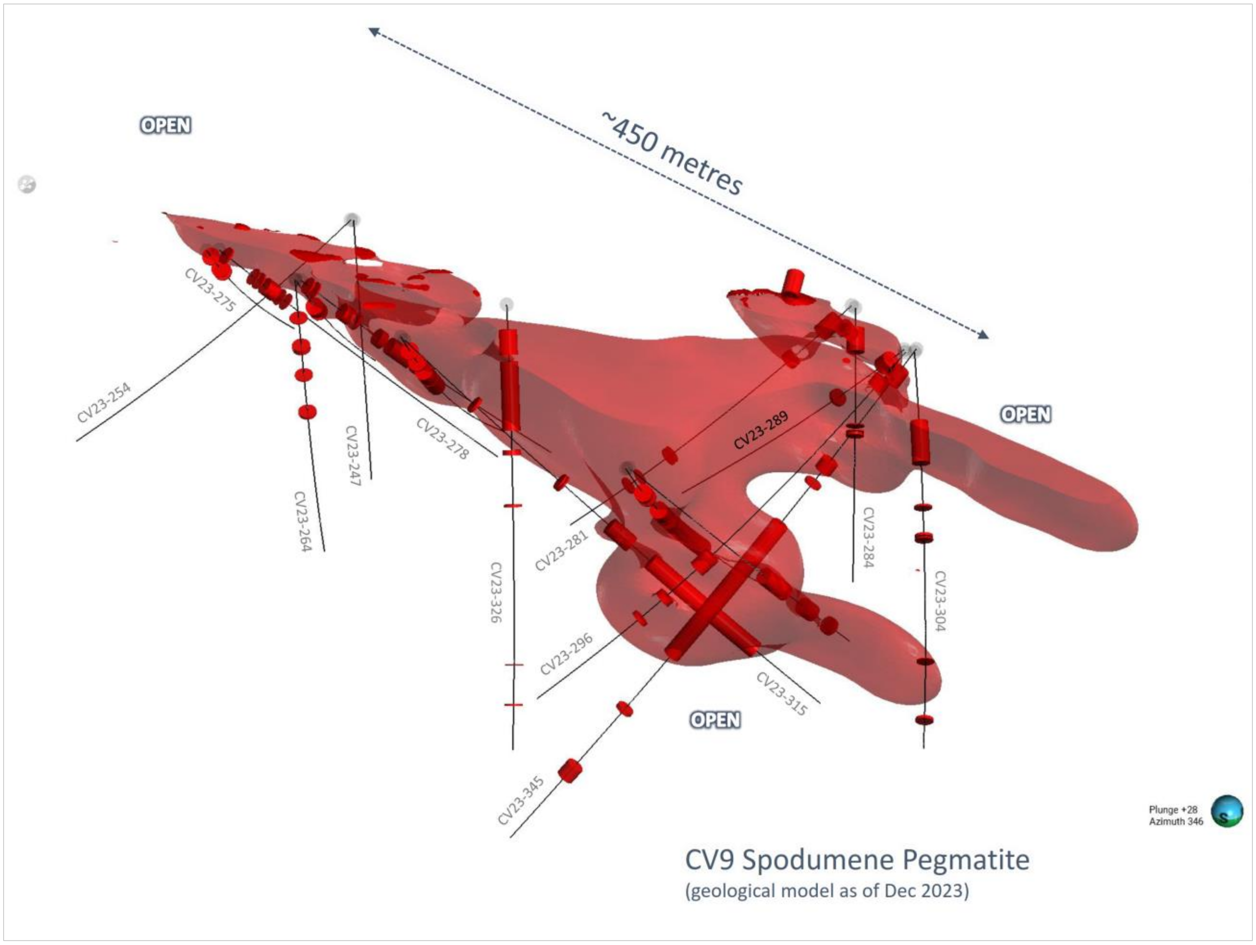



**Figure 7-30: Preliminary geological model of the CV9 Pegmatite (oblique view) - not to scale**

### 7.4.1.6 CV10 Spodumene Pegmatite Cluster

The CV10 Spodumene Pegmatite cluster was discovered in 2019 in the northwest portion of the FCI West claim block, approximately 1.6 km west along strike of the CV9 Spodumene Pegmatite cluster (Figure 7-5). The cluster consists of three variably exposed pegmatite outcrops spanning a corridor of approximately 75 m long by 25 m wide. The largest of the outcrops is estimated at approximately 37 m long by 15 m wide and hosts 10% to 15% visually identified spodumene (Figure 7-31). The CV10 Spodumene Pegmatite cluster trend remains to be drill tested.

Spodumene mineralization at CV10 consists of medium-grained light-grey anhedral crystals, typically ranging from 1 cm to 3 cm in size (Figure 7-32). The spodumene is commonly associated with black-purple tourmaline.

**Figure 7-31: Main outcrop at the CV10 Spodumene Pegmatite cluster**

**Figure 7-32: Spodumene crystals in saw-cut sample from CV10**

#### 7.4.1.7 CV12 Spodumene Pegmatite Cluster

The CV12 Spodumene Pegmatite cluster is located at the east end of the FCI West claim block, approximately 500 m to 600 m north of the CV8 Spodumene Pegmatite cluster (Figure 7-5 and Figure 7-27). It was initially discovered in 2019, characterized by one sample that graded 0.27% $Li_2O$; however, was further evaluated in 2021 with high-grade samples collected and more mineralized pegmatite outcrop discovered. The trend consists of at least 16 pegmatite outcrops separated by till cover, including three well-mineralized in spodumene (Figure 9-5). The cluster is highlighted by two large adjacent outcrops reaching >100 m in combined length and up to 28 m in width (Figure 7-33). Collectively, the CV12 Pegmatite cluster extends over an approximate 1 km trend.

One drill hole was completed at the CV12 pegmatite (CF21-014) in 2021 for a total of 114.0 m. However, only a few metre-scale intervals of pegmatite were intercepted, with variable spodumene content (4.6 m at 0.36% $Li_2O$ and 144 ppm $Ta_2O_5$, and 0.4 m at 0.38% $Li_2O$ and 5,300 $Ta_2O_5$). This was subsequently interpreted to be the result of a fault zone that cross-cuts the pegmatite in this specific area. The vast majority of the CV12 Spodumene Pegmatite cluster remains to be drill tested.

Spodumene at CV12 is dominantly whitish-grey and has trace- to minor sericite alteration (Figure 7-34). Spodumene ranges in size from very coarse crystals to a fine-grained matrix, with fine to medium-grained light grey spodumene becoming most notable on cut surfaces. Lepidolite and pink tourmaline are also variability present, with muscovite and black tourmaline often displaying internal zonation. Outcrops along the local CV12 trend display strong mineral zonation and range from feldspar-rich pegmatite (rare spodumene) to quartz rich pegmatite (abundant spodumene).

Figure 7-33: Aerial view of two immediately adjacent spodumene pegmatite outcrops at CV12

Figure 7-34: Spodumene in outcrop at the CV12 Spodumene Pegmatite cluster

### 7.4.1.8 CV14 Spodumene Pegmatite Cluster

The CV14 Spodumene Pegmatite cluster is located at the east end of the Felix claim block, approximately 1.5 km along trend to the southwest of the CV10 Spodumene Pegmatite cluster. (Figure 7-5). Collectively, CV14 forms part of an approximate 3.6 km long prospective spodumene pegmatite trend extending through CV10, and to the CV9 Spodumene Pegmatite.

The cluster consists of seven pegmatite outcrops, of which two are categorized as spodumene pegmatite (>5% spodumene), spanning a trend of approximately 125 m. The primary spodumene pegmatite outcrop is approximately 25 m long by 8 m wide. Spodumene crystals are typically medium grey at 5 cm to 10 cm in size (Figure 7-35).


**Figure 7-35: Spodumene in outcrop at the CV14 Spodumene Pegmatite cluster**

### 7.4.2 Maven Trend (copper, gold, silver)

The Maven Copper-Gold-Silver Exploration Trend is an approximately 10+ km long corridor, which hosts numerous Cu-Au-Ag showings and extends in a general east-west direction across the southern portion of the FCI West claim block and onto the Shaakichiuwaanaan claim block.

Mineralization at Maven consists of quartz-sulphide lenses/veins/veinlets hosted within mafic/amphibolite rock types or silicate iron formation, as well as interpreted epigenetic remobilization of mineralization within shear zones. Minor occurrences of ultramafic rocks are also documented. At the showings, semi-massive to disseminated sulphides are dominated by pyrrhotite and chalcopyrite, with common quartz and variable to absent pyrite and/or sphalerite. The nature mineralization has been broadly interpreted to be associated with the volcanogenic massive sulphide style (i.e., exhalative in nature).

### 7.4.3 Golden Trend (gold)

The Golden Trend is an approximate 10+ km long corridor, which hosts several Au showings and extends in a general east-west direction across the northern portion of the FCI West claim block and Deca-Goose claim block. The primary mineral occurrence on the trend is the Golden Gap Prospect, which has returned 3 g/t to 108 g/t Au in outcrop and 10.48 g/t Au over 7 m in a drill hole. Mineralization along the trend occurs dominantly in quartz-rich gossanous units.

# 8. Deposit Types

The primary target and deposit model for the Shaakichiuwaanaan Property are lithium-cesium-tantalum ("LCT") pegmatites (Figure 8-1), e.g., CV5 & CV13. These generally have granitic or alaskitic compositions. Major constituent minerals are quartz, albite, or locally orthoclase, along with lesser amounts of muscovite and lithium-bearing minerals such as spodumene. Mafic minerals are generally minor constituents, including biotite, tourmaline, garnet, or cordierite. Oxide and sulphide minerals are rare. These pegmatites are often coarse-grained, frequently with finer-grained, sometimes graphitic margins. Other elements sometimes associated with lithium include cesium, tantalum, beryllium, phosphorus, and rare earths (Cerny & Ercit, 2005). Lithium-bearing minerals are most commonly spodumene, petalite, and lepidolite. Tantalum-bearing minerals include pyrochlore and columbite-tantalite.

LCT pegmatites are major sources of tantalum and cesium production and accounted for roughly 58% of the world's lithium production in 2022 (Bird, 2023). The balance of lithium production is from brines, predominantly in Chile. Total global lithium production for all sources is estimated at between 692 kt to 767 kt of lithium carbonate equivalent ("LCE") (Bird, 2023). Australia dominates global lithium production accounting for roughly half of the market, with its production coming predominantly from spodumene pegmatite. Some of the largest pegmatite deposits globally include Greenbushes, Pilgangoora, and Wodgina in Western Australia, Goulamina in Mali, and Manono in the Democratic Republic of Congo.

Depending on the size and attitude of the pegmatite, a variety of mining techniques are used, including artisanal surface mining, open pit surface mining, small underground workings, and large underground operations using room-and-pillar design. In favorable circumstances, what would otherwise be gangue minerals (quartz, potassium feldspar, albite, and muscovite) can be mined along with lithium and or tantalum as coproducts (Bradley, McCauley, & Stillings, 2017).

Most LCT pegmatites are hosted by metamorphosed supracrustal rocks in the upper greenschist to lower amphibolite metamorphic grades. LCT pegmatite intrusions generally are emplaced late during orogeny, with emplacement being controlled by pre-existing structures. Typically, they are located near evolved, peraluminous granites (i.e., S-Type) and leucogranites from which they are inferred to be derived by fractional crystallization. In cases where a parental granite pluton is not exposed, one is inferred to lie at depth. These pegmatite melts are enriched in fluxing components including $H_2O$, F, P, and B, which depress the solidus temperature, lower the density, and increase rates of ionic diffusion. This enables pegmatites to form thin dikes and massive crystals despite having a felsic composition and temperatures that are significantly lower than ordinary granitic melts. LCT pegmatites crystallized at low temperatures between about 350 °C and 550 °C, and in a very short time from days to years (Bradley, McCauley, & Stillings, 2017).

Exploration and assessment for LCT pegmatites rely on a number of considerations. In remote areas, such as the James Bay region, where exploration has been historically minimal, the key criteria are an orogenic hinterland setting, appropriate regional metamorphic grades, and the presence of evolved granites and common granitic pegmatites. New LCT pegmatites are most likely to be found near known deposits. Pegmatites tend to show a regional mineralogical and geochemical zoning pattern with respect to the inferred parental granite, with the greatest enrichment in more distal pegmatites. Mineral-chemical trends in common pegmatites that can point toward an evolved LCT pegmatite include increasing rubidium in potassium feldspar, increasing lithium in white mica, increasing manganese in garnet, and increasing tantalum and manganese in columbite-tantalite. Most LCT pegmatite bodies show a distinctive internal zonation featuring four zones: border, wall, intermediate (where lithium, cesium, and tantalum are generally concentrated), and core. This zonation is expressed both in cross-section and map view; therefore, what may appear to be a common pegmatite may instead be the edge of a mineralized body (Bradley, McCauley, & Stillings, 2017).

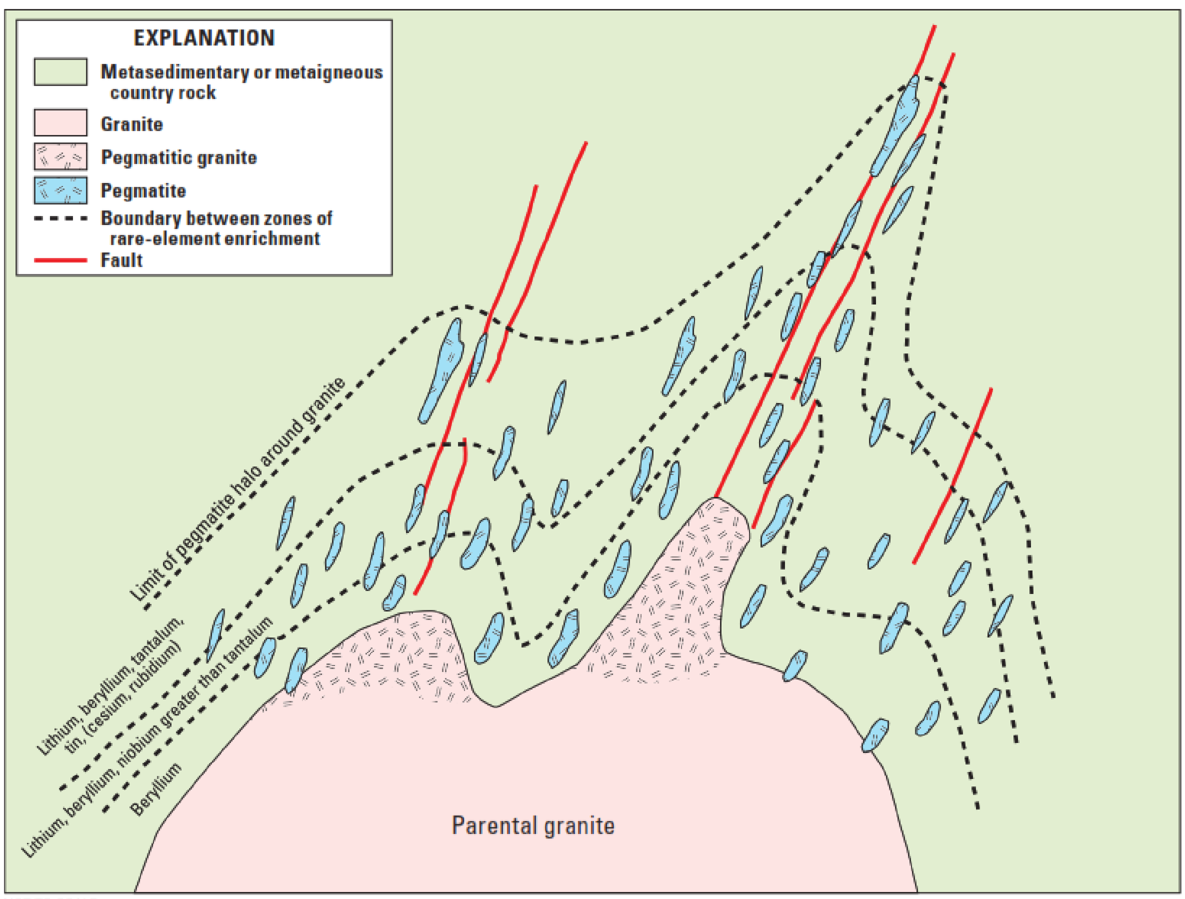



**Figure 8-1: LCT pegmatite deposit model (Bradley, McCauley, & Stillings, 2017)**

# 9. Exploration

The Company's non-drilling exploration activities at the Shaakichiuwaanaan Property include surface mapping and rock sampling, prospecting, channel sampling, ground and airborne geophysics, and remote sensing surveys. The focus has been predominantly for LCT pegmatite, although significant base and precious metal exploration has also been completed.

A summary of these activities follows. All drill exploration activities completed by the Company are presented in Chapter 10 - Drilling.

The QP notes that prospecting surface rock samples (grab/chip) and associated assays, as discussed herein, are selective by nature and represent a point location and, therefore, are not necessarily representative of the mineralized horizon sampled.

## 9.1 2017 Through 2020

In 2017, the Company completed a short reconnaissance program, collecting three surface grab samples from the outcrop described by Virginia Mines, and confirmed the presence of coarse-grained spodumene in two sub-parallel trending pegmatites – the 'CV1' outcrop (described historically by Virginia as hosting "*cristaux de spodumène*"), and the 'CV2' outcrop. The sampling returned 0.80% and 3.48% $Li_2O$, and 1.22% $Li_2O$ from the CV1 and CV2 pegmatites, respectively, along with anomalous tantalum (Smith D. L., 2018). Additionally, a sample of a spodumene crystal at the CV1 outcrop returned 7.32% $Li_2O$.

The Company expanded upon the work in 2018 with additional surface prospecting and rock sampling, which resulted in the discovery of two new pegmatite outcrops, CV3 and CV4 – grab sample assays of 1.61% $Li_2O$ and 0.74% $Li_2O$, respectively (Smith D. L., 2019). In addition, channel sampling was completed across the CV1 and CV2 Pegmatite outcrops. At CV1, 40 samples collected from five channels averaged 1.35% $Li_2O$. Highlights from the channel sampling include 2.28% $Li_2O$ and 208 ppm $Ta_2O_5$ over 6 m (sample CV1-CH03) and 1.54% $Li_2O$ and 136 ppm $Ta_2O_5$ over 8 m (sample CV1-CH01). Although the width of the CV1 outcrop approaches 30 m, lengths of the channel cuts were limited to only 11 m due to the physical characteristics and positioning of the outcrop. At CV2, eight samples (seven pegmatites and one amphibolite) were collected over two channels, with sample assays of pegmatite ranging from 0.07% $Li_2O$ to 2.04% $Li_2O$ and collectively averaging 0.72% $Li_2O$.

In July 2019, the Company expanded its scope of exploration with a stronger focus on base and precious metals with lithium (± tantalum) of secondary interest due to the declining market environment for those commodities at the time. The field work included prospecting of historical base and precious metal showings and prospects (e.g., Golden Gap, Lac Bruno, Tyrone T9, etc.) as well as completion of a soil sampling grid extending northeast of the Lac Bruno boulder field (Smith, Darren L., 2021 - GM72176).

A total of 680 rock samples and 211 soil samples were collected during the 2019 program and resulted in the discovery of new occurrences of gold (West Golden Gap, New Lac Bruno), copper-gold-silver (Elsass, Lorraine, Black Forrest, Hund), and lithium-tantalum (pegmatite outcrops CV5 through CV11), as well as further understanding of known targets (Smith D. L., 2020 - GM71564), (Smith, Darren L., 2021 - GM72176), and (Smith D. L., 2019 - GM71513)). Sample results ranged from nil to 11.9 g/t Au, nil to 171 ppm Ag, nil to 8.15% Cu, nil to 4.72 $Li_2O$, and nil to 1,011 ppm $Ta_2O_5$. Sample assay highlights of outcrop occurrences include: 3.63% Cu, 0.64 g/t Au, and 52.3 g/t Ag (Elsass), 8.15% Cu, 1.33 g/t Au, and 171 g/t Ag (Lorraine), 3.28% Cu, 0.78 g/t Au, and 30.1 g/t Ag (Hund), 1.13% Cu, 0.05 g/t Au, and 19.5 g/t Ag (Black Forrest), 2.81 g/t Au (West Golden Gap), 1.4 g/t Au (New Lac Bruno), 0.68% Cu, 0.11 g/t Au, and 5.3 g/t Ag (Lac Farley), 4.06% $Li_2O$ and 564 ppm $Ta_2O_5$ (CV5 outcrop), 3.85% $Li_2O$ (CV6 outcrop), 4.44% $Li_2O$ and 195 ppm $Ta_2O_5$ (CV7 outcrop), 4.44% $Li_2O$ and 205 ppm $Ta_2O_5$ (CV8 outcrop), 4.72% $Li_2O$ (CV9 outcrop), 1.33% $Li_2O$ and 255 ppm $Ta_2O_5$ (CV10), 0.66% $Li_2O$ and 386 ppm $Ta_2O_5$ (CV11 outcrop).

The exploration completed by the Company between 2017 and 2019 outlined three primary exploration trends, crossing roughly east-west over large portions of the Property – the Maven Trend (copper, gold, silver), Golden Trend (gold), and CV Trend (lithium, tantalum). The Golden Trend is focused over the northern areas of the Property, the Maven Trend the southern areas, and the CV Trend 'sandwiched' between. Historically, the Golden Trend has received a majority of the exploration focus followed by the Maven Trend. However, the identification of the CV Trend and the numerous lithium-tantalum pegmatites discovered represents a previously unknown lithium pegmatite district that was recognized by the Company and its geological consultants. There had been no documented exploration for lithium pegmatite on the Property prior to the exploration by the Company.

A detailed review and discussion through 2019 of the individual mineral occurrences that comprise the Maven, Golden, and CV exploration trends is presented in (Smith, Darren L., 2021 - GM72176) and (Smith D. L., 2019 - GM71513). A summary of surface results through 2020 for the Maven Trend and CV5 Pegmatite area is presented in Figure 9-1 and Figure 9-2.

No field work was completed in 2020 by the Company; however, desktop work was advanced and included a reinterpretation of historical induced polarization and resistivity surveys (IP-Resistivity) and airborne magnetic survey data. The reinterpretation of the data was completed by Dynamic Discovery Geoscience. A major finding of the work indicates that the majority of the follow-up drill holes to test the historical 10.5 g/t Au over 7 m drill intercept at the Golden Gap Prospect, did not test the mineralized zone's potential strike extension to the east and rather is interpreted to have followed a secondary trend (Gaia Metals Corp., 2020). Therefore, the data indicates significant potential for follow-up drilling at Golden Gap remains. The magnetic data was also used to further assess the local structure proximal to the lithium pegmatite occurrences discovered to date.

## 9.2 2021

Exploration continued in 2021 and focused on the Maven Trend and the CV Trend ahead of initial diamond drilling, which followed in the fall. Airborne and surface work included geological mapping and rock sampling, ground-based induced-polarization and resistivity survey, airborne magnetic survey, and a remote sensing survey (Smith, Mickelson, & Blu, 2023 - GM73402).

During the summer months, an IP-Resistivity geophysical survey was completed over a large portion of the Maven Trend. A total of 62.9 line-km of data was collected by TMC Geophysics and interpretation completed by Dynamic Discovery Geoscience (Figure 9-3). The majority of the survey was completed at a line spacing of 100 m over new target areas and widened to 200 m spacing where there was overlap with existing historical IP-Resistivity data sets. The target was copper-gold-silver mineralization along the Maven Trend in which surface sampling was observed to be associated with chalcopyrite-quartz veining and disseminations within an amphibolite host. The data set outlined a significant number of chargeability anomalies/axis correlating with several of the known showings and prospects along the trend, including Bonoeil, Lorraine, Elsass, Tyrone-T9, and Black Forrest. These chargeability anomalies were also often coincident with a conductive axis. A strong chargeability and conductivity lineament was also interpreted to be related to the Lac de La Corvette Showing.

In addition to the geophysical programs, the Company engaged KorrAI of Halifax, Nova Scotia, to complete a remote sensing survey over a majority of the Property area (FCI West, FCI East, and Corvette Main claim blocks). The survey used advanced satellite imagery, integrated artificial intelligence, and machine learning to identify potentially undiscovered outcrops for prospecting follow-up, as well as map water bodies. This work has not proven effective at identifying new targets for copper-gold-silver, or lithium pegmatite on the Property to date; however, the survey produced numerous pegmatite targets across the Property that remain to be assessed.

In December 2021, a high-resolution heliborne magnetic survey was completed over a large portion of the Property, including the FCI West, FCI East, and the western portions of the Corvette Main block. A total of 2,075 line-km of data was collected at 50 m spacing by Prospectair Geosurveys Inc., with interpretation completed by Dynamic Discovery Geoscience Ltd. (Figure 9-4). The purpose of the survey was to increase the resolution of the magnetic data set for exploration so as to better isolate trends and recognize structures across the Property. Of particular interest was increased resolution over the CV5 Pegmatite corridor as regional magnetics suggested the largest pegmatite occurrences may be associated with cross faults. Additionally, the high-resolution of the data set would further enhance local trends and assist in indirectly mapping potential pegmatite extensions (magnetic lows) and add an additional qualifying parameter to drill hole targeting during the Company's future drill campaigns.

Surface prospecting was also completed in late August 2021, and over several days during the course of the fall drill program. The field work followed up on showings along the Maven Trend to refine drill targets ahead of the pending drill program, as well as certain areas of the CV Trend. A total of 164 grab/chip samples were collected across the Property, predominantly on the FCI West claim block.

The most significant result of the 2021 mapping and rock sampling program was the recognition of the CV12 lithium pegmatite cluster, where numerous lithium pegmatite outcrops were discovered (Figure 9-5). Lithium pegmatite at CV12 was initially discovered in 2019 and characterized by one sample that graded 0.27% $Li_2O$; however, this was significantly expanded upon during the 2021 follow-up. Eleven grab samples were collected in 2021 from the CV12 Pegmatite and associated trend with numerous pegmatite outcrops catalogued. Analytical results ranged from nil to 5.98% $Li_2O$ and 49 ppm to 1,478 ppm $Ta_2O_5$, with an average of 2.83% $Li_2O$ and 438 ppm $Ta_2O_5$.

In addition, two lithium-tantalum mineralized boulder samples were discovered east-southeast of the CV12 and CV8 pegmatites with grab samples assays of 2.69% $Li_2O$ and 198 ppm $Ta_2O_5$, and 2.20% $Li_2O$ and 265 ppm $Ta_2O_5$, respectively. Based on glacial ice movement in the region, the discovery indicates additional yet to be discovered pegmatite outcrop is present to the northeast, and on strike with the Company's Deca-Goose claim block.

Prospecting along the Maven Trend, completed to refine initial drill targets, returned multiple samples consistent with area showings. Six samples were collected exceeding 1% Cu to a high of 3.53% Cu, 3.15 g/t Au, and 46.4 g/t Ag from a chalcopyrite-quartz amphibolite at the Tyrone-T9 Showing.

The exploration results of the 2021 surface program demonstrated the strong multi-commodity potential of the Property. A significant number of surface targets remain to be assessed along the Maven Trend, and the gold potential of the Property, particularly along the Golden Trend at the Golden Gap Prospect, requires further examination. The LCT potential of the Property continued to be evidenced by the recognition of the CV12 Spodumene Pegmatite cluster.

## 9.3 2022

Based on the successful lithium pegmatite exploration in 2021, the 2022 exploration campaign reoriented firmly towards LCT pegmatite (i.e., lithium) with only minor base and precious metals work completed. Exploration included prospecting and rock sampling, surface outcrop mapping, channel sampling, and a LiDAR and orthophoto survey.

In August 2022, Group PHB (Perron, Hudon, Belanger Inc.) completed a light detection and ranging ("LiDAR") and digital photogrammetric (orthophoto) survey over the entirety of the Shaakichiuwaanaan Property. The stated accuracy of this survey is +/-0.25 m horizontal error and +/-0.15 m vertical error. The primary purpose of the survey was to guide subsequent surface exploration through target generation of potential pegmatite outcrops that could be ground-truthed. The survey would also serve as tight topographical control for future geological modelling based on drill hole data. The orthophoto data generated a significant amount of LCT pegmatite targets, the majority of which remain to be prospected (Figure 9-6).

Minor sampling was completed along the Maven Trend as well as along the Golden Trend. This work focused on confirmation sampling of historical showings situated on the recently acquired Deca-Goose and Felix claim blocks. Assay results were generally in line with historical sampling.

A large focus of the 2022 surface exploration was on mapping and prospecting of the local trends at the various CV spodumene pegmatite clusters that had been identified to date at the Property – CV4, CV5, CV8, CV9, CV10, and CV12. This work was highly successful with each cluster further defined through new spodumene pegmatite outcrop being identified and sampled, as well as host rock associations further understood. Outcrop grab/chip sampling returned results in line with previous sampling. Outcrop channel sampling was also completed and returned 1.5 m at 1.12% $Li_2O$ (CV4), 5.6 m at 1.93% $Li_2O$ (CV8), 15.0 m at 0.46% $Li_2O$ (CV9), and 21.9 m at 0.80% $Li_2O$; 7.7 m at 1.46% $Li_2O$, 10.1 m at 1.09% $Li_2O$ (CV12). The CV10 cluster was not channel sampled in 2022.

The most significant result of the 2022 surface exploration was the discovery of the CV13 Spodumene Pegmatite cluster, situated between the CV8 and CV12, and CV5 Spodumene Pegmatite clusters (Figure 9-7). The CV13 Pegmatite cluster is characterized by two contiguous trends of spodumene pegmatite outcrop, totalling approximately 2.3 km in combined strike length, situated within the apex of a regional structural flexure. A total of 38 pegmatite surface grab/chip samples were collected at the cluster, of which, 14 assayed >1% $Li_2O$ to a peak of 3.73% $Li_2O$. Outcrop channel sampling followed with results including 14.2 m at 1.17% $Li_2O$ (CH22-025/026), 13.1 m at 1.57% $Li_2O$ (CH22-017), and 10.5 m at 1.53% $Li_2O$ (CH22-018/19).

A total of 236 surface rock samples were collected over the course of the 2022 program and more than 70 spodumene pegmatite outcrops mapped across the Property. More than 20 km of prospective LCT pegmatite trend remained to be evaluated following the 2022 program.

## 9.4 2023

Surface exploration in 2023 included an orientation IP-Resistivity geophysical survey over a large portion of the CV5 Spodumene Pegmatite, a ground magnetic survey over the CV5 to CV13 corridor, a ground gravity orientation survey, as well as geological mapping and rock sampling, prospecting, and channel sampling. Additionally, an airborne magnetic and radiometric survey was completed over the Corvette Main, FCI East, and Felix claim blocks.

In January 2023, a total of 7.3 line-km of IP-Resistivity data was collected along irregularly spaced lines of 0.6 km to 1.2 km in length, oriented perpendicular across the CV5 Pegmatite. The survey was completed by TMC Geophysics and interpretation was completed by Dynamic Discovery Geoscience. The data was collected as an orientation survey approach with the purpose of evaluating the method for direct detection pegmatite. The results were inconclusive with respect to identifying the principal pegmatite body at CV5; however, the method may have merit in identifying certain geological contacts as well as further defining the local pegmatite trend (Figure 99-8).

In the late August-September period, a 3,349 line-km high-resolution heliborne magnetic and radiometric survey was completed over large portions of the Property. The objectives were to complete the detailed magnetic survey over areas of the Property not covered in the prior 2021 survey, and to collect radiometric data to evaluate its ability to distinguish pegmatite outcrops from surrounding rock types and glacial till. The survey was flown using the same instruments, parameters (50-m line spacing), and service provider (Prospectair Geosurveys ) as the 2021 survey. The interpretation was also completed by the same service provider (Dynamic Discovery Geoscience) and the 2023 data set merged with the 2021 data set to provide a complete, detailed, and modern magnetic data set for the Property (Figure 9-4). The radiometric data, which was collected alongside the magnetic data, has thus far proven to be inconclusive in terms of vectoring for lithium pegmatite at the Property.

In the late September-October period, a 190 line-km continuous ground magnetic survey (50-m line spacing) was completed by TMC Geophysics over the CV5 through CV13 corridor. The objective was to obtain the strongest resolution magnetic data set as practical for a more detailed understanding of local geological trends. The corridor targeted is host to abundant glacial till resulting in significantly less outcrop exposure. The data has been a useful tool in drill planning and geological interpretation over the corridor.

In the late September-October period, a 326-station ground gravity orientation survey (25-m station spacing, 18 lines at 100-m line spacing) was completed by TMC Geophysics over the western portions of the CV5 Pegmatite. The purpose of the survey was to determine if the method could detect the pegmatite directly and/or identify the local trend. The results of the orientation survey were largely inconclusive and, therefore, no further gravity surveying is expected (Figure 9-9).

Over the summer-fall period, a surface exploration program was completed and included detailed geological mapping at the CV5 Pegmatite, channel sampling at the CV13 Pegmatite, and prospecting and rock sampling over regional areas of the Property. The program was impacted by the regional forest fires over the period, which prevented access to the Property for a significant amount of the field season.

A total of 474 surface rock grab/chip samples were collected over the course of the 2023 prospecting program. The most significant result of the 2023 surface exploration was the discovery of the CV14 Spodumene Pegmatite cluster, situated approximately 1.5 km along geological trend of the CV10 Spodumene Pegmatite (Figure 9-10). Two grab samples assayed 0.94% $Li_2O$ and 0.86% $Li_2O$ with the primary outcrop approximate 33 m by 9 m in size. The discovery highlights an approximate 3.6 km long prospective trend extending from CV9, through CV10, to CV14.

Outcrop channel sampling was also completed in 2023 at the CV13 Spodumene Pegmatite. A total of 147 m of channel samples were collected with results including 13.4 m at 1.22% $Li_2O$; 6.4 m at 1.44% $Li_2O$; and 5.4 m at 1.93% $Li_2O$.

## 9.5 2024

Through 2024, as of the date of this Report, the Company has completed a surface exploration program which has included detailed geological mapping at the CV5 and CV13 pegmatites, channel sampling at multiple spodumene pegmatite clusters, and regional prospecting. A LiDAR and orthophoto survey, and heliborne magnetic and radiometric survey have also been completed in 2024 over the JBN-57 claim block.

As of the date of this Report, no further details of the program, including sample assays, have been reported.

## 9.6 Lithium Pegmatite Surface Sampling Summary

### 9.6.1 CV5 Spodumene Pegmatite Cluster

CV5 was the first spodumene pegmatite to be sampled at the Property. A total of 46 grab/chip rock samples of pegmatite outcrop have been collected at CV5 through April 2024, with results ranging from 0.00% to 7.32% $Li_2O$ and 1 ppm to 2,490 ppm $Ta_2O_5$. Channel sampling, collectively totalling 63.2 m, was completed in 2018 and 2022 with highlights including 11.0 m at 1.36% $Li_2O$ and 8.0 m at 1.54% $Li_2O$. Channel locations are presented in Figure 10-3 in Section 10.1.

### 9.6.2 CV13 Spodumene Pegmatite Cluster

A total of 40 grab/chip rock samples of pegmatite outcrop have been collected at CV13 through April 2024, with results ranging from 0.00% to 3.73% Li2O and nil to 948 ppm $Ta_2O_5$. Channel sampling, collectively totalling 267.7 m, was completed in 2022 and 2023 with highlights including 14.2 m at 1.17% $Li_2O$, 13.1 m at 1.57% $Li_2O$, 13.4 m at 1.22% $Li_2O$, and 10.5 m at 1.53% $Li_2O$.

### 9.6.3 CV4 Spodumene Pegmatite Cluster

A total of 7 grab/chip rock samples of pegmatite outcrop have been collected at CV4 through April 2024, with results ranging from 0.00% to 2.00% $Li_2O$ and 63 ppm to 548 ppm $Ta_2O_5$. Channel sampling, collectively totalling 4.4 m, was completed in 2022 with results of 1.5 m at 1.12% $Li_2O$ and 1.9 m at 0.58% $Li_2O$.

### 9.6.4 CV8 Spodumene Pegmatite Cluster

A total of 6 grab/chip rock samples of pegmatite outcrop have been collected at CV8 through April 2024, with results ranging from 0.1% to 6.72% $Li_2O$ and 86 ppm to 397 ppm $Ta_2O_5$. Channel sampling, collectively totalling 8.4 m, was completed in 2022 with results of 5.6 m at 1.93% $Li_2O$ and 2.8 m at 1.74% $Li_2O$.

### 9.6.5 CV9 Spodumene Pegmatite Cluster

A total of 26 grab/chip rock samples of pegmatite outcrop have been collected at CV9 through April 2024, with results ranging from 0.00% to 4.71% $Li_2O$ and 15 ppm to 401 ppm $Ta_2O_5$. Channel sampling, collectively 17.1 m, was completed in 2022 with highlights including 15.0 m at 0.46% $Li_2O$.

### 9.6.6 CV10 Spodumene Pegmatite Cluster

A total of 6 grab/chip rock samples of pegmatite outcrop have been collected at CV10 through April 2024, with results ranging from 0.11% to 1.88% $Li_2O$ and 133 ppm to 255 ppm $Ta_2O_5$. No channel sampling has been completed at CV10 to date.

### 9.6.7 CV12 Spodumene Pegmatite Cluster

A total of 14 grab/chip rock samples of pegmatite outcrop have been collected at CV12 through April 2024, with results ranging from 0.00% to 5.98% $Li_2O$ and 49 ppm to 1,478 ppm $Ta_2O_5$. Channel sampling, collectively 84.1 m, was completed in 2022 with highlights including 21.9 m at 0.80% $Li_2O$, 7.7 m at 1.46% $Li_2O$, and 10.1 m at 1.09% $Li_2O$.

### 9.6.8 CV14 Spodumene Pegmatite Cluster

A total of 12 grab/chip rock samples of pegmatite outcrop have been collected at CV14 through April 2024, with results ranging from 0.01% to 0.94% $Li_2O$ and nil to 88 ppm $Ta_2O_5$. No channel sampling has been completed at CV14 to date.

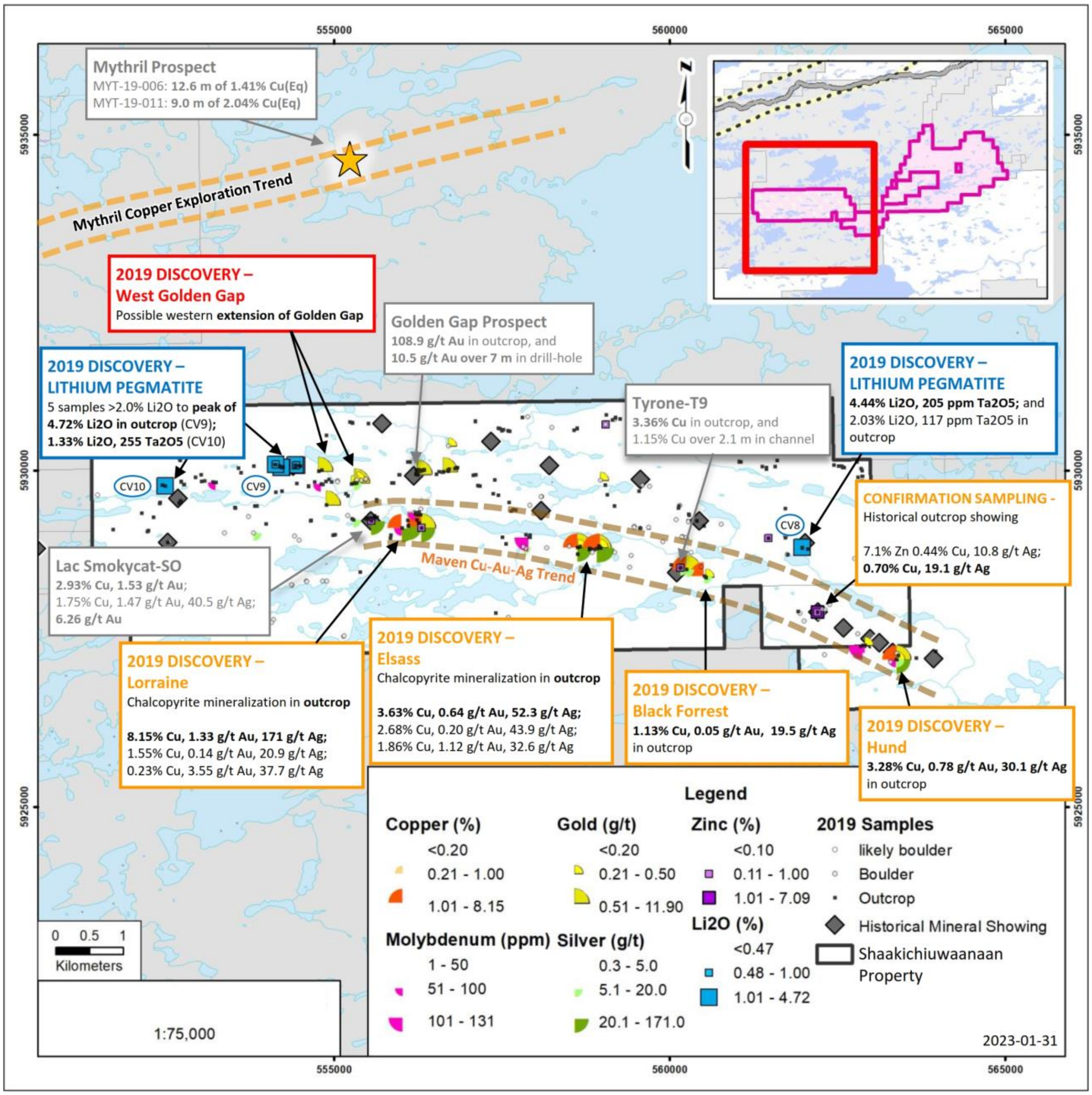



**Figure 9-1: Summary of surface exploration through 2020 at the Maven Trend & western CV Trend**

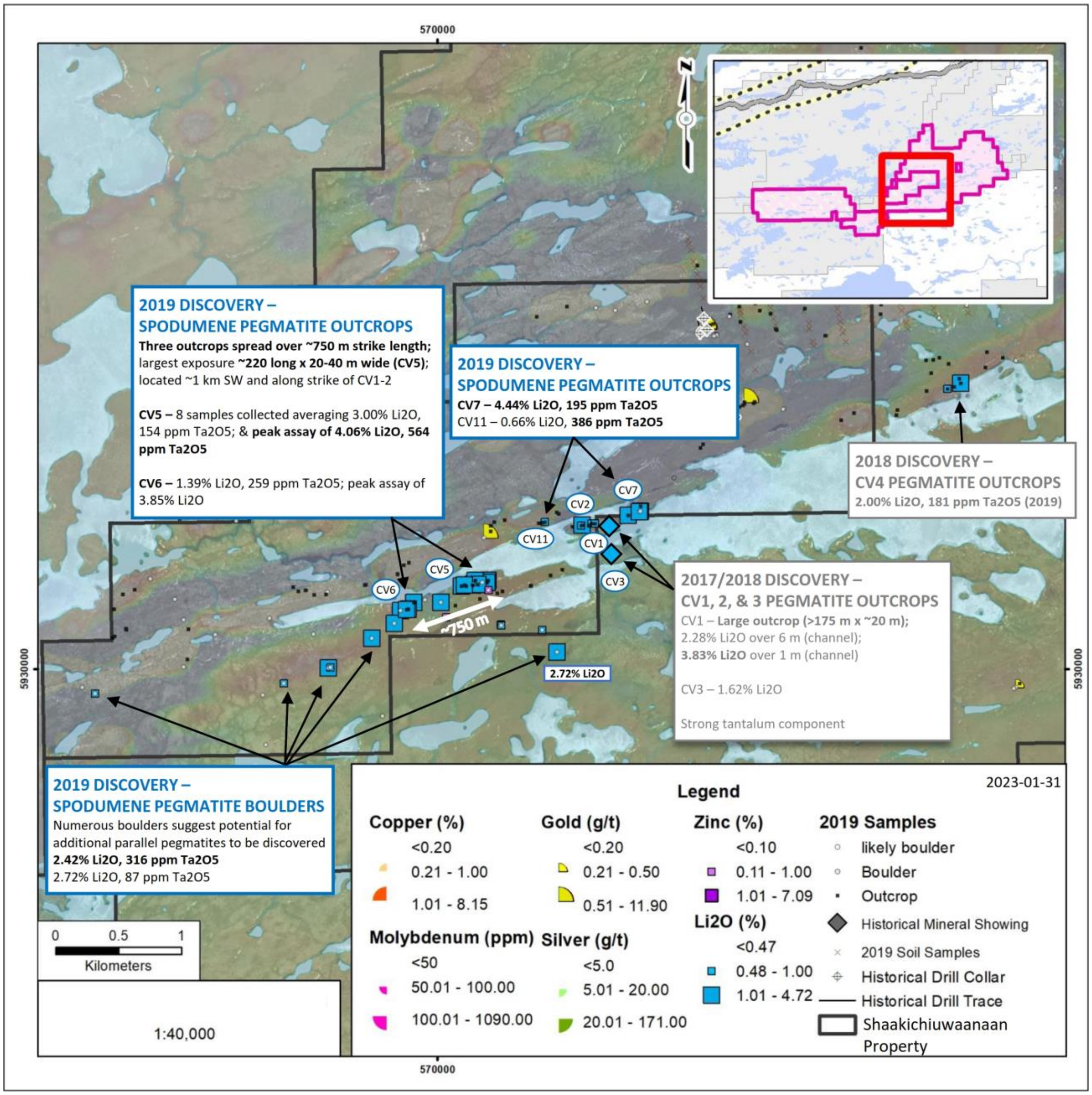
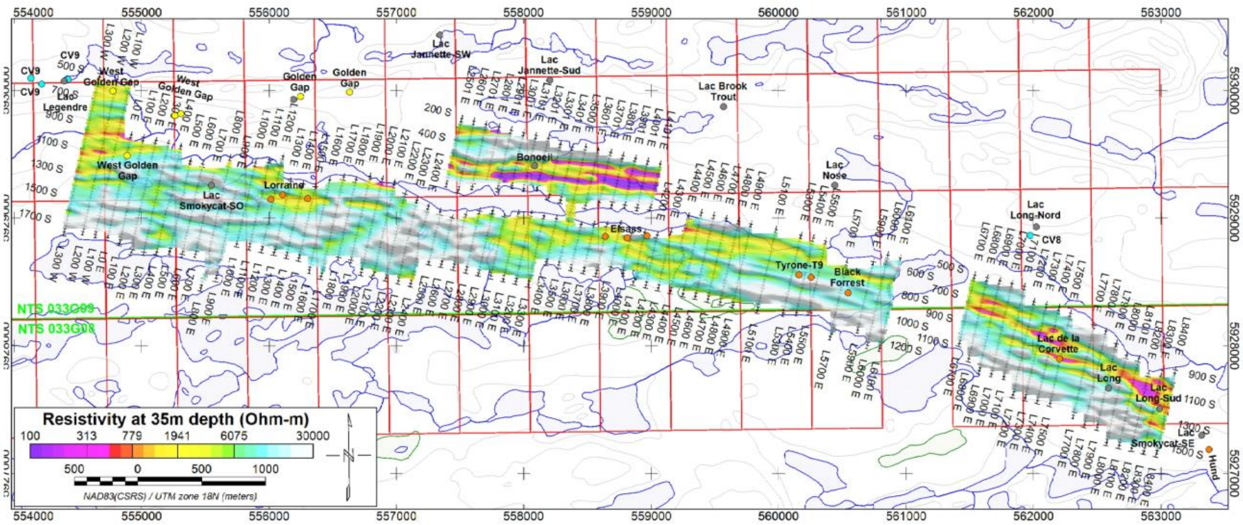



**Figure 9-2: Summary of surface exploration through 2020 at the CV5 Spodumene Pegmatite**



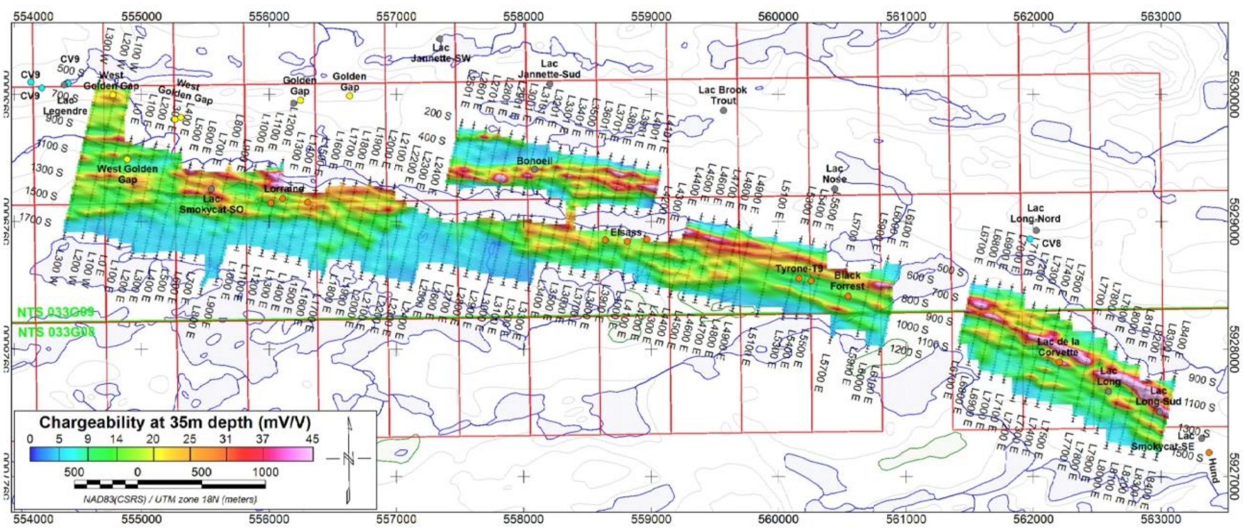




**Figure 9-3: Results of 2021 IP-Resistivity survey over the Maven Trend**

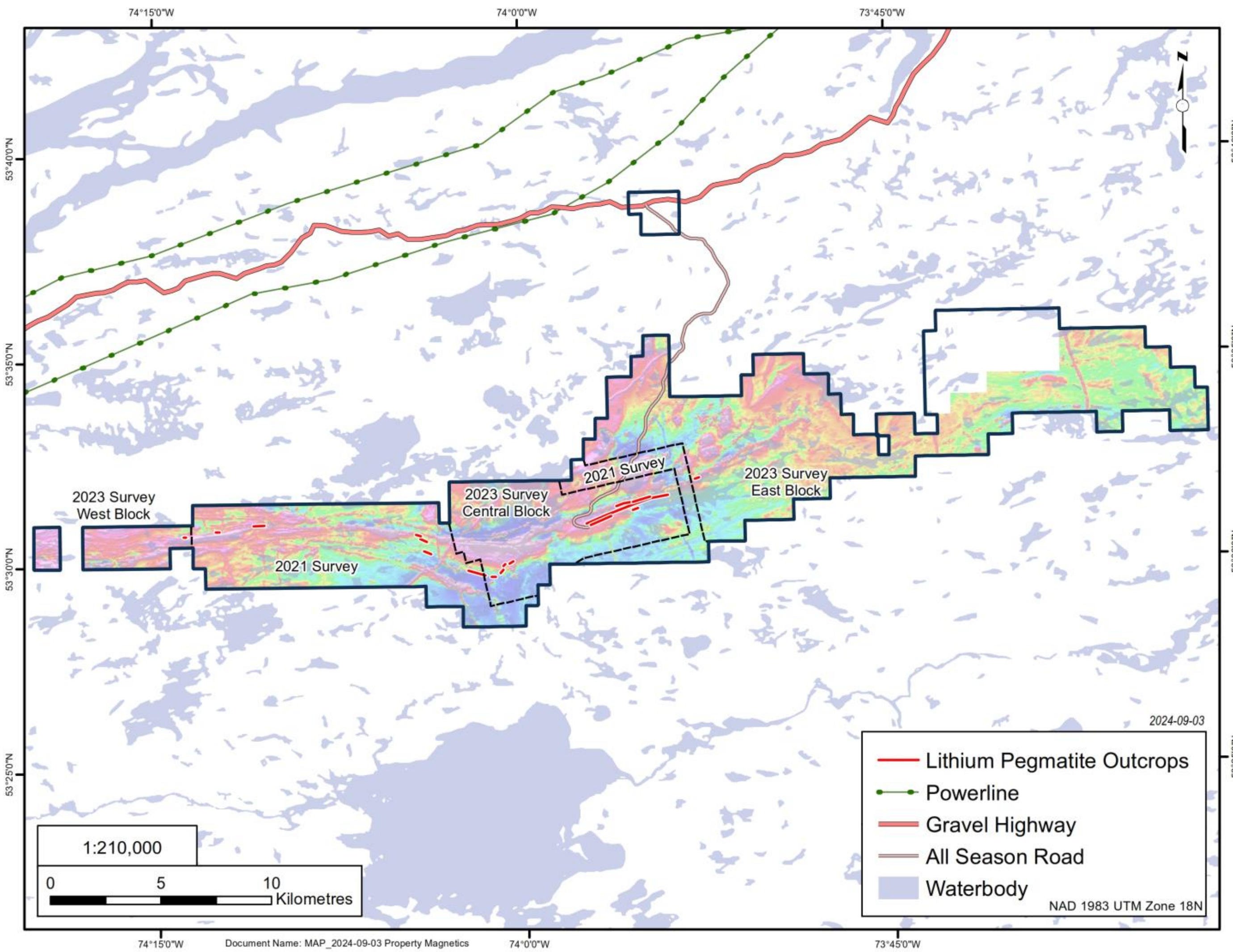



Figure 9-4: Merged 2021 & 2023 heliborne magnetic survey data coverage on the Shaakichiuwaanaan Property

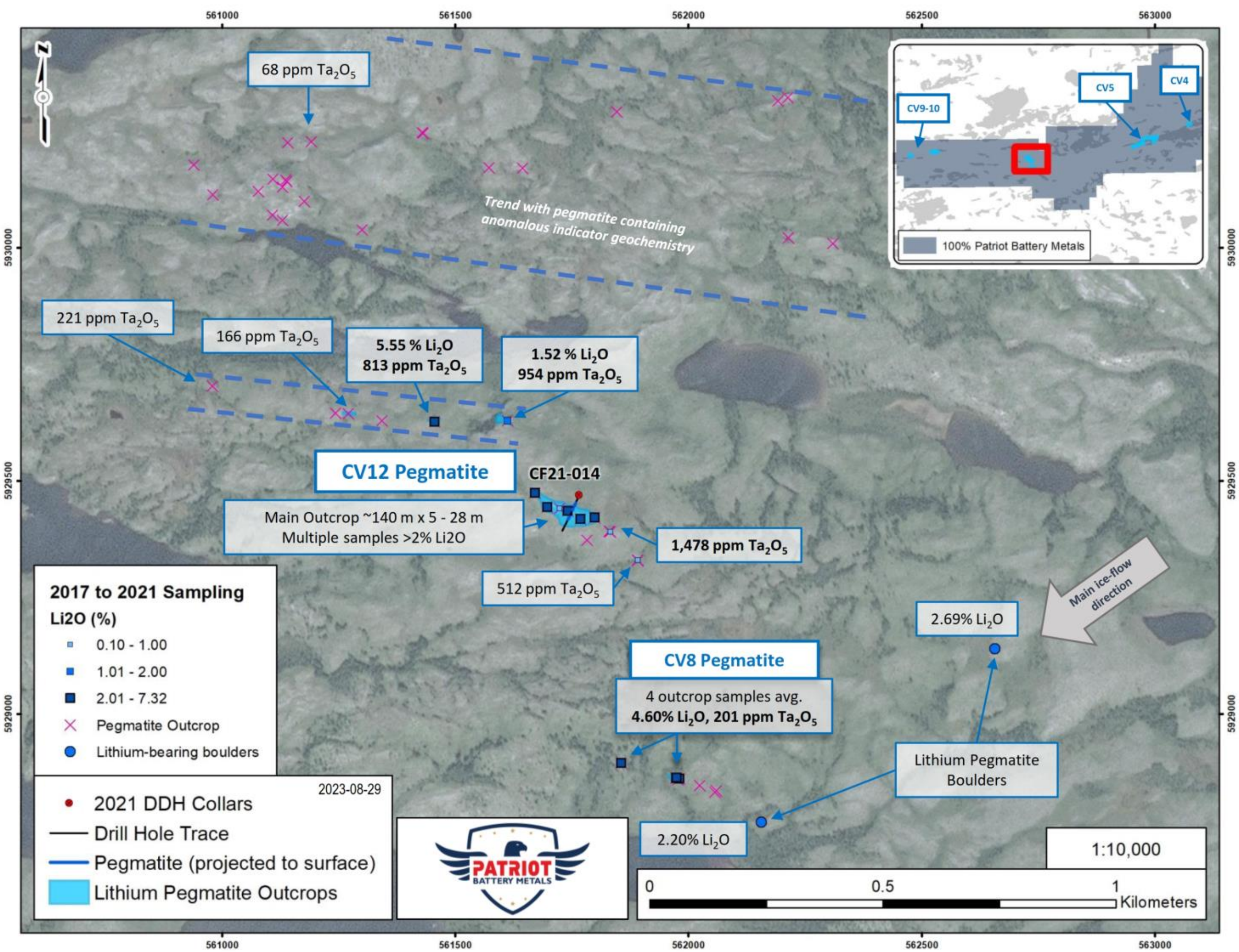



**Figure 9-5: Summary of surface exploration through 2021 at the CV8 and CV12 Spodumene Pegmatite clusters**

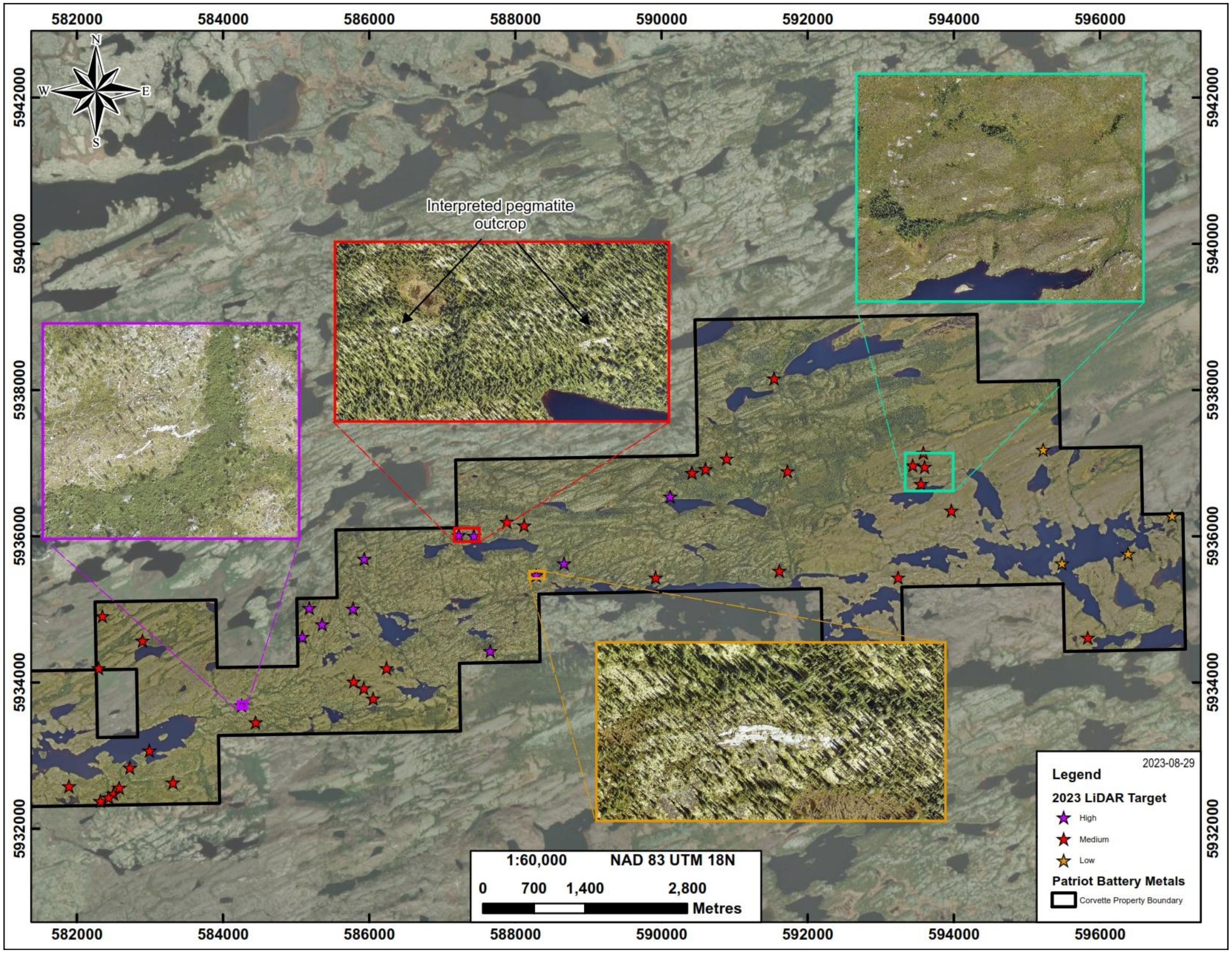



**Figure 9-6: 2022 LiDAR and orthophoto survey derived targets over Corvette East claim block**

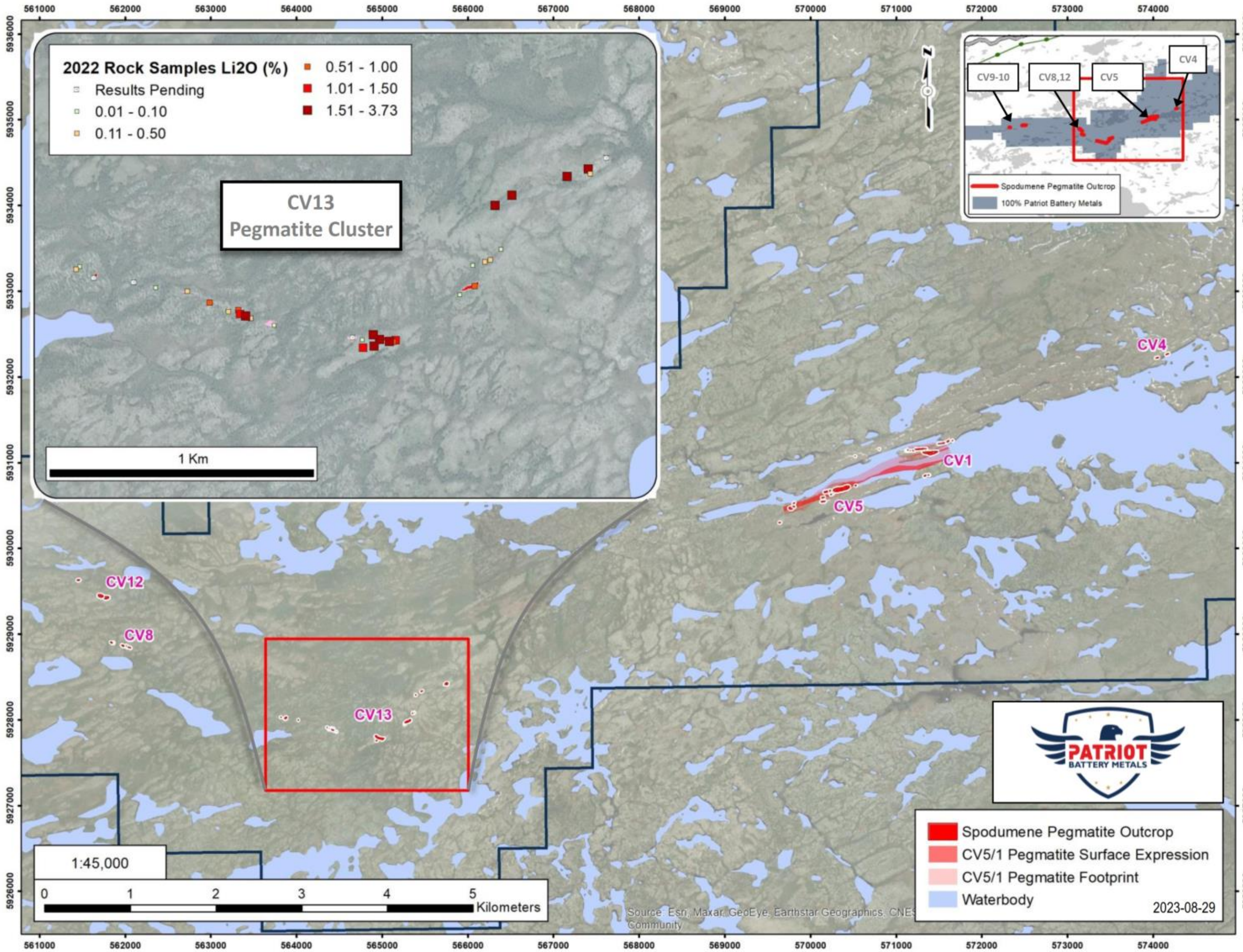



Figure 9-7: 2022 outcrop mapping and surface sampling summary at the CV13 Spodumene Pegmatite cluster (CV5 footprint through end 2022)

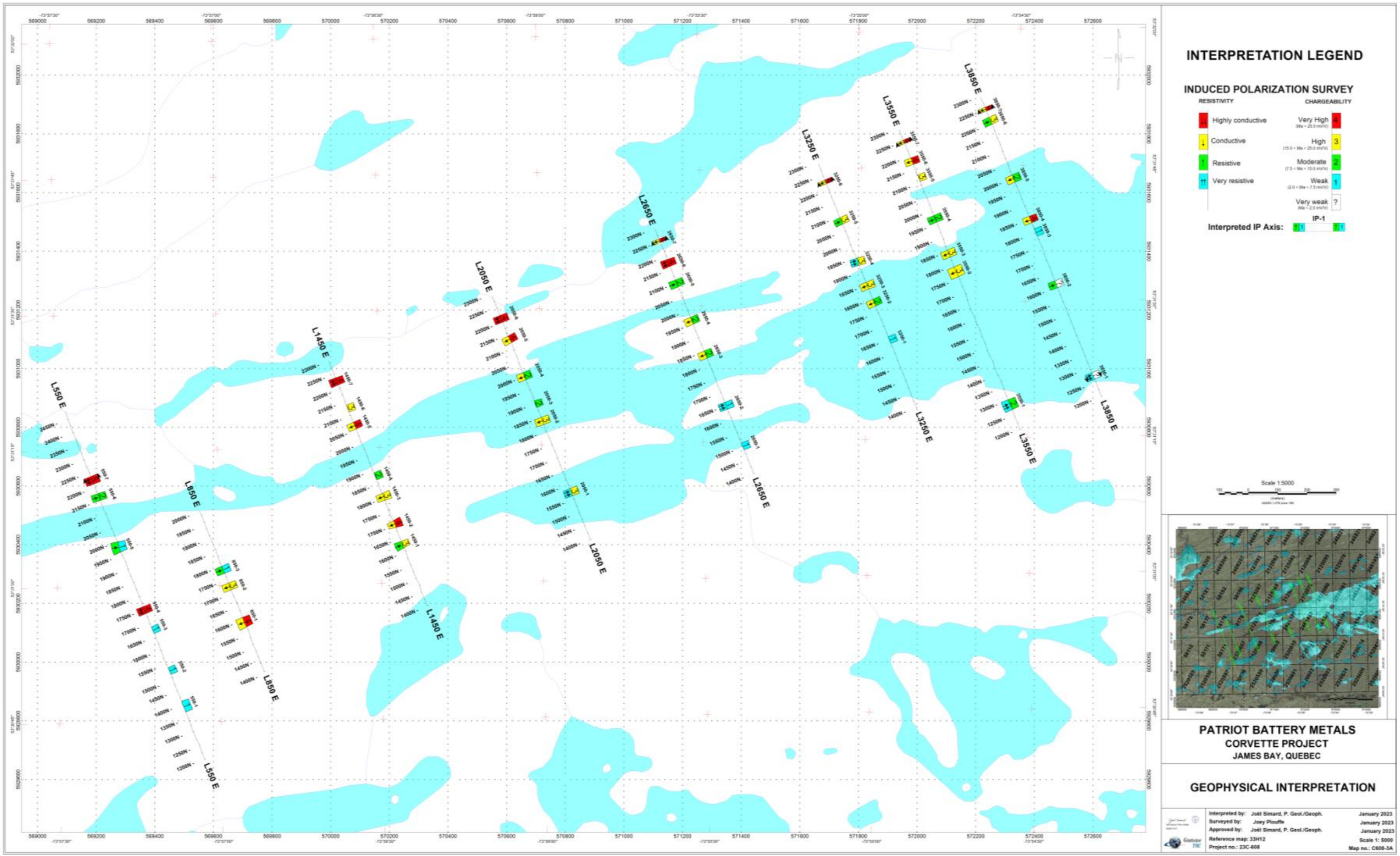



**Figure 99-8: Interpretation of 2023 IP-Resistivity orientation survey data over the central areas of the CV5 Pegmatite**

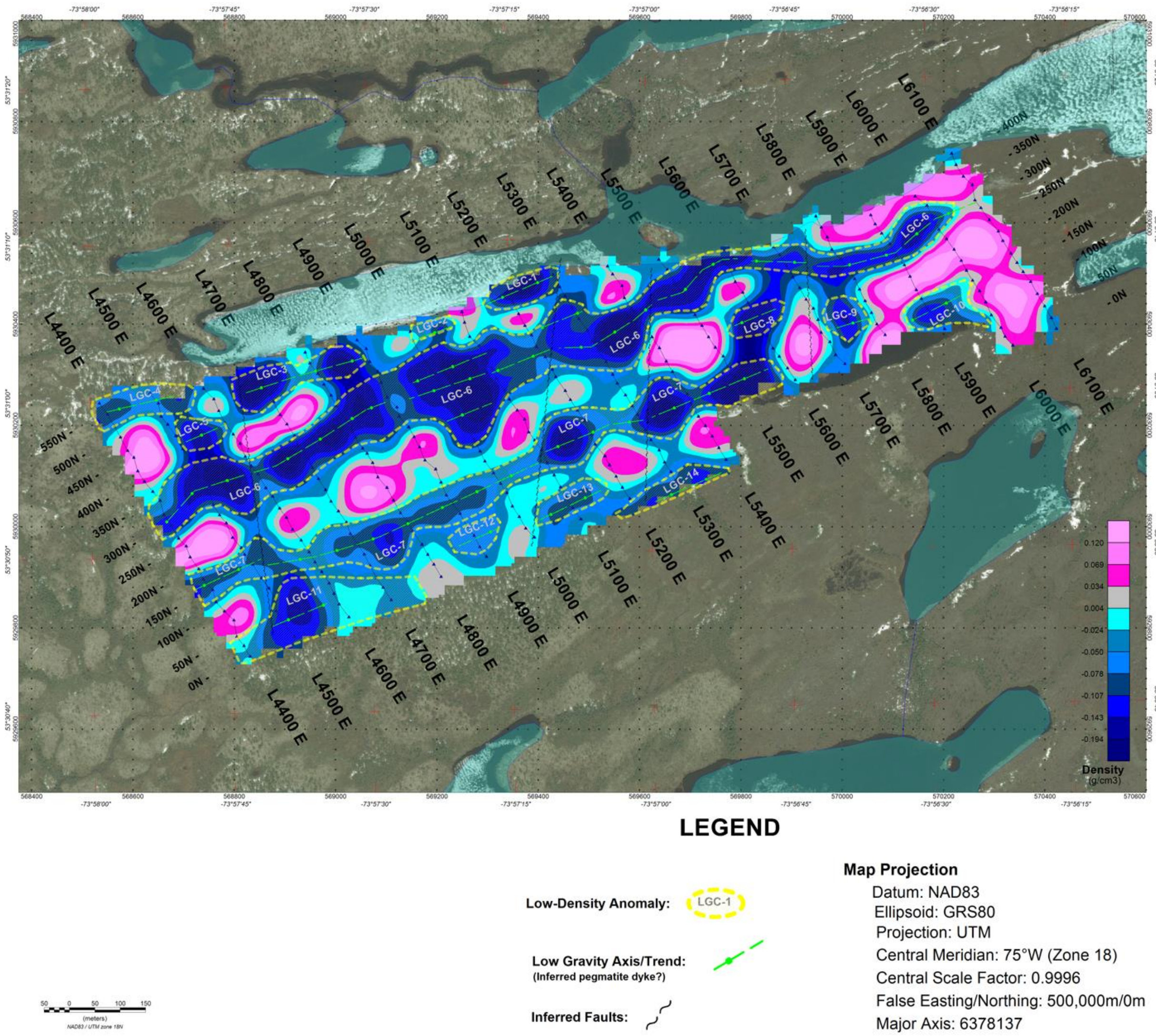



**Figure 9-9: Interpretation of 2023 ground gravity orientation survey data over the western areas of the CV5 Pegmatite**

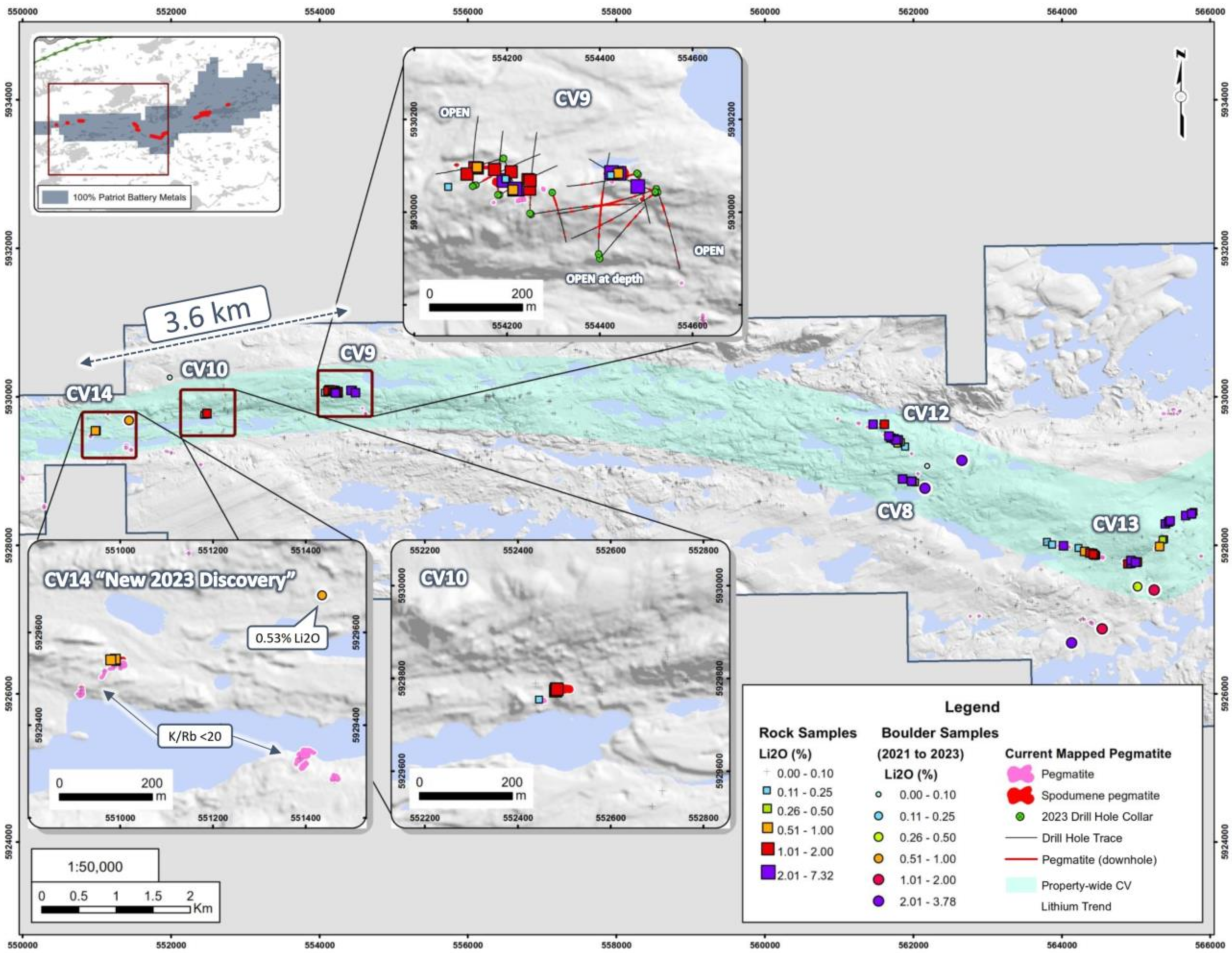



**Figure 9-10: Summary of 2023 surface sampling over the western areas of the Property**

# 10. Drilling

## 10.1 Drilling Campaigns

The Company completed drilling at the Property in 2021 (Maven and CV trends), 2022 (CV Trend), 2023 (CV Trend, Camp), and 2024 (CV Trend). Drilling through April 2023 is described in detail in the previous technical reports completed on the Property, including drill hole coordinates and results (Knox, 2022); (McCracken & Cunningham, 2023). The following sections provide a summary of the 2021, 2022, and 2023 (through April) drill programs for context and completion. A detailed description of the subsequent drilling at the Property is presented below for the period of May 2023 through April 2024, which includes the last drill hole (CV24-526) incorporated into the updated MRE for the Shaakichiuwaanaan Project, including both the CV5 and CV13 spodumene pegmatites, announced August 5, 2024 (Patriot, 2024a), and outlined in this Report.

The Shaakichiuwaanaan database includes 537 diamond drill holes completed over the 2021, 2022, 2023, and 2024 (through the end of April – drill hole CV24-526) programs, for a collective total of 169,526 m, as well as 88 outcrop channels totalling 520 m. The Shaakichiuwaanaan MRE is supported by 344 holes (129,673 m) and 11 outcrop channels (63 m) at CV5, and 132 holes (29,059 m) and 54 outcrop channels (340 m) at CV13 (Table 10-1).

A plan view drill hole location map for all holes completed by the Company at the Property to date is in Figure 10-1. Plan view drill hole location maps for all holes completed by the Company that have informed the Shaakichiuwaanaan geological model and MRE (i.e., through CV24-526), in addition to channels, are presented in Figure 10-2 through Figure 10-5.

**Table 10-1: Company diamond drill hole summary at the Property**

| Year | Target | No. Holes | Metres | Comments |
|---|---|---|---|---|
| 2021 | Maven | 10 | 1,177 | |
| | CV5 Pegmatite | 4 | 758 | |
| | CV12 Pegmatite | 1 | 114 | |
| 2022 | CV5 Pegmatite | 76 | 23,951 | |
| | CV13 Pegmatite | 14 | 2,647 | |
| 2023 | CV5 Pegmatite | 168 | 58,460 | |
| | CV13 Pegmatite | 74 | 14,917 | |
| | CV9 Pegmatite | 18 | 4,071 | |
| | Shaakichiuwaanaan Camp | 6 | 765 | To support construction |
| 2024 | CV5 Pegmatite | 121 | 51,111 | |
| | CV13 Pegmatite | 45 | 11,557 | |

| Year | Target | No. Holes | Metres | Comments |
|---|---|---|---|---|
| | **Total Property** | 537 | 169,526 | |
| | **Total Shaakichiuwaanaan MRE** | **476** | **158,732** | CV5 and CV13 pegmatites |
| | **Total CV5 Pegmatite** | 369 | 134,279 | |
| | **Total CV13 Pegmatite** | 133 | 29,121 | |
| | **Total CV9 Pegmatite** | 18 | 4,071 | |
| | **Total CV12 Pegmatite** | 1 | 114 | |

All diamond drill holes, from 2021 through April 2024, were completed by Fusion Forage Drilling Ltd. of Hawkesbury, Ontario. The 2021 and 2022 programs, as well as the summer-fall 2023 program, utilized exclusively helicopter transportable drill rigs. However, the winter/spring 2023 and 2024 programs utilized a combination of helicopter transportable, and skid mounted drill rigs due to the construction of a temporary winter road, and later an all-season road, extending from the Trans-Taiga Road to the CV5 Pegmatite.

To date, no oriented drill coring has been completed; however, downhole optical and acoustic televiewer surveys have been completed on multiple holes to assess overall structure. This data has guided the geological model supporting the CV5 MRE as well as subsequent refinement.

With respect to the 2021, 2022, 2023, and 2024 (through drill hole CV24-526) drill programs as discussed herein, there were no drilling, sampling, or recovery factors identified that could materially impact the accuracy and reliability of the results presented herein. No detailed evaluation has been completed on drilling completed subsequent to the updated MRE.

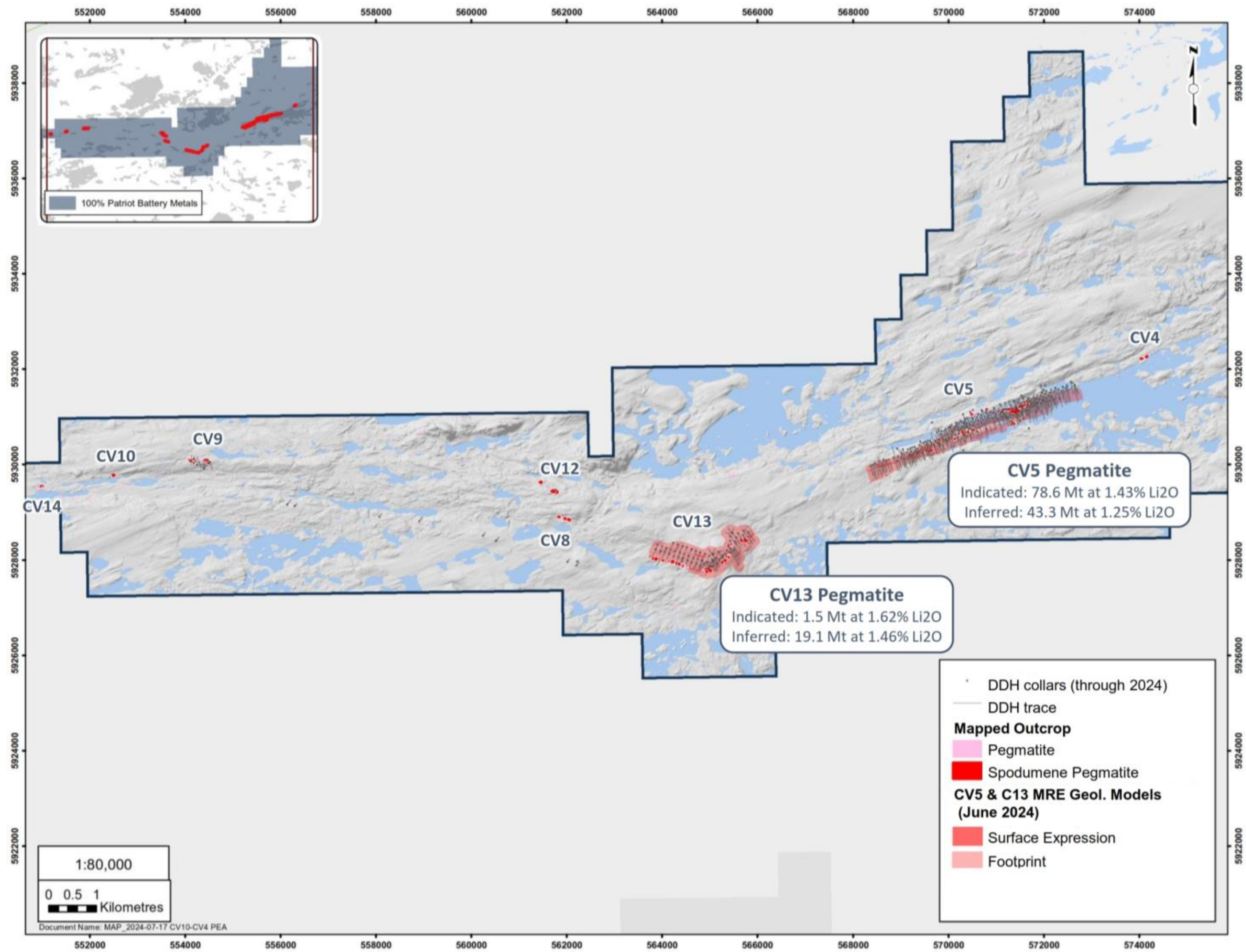



Figure 10-1: Drill holes completed at the Shaakichiuwaanaan Property up to CV24-526

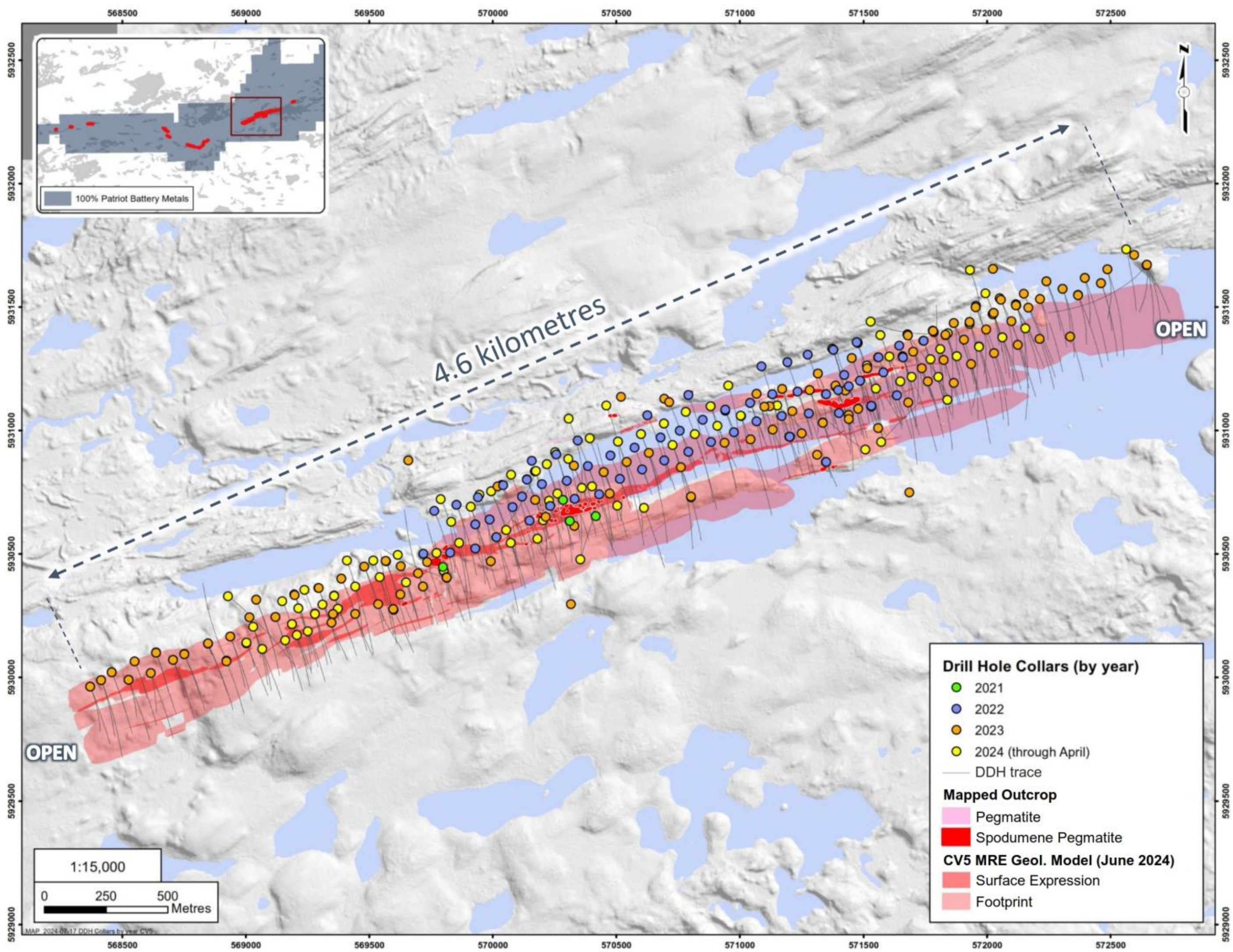



Figure 10-2: Drill holes completed at the CV5 Spodumene Pegmatite

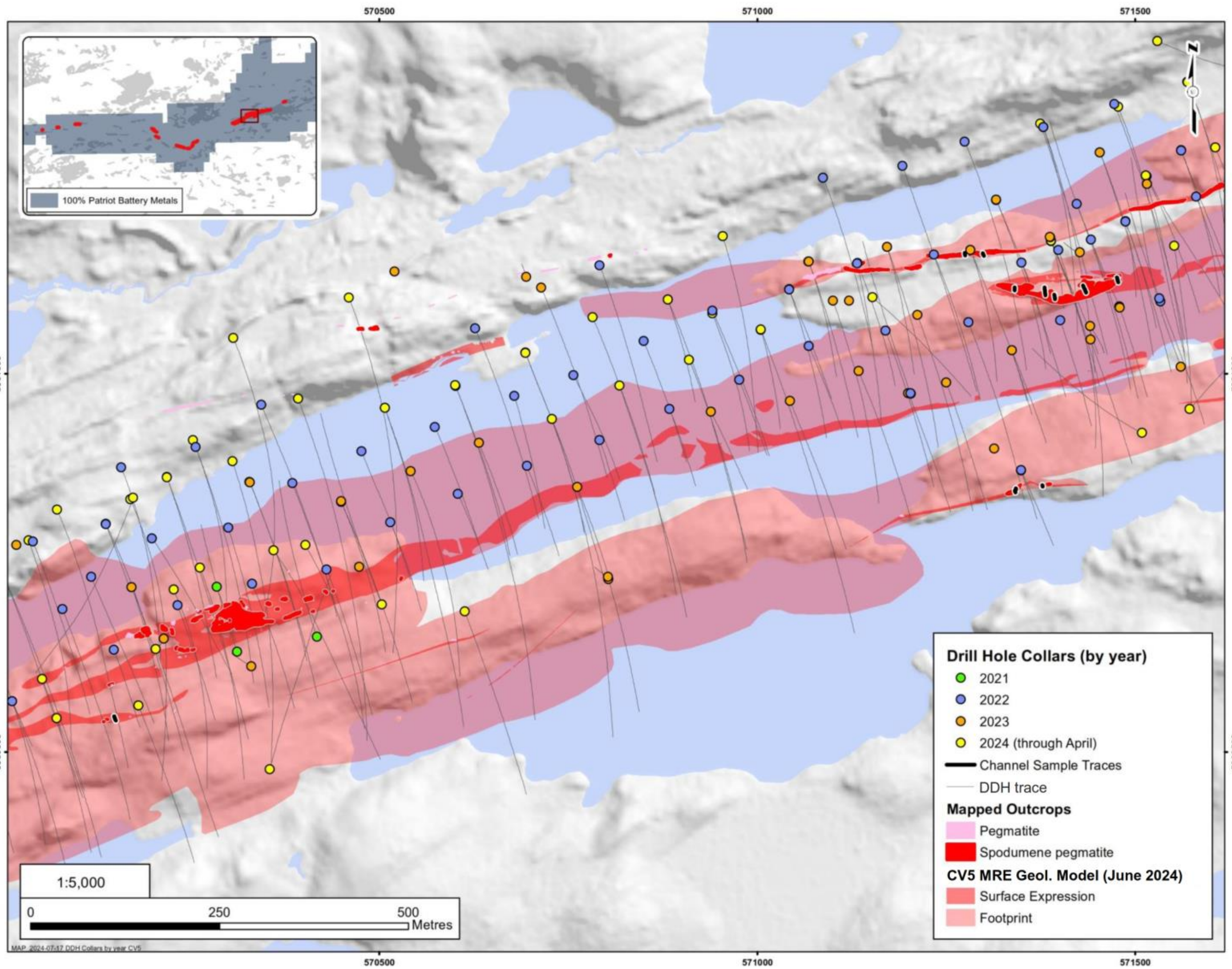



Figure 10-3: Channel sample locations at the CV5 Spodumene Pegmatite

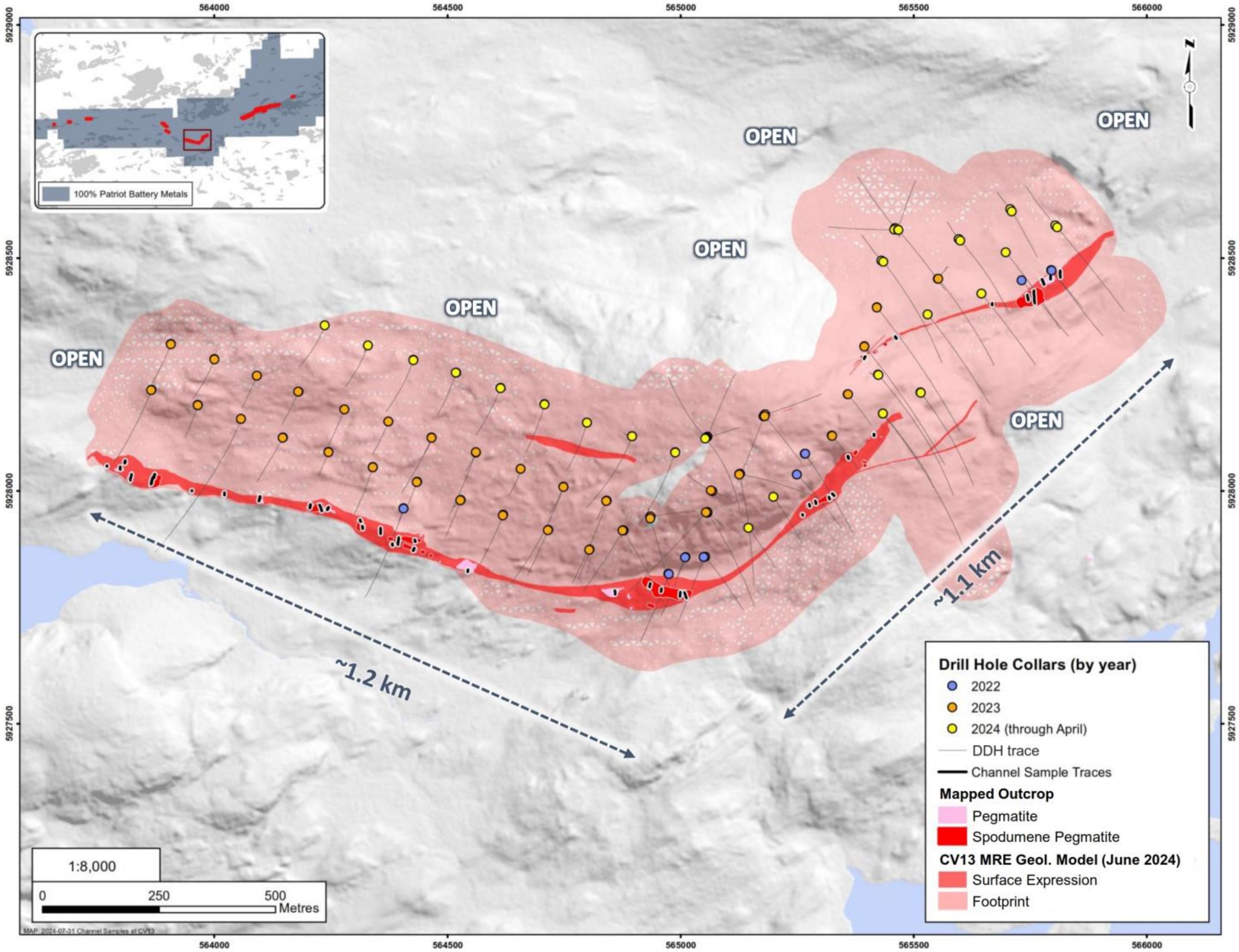



Figure 10-4: Drill holes and channels completed at the CV13 Spodumene Pegmatite

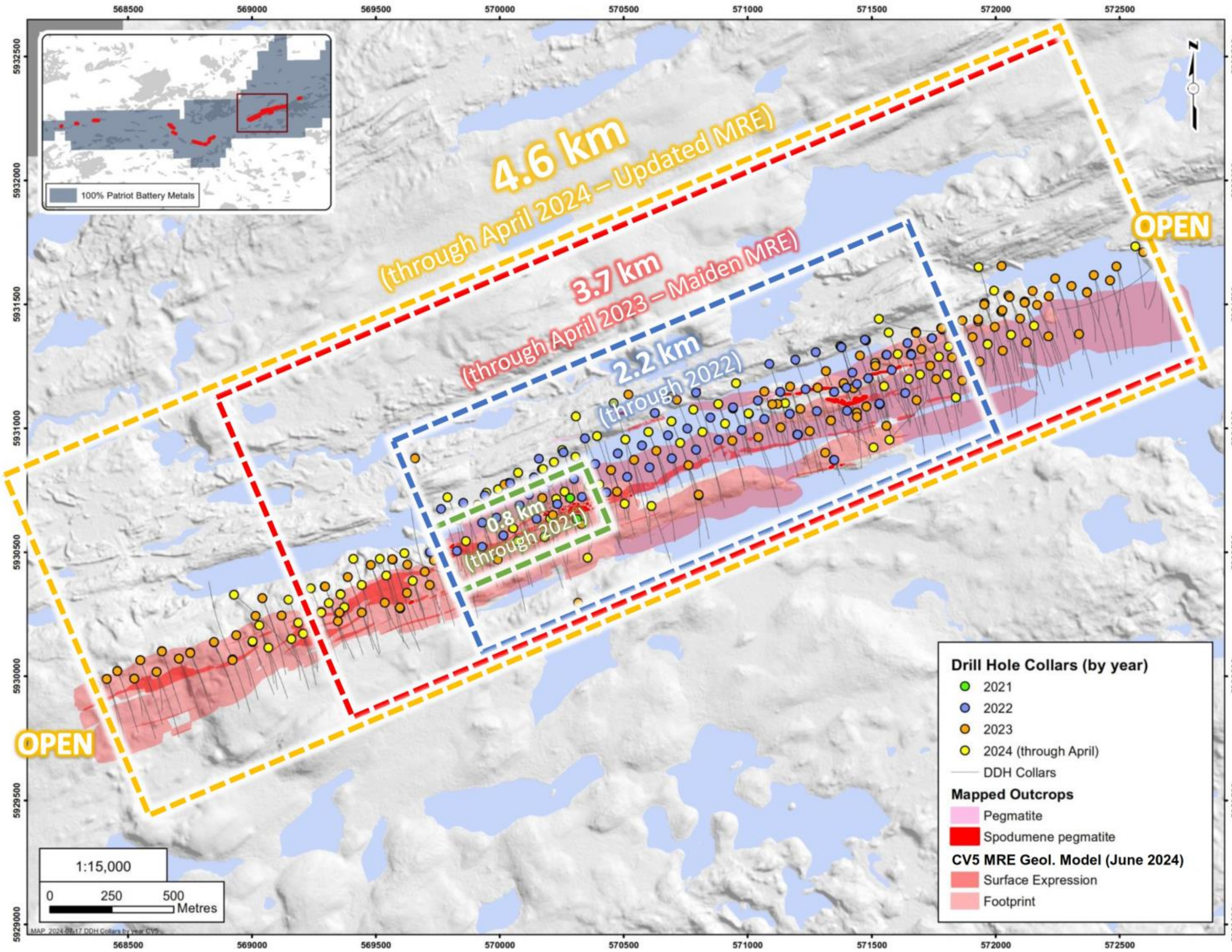



Figure 10-5: Delineation of the CV5 Spodumene Pegmatite by year

### 10.1.1 2021 Drill Program

The Company completed a diamond drill program on the Property in September – October 2021. The program included 15 NQ size diamond drill holes, totalling 2,048.2 m, and was split over two prospective trends – the CV Lithium Trend (871.7 m over five holes) and the Maven Copper-Gold-Silver Trend (1,176.6 m over 10 holes). The drill program (drill holes CF21-001 through CF21-014) marked the first documented drilling along the Maven Trend, as well as for lithium pegmatite on the Property (Figure 10-1 and Figure 10-6)

The primary objective of the lithium pegmatite drilling in 2021 at the CV Trend was to test if two of the spodumene pegmatite outcrops at CV5 continued to depth. The drilling was very successful with results including:

- 148.7 m at 0.92% $Li_2O$, including 73.0 m at 1.09% $Li_2O$ (CF21-001, the 'discovery hole');
- 154.1 m at 0.94% $Li_2O$, including 38.0 m at 1.38% $Li_2O$ (CF21-002);
- 59.1 m at 1.23% $Li_2O$, including 33.0 m at 1.80% $Li_2O$ (CF21-003);
- 63.6 m at 0.64% $Li_2O$, including 30.0 m at 1.13% $Li_2O$ (CF21-004).

In addition to the lithium, the intervals also contained significant tantalum, in line with surface results.

Drilling in 2021 at the Maven Trend tested geophysical and surface derived targets at the Lac de la Corvette, Tyrone-T9, Elsass, and Lorraine showings/prospects. The program returned anomalous to moderate grades over several drill holes (Figure 10-6), including individual sample highs comparable to prior surface results – 3.1 m of 0.34% Cu, 0.21 g/t Au, and 6.7 g/t Ag within a larger interval of 28.4 m of 0.12% Cu, 0.06 g/t Au, and 2.3 g/t Ag (CF21-013, Lorraine), and 0.2 m of 2.12% Cu, 0.26 g/t Au, and 25.4 g/t Ag (CF21-008A, Tyrone-T9). Mineralization consists of visible chalcopyrite present as stringers and disseminations.

Additionally, two holes that targeted the Maven Trend intersected LCT quartz-feldspar-muscovite pegmatite intervals – CF21-008A and 009 of 10.3 m and 20.0 m, respectively. Although only weakly mineralized in lithium, the bulk mineralogy, textures, and presence of holmquistite in the host amphibolite confirms their LCT nature. Drill holes CF21-008A and 009 are located approximately 1.5 km to 2.0 km west-southwest of the CV8 and CV12 pegmatite clusters, and may indicate the discovery of a secondary, sub-parallel, LCT pegmatite trend (Figure 10-6). Additional drill testing is warranted.

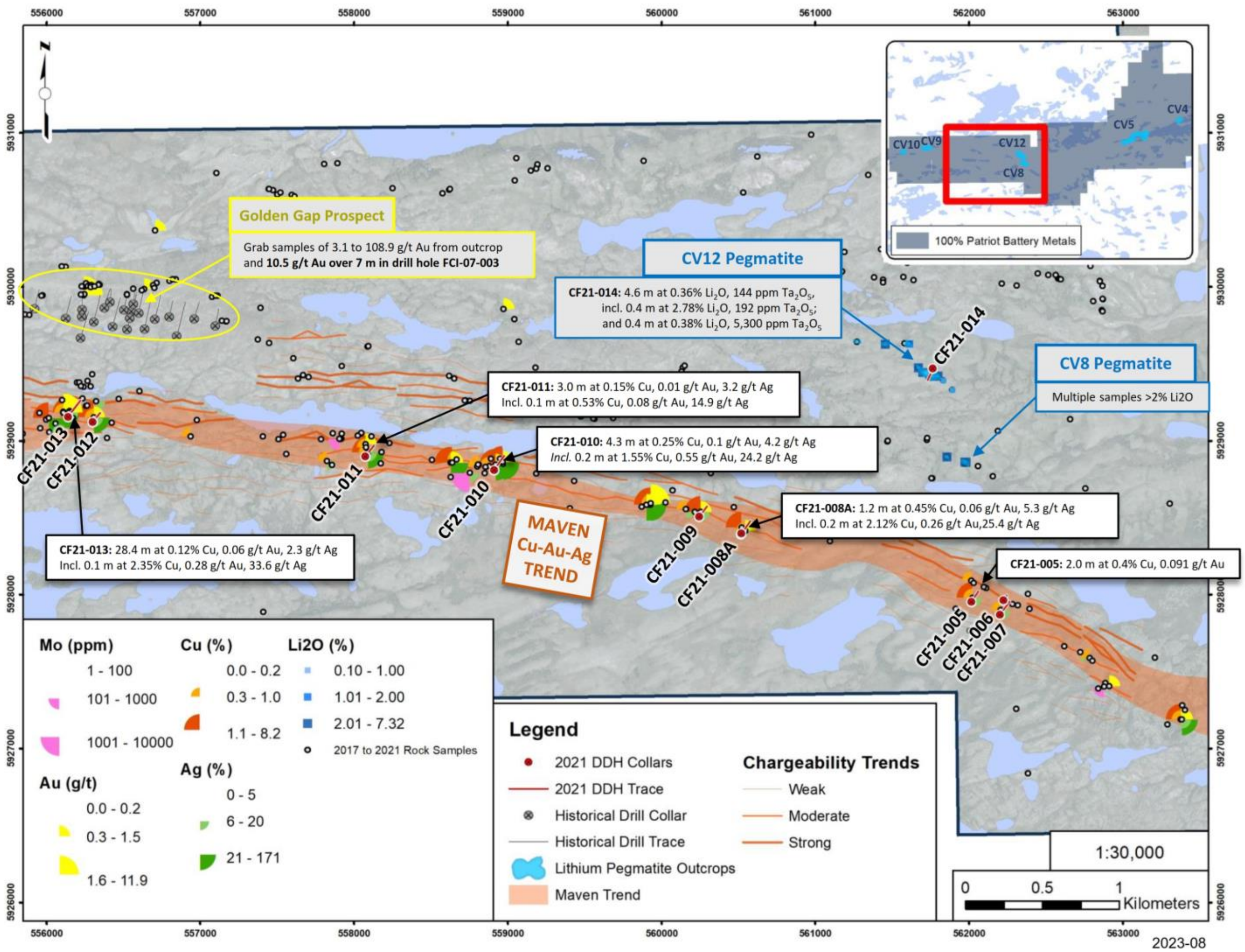



**Figure 10-6: 2021 Drill hole results summary at the Maven Trend and CV12 Spodumene Pegmatite**

### 10.1.2 2022 Drill Program

The Company completed a diamond drill campaign on the Property throughout 2022, which included winter/spring and summer/fall programs (through drill hole CV22-104). Collectively, the program included 90 NQ size diamond drill holes, totalling 26,597.8 m – 76 holes totalling 23,951.2 m at the CV5 Spodumene Pegmatite and 14 holes totalling 2,647 m at the CV13 Spodumene Pegmatite (Figure 10-1 and Figure 10-4).

The primary objective of the drilling was delineation of the CV5 Spodumene Pegmatite in support of a maiden MRE and initial drill testing of the CV13 Spodumene Pegmatite discovered earlier in the year. The drilling at both pegmatites was very successful with results including:

At the CV5 Spodumene Pegmatite:

- 156.9 m at 2.12% $Li_2O$, including 25.0 m at 5.04% $Li_2O$ or 5.0 m at 6.36% $Li_2O$ (CV22-083);
- 52.2 m at 3.34% $Li_2O$, including 15.0 m at 5.10% $Li_2O$ (CV22-093);
- 131.2 m at 1.96% $Li_2O$, including 57.0 m at 2.97% $Li_2O$ (CV22-100);
- 159.7 m at 1.65% $Li_2O$, including 37.0 m at 3.04% $Li_2O$ (CV22-042);
- 73.0 m at 2.14% $Li_2O$, including 40.7 m at 3.01% $Li_2O$ (CV22-017);
- 100.9 m at 1.24% $Li_2O$, including 9.0 m at 3.62% $Li_2O$ (CV22-028);
- 152.8 m at 1.22% $Li_2O$, including 66.0 m at 1.51% $Li_2O$ (CV22-030).

At the CV13 Spodumene Pegmatite:

- 22.6 m at 1.56% $Li_2O$, including 6.0 m at 3.19% $Li_2O$ (CV22-092);
- 22.4 m at 1.28% $Li_2O$ (CV22-077) – collared in lithium pegmatite;
- 15.6 m at 1.50% $Li_2O$ (CV22-081) – collared in lithium pegmatite;
- 18.8 m at 1.01% $Li_2O$, including 4.0 m at 2.37% $Li_2O$ (CV22-103);
- 17.3 m at 1.41% $Li_2O$, including 8.0 m at 2.09% $Li_2O$ (CV22-104).

A major development from the 2022 drill campaign was the recognition of a continuous high-grade zone at CV5, termed the 'Nova Zone' (Figure 10-7). At the end of the 2022 program the Nova Zone had been delineated over a strike length of approximately 350 m (later extended to at least 1.1 km in drilling through April 2024). This included intersections in drill holes CV22-017 (40.7 m at 3.01% $Li_2O$), CV22-042 (37.0 m at 3.04% $Li_2O$), CV22-066 (38.0 m at 2.17% $Li_2O$, including 2.0 m at 6.41% $Li_2O$), and CV22-083 (25.0 m at 5.04% $Li_2O$, including 5.0 m at 6.36% $Li_2O$), CV22-093 (15.0 m at 5.10% $Li_2O$), and CV22-100 (57.0 m at 2.97% $Li_2O$).

Through the end of the 2022 drill program (drill hole CV22-104), the drilling data supported the interpretation of a large, dominantly spodumene-bearing, principal pegmatite body of significant continuity, thickness, and length, extending over a strike length of at least 2.2 km (drill hole to drill hole). The strike length of CV5 has since been extended to 4.6 km (drilling through April 2024) and remains open at both ends along strike and to depth along most of its length.

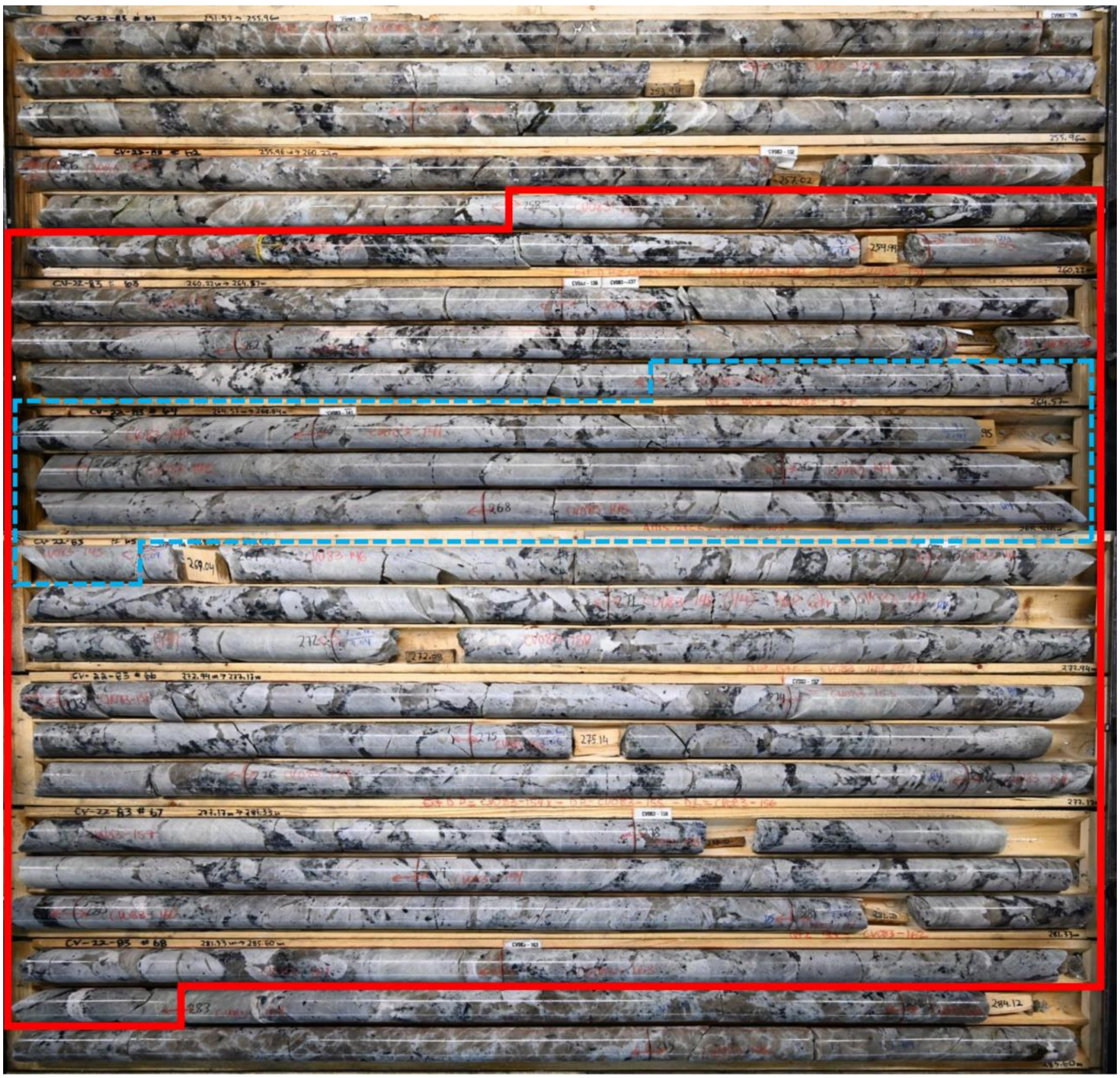


**Figure 10-7: Nova Zone drill core intersection (25.0 m at 5.04% $Li_2O$) in CV22-083 (red box) including 5.0 m at 6.36% $Li_2O$ (dashed blue box)**

### 10.1.3 2023 Drill Program (January through April)

The Company completed a diamond drill campaign on the Property throughout 2023, of which drilling through April (i.e., hole CV23-190) was included as the final holes supporting the maiden MRE for the CV5 Spodumene Pegmatite. The program included 86 NQ (predominant) and HQ-size diamond drill holes, totalling 31,751.9 m, all targeting the CV5 Spodumene Pegmatite (CV23-105 through CV23-190). Additionally, three holes (614.8 m) were completed for hydrogeological purposes at the Company's Shaakichiuwaanaan Camp situated on the south side of the Trans-Taiga Road, approximately 13 km directly north of the CV5 Pegmatite.

The primary objective of the drilling was continued delineation of the CV5 Spodumene Pegmatite in support of a maiden MRE (Figure 10-8), as well as collect hydrogeological information to support a preliminary hydrological model for the CV5 area. The drilling at both pegmatites was very successful and extended the strike length of CV5 to 3.7 km (drill hole to drill hole), up from 2.2 km at the end of 2022, with it remaining open (Figure 10-5). Drill result highlights include:

- 83.7 m at 3.13% $Li_2O$, including 19.8 m at 5.28% $Li_2O$ and 5.1 m at 5.17% $Li_2O$ (CV23-105);
- 139.2 m at 1.26% $Li_2O$, including 36.2 m at 1.74% $Li_2O$ (CV23-190);
- 130.3 m at 1.56% $Li_2O$, including 52.7 m at 2.45% $Li_2O$ (CV23-134);
- 122.6 m at 1.89% $Li_2O$, including 8.1 m at 5.01% $Li_2O$ (CV23-138);
- 101.2 m at 1.59% $Li_2O$, including 8.8 m at 5.20% $Li_2O$ (CV23-141);
- 108.0 m at 2.44% $Li_2O$, including 16.0 m at 4.08% $Li_2O$ (CV23-181).

The program provided the final set of drill hole data informing a maiden Mineral Resource Estimate for the CV5 Spodumene Pegmatite, announced in July 2023 (Patriot, 2023a), which established the CV5 Spodumene Pegmatite as a worldclass lithium pegmatite, ranking largest in the Americas and 8th largest globally at the time. The geological model footprint and drill holes (with highlighted results) that supported the maiden MRE are presented in Figure 10-10).

The Nova Zone, first discovered during the 2022 drill program, was expanded over the course of the 2023 drill program (January through April) to 1.1 km – from drill hole CV23-132 eastward to drill hole CV23-108. At the Nova Zone, geological modelling supports a continuous spodumene mineralized zone of variable thickness, at grades of 2–5+% $Li_2O$, occurring between vertical depths of approximately 125 m to 325 m. The high-grade zone includes a higher-grade sub-zone that is an approximate 3 m to 25 m thick (core length) band of 5+% $Li_2O$ Spodumene Pegmatite that had been traced (at 100 m drill spacing) over a minimum 200 m strike length between drill holes CV22-083, 093, and CV23-105 through the end of the program (April 2023). Core photos of the Nova Zone are presented in Figure 7-11, and Figure 10-7 and Figure 10-9.


**Figure 10-8: Spodumene pegmatite from drill hole CV23-190 grading ~1.8% $Li_2O$**


**Figure 10-9: High-grade (4+% $Li_2O$) spodumene pegmatite from the Nova Zone in drill hole CV23-181**

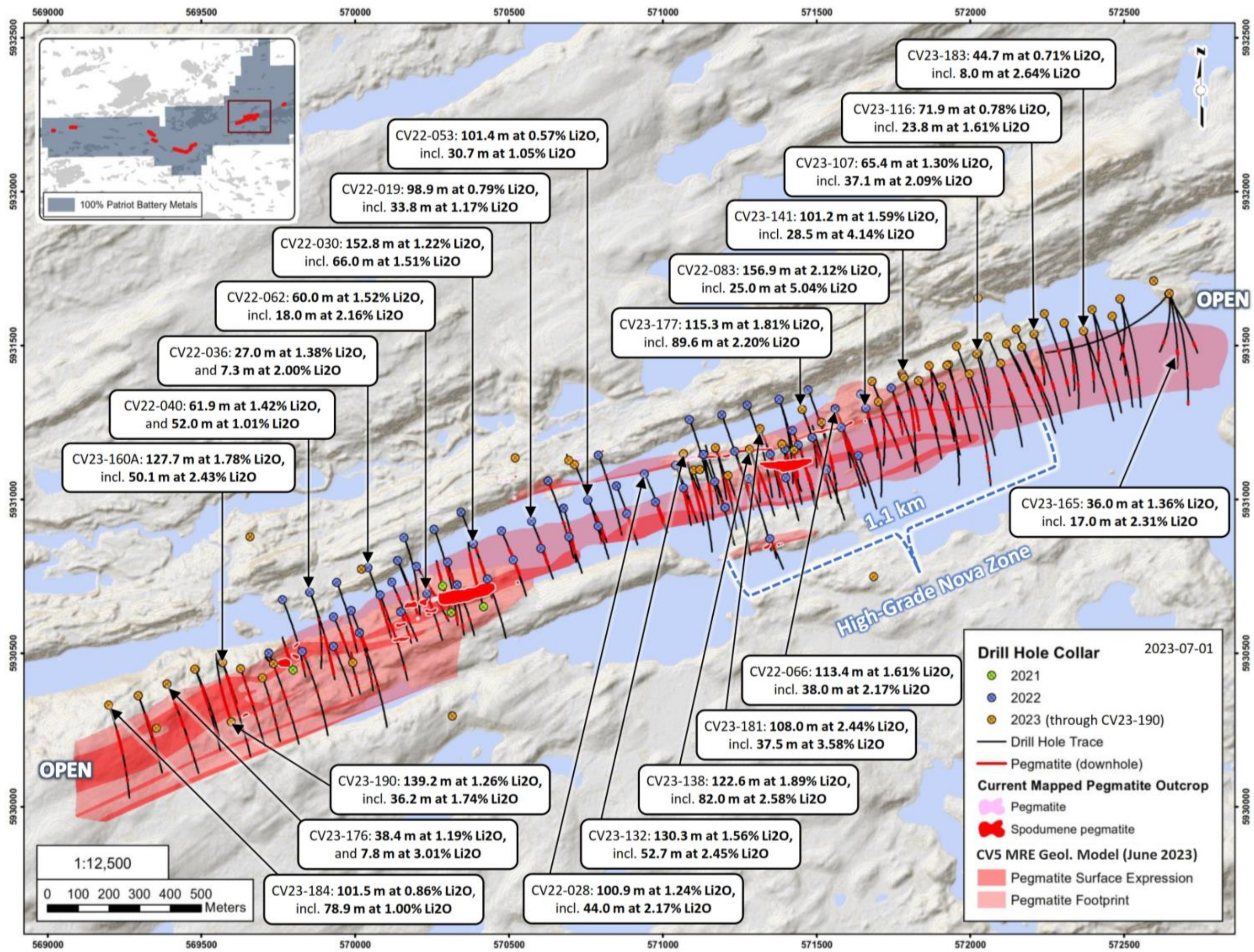



**Figure 10-10: Drill hole intersection highlights at the CV5 Spodumene Pegmatite through April 2023 (CV23-190)**

### 10.1.4 Drilling Subsequent to the Maiden CV5 MRE (May through November 2023)

The Company completed a diamond drill campaign on the Property from May through November 2023 (i.e., drill hole CV23-105 to CV23-365), subsequent to the maiden MRE at CV5. The program included 180 NQ-size diamond drill holes, totalling 46,378.4 m, targeting the CV5, CV13, and CV9 spodumene pegmatites, and included multiple hydrogeological holes at CV5 (Figure 10-1, Figure 10-2, Figure 10-4, Figure 10-11). Additionally, three of these holes (149.8 m) were completed for hydrogeological purposes at the Company's Shaakichiuwaanaan Camp situated on the south side of the Trans-Taiga Road, approximately 13 km directly north of the CV5 Pegmatite.

The main objectives of the program were to further delineate the CV5 Pegmatite westwardly, complete targeted infill to improve geological confidence, and collect hydrogeological information to support a preliminary hydrological model for the CV5 area. Drill spacing and orientations were generally continued from the prior program, although more varied to accommodate the expanding objectives.

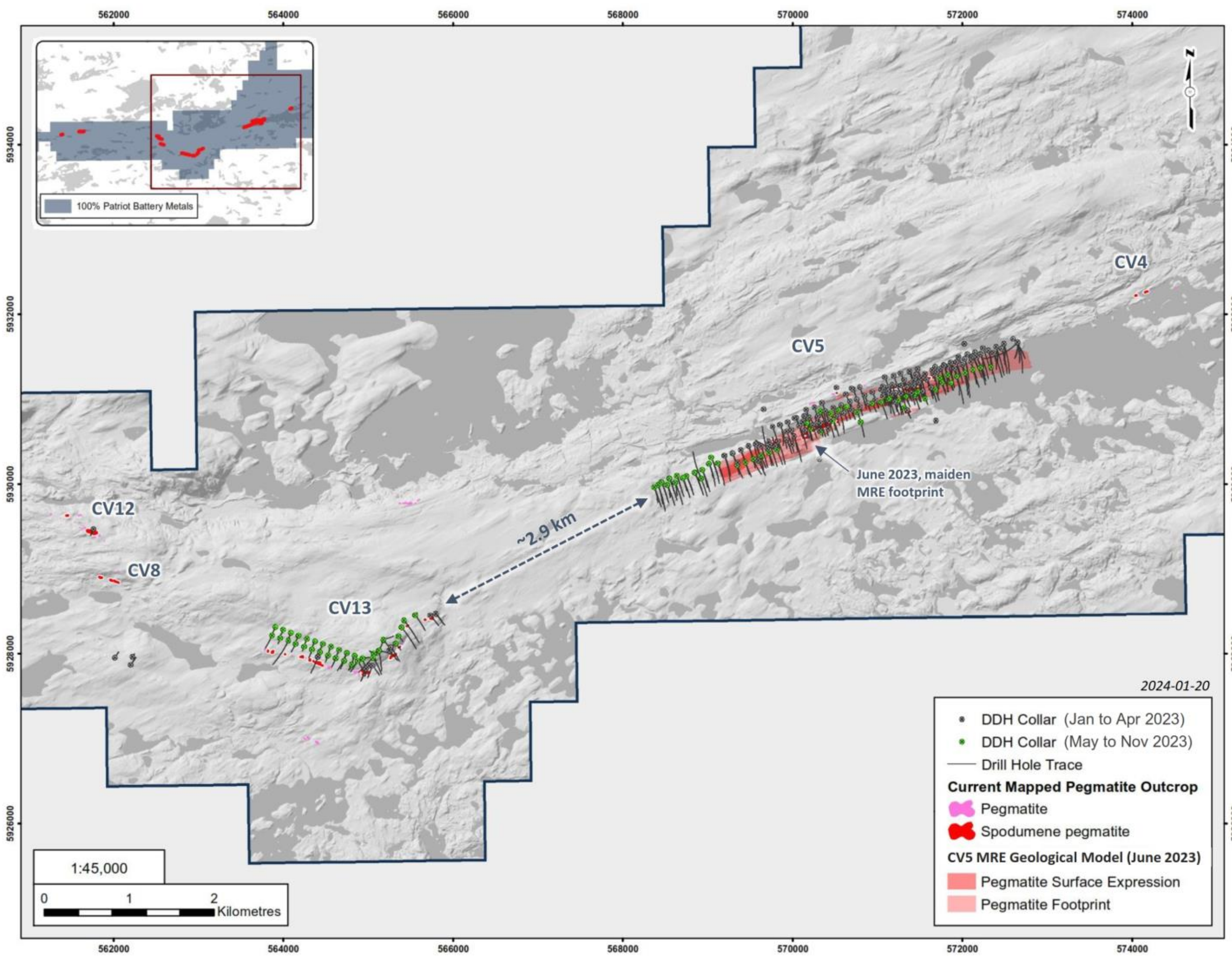



**Figure 10-11: Drill holes completed through 2023 (CV23-365) along the CV5 and CV13 corridor**

#### 10.1.4.1 CV5 Spodumene Pegmatite

During the 2023 May through November drill program, a total of 82 holes (26,625.5 m) were completed at the CV5 Spodumene Pegmatite (Figure 10-12). The main objectives of the program were to delineate the CV5 Pegmatite westwardly, complete targeted infill to improve geological confidence, and collect hydrogeological information to support a preliminary hydrological model for the CV5 area.

The drill hole plan continued to be grid-based with drill holes oriented similar to that of the prior program (south-southeasterly); however, at more varied dips due to targeted infill and hydrogeological objectives. Drill holes spacing was typically 50 m to 100 m. Drill result highlights include:

MRE infill holes:

- 172.4 m at 0.95% $Li_2O$, including 34.5 m at 1.85% $Li_2O$ (CV23-199);
- 133.9 m at 1.21% $Li_2O$, including 41.5 m at 1.52% $Li_2O$; and 42.2 m at 1.59% $Li_2O$, including 10.1 m at 3.22% $Li_2O$ (CV23-298);
- 67.1 m at 1.56% $Li_2O$, including 13.0 m at 3.44% $Li_2O$ (CV23-241);
- 63.0 m at 1.13% $Li_2O$ (CV23-230);
- 50.5 m at 1.42% $Li_2O$, including 11.4 m at 3.13% $Li_2O$; and 38.7 m at 2.06% $Li_2O$, including 15.6 m at 3.26% $Li_2O$ (CV23-285).

Westerly step-out holes:

- 46.3 m at 1.20% $Li_2O$, including 34.8 m at 1.59% $Li_2O$ (CV23-209);
- 56.6 m at 1.37% $Li_2O$, including 9.9 m at 3.58% $Li_2O$ (CV23-231);
- 50.1 m at 1.17% $Li_2O$, 38.0 m at 1.44% $Li_2O$, and 17.2 m at 2.20% $Li_2O$ (CV23-223);
- 48.4 m at 1.21% $Li_2O$, including 11.0 m at 3.42% $Li_2O$ (CV23-211);
- 29.2 m at 1.35% $Li_2O$, including 8.4 m at 3.50% $Li_2O$ (CV23-240);
- 89.5 m at 1.01% $Li_2O$, 17.9 m at 1.31% $Li_2O$, and 19.0 m at 2.56% $Li_2O$, including 11.6 m at 3.25% $Li_2O$ (CV23-246).

The drilling completed in the 2023 (May through November) program extended the strike length of the CV5 Spodumene Pegmatite by 900 m to the west for a collective strike length of 4.6 km, drill hole to drill hole, where it remains open along strike and at depth.

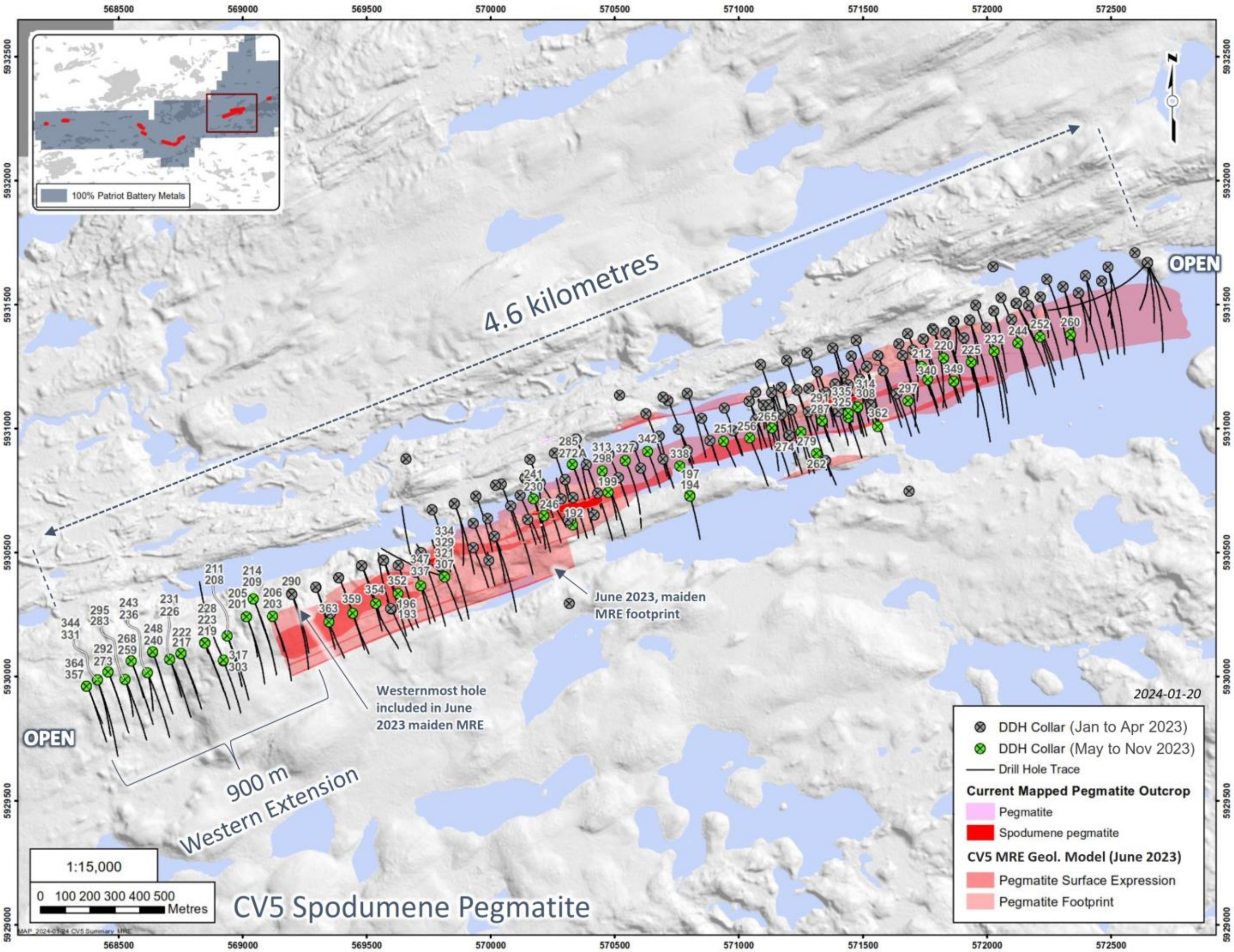



**Figure 10-12: Drill holes completed through 2023 (CV23-365) at the CV5 Spodumene Pegmatite**

#### 10.1.4.2 CV13 Spodumene Pegmatite

During the 2023 May through November drill program, a total of 74 holes (14,917.1 m) were completed at the CV13 Spodumene Pegmatite (Figure 10-13). The main objectives of the program were to follow-up on the successful initial drill testing in 2022 and further delineate the CV13 Pegmatite along strike and to depth.

The drill hole plan for the program at CV13 was more grid-based and systematic compared to the initial 2022 drilling; however, drill hole orientations were widely varied due to the orientation of the pegmatite changing along its length. Drill hole spacing was typically targeted at 100 m; however, varied from approximately 50 m to 150 m depending on the location along the trend. Drill result highlights include:

- 12.7 m at 2.46% $Li_2O$, including 7.6 m at 3.82% $Li_2O$ (CV22-191);
- 8.0 m at 2.86% $Li_2O$, including 4.3 m at 5.03% $Li_2O$ (CV23-195);
- 10.2 m at 2.70% $Li_2O$, including 5.8 m at 4.48% $Li_2O$ (CV23-198);
- 28.7 m at 1.49% $Li_2O$, including 20.4 m at 2.03% $Li_2O$ (CV23-311);
- 19.2 m at 1.74% $Li_2O$ (CV23-215);
- 22.5 m at 1.10% $Li_2O$, including 15.2 m at 1.57% $Li_2O$ (CV23-300);
- 16.1 m at 1.54% $Li_2O$, including 7.2 m at 2.57% $Li_2O$ (CV23-319);

A significant development from the program was the identification of a new high-grade zone located near-surface (~40-50 m vertical depth) near the apex of the pegmatite. Results from this zone include 12.7 m at 2.46% $Li_2O$ including 7.6 m at 3.82% $Li_2O$ (CV23-191), and 8.0 m at 2.86% $Li_2O$ including 4.3 m at 5.03% $Li_2O$ (CV23-195). Additionally, drill hole CV23-195 returned two samples assaying greater than 6% $Li_2O$ including 1.2 m at 6.41% $Li_2O$ (Patriot, 2023b).

Additionally, the widest mineralized drill intercept reported to date at the time from CV13 was returned from this program - 28.7 m at 1.49% $Li_2O$, including 20.4 m at 2.03% $Li_2O$ (CV23-311) along the east arm. This hole also returned a cumulated 71 m of pegmatite over 13 separate individual intervals, the most pegmatite encountered in drill hole at CV13 at the time, and indicates potential for additional pegmatite volume to be discovered in the area.

Through 2023, the CV13 Spodumene Pegmatite had been traced by drilling over an approximate 2.3 km strike length and remained open along strike at both ends and to depth.

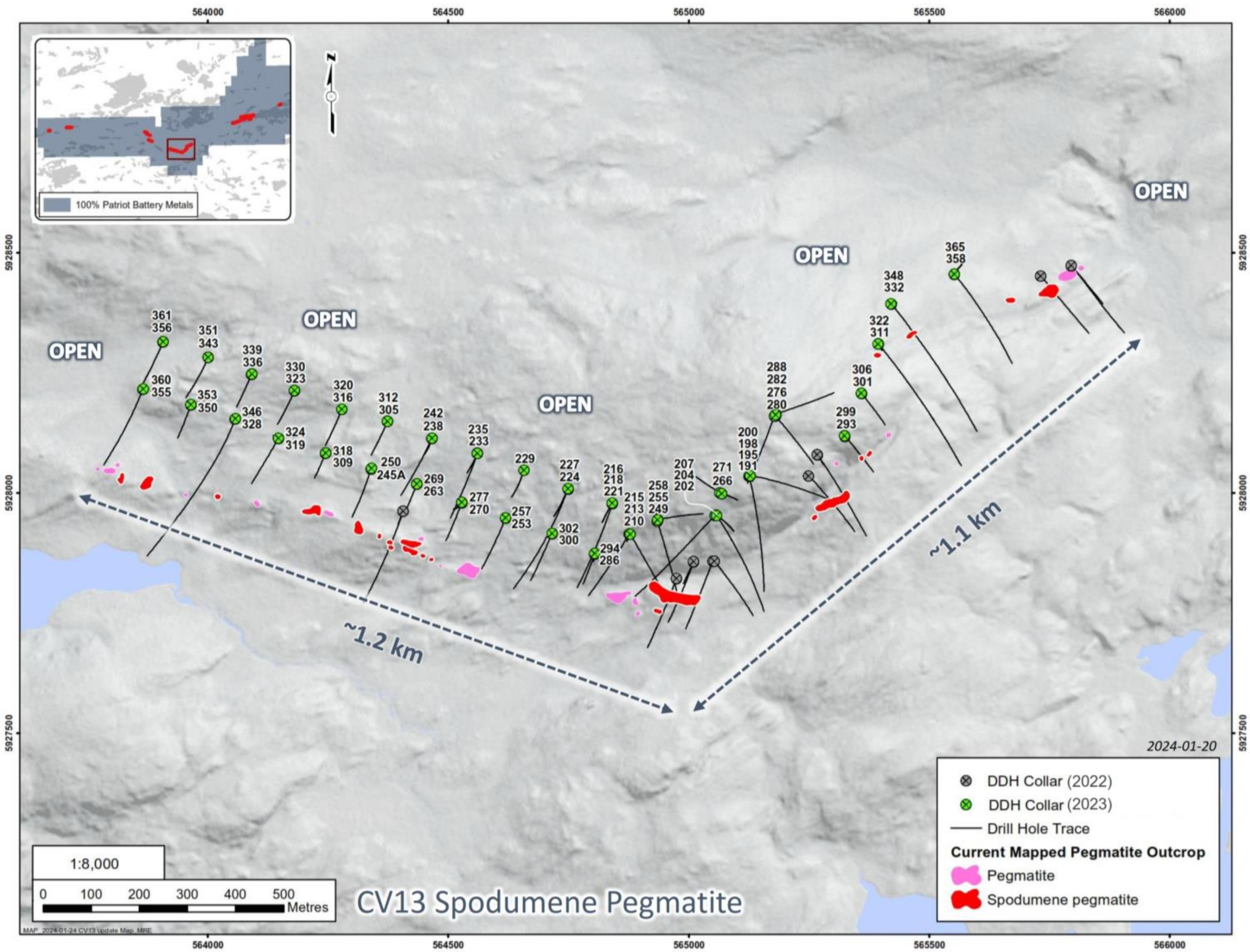



Figure 10-13: Drill holes completed through 2023 (CV23-365) at the CV13 Spodumene Pegmatite

### 10.1.4.3 CV9 Spodumene Pegmatite

During the 2023 May through November drill program, a total of 18 holes (4,071.2 m) were completed at the CV9 Spodumene Pegmatite. The program was the maiden drill testing of the Spodumene Pegmatite outcrops that define the CV9 Pegmatite at surface, with a primary objective to determine the geometry and orientation of the pegmatite system. As such, the drill plan for the program was irregular with a variety of hole orientations (strike and dip) and multiple collars completed from the same pad.

Results include:

- 99.9 m at 0.39% $Li_2O$, including 30.6 m at 0.80% $Li_2O$ (CV23-345);
- 15.7 m at 0.76% $Li_2O$, including 10.8 m at 1.00% $Li_2O$ (CV23-267);
- 17.9 m at 0.69% $Li_2O$, including 8.6 m at 1.03% $Li_2O$ (CV23-310);
- 7.7 m at 1.35% $Li_2O$ (CV23-333).

The results are encouraging and confirm widespread spodumene mineralization is present at depth at CV9. The pegmatite intersected in drill hole at CV9 is variably mineralized (typically <5% to 15% spodumene content), with strong grades (>1% $Li_2O$) demonstrated over 7 to 10+ m intervals in addition to wider and more moderately mineralized zones (e.g., 30.6 m at 0.80% $Li_2O$ in CV23-345). High grades of spodumene pegmatite were also intercepted with multiple holes returning individual sample grades over 2% $Li_2O$, including a peak sample high of 4.28% $Li_2O$ (over 0.6 m) in CV23-345 – the last drill hole of the program at CV9.

Of particular significance is the demonstrated thickening of pegmatite from <5 m to ~80 m interpreted true width at depth. This is a strong indication of overall tonnage potential in the system. Additionally, due to internal fractionation of pegmatitic melts, it is common to have strong variability in grades over short distances which may result in low to moderate grades being immediately proximal to high grades. This, coupled with the common presence of spodumene in the system, is very encouraging and supports a considerable potential for wide and well mineralized intervals of spodumene pegmatite to be present at CV9 along strike and/or at depth.

Following the maiden 2023 drill program, the interpreted orientation of the CV9 Spodumene Pegmatite is steeply dipping northerly, with a possible plunge easterly (Figure 7-30), which is similar to the general orientation of the CV5 Spodumene Pegmatite. At CV9, variably mineralized spodumene pegmatite has now been traced by drilling and outcrop over a distance of ~450 m and remains open along strike at both ends and at depth (Figure 10-16). The spodumene is typically present as centimetre (up to decimetre) size crystals hosted within a smoky quartz – feldspar pegmatite, with accessory tourmaline and mica (Figure 10-14 and Figure 10-15).


**Figure 10-14: Spodumene pegmatite from drill hole CV23-267. Approx. 1.0% $Li_2O$ over interval (70.0 m to 78.6 m)**


**Figure 10-15: Spodumene pegmatite from drill hole CV23-333, including 7.7 m at 1.35% $Li_2O$ (146.0 m to 153.7 m)**

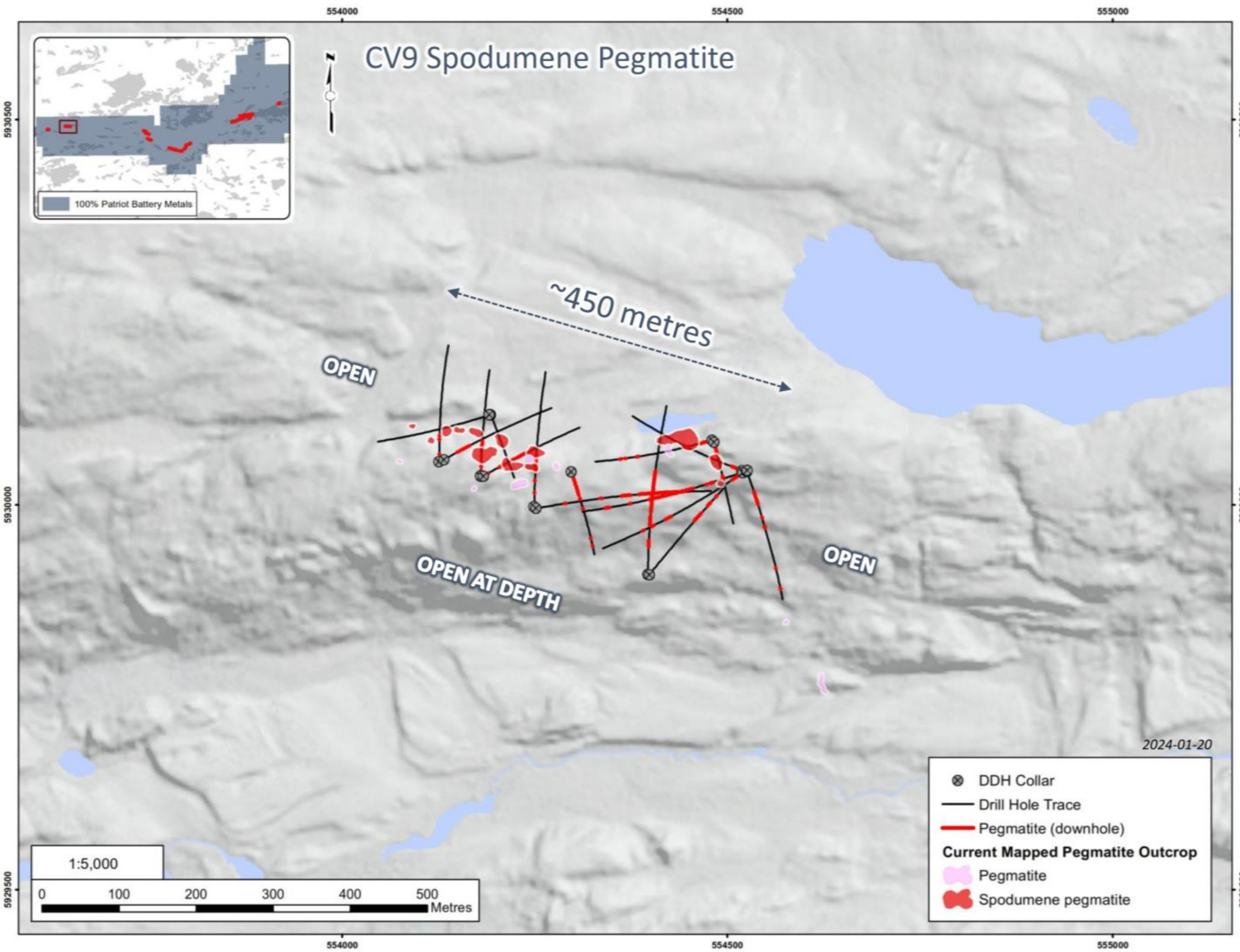



**Figure 10-16: Drill holes completed through 2023 at the CV9 Spodumene Pegmatite**

### 10.1.5 2024 Drill Program

In January 2024, the Company commenced a drill campaign on the Property focused on the CV5 and CV13 spodumene pegmatites. Drilling completed through to the end of the winter-spring program (i.e., CV24-526) has been incorporated into the updated Shaakichiuwaanaan MRE. Over this period (winter-spring 2024) a total of 166 drill holes, totalling 62,667.7 m, were completed across the CV5 and CV13 spodumene pegmatites (Figure 10-2 and Figure 10-4).

#### 10.1.5.1 CV5 Spodumene Pegmatite

During the 2024 winter/spring drill program, a total of 121 holes (51,110.8 m) were completed at the CV5 Spodumene Pegmatite (Figure 10-2). The primary focus of the program was infill drilling at CV5, with the overarching objective to improve the confidence of the geological model to support an upgrade in confidence from the Inferred category to the Indicated category in a future Mineral Resource Estimate. No step-out holes along strike were completed at CV5 during the program.

The drilling targeted ~50 m spaced pegmatite pierce points, which was anticipated to support conversion to the Indicated category when coupled with modify factors. Drill results highlights include:

- 123.3 m at 1.66% $Li_2O$, including 54.9 m at 2.50% $Li_2O$ (CV24-374);
- 124.9 m at 1.72% $Li_2O$, including 13.4 m at 4.04% $Li_2O$ (CV24-473).
- 122.5 m at 1.42% $Li_2O$, including 35.8 m at 2.15% $Li_2O$ (CV24-405);
- 135.7 m at 1.02% $Li_2O$, including 44.7 m at 2.03% $Li_2O$ (CV24-410);
- 112.7 m at 1.20% $Li_2O$, including 21.7 m at 1.93% $Li_2O$ (CV24-503);
- 100.8 m at 1.97% $Li_2O$, including 69.8 m at 2.52% $Li_2O$ (CV24-392);
- 90.2 m at 1.29% $Li_2O$ and 48.5 m at 1.25% $Li_2O$ (CV24-377);
- 94.9 m at 1.10% $Li_2O$, including 26.1 m at 2.16% $Li_2O$ (CV24-378);
- 70.1 m at 2.44% $Li_2O$, including 46.9 m at 3.53% $Li_2O$ or 16.1 m at 5.02% $Li_2O$ (CV24-401A);
- 63.7 m at 2.68% $Li_2O$, including 35.6 m at 3.78% $Li_2O$ (CV24-404).

The program was successful in further delineation of the CV5 Spodumene Pegmatite with results generally in line with expectations. Several new mineralized pegmatite veins were encountered at depth at various locations at CV5 and highlight the strong potential remaining for additional discovery at CV5.

Through winter/spring program, the CV5 Spodumene Pegmatite had been traced by drilling over a strike length of at least 4.6 km (drill hole to drill hole) and remains open along strike at both ends and to depth along a significant portion of its length. Mineralized pegmatite at CV5 has been traced to within approximately 1.5 km of the CV4 Spodumene Pegmatite to the east and 2.9 km of the CV13 Spodumene Pegmatite to the west (Figure 10-17). A detailed discussion on the geology of the CV5 Pegmatite, included cross-sections, is presented Section 7.4.1.1 – CV5 Spodumene Pegmatite.

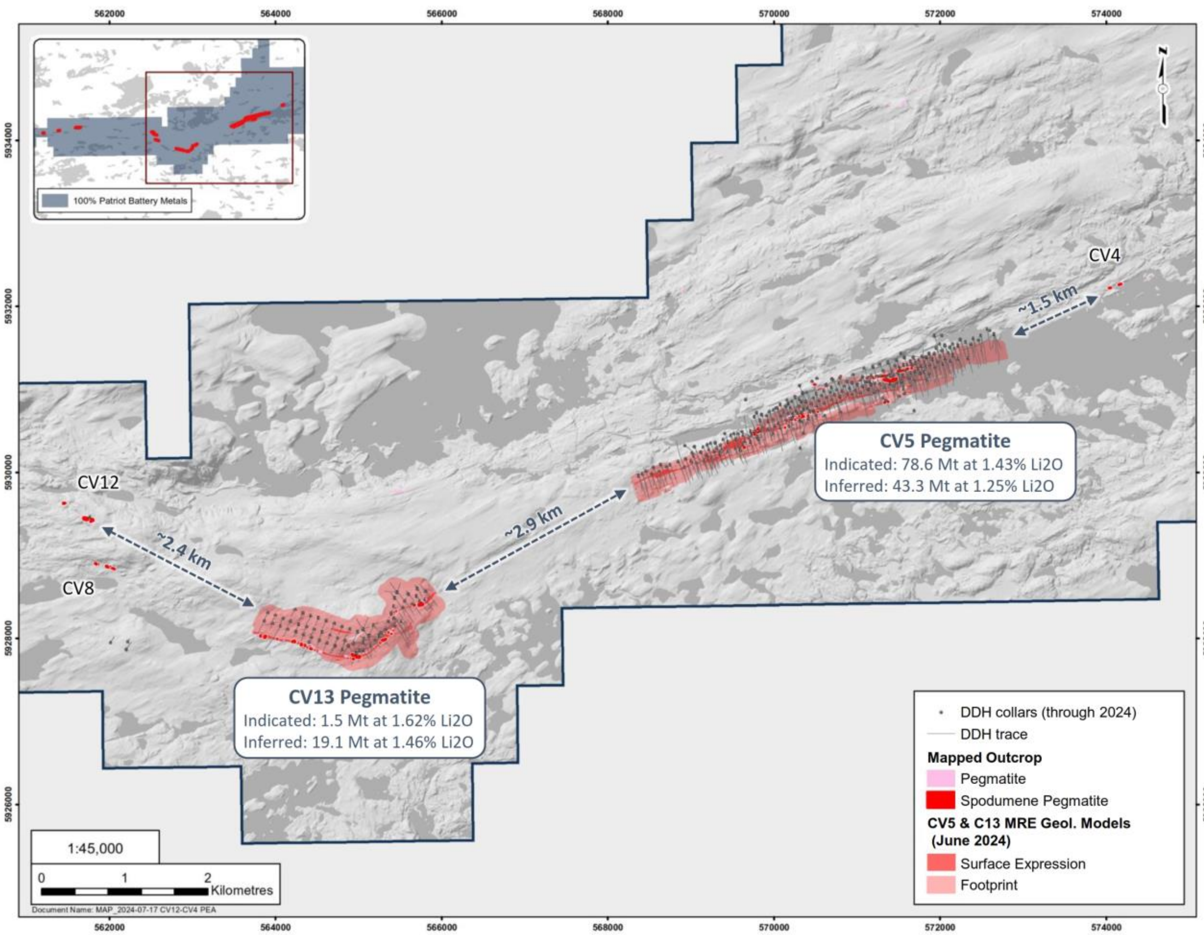



**Figure 10-17: Drill holes completed through April 2024 at the at the CV5 and CV13 spodumene pegmatites**

#### 10.1.5.2 CV13 Spodumene Pegmatite

During the 2024 winter/spring drill program, a total of 45 holes (11,556.9 m) were completed at the CV13 Spodumene Pegmatite (Figure 10-4). The drilling at CV13 focused on further delineation of the pegmatite to depth along the eastern and western arms ahead of a maiden MRE.

Drill hole spacing and orientation followed that of the prior 2023 drilling. Drill result highlights include:

- 51.7 m at 1.77% $Li_2O$, including 9.7 m at 5.16% $Li_2O$ (CV24-525);
- 34.4 m at 2.90% $Li_2O$, including 21.9 m at 3.58% $Li_2O$ (CV24-470);
- 33.4 m at 2.40% $Li_2O$, including 11.1 m at 4.33% $Li_2O$, and 17.6 m at 1.89% $Li_2O$, including 5.6 m at 3.40% $Li_2O$ (CV24-507);
- 43.2 m at 1.10% $Li_2O$, including 12.9 m at 3.06% $Li_2O$ (CV24-498);
- 27.1 m at 1.02% $Li_2O$ including 7.6 m at 2.39% $Li_2O$ (CV24-513);
- 32.1 m at 0.78% $Li_2O$, including 10.7 m at 2.17% $Li_2O$ (CV24-499);
- 33.4 m at 2.40% $Li_2O$, including 11.1 m at 4.33% $Li_2O$, and 17.6 m at 1.89% $Li_2O$, including 5.6 m at 3.40% $Li_2O$ (CV24-507);
- 43.2 m at 1.10% $Li_2O$, including 12.9 m at 3.06% $Li_2O$ (CV24-498);
- 32.1 m at 0.78% $Li_2O$, including 10.7 m at 2.17% $Li_2O$ (CV24-499).

The program was the most successful to date at CV13. Along the western arm, the pegmatite was extended down-dip over 400 m, moreover, along the eastern arm the high-grade Vega Zone was discovered. At the end of the program, the Vega Zone had been delineated to be relatively flat-lying to shallow dipping and near-surface (starting at ~100 m vertical depth from surface), covering an area of approximately 380 by 220 m (drill hole intercept to drill hole intercept) with an interpreted true thickness of ~8 to 30+ m, hosted within a wider moderately to strongly mineralized pegmatite body. The Vega Zones was discovered near the end of the program and remains open.

Through winter/spring program, the CV13 Spodumene Pegmatite had been traced by drilling over a strike length of at least 2.3 km (drill hole to drill hole) and remains open along strike at both ends and to depth along a significant portion of its length. Mineralized pegmatite at CV13 has been traced to within approximately 2.9 km of the CV5 Spodumene Pegmatite to the northeast and 2.4 km of the CV12 Spodumene Pegmatite to the northwest (Figure 10-17). A detailed discussion on the geology of the CV13 Pegmatite, included cross-sections, is presented Section 7.4.1.2 – CV13 Spodumene Pegmatite.

## 10.2 Structure

To date, no oriented drill coring has been completed; however, downhole optical and acoustic televiewer surveys have been completed on multiple holes to assess overall structure of the CV5 and CV13 Spodumene Pegmatites. The surveying was completed by DGI Geoscience Inc. over multiple periods. The data has guided the geological model supporting the Shaakichiuwaanaan Mineral Resource Estimate.

## 10.3 Collar Survey

Each drill hole collar (CF21-001 through CV24-526) was surveyed with an RTK tool (Topcon GR5 or Trimble Zephyr 3), with some minor exceptions that were surveyed using a handheld GPS (Garmin GPSMAP 64s) only. All collar survey data has been validated by the project geologists on site, and by the database lead.

## 10.4 Downhole Deviation Survey

Downhole deviation surveys for each drill hole were completed with a Devico DeviGyro tool (2021 holes), Reflex Gyro Sprint IQ tool (2022, 2023, and 2024 holes), Axis Champ Gyro (2023 and 2024 holes), or Reflex OMNI Gyro Sprint IQ (2024 holes). Surveys were conducted in continuous mode with data collected at approximate 3–5 m intervals. The use of the north seeking gyro tool system negated potential deflection issues arising from minor but common pyrrhotite within the host amphibolite. All collar and downhole deviation data have been validated by the project geologists on site, and by the database lead.

## 10.5 Core Logging and Sampling Procedures

Procedures at the drill followed industry best practices with drill core placed in either 4 or 5 ft long, typically flat, square-bottom wooden boxes, with the appropriate hole and box ID noted and block depth markers placed in the box. Core recovery typically exceeds 90%. Once full, the box was fibre-taped shut with wooden lids at the drill and box slung directly to Mirage Lodge for processing (2021) or north by helicopter to a laydown area on the Trans-Taiga Road (KM-270 or KM-277), where they were then transported by truck to Mirage Lodge for processing (2022 and 2023). In 2023 (winter) and 2024 the core was also transported by winter / all-season road from the CV5 Pegmatite to Mirage Lodge for processing.

Upon receipt at the core shack at Mirage Lodge, the core box information was confirmed and all drill cores were pieced together, oriented to maximum foliation. The core was then metre-marked, geotechnically logged (TCR, RQD, ISRM, and Q-Method (since mid-winter 2023)), alteration logged, structure logged, geologically logged (rock type), and sample logged and marked on an individual sample basis. The logging of drill core was qualitative by nature, and included estimates of spodumene grain size, inclusions, and model mineral estimates. The drill core was then, prior to sampling, wet- and dry-photographed for a digital record of all cores received in the core shack.

These logging practices meet current industry standard practices and are of appropriate detail to support a Mineral Resource estimation. All protocols employed are considered appropriate for the sample type and nature of mineralization and are considered the optimal approach for maintaining representativeness in sampling. Further details are provided below.

### 10.5.1 2021 Drill Program

Core sample collection was guided by lithology, mineralogy, and textural changes, as determined during geological logging (i.e., by a geologist). As target mineralization/rock type would typically be visible to the naked eye – chalcopyrite for the Maven and pegmatite for the CV Trend – a protocol was set whereby the sampling could continue at least 10 m on either side of the visually identified mineralized zone with the geologist able to extend sampling at their discretion. Sample lengths targeted 1.0 m within a mineralized zone and was extended to 1.5 m outside of mineralized zones. If target mineralized sample zones were interfingered with interpreted unmineralized zones over short intervals, the entire section was sampled. All pegmatite encountered in drill hole was sampled, irrespective of perceived mineralization.

Samples that were marked were cut in half using a core saw with one half collected for analysis, and the other half remaining in the core box for reference. Where a duplicate sample was indicated, the half core remaining in the box was cut in half again, producing two quarter-core pieces with one collected for analysis and the other remaining in the core box for reference. In addition to quarter-core duplicates, the QA/QC program included systematic insertion of quartz blanks, and certified reference materials.

Samples collected for analysis were placed in a labelled heavy-duty plastic sample bag with the corresponding sample tag. The bags were closed with zip ties and catalogued before being packaged in labelled and sealed rice sacs, which were placed into a pallet-size heavy-duty sac, ready to be transported to the lab. The pallets of samples were loaded onto regularly scheduled truck shipments from Mirage Lodge by Kepa Transport and transported by ground to Activation Laboratories in Ancaster, Ontario. Samples were tracked during shipment along with chain of custody documentation. Upon arrival at the laboratory, the samples were cross-referenced with the shipping manifest to confirm all samples were accounted for and had not been tampered with.

All unsampled 2021 drill core remaining in the core boxes was either flown back to the Property for long-term storage (cross-stacked), or in long-term storage at the Company's Shaakichiuwaanaan Camp. All analytical reject and pulp material is currently stored at Shaakichiuwaanaan Camp.

### 10.5.2 2022, 2023, & 2024 Drill Programs

For the 2022, 2023, and 2024 drill programs, current as to the date of this Report, the protocols outlined for the 2021 drill program were continued with only minor adjustments and refinements. Additionally, all drilling in 2022, 2023, and 2024 focused solely on lithium pegmatite, with no base or precious metal targets drill tested.

Core sample collection was guided by lithology, mineralogy, and textural changes, as determined during geological logging (i.e., by a geologist). All pegmatite intervals were sampled in their entirety (half-core), whether spodumene mineralization was noted or not (in order to ensure an unbiased sampling approach) in addition to ~1 m to 3 m of sampling into the adjacent host rock (dependent on pegmatite interval length) to "shoulder" the sampled pegmatite. The geologist may extend this shoulder distance at their discretion based on logging observations. If target mineralized sample zones were interfingered with interpreted unmineralized zones over short intervals, the entire section was sampled. All pegmatite encountered in drill hole was sampled, irrespective of perceived mineralization.

The targeted minimum individual sample length was typically 0.3 m to 0.5 m and the maximum sample length was typically 2.0 m. Targeted individual pegmatite sample lengths are 1.0 m to 1.5 m. Additionally, samples of the host, non-pegmatite rock unit(s) were collected at systematic intervals (one sample every ~20 m) throughout the hole, in addition to samples of interest as determined by the logging geologist.

All sample marked drill core was saw-cut using an Almonte automatic core saw, with one half-core collected for assay, and the other half-core remaining in the box for reference. Where a duplicate sample was indicated (collected through only hole CV23-365), the half core remaining in the box was cut in half again, producing two quarter-core pieces with one collected for analysis and the other remaining in the core box for reference. In addition to quarter-core duplicates, the QA/QC program included systematic insertion of quartz blanks, and certified reference materials.

A new addition to the protocol for in 2022 was the systematic collection of specific gravity ("SG") measurements using the water immersion method. SG measurements were collected for the entire half-core sample interval at a rate of approximately one sample every 4 m to 6 m and over each rock type encountered.

Samples collected for analysis were placed in a labelled heavy-duty plastic sample bag with the corresponding sample tag. The bags were closed with zip ties and catalogued before being packaged in labelled and sealed rice sacs, which were placed into a pallet-size heavy-duty sac, ready to be transported to the lab.

For 2022 drill core, the pallets of samples were loaded onto regularly scheduled truck shipments from Mirage Lodge, by third-party service provider Kepa Transport, and transported by ground to SGS Canada Laboratories in Lakefield, Ontario (vast majority), Sudbury, Ontario (CV22-028, 029, 030), or Burnaby, British Columbia (CV22-031, 032, 033, and 034). Samples were tracked during shipment along with chain of custody documentation. Upon arrival at the laboratory, the samples were cross-referenced with the shipping manifest to confirm all samples were accounted for and had not been tampered with.

For 2023 drill core, the pallets of samples were shipped 'on-demand' by ground transport, by the drill contractor (Forage Fusion Drilling), directly to SGS Canada's laboratory in Lakefield, Ontario, (CV23-105, 106, and 107) and Val-d'Or, Québec, (CV23-108 through 365). Samples were tracked during shipment along with chain of custody documentation. Upon arrival at the laboratory, the samples were cross-referenced with the shipping manifest to confirm all samples were accounted for and had not been tampered with.

For 2024 drill core, the pallets of samples were shipped 'on-demand' by ground transport, by the drill contractor (Forage Fusion Drilling), directly to SGS Canada's laboratory in Raddison, Québec, or Val-d'Or, Québec. Samples were tracked during shipment along with chain of custody documentation. Upon arrival at the laboratory, the samples were cross-referenced with the shipping manifest to confirm all samples were accounted for and had not been tampered with.

All unsampled drill core remaining in the core boxes are either in temporary storage at Mirage Lodge or at the Company's Shaakichiuwaanaan Camp. All analytical rejects and pulp material are currently in temporary storage at SGS Canada's lab facilities or in long-term storage at the Company's Shaakichiuwaanaan Camp.

## 10.6 Qualified Person's Opinion

The QP is of the opinion that the drilling and logging procedures and protocols employed by the Company meet acceptable industry standards and are sufficient to support geological and Mineral Resource modelling.

# 11. Sample Preparation, Analyses, and Security

## 11.1 Sample Preparation

### 11.1.1 Rock and Channel Sampling Programs

Channel sampling followed best industry practices with a 3-cm to 5-cm wide, saw-cut channel completed across the pegmatite as practical, perpendicular to the interpreted pegmatite strike. Samples were collected at ~1-m contiguous intervals with the channel bearing noted, and GPS coordinates were collected at the start and end points of the channel.

The rock type and mineralogy of each channel sample was logged on site at the time of collection. Channel samples were not geotechnically logged by nature; however, channel recovery was effectively 100%.

All rock (2023) and channel (2023 and 2024) samples collected for analysis were placed in a labelled heavy-duty plastic sample bag with the corresponding sample tag and closed with zip ties. Samples were transported by road or helicopter to Shaakichiuwaanaan Camp or Mirage Lodge, catalogued, and packaged in labelled and sealed rice sacks for transport to the analytical lab. Samples were then shipped directly from Shaakichiuwaanaan Camp or Mirage Lodge to SGS Canada's laboratory in Val-d'Or, Québec, using a dedicated service provider contracted by the Company. The Company largely relied on internal laboratory quality assurance/quality control ("QA/QC") for its surface rock samples; however, the occasional certified reference material ("CRM") and blank were submitted with sample batches. For the 2023-2024 channel samples, a protocol was followed which included systematic insertion of blanks and CRMs in sample batches submitted to the lab.

Upon receipt at the SGS Canada laboratory (2023 and 2024), each sample was sorted and catalogued. An updated standard drill core sample preparation was then completed, which included drying at 105 °C, crushing to 90% passing 2 mm, riffle split 250 g, and pulverizing 85% passing 75 microns (package PRP89).

The primary labs used during the surface exploration programs have the relevant accreditations (ISO 17025) and are independent of the Company.

### 11.1.2 2023-2024 Drill Program (May 2023 to April 2024, holes CV23-191 to CV24-526)

Core samples collected from the 2023-2024 drill holes completed subsequent to those included in the 2023 CV5 MRE (i.e., CV23-191 to Cv24-526) were shipped to SGS Canada's laboratory in Val-d'Or, Québec, or Radisson, Québec, for sample analysis preparation.

Upon receipt at the lab, each sample was sorted and catalogued. An updated standard drill core sample preparation was then completed which included drying at 105 °C, crushing to 90% passing 2 mm (instead of the prior 75% passing 2 mm), riffle split 250 g, and pulverizing 85% passing 75 microns (package PRP89).

The primary lab (SGS Canada) used for the 2023-2024 core analysis is a commercial lab with the relevant accreditations (ISO 17025) and is independent of the Company.

## 11.2 Analytical Procedure

### 2023-2024 Drill Program

Subsequent to the 2023 CV5 MRE, all the 2023-2024 drill program core sample pulps were shipped by air, from SGS Canada's Val-d'Or, Québec, or Radisson, Québec, preparation facility to SGS Canada's laboratory in Burnaby, British Columbia, where the samples were homogenized and subsequently analyzed for multi-element (including Li and Ta) using sodium peroxide fusion with ICP-AES/MS finish (codes GE_ICP91A50 and GE_IMS91A50). The analytical package had a relatively high detection limit for Li (5%), so overlimit analyses were not required. Overlimits for Cs and Rb, where requested, were determined by acid digestion for alkaline metals ("AAS"), and Ta by borate fusion XRF.

The primary lab (SGS Canada) used for the 2023-2024 core analysis is a commercial lab with the relevant accreditations (ISO 17025) and is independent of the Company and vendor. Further information detailing the laboratory's analytical methods, including detection limits, is available on their website (SGS Canada, 2022) as well as by direct request.

## 11.3 Quality Assurance/Quality Control

### 11.3.1 Channel Sample Program

A total of 430 samples, totalling 218.4 m, were collected from channel samples during the 2023-2024 program and were included in the 2024 MRE. A protocol was followed which included systematic insertion of blanks and CRMs in sample batches submitted to the lab.

### 11.3.2 2023-2024 Drill Program (Holes CV23-191 to CV24-526)

SGS Canada implements routine QA/QC protocols during internal analysis. These are routine procedures that consist of using pulp duplicates for repeat analysis and internal CRMs.

In addition to the standard internal laboratory QA/QC, the Company implemented a QA/QC protocol, following industry best practices, into the program. This protocol included systematic insertion of quartz blanks and CRMs into sample batches. Additionally, analysis of pulp-split and coarse-split (through hole CV23-365 only) sample duplicates were completed at the primary laboratory (SGS Canada) to assess analytical precision at different stages of the laboratory preparation process, and pulp-split duplicates prepared at the primary lab for subsequent check analysis and validation at an external (secondary) laboratory (ALS Canada).

Throughout the program, the Company followed the same QA/QC protocols in place from the prior program, with the exception of quarter-core and course-split duplicates no longer being collected after CV23-190 and CV23-365, respectively. A review of the existing data set determined that the quarter-core and coarse-split duplicates were no longer required as part of its QA/QC protocols.

#### 11.3.2.1 Blanks

Blanks consisted of an approximate 0.4 kg to 0.5 kg sample of ‘coarse silica blank material’ from OREAS, at a size of approximately 0.5 cm to 1 cm per piece silica blank. A total of 1,042 quartz blanks were submitted as control samples over the 2023-2024 drill program.

For lithium (Figure 11-1; lower detection limit of 10 ppm with GE_ICP91A50 method), the trend was around 13 ppm for the blank. At 3x the lower detection limit (30 ppm) a warning was issued, and at 10x the detection limit (100 ppm) the assay failed. When an assay failed, a request to re-assay five samples before and after was made to the lab. For this drill program, one sample failed the lithium 10x detection limit threshold.

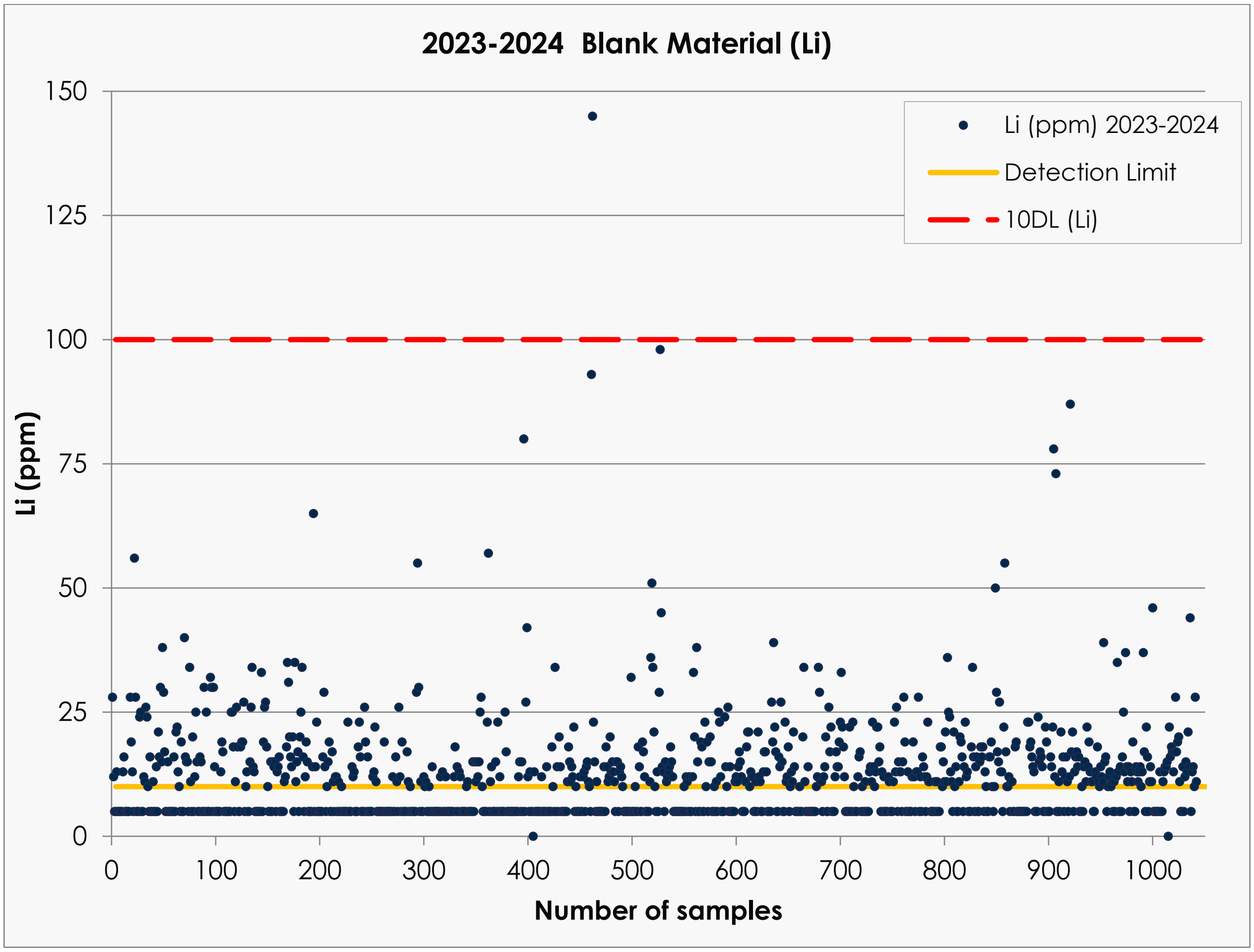



**Figure 11-1: Blank sample results (Li) from the 2023-2024 drilling campaign;**

For tantalum with a detection limit of 0.5 ppm with GE_IMS91A50 method), the decision was to set the failed values at 10 times the detection limit (5 ppm). When an assay failed, a request to re-assay five samples before and after was made to the lab. For this drill program, three sample failed the tantalum 10x detection limit threshold.

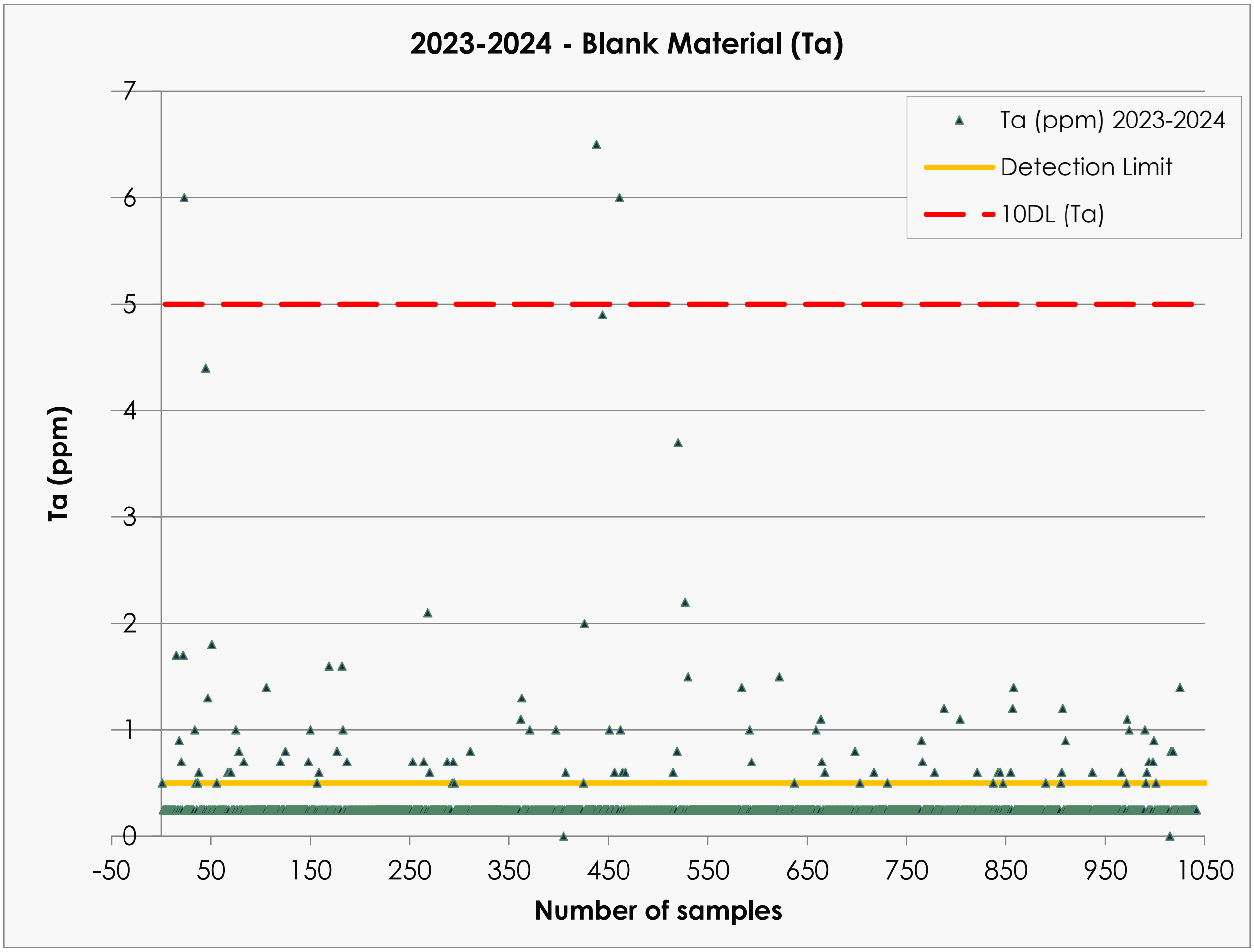



**Figure 11-2: Blank sample results (Ta) from the 2023-2024 drilling campaign**

### 11.3.2.2 Certified Reference Materials

Several CRMs were used during the 2023-2024 drill program – AMIS0342, AMIS0355, and AMIS0565 (Table 11-1). In its procedure, Patriot's geologists set a warning when an element was ± 2 standard deviations, and the element was considered failed if above ± 3 standard deviations. Failing rate is minimal for the 2023-2024 drill program.

Table 11-1: Certified reference materials used in the 2023-2024 drill program

| Standard (CRM) | Standard Supplier | Laboratory | Certified Lithium Value (ppm) | Quantity Inserted | Mean Grade (Li ppm) | Lower Process Limit (Mean - 3SD) | Upper Process Limit (Mean - 3SD) | Failed (Outliers) | (%) Passing Quality Control |
|---|---|---|---|---|---|---|---|---|---|
| AMIS0342 | AMIS | SGS | 1,612 | 337 | 1,704 | 1,454 | 1,955 | 1 | 99.7 |
| AMIS0355 | AMIS | SGS | 7,268 | 299 | 7,507 | 6,253 | 8,761 | 1 | 99.7 |
| AMIS0565 | AMIS | SGS | 5,424 | 330 | 5,562 | 4,860 | 6,264 | 3 | 99.1 |
| **Total** | | | | **966** | | | | **5** | 99.5 |

| Standard (CRM) | Standard Supplier | Laboratory | Certified Tantalum Value (ppm) | Quantity Inserted | Mean Grade (Ta ppm) | Lower Process Limit (Mean - 3SD) | Upper Process Limit (Mean - 3SD) | Failed (Outliers) | (%) Passing Quality Control |
|---|---|---|---|---|---|---|---|---|---|
| AMIS0342 | AMIS | SGS | 169 | 337 | 171 | 120 | 222 | 0 | 100 |
| AMIS0355 | AMIS | SGS | 214 | 299 | 219 | 93 | 345 | 1 | 99.7 |
| AMIS0565 | AMIS | SGS | 46 | 330 | 46 | 4 | 88 | 0 | 100.0 |
| **Total** | | | | **966** | | | | **1** | 99.9 |

#### 11.3.2.3 Pulp Duplicates

A total of 1,116 pulp duplicates were collected from the 2023-2024 drill program (Figure 11-3 and Figure 11-4).

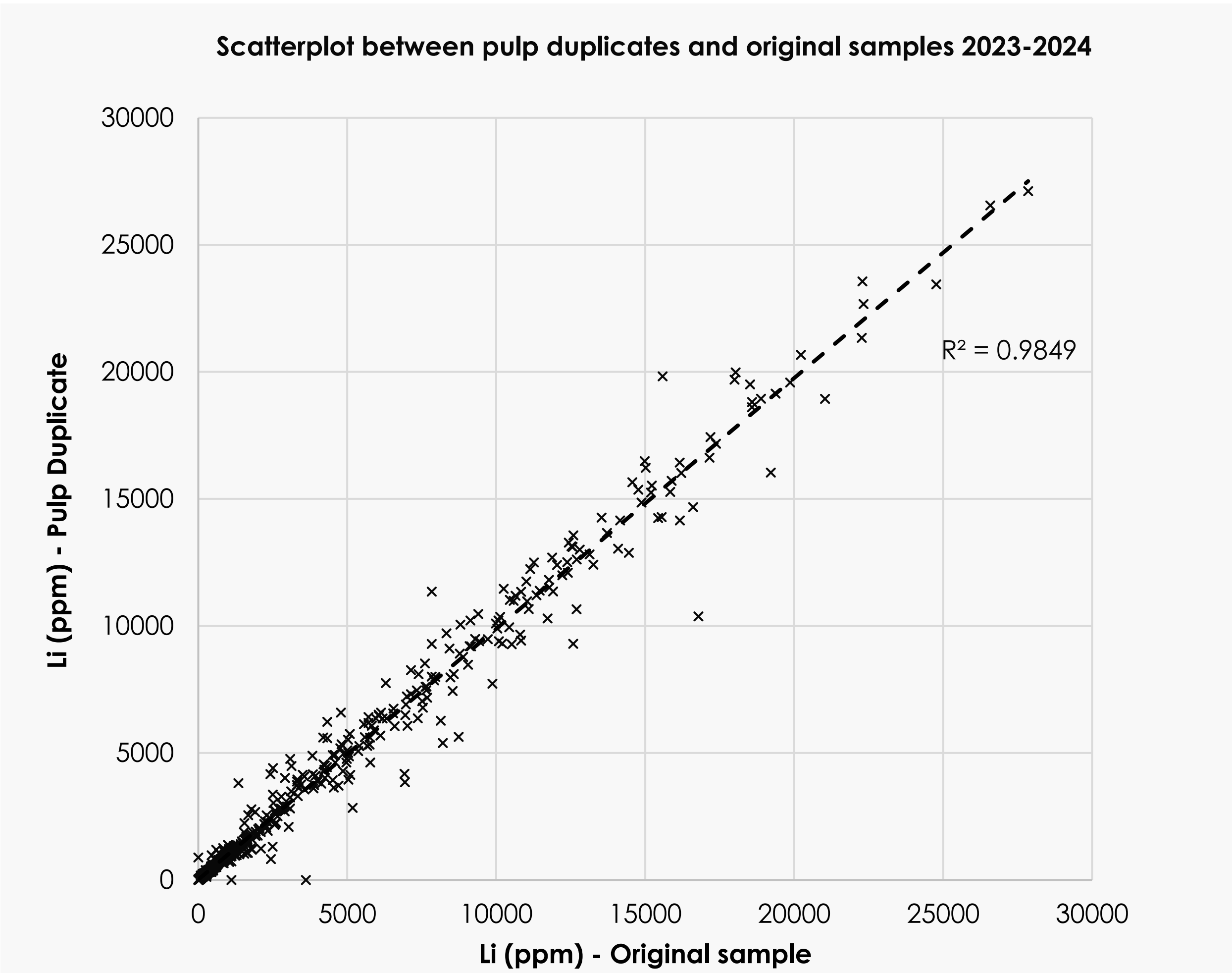



**Figure 11-3: Pulp duplicates (Li) for the 2023-2024 program**

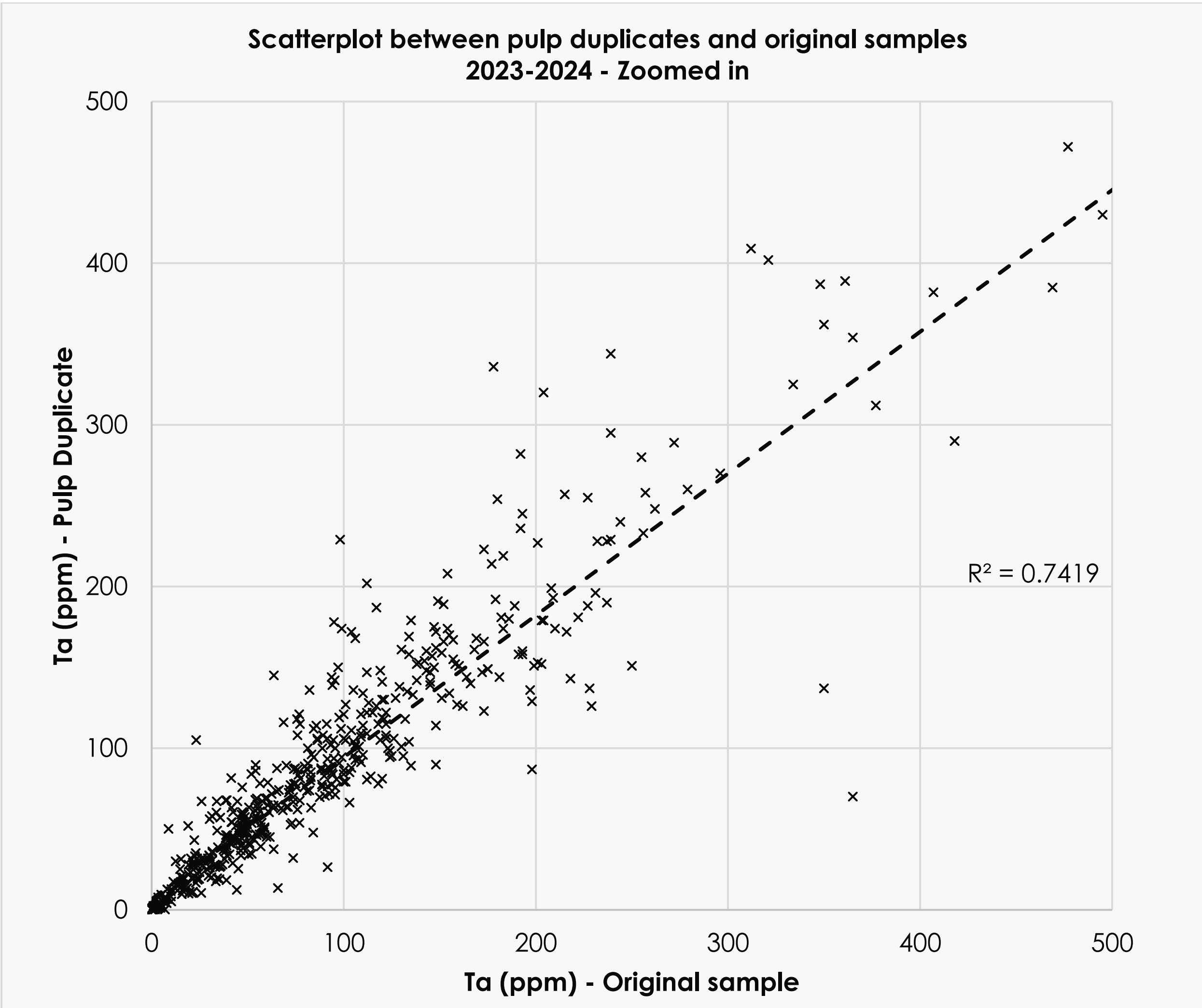



**Figure 11-4: Pulp duplicates (Ta) for the 2023-2024 program**

For both elements, the coefficient of determination is good, which shows a good reproducibility between the original samples and the duplicates. Although, for tantalum, pulp duplicate seems systematically lower than the original assays …

### 11.3.2.4 External Pulp Duplicates (secondary lab check)

A total of 1,115 pulp-split duplicates, created at the primary laboratory (SGS Canada) from core samples collected from the 2023-2024 drill program (at the CV5 and CV13 pegmatites), were submitted for check analysis to ALS Canada's Vancouver, British Columbia, laboratory. Upon receipt at ALS Canada, the pulp samples were homogenized via manual sheet rolling (package ROL-21) and analyzed by ICP-MS following a sodium peroxide fusion (package ME-MS89L). As of the effective date, 737 assays were received, and scatterplots were created with that subset (Figure 11-5 and Figure 11-6).

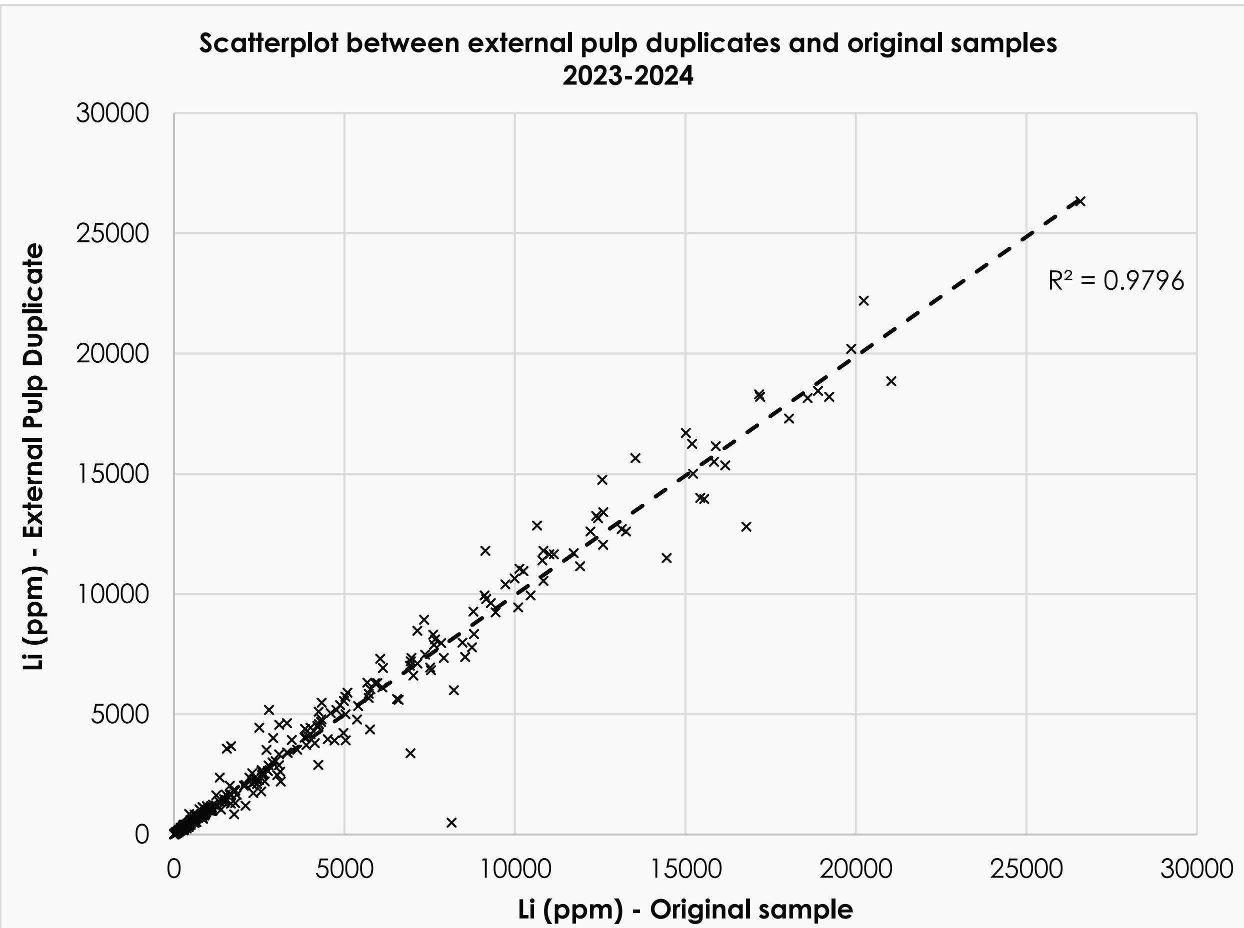



**Figure 11-5: External pulp duplicates (Li) for the 2023-2024 program**

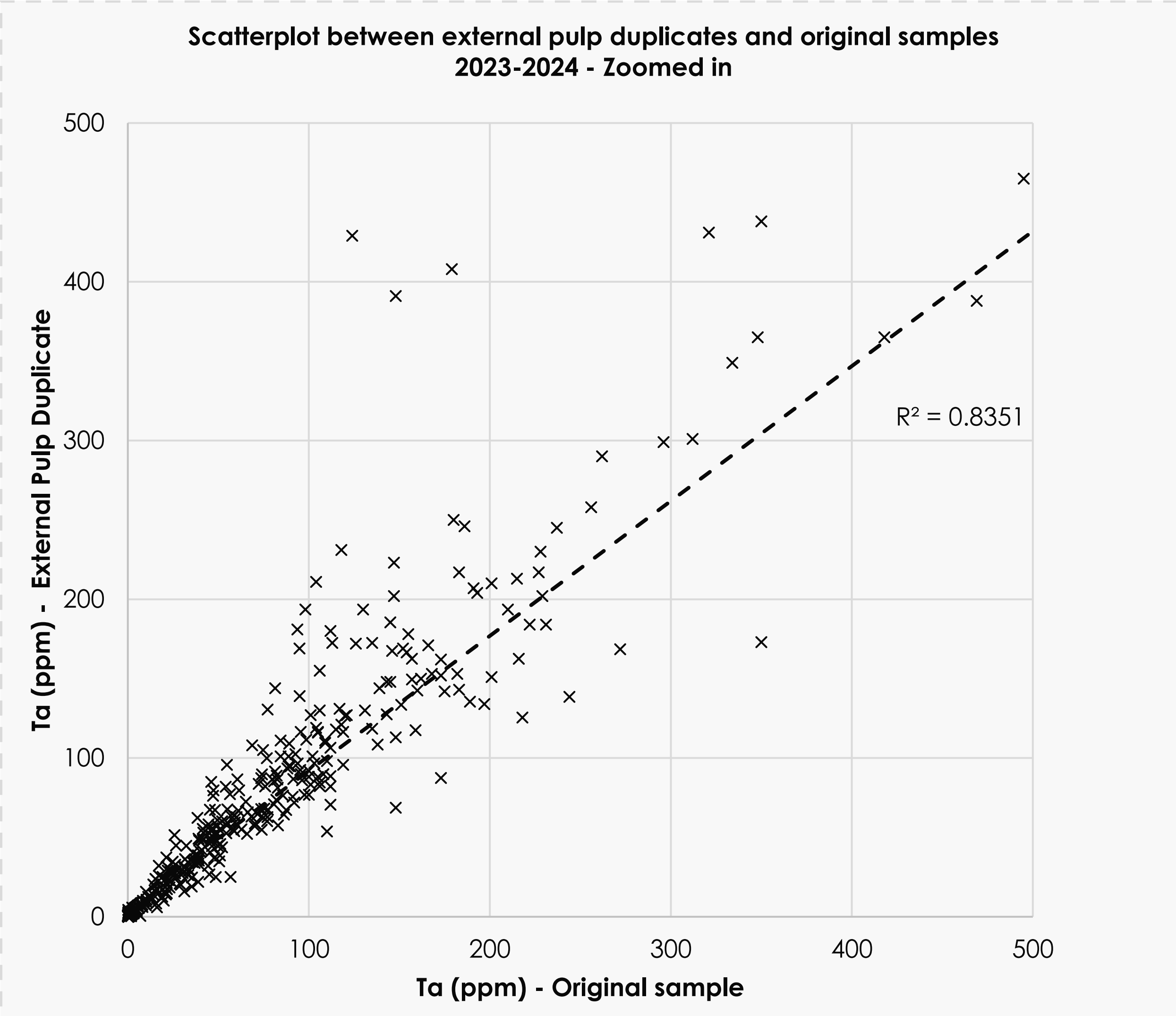



**Figure 11-6: External pulp duplicates (Ta) for the 2023-2024 program**

For lithium, the coefficient of determination is excellent and shows excellent reproducibility between both laboratories. For tantalum, the correlation between both laboratories is good with a positive bias to the primary laboratory.

### 11.3.2.5 Reject Duplicates

A total of 494 coarse reject duplicates were complete during the 2023 program (Figure 11-7 and Figure 11-8). For both element the coefficient of determination was good. Analysis of coarse reject duplicates was discontinued following the 2023 program.

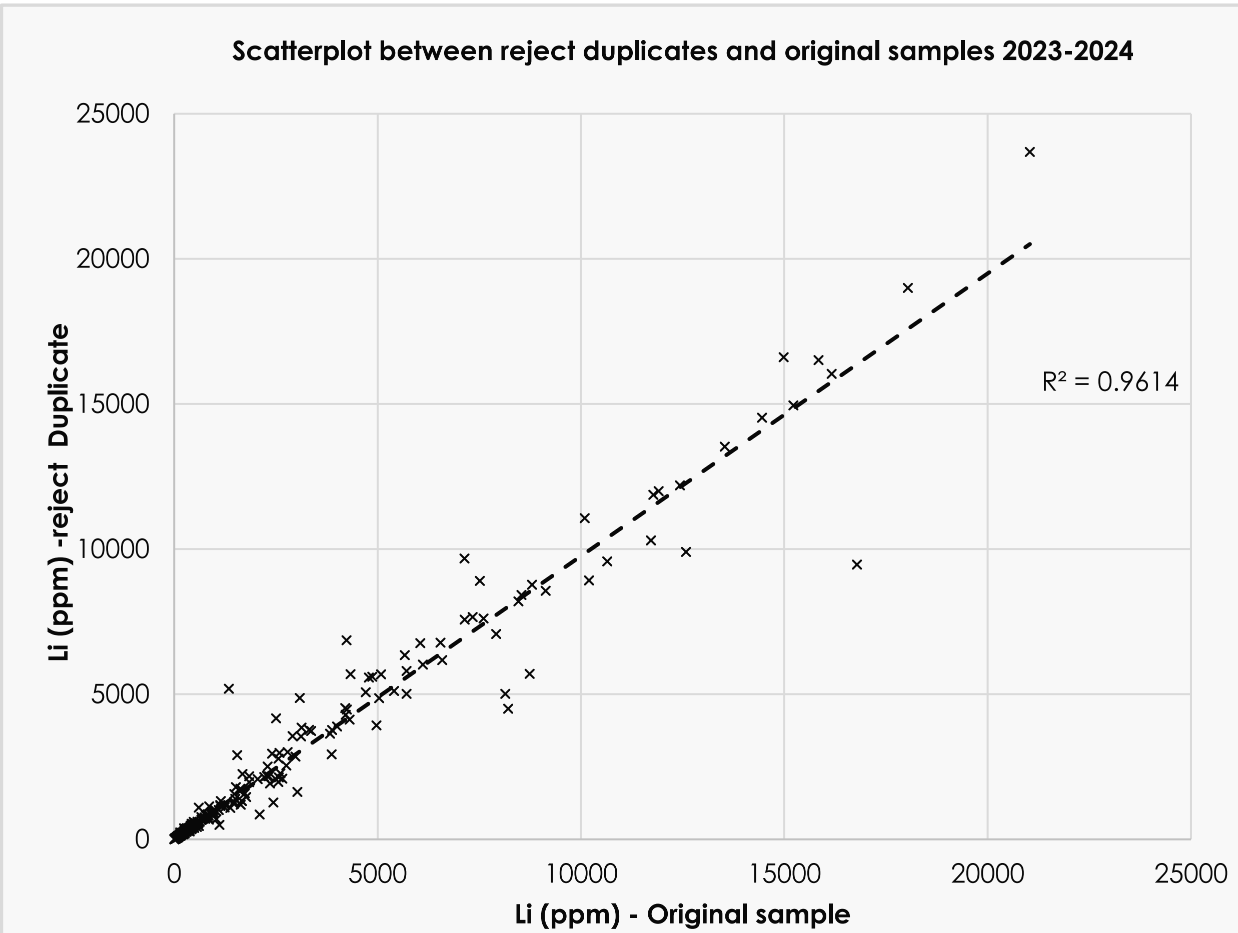



**Figure 11-7 : Reject duplicates (Li) for the 2023-2024 program**

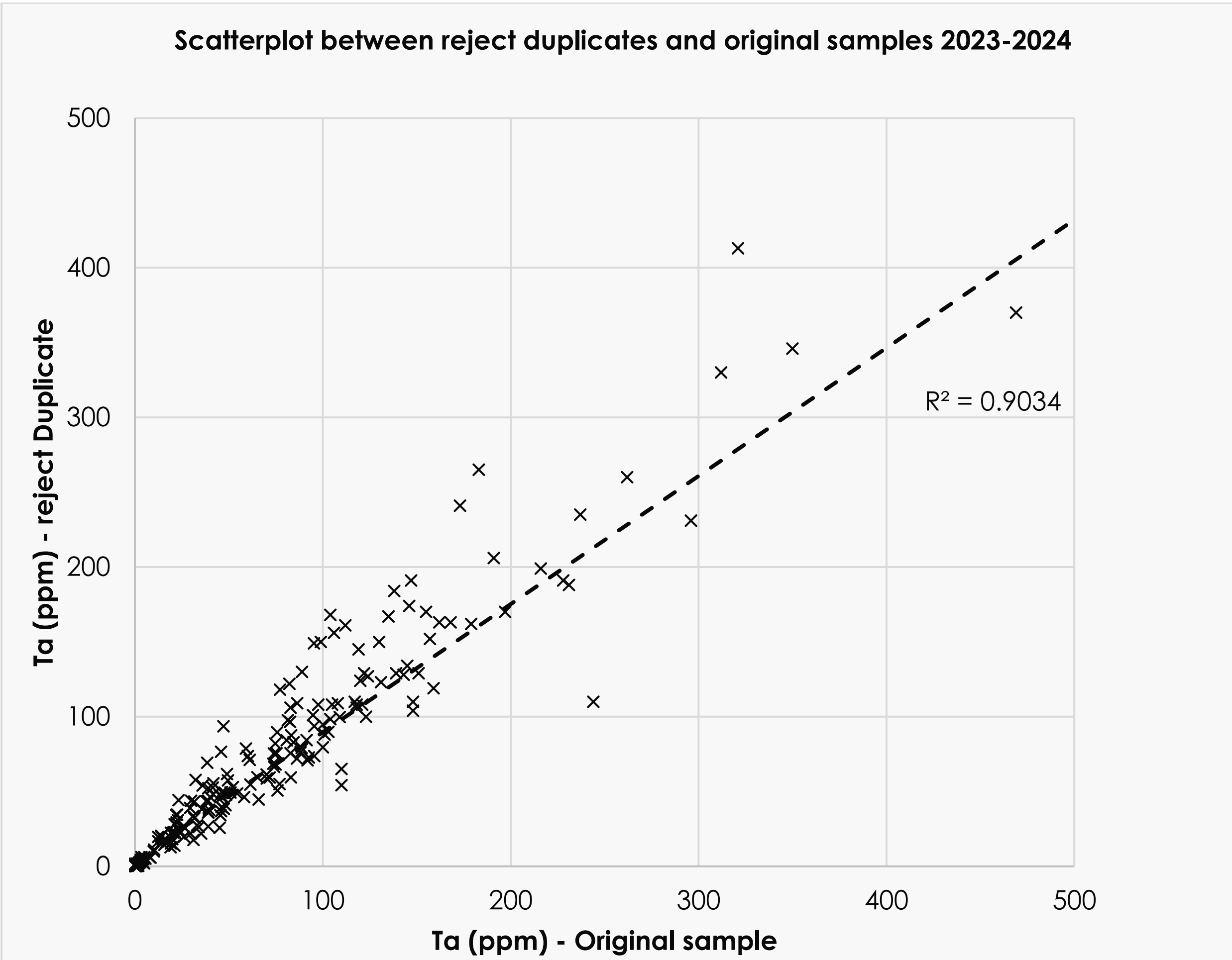



Figure 11-8: Reject duplicates (Ta) for the 2023-2024 program

## 11.4 Sample Security

The Company followed industry standard chain of custody methods and approaches for the 2023 and 2024 core samples. Sample security and chain of custody for the drill core started with the removal of the core from the core barrel at the drill. Upon receipt of the core in the core shack, custody was transferred to the Company or its representatives for core processing. Once complete, drill core samples were shipped, typically weekly, by ground transport SGS Canada's Val-d'Or, Québec, or Radisson, Québec, preparation facility.

All sample bags were catalogued upon receipt at the lab and cross-referenced with the Company's shipping manifest to ensure all samples had arrived. Additionally, upon receipt at the lab, all sample bags were assessed for signs of tampering.

The Company's sample security and chain of custody protocols included dates and a waybill/form documentation for each sample batch/shipment with respect to when they had departed the core shack area and when they had been received at the laboratory.

## 11.5 Qualified Person's Opinion

It is the QP's opinion that the sample preparation, security, and analytical procedures for channel and drill core sampling put in place by the Company meet acceptable industry standards and are sufficient to support geological and Mineral Resource modelling.

# 12. Data Verification

## 12.1 Geology

### 12.1.1 Site Investigation

Mr. Todd McCracken, P.Geo. and QP of this chapter, visited the Property from June 4 to 7, 2024, as part of this mandate and previously from April 7 to 11, 2023. Mr. McCracken stayed at Mirage Lodge, which is still the geological logging facility, and visited the exploration camp (Shaakichiuwaanaan). Access to the Property was by chartered helicopter from camp.

Mr. McCracken examined the Project setting and outcrops and reviewed numerous drill collar sites and channels (Figure 12-1). CV13 and CV9 areas, which were not previously inspected in 2023, were examined as well as the CV5 area during the 2024 site visit.

**Figure 12-1: Channeled outcrop examined during the site visit**

### 12.1.2 Drill Collar Validation

The QP confirmed the locations of 99 surface drill hole collars and eight channel locations during the June 2024 site visit. The QP collected the collar locations using a handheld GPS unit (Figure 12-2). Less than 4% of the boreholes were outside the expected tolerance of a handheld GPS (±5 m).

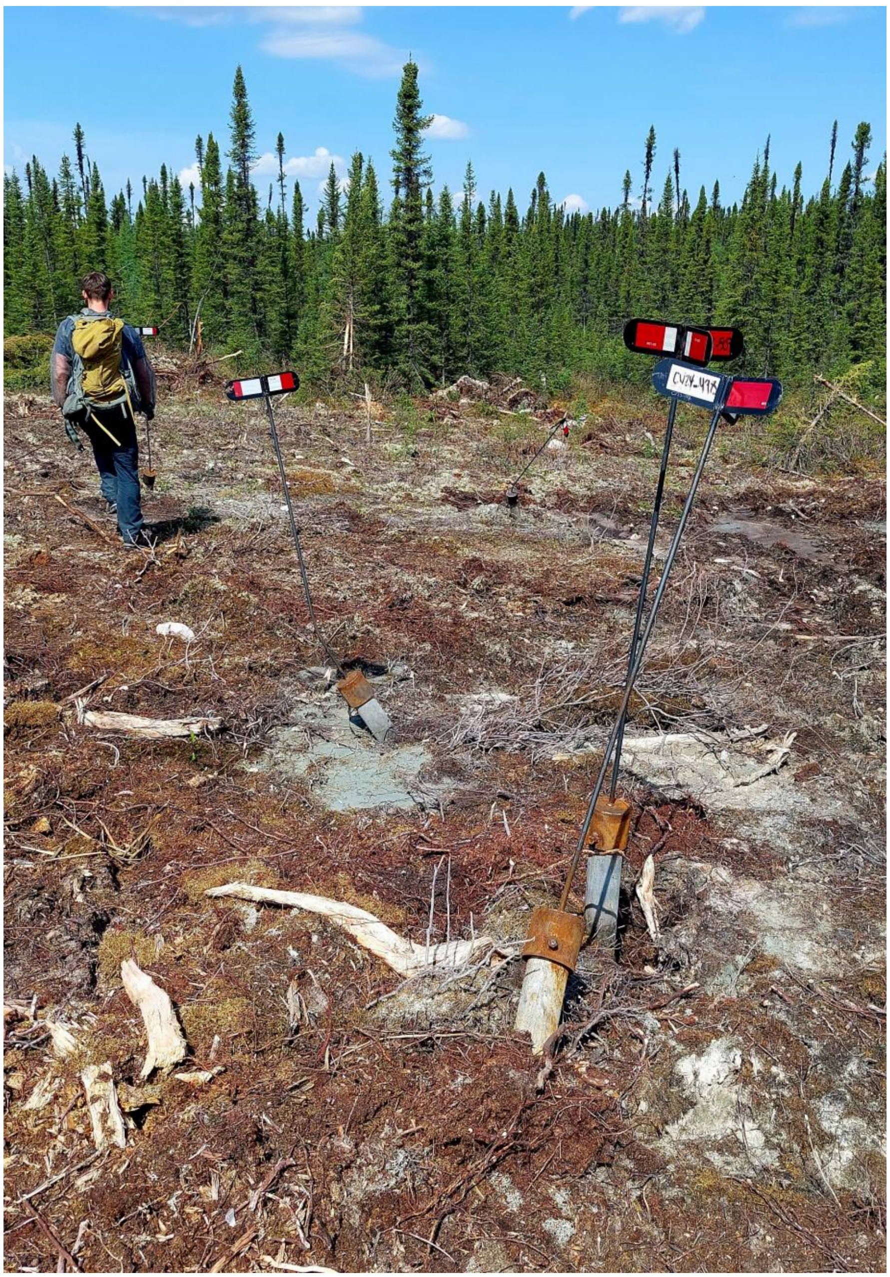


**Figure 12-2: Drill collar validation**

### 12.1.3 Database Validation

Mr. McCracken validated the digital database. The Company uses MX database software with scroll-down menus that are integrated in Leapfrog Geo. The database was exported into a .CSV format to be validated by Mr. McCracken.

Survey and collar data was verified. Assays were provided in PDF and CSV format direct from the analytical laboratory and were all validated for Li and Ta against the original assay certificates. No discrepancies between the Company's MX database and the original assays certificates were identified.

Due to the outcrops surface, some channel sample "collars" were moved vertically, usually less than 5 m, in Leapfrog so that the completed channel could be located below the topography.

## 12.2 Mining Validation

The mining block model used to complete the study was a modified version from the MRE block model to take into consideration modifying factor such as dilution and mining recovery. The mineralized material in the open pit and underground stopes design were estimated to validate the tonnage and grade between both models on in situ basis and were matching perfectly. The MRE block model was perform in Leapfrog and the Mining block model was on Deswik software.

## 12.3 Qualified Person's Opinion

It is the QP's opinion that the data has been suitably validated. Mr. McCracken also believes that the sample database provided by the Company and validated by himself is suitable to support the MRE and engineering studies.

# 13. Mineral Processing and Metallurgical Testing

## 13.1 Introduction

Patriot engaged Primero and SGS Canada in 2023 to assist with a metallurgical test work program for the CV5 deposit. Test work was completed at the SGS Lakefield Ontario facility. The scope of the program included both mineralogical characterization and metallurgical test work. Both SGS and Primero are independent of the Company and are industry recognized in lithium pegmatite processing. The objectives of the metallurgical test work program being to confirm the dominant lithium bearing mineral species for CV5 and evaluate the beneficiation performance of the deposit using a conventional spodumene DMS flowsheet. The target performance was the generation of a concentrate with s grade >5.5% $Li_2O$ and <1.2% $Fe_2O_3$ with maximizing lithium recovery.

### 13.1.1 Test Work Overview

Test work was carried out by SGS Canada at their Lakefield, Ontario, metallurgical testing facility. The test work program was broken up into a series of projects summarized as the following:

- 19005-01 (SGS, 2023a)) – Mineralogical characterization on 20 samples of drill core from the CV5 Pegmatite. Characterization work used a combination of TIMA-X (Quantitative SEM) Electron Probe Micro-Analysis ("EPMA"), Laser Ablation by Inductively Coupled Plasma Mass Spectrometry ("LA by ICP-MS"), X-ray diffraction ("XRD") analysis, and chemical assays.
- 19005-02 (SGS, 2023b) – Initial dense media separation ("DMS") test work was completed on two composites from CV5 Pegmatite. Heavy liquid separation ("HLS") tests were done with material crushed to a top size of 6.35 mm and 9.5 mm respectfully. Results from HLS results were used to determine specific gravity ("SG") cut points for two DMS trails as well as a top size selection of 9.5 mm. Additionally four bench scale flotation tests were completed on the DMS middlings and DMS bypass fraction (the -0.85 mm fraction) to identify future recovery opportunities for the Project.
- 19005-04 (SGS, 2023c) – Variability testing was completed using HLS and magnetic separation with a sample top size of 9.5 mm. Eleven variability composites ("Var Comp")were tested sourced from CV5. Samples were chosen that exhibited a range of lithia (i.e., $Li_2O$) and iron (i.e., $Fe_2O_3$) grades. This work's focus was confirming a DMS only flowsheet in the processing of CV5.
- 19005-06 (SGS, 2023d) – Semi-quantitative XRD and HLS test work was completed on five samples originating from the CV13 Pegmatite. This work was to investigate future opportunities in mining CV13.

- 19005-02A (SGS, 2024) – Variability testing was completed using HLS and magnetic separation with a sample top size of 9.5 mm and a bottom size of 0.60 mm. A composite sample representing the Project's starting open pit was tested via a two-size range (-9.5 mm to +3.3 mm and -3.3 mm to +0.60 mm) DMS and dry magnetic separation program. Eleven composites were tested from the CV5 Pegmatite and five composites representing the host rock surrounding the CV5 Pegmatite. Size by size elemental assays well as size-by-size HLS test work were completed on the pegmatite samples to quantify the distribution/liberation nature of the spodumene. The host rock samples were analysed distinctly via HLS to assesses and quantify where these external dilution materials would report to in DMS flowsheet.

### 13.1.2 Test Material

To date, approximately 714 kg of quarter-core NQ and 707 kg half-core NQ of lithium-bearing pegmatite samples from CV5 has been used in the metallurgical test program. Additionally, 345 kg of half-core NQ samples, representing the host rock surrounding CV5, has been tested metallurgically. The length of drill core tested from CV5 Pegmatite sums up to approximately 797 m.

A list of the source of samples is shown in Table 13-1 and a map of the location of each drill hole is shown in Figure 13-1.

**Table 13-1: Sources of samples for metallurgical programs completed on CV5 Pegmatites**

| Metallurgical Sample ID | Hole ID | From (m) | To (m) | Interval (m) | % $Li_2O$ | % $Fe_2O_3$ | Test Program Number | Purpose |
|---|---|---|---|---|---|---|---|---|
| CF001-028 | CF21-001 | 27 | 28 | 1 | 2.41 | 0.50 | 19005-01[1] | Mineralogical characterization |
| CF001-089 | CF21-001 | 80 | 81 | 1 | 2.17 | 0.76 | | |
| CF001-103 | CF21-001 | 91 | 92 | 1 | 2.37 | 2.27 | | |
| CF001-119 | CF21-001 | 106 | 107 | 1 | 0.02 | 0.15 | | |
| CF001-129 | CF21-001 | 114 | 115 | 1 | 0.02 | 0.10 | | |
| CF001-148 | CF21-001 | 131 | 132 | 1 | 1.08 | 0.48 | | |
| CF001-177 | CF21-001 | 157 | 158 | 1 | 0.43 | 0.90 | | |
| CF001-188 | CF21-001 | 166 | 167 | 1 | 3.53 | 0.29 | | |
| CF001-227 | CF21-001 | 203 | 204 | 1 | 5.23 | 0.85 | | |
| CF001-229 | CF21-001 | 204 | 205 | 1 | 1.59 | 0.33 | | |
| CF002-047 | CF21-002 | 105 | 106 | 1 | 0.00 | 0.07 | | |
| CF002-094 | CF21-002 | 145 | 146 | 1 | 1.85 | 0.27 | | |
| CF002-099 | CF21-002 | 150 | 151 | 1 | 0.24 | 0.36 | | |
| CF002-110 | CF21-002 | 159 | 160 | 1 | 3.85 | 0.39 | | |
| CF002-150 | CF21-002 | 195 | 196 | 1 | 1.23 | 0.85 | | |

| Metallurgical Sample ID | Hole ID | From (m) | To (m) | Interval (m) | % $Li_2O$ | % $Fe_2O_3$ | Test Program Number | Purpose |
|---|---|---|---|---|---|---|---|---|
| CF002-177 | CF21-002 | 218 | 219 | 1 | 1.03 | 0.39 | | |
| CF002-188 | CF21-002 | 227 | 228 | 1 | 2.05 | 0.86 | | |
| CF004-020 | CF21-004 | 48 | 49 | 1 | 2.17 | 0.49 | | |
| CF004-043 | CF21-004 | 69 | 70 | 1 | 2.67 | 0.50 | | |
| CF004-051 | CF21-004 | 76 | 77 | 1 | 0.17 | 2.89 | | |
| CF21-001Met | CF21-001 | 26 | 99 | 73 | 1.16 | 0.75 | 19005-02[1] | Initial mineral processing program (HLS, DMS, magnetic separation, flotation) |
| | | 142 | 173 | 31 | | | | |
| | | 200 | 213 | 14 | | | | |
| CF21-002Met | CF21-002 | 79 | 132 | 53 | 1.05 | 0.31 | | |
| | | 145 | 179 | 34 | | | | |
| | | 189 | 203 | 14 | | | | |
| | | 209 | 233 | 24 | | | | |
| HLS-COMP-001 | CV22-017 | 226 | 236 | 10 | 1.40 | 1.10 | 19005-04[1] | HLS screening across CV5 |
| HLS-COMP-002 | CV22-019 | 133 | 140 | 7 | 1.16 | 0.83 | | |
| | | 141 | 144 | 3 | | | | |
| HLS-COMP-003 | CV22-025 | 28 | 38 | 10 | 1.14 | 0.80 | | |
| HLS-COMP-004 | CV22-035 | 139 | 143 | 4 | 1.33 | 0.68 | | |
| | | 157 | 163 | 6 | | | | |
| HLS-COMP-005 | CV22-038 | 233 | 243 | 10 | 1.68 | 0.81 | | |
| HLS-COMP-006 | CV22-040 | 331 | 341 | 10 | 0.67 | 0.59 | | |
| HLS-COMP-007 | CV22-042 | 180 | 190 | 10 | 1.57 | 0.57 | | |
| HLS-COMP-008 | CV22-048 | 396 | 398 | 2 | 1.35 | 0.34 | | |
| | | 418 | 423 | 6 | | | | |
| | | 424 | 426 | 2 | | | | |
| HLS-COMP-009 | CV22-052 | 183 | 193 | 10 | 2.04 | 0.31 | | |
| HLS-COMP-010 | CV22-054 | 55 | 65 | 10 | 1.20 | 0.29 | | |
| HLS-COMP-011 | CV22-070 | 180 | 190 | 10 | 2.73 | 0.42 | | |

| Metallurgical Sample ID | Hole ID | From (m) | To (m) | Interval (m) | % $Li_2O$ | % $Fe_2O_3$ | Test Program Number | Purpose |
|---|---|---|---|---|---|---|---|---|
| Zeppelin COMP-001 | CV23-160A | 64 | 75 | 11 | 1.38 | 0.63 | 19005-02A[2] | Size by Size HLS testing, these composites were used in a DMS testing. Sample designed to represent the pegmatite from the first 4 years of the Project. |
| | CV23-160A | 92 | 101 | 9 | | | | |
| | CV23-160A | 176 | 190 | 13 | | | | |
| | CV23-161 | 87 | 96 | 10 | | | | |
| | CV23-161 | 116 | 126 | 10 | | | | |
| | CV23-161 | 139 | 149 | 10 | | | | |
| | CV23-172 | 106 | 114 | 7 | | | | |
| | CV23-172 | 150 | 169 | 19 | | | | |
| | CV23-176 | 93 | 107 | 14 | | | | |
| | CV23-176 | 115 | 126 | 11 | | | | |
| | CV23-176 | 164 | 172 | 8 | | | | |
| | CV23-190 | 28 | 36 | 8 | | | | |
| | CV23-190 | 99 | 114 | 15 | | | | |
| | CV23-190 | 134 | 146 | 12 | | | | |
| Zeppelin COMP-002 | CV23-182 | 159 | 190 | 30 | 0.71 | 0.83 | | |
| Zeppelin COMP-003 | CV23-184 | 167 | 173 | 6 | 1.68 | 0.53 | | |
| | CV23-184 | 184 | 196 | 12 | | | | |
| | CV23-184 | 206 | 219 | 13 | | | | |
| Zeppelin COMP-005 | CV23-120 | 280 | 291 | 11 | 0.30 | 0.60 | | HLS Variability Testing |
| | CV23-120 | 307 | 310 | 4 | | | | |
| Zeppelin COMP-006 | CV23-130 | 202 | 219 | 17 | 1.01 | 1.22 | | |
| Zeppelin COMP-007 | CV23-120 | 253 | 268 | 14 | 0.43 | 0.94 | | |
| Zeppelin COMP-008 | CV23-189 | 227 | 234 | 7 | 0.05 | 0.90 | | |
| Zeppelin COMP-009 | CV23-140 | 335 | 339 | 4 | 0.75 | 3.06 | | |
| | CV23-115 | 314 | 318 | 4 | | | | |
| Zeppelin COMP-010 | CV23-134 | 128 | 140 | 11 | 0.16 | 0.37 | | |
| | CV23-134 | 143 | 147 | 4 | | | | |
| Zeppelin COMP-011 | CV23-182 | 97 | 110 | 13 | 0.14 | 0.89 | | |
| Zeppelin COMP-012 | CV23-120 | 310 | 320 | 10 | 0.22 | 2.24 | | |
| | CV23-160A | 327 | 331 | 4 | | | | |

(1) All samples in test program 19005-01, 19005-02, 19005-04 are quarter-core NQ.

(2) All samples in test program 19005-02A are half-core NQ.

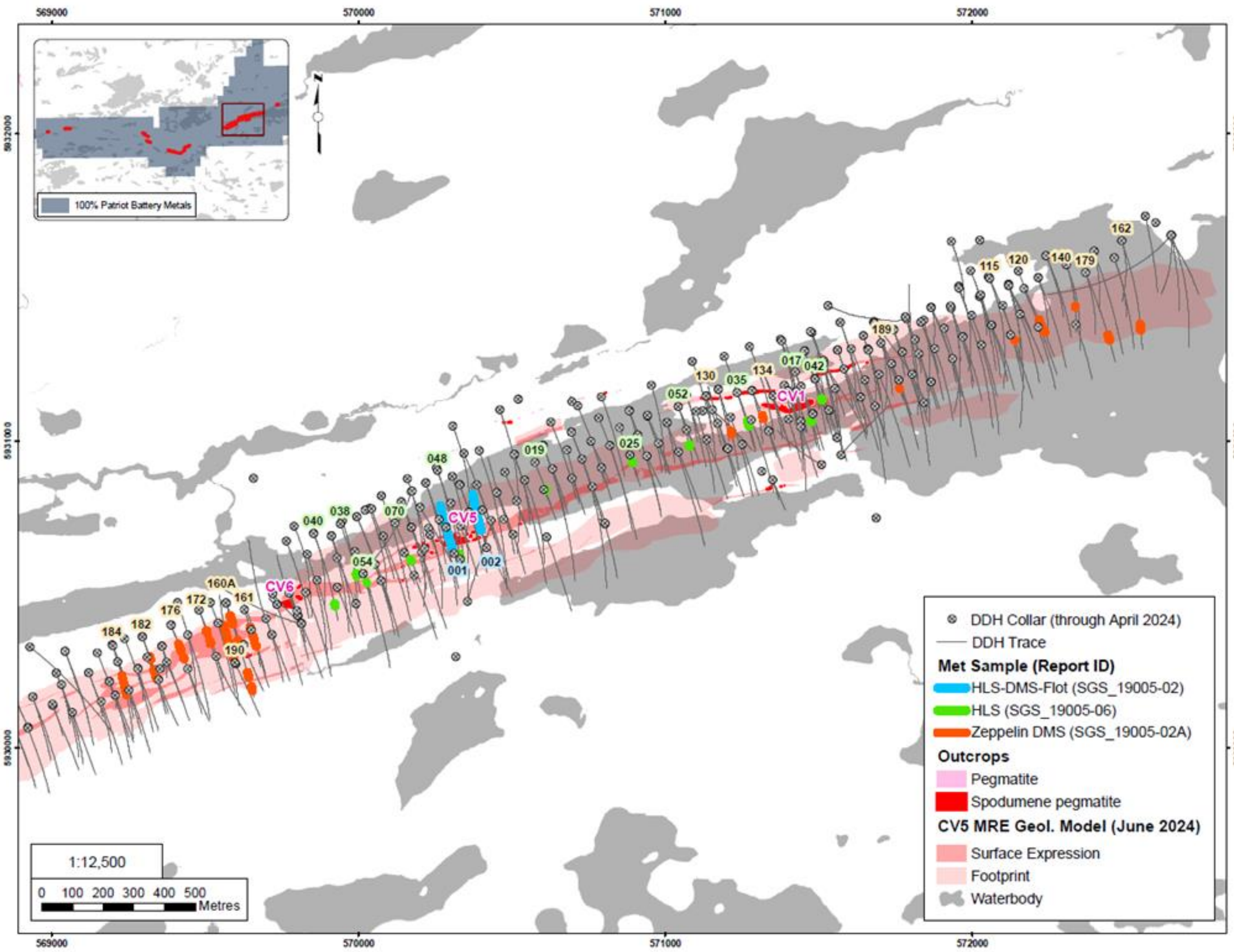



**Figure 13-1: Location of HLS and DMS samples collected of drill core from the CV5 Spodumene Pegmatite**

**Table 13-2: Sources of samples for metallurgical programs completed on host rock surrounding CV5**

| Metallurgical Sample ID | Hole ID | From (m) | To (m) | Interval (m) | % $Li_2O$ | % $Fe_2O_3$ | Test Program Number | Purpose |
|---|---|---|---|---|---|---|---|---|
| Zeppelin COMP-004 | CV23-160A | 59 | 62 | 3 | 0.11 | 8.38 | 19005-02A[1] | Size by Size HLS testing, dilution material used in DMS testing |
| | CV23-160A | 190 | 193 | 3 | | | | |
| | CV23-161 | 84 | 87 | 3 | | | | |
| | CV23-161 | 166 | 171 | 5 | | | | |
| | CV23-172 | 103 | 106 | 3 | | | | |
| | CV23-172 | 121 | 124 | 3 | | | | |
| | CV23-176 | 129 | 132 | 3 | | | | |
| | CV23-176 | 160 | 164 | 4 | | | | |
| | CV23-182 | 193 | 209 | 16 | | | | |
| | CV23-184 | 146 | 149 | 3 | | | | |
| | CV23-184 | 228 | 231 | 3 | | | | |
| | CV23-190 | 23 | 27 | 4 | | | | |
| | CV23-190 | 165 | 168 | 3 | | | | |
| Zeppelin COMP-013 | CV23-160A | 394 | 415 | 21 | 0.02 | 13.10 | | HLS Variability Testing |
| Zeppelin COMP-014 | CV23-162 | 380 | 405 | 25 | 0.04 | 1.78 | | |
| Zeppelin COMP-015 | CV23-160A | 331 | 350 | 20 | 0.01 | 10.40 | | |
| Zeppelin COMP-016 | CV23-179 | 310 | 337 | 27 | 0.04 | 3.59 | | |

[1] All samples in test program 19005-02A are half-core NQ

Although CV13 currently is not part of the material considered for the PEA, metallurgical testing (HLS) was conducted on drill core from the CV13 Pegmatite. A list of the source of samples used in testing of the pegmatite around CV13 is shown in Table 13-3.

**Table 13-3: Sources of samples for metallurgical programs completed on pegmatite from CV13**

| Metallurgical Sample ID | Hole ID | From (m) | To (m) | Interval (m) | % $Li_2O$ | % $Fe_2O_3$ | Test Program Number | Purpose |
|---|---|---|---|---|---|---|---|---|
| HLS-COMP-012 | CV22-077 | 10 | 20 | 10 | 1.42 | 0.22 | 19005-06[1] | HLS screening across CV13 |
| HLS-COMP-013 | CV22-092 | 33 | 43 | 10 | 0.84 | 0.19 | | |
| HLS-COMP-014 | CV22-103 | 24 | 33 | 10 | 1.25 | 0.33 | | |
| HLS-COMP-015 | CV22-082 | 28 | 33 | 5 | 1.25 | 0.21 | | |
| | CV22-084 | 29 | 34 | 5 | | | | |
| HLS-COMP-016 | CV22-085 | 167 | 175 | 8 | 0.95 | 0.33 | | |

[1] All samples in test program 19005-06 are quarter-core NQ

#### 13.1.2.1 Head Sample Characterization

Head assays of the eleven CV5 variability composite samples ranged from 0.67%–2.73% $Li_2O$ and 0.29%–1.10% $Fe_2O_3$. All samples contained rubidium and cesium, with averages of 2,927 g/t Rb and 980 g/t Cs, respectively.

Var Comp 1 through 5, 9, and 10 all returned $Ta_2O_5$ above the detection limit of 0.01% $Ta_2O_5$. Some samples contained $Ta_2O_5$ at levels up to 0.03%. There is an opportunity to consider recovery of tantalite as the flowsheet is developed.

Head grades of $Li_2O$ and $Fe_2O_3$ for the variability composite samples are presented in Figure 13-2.

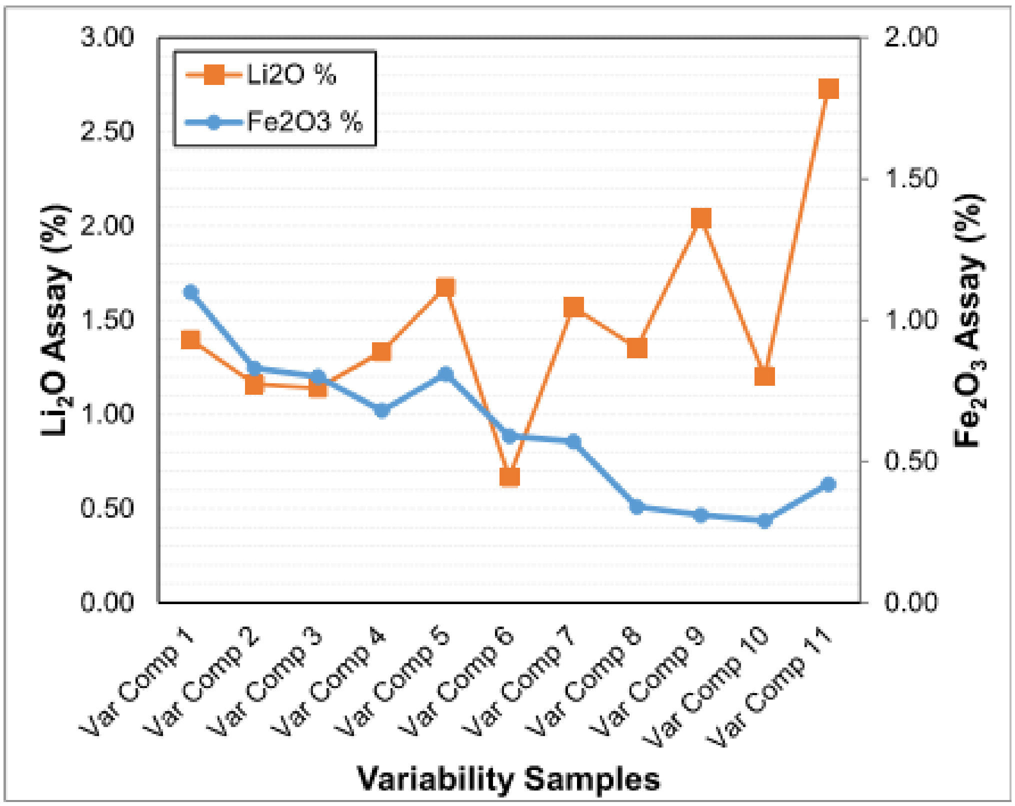



**Figure 13-2: Variability composite head grades**

Sixteen composite samples, along with a master composite, were analyzed based on chemical assays by size to determine lithium deportment. Figure 13-3 summarizes the lithium distribution across particle sizes for all composites, while Table 13-4 provides the associated lithium and iron grades.

The majority of the lithium is found in the coarser size fractions (+1.70 mm), ranging from approximately 65% to 96% of the total lithium. Zeppelin Comp-003, which was a high-grade spodumene bearing pegmatite, has the highest lithium distribution at 96% of the lithium in the +1.70 mm size fraction, while Zeppelin Comp-008 (a pegmatite very low is spodumene) has the lowest at 65% of lithium in the +1.70 mm size fraction.

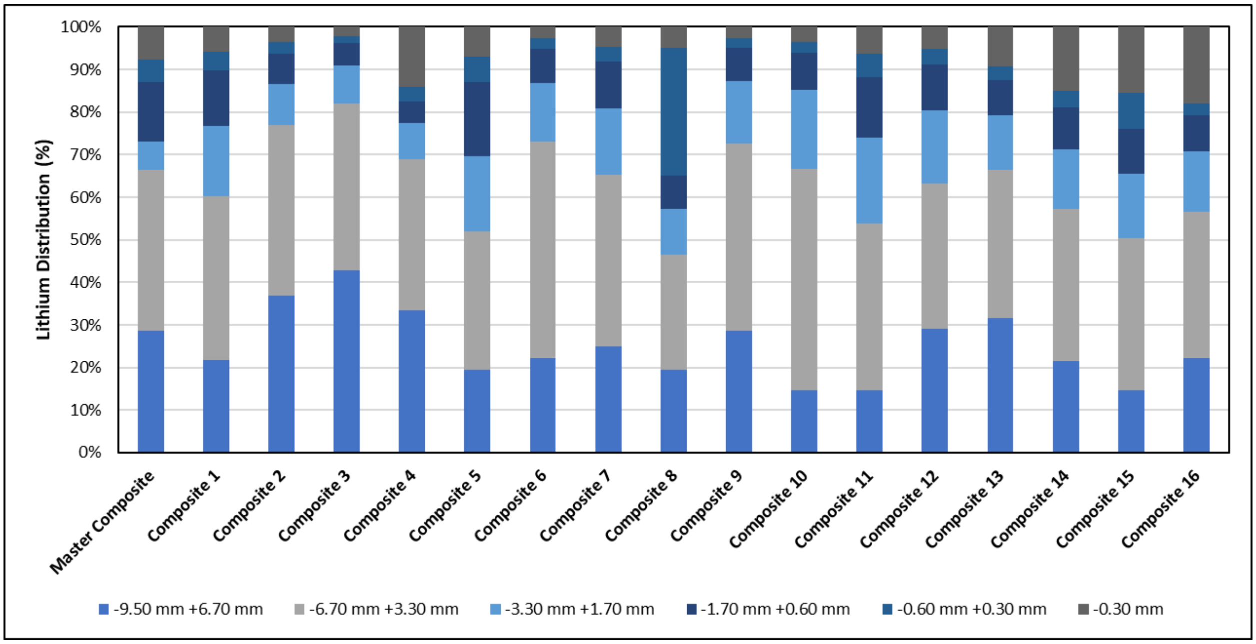



**Figure 13-3: Size by assay - Lithium distribution**

**Table 13-4: Lithium ($Li_2O$) and iron ($Fe_2O_3$) grade distribution with size in CV5**

| Samples | Feed | | -9.50 mm +6.70 mm | | -6.70 mm +3.30 mm | | -3.30 mm +1.70 mm | | -1.70 mm +0.60 mm | | -0.60 mm +0.30 mm | | -0.30 mm | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Grade | $Fe_2O_3$ Grade |
| Zeppelin Master Comp | | | 1.76 | 1.88 | 1.33 | 1.91 | 1.20 | 1.44 | 1.10 | 1.37 | 0.86 | 1.26 | 0.60 | 2.78 |
| Zeppelin Comp-001 | 1.38 | 0.63 | 1.18 | 0.45 | 1.38 | 0.63 | 1.33 | 0.66 | 1.27 | 0.66 | 1.01 | 0.70 | 0.77 | 0.76 |
| Zeppelin Comp-002 | 0.71 | 0.83 | 0.67 | 0.69 | 0.69 | 0.65 | 0.75 | 0.62 | 0.77 | 0.82 | 0.62 | 1.15 | 0.45 | 1.09 |
| Zeppelin Comp-003 | 1.68 | 0.53 | 1.59 | 0.43 | 1.46 | 0.54 | 1.59 | 0.56 | 1.59 | 0.59 | 1.16 | 0.84 | 0.97 | 0.80 |
| Zeppelin Comp-004 | 0.11 | 8.38 | 0.11 | 8.52 | 0.11 | 8.48 | 0.11 | 7.92 | 0.10 | 7.81 | 0.12 | 7.42 | 0.12 | 9.52 |
| Zeppelin Comp-005 | 0.30 | 0.60 | 0.17 | 0.48 | 0.32 | 0.55 | 0.37 | 0.78 | 0.47 | 0.68 | 0.45 | 0.75 | 0.41 | 0.91 |
| Zeppelin Comp-006 | 1.01 | 1.22 | 1.23 | 1.09 | 1.53 | 1.13 | 0.92 | 1.23 | 0.82 | 1.27 | 0.71 | 1.39 | 0.58 | 1.57 |
| Zeppelin Comp-007 | 0.43 | 0.94 | 0.47 | 0.54 | 0.45 | 0.81 | 0.39 | 0.99 | 0.37 | 0.90 | 0.30 | 0.92 | 0.30 | 1.25 |
| Zeppelin Comp-008 | 0.05 | 0.90 | 0.06 | 1.53 | 0.06 | 0.89 | 0.06 | 0.85 | 0.06 | 1.03 | 0.06 | 1.03 | 0.07 | 1.34 |
| Zeppelin Comp-009 | 0.75 | 3.06 | 0.86 | 3.40 | 0.99 | 2.77 | 0.86 | 3.20 | 0.69 | 3.10 | 0.45 | 2.72 | 0.34 | 3.19 |
| Zeppelin Comp-010 | 0.16 | 0.37 | 0.12 | 0.22 | 0.28 | 0.28 | 0.21 | 0.30 | 0.14 | 0.25 | 0.12 | 0.29 | 0.13 | 0.31 |
| Zeppelin Comp-011 | 0.14 | 0.89 | 0.10 | 0.65 | 0.15 | 0.61 | 0.16 | 0.72 | 0.15 | 0.98 | 0.13 | 1.21 | 0.10 | 1.32 |
| Zeppelin Comp-012 | 0.22 | 2.24 | 0.39 | 2.11 | 0.26 | 2.19 | 0.30 | 2.07 | 0.24 | 2.27 | 0.19 | 2.57 | 0.17 | 3.50 |
| Zeppelin Comp-013 | 0.02 | 13.10 | 0.02 | 13.20 | 0.01 | 13.20 | 0.01 | 12.90 | 0.01 | 12.80 | 0.01 | 12.20 | 0.01 | 13.20 |
| Zeppelin Comp-014 | 0.04 | 1.78 | 0.03 | 1.39 | 0.03 | 1.91 | 0.03 | 1.57 | 0.03 | 1.80 | 0.03 | 2.09 | 0.04 | 2.22 |
| Zeppelin Comp-015 | 0.01 | 10.40 | 0.01 | 10.40 | 0.01 | 10.40 | 0.01 | 10.30 | 0.01 | 10.30 | 0.02 | 10.50 | 0.01 | 10.10 |
| Zeppelin Comp-016 | 0.04 | 3.59 | 0.05 | 3.71 | 0.05 | 3.43 | 0.05 | 3.45 | 0.05 | 3.40 | 0.05 | 3.60 | 0.06 | 4.11 |

### 13.1.2.2 Mineralogy

Mineralogical characterization test work was carried out on 20 samples of drill core from the CV5 Pegmatite (CF21-001, 002, and 004) using a combination of TIMA-X (Quantitative SEM) EPMA, Laser Ablation by Inductively Coupled Plasma Mass Spectrometry (LA by ICP-MS), XRD analysis, and chemical assays. Generally, spodumene was found to be the dominant lithium mineral species across all samples.

Semi-Quantitative XRD was performed on the 11 CV5 HLS variability composite samples (19005-02) and the 16 CV5 pegmatites and non-pegmatites of the 19005-02A program.

Spodumene was identified as the dominant lithium-bearing mineral, with spodumene content varying from 7.9%–32.1%. Spodumene content corresponded with $Li_2O$ assay results with Var Comp 6 (0.67% $Li_2O$, 7.9% spodumene) and Var Comp 11 (2.73% $Li_2O$, 32.1% spodumene) having the lowest and the highest $Li_2O$ and spodumene content, respectively.

Results indicate that the main gangue minerals in the samples are quartz and albite, comprising 47%–74% of the total samples. Minor quantities of lepidolite (up to 3.5%) and moderate quantities of muscovite (up to 17.1%) were also present. Occurrences of up to 16% tourmaline were identified in CV5 samples via TIMA-X.

XRD results for the variability composite samples are indicated in Figure 13-4.

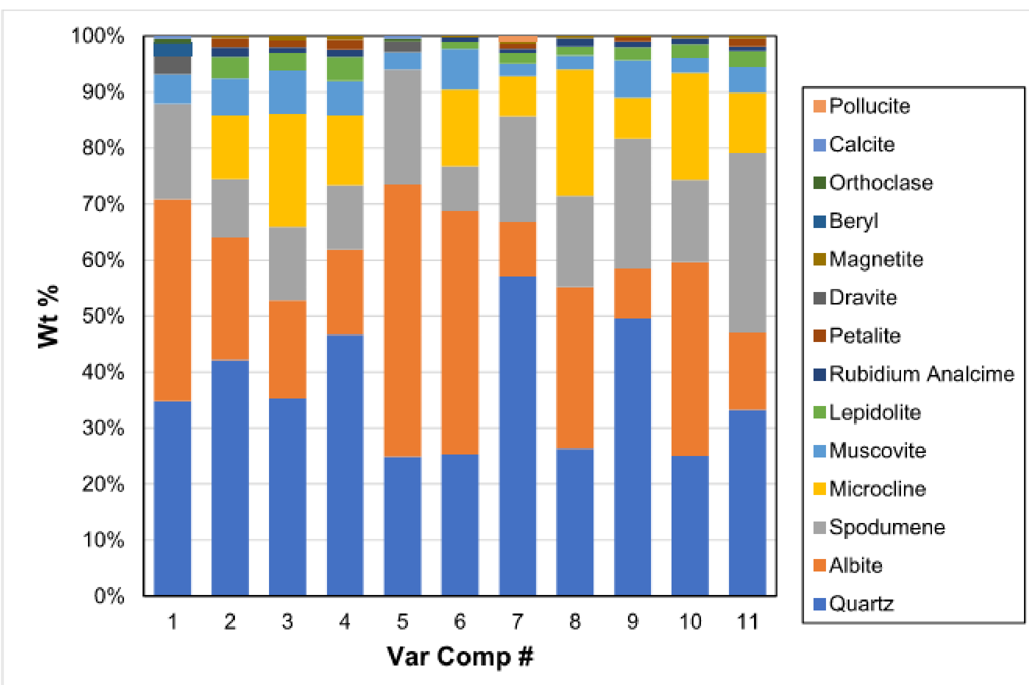



**Figure 13-4: XRD results on variability composite samples**

### 13.1.2.3 Particle Size Distribution

Particle size analysis was performed on 0.5 kg subsamples from each CV5 variability composite sample after crushing to -9.5 mm in the laboratory. All variability composites had a similar particle size distribution with P80 values from 7.5 mm–8.0 mm. Particle size distributions for the variability composite samples is indicated in Figure 13-5.

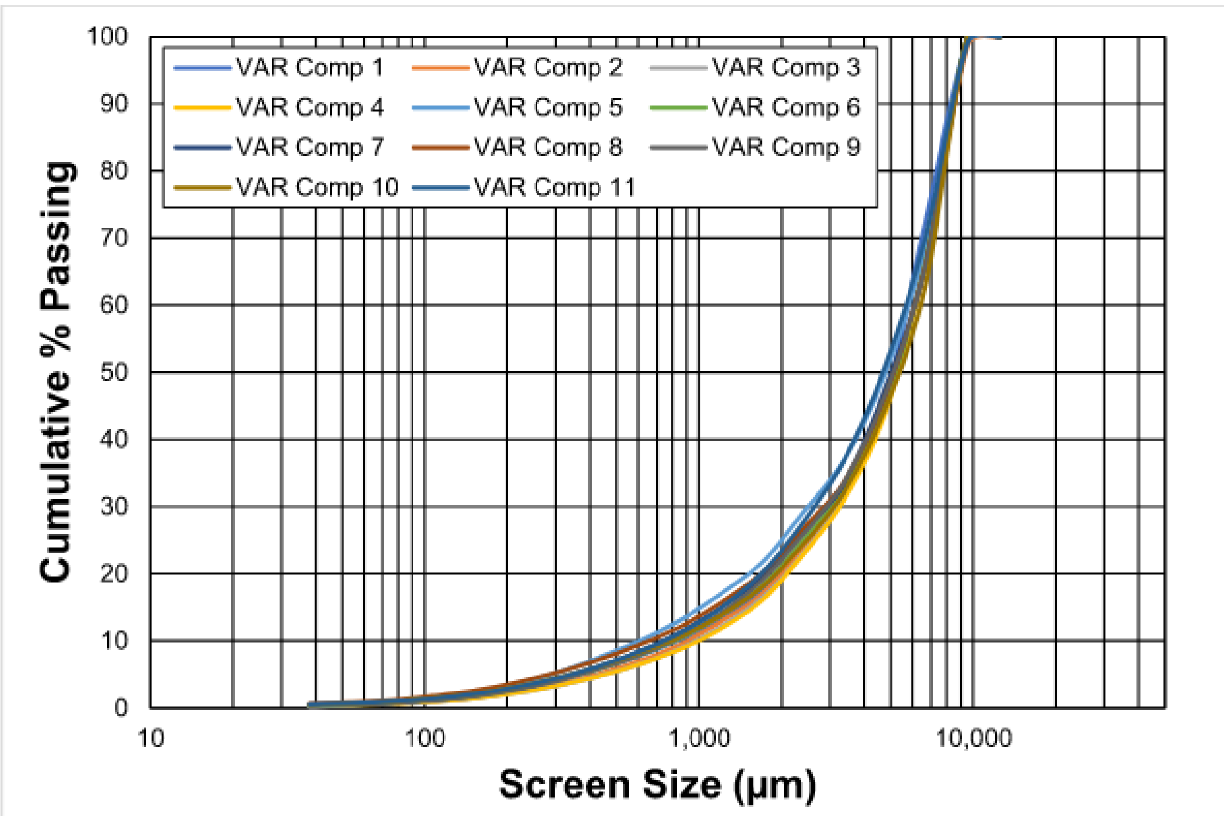



**Figure 13-5: Particle size distributions for variability composite samples**

### 13.1.2.4 Heavy Liquid Separation

#### SGS - 19005-04

A 1.5 kg subsample of each -9.5 mm variability composite was screened at 0.85 mm. The -0.85 mm fraction was set aside and HLS test work at a single SG cut point of 2.85 was performed on the -9.5 mm +0.85 mm fraction. All HLS sink and float products and the -0.85 mm fractions were assayed.

HLS sinks results indicate $Li_2O$ grades of 5.03%–6.58% and HLS Stage Li recoveries of 61.0%–92.5%. Nine of the 11 variability composites achieved a concentrate grade of >5.5% $Li_2O$ and Global HLS recovery >72%.

Var Comp 3 recorded 5.35% $Li_2O$ grade and 90.1% Li recovery while Var Comp 6 recorded 5.03% $Li_2O$ grade and 60.1% Li recovery. There appears to be a strong potential for these samples to achieve >5.5% $Li_2O$ grade at marginally lower recoveries using a higher SG cut point than 2.85.

$Fe_2O_3$ grades were recorded as 0.52%–1.79% before any magnetic separation was applied.

Global HLS results are indicated in Figure 13-6.

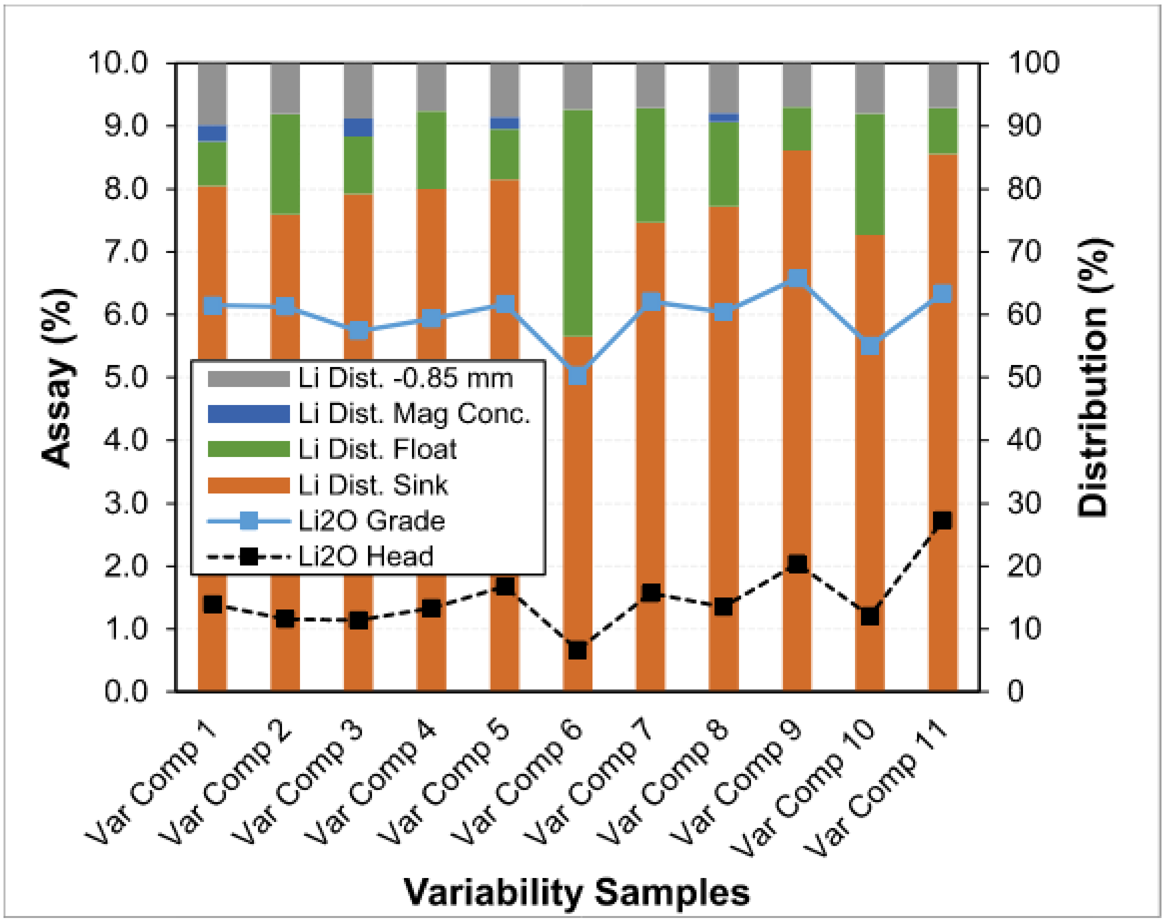
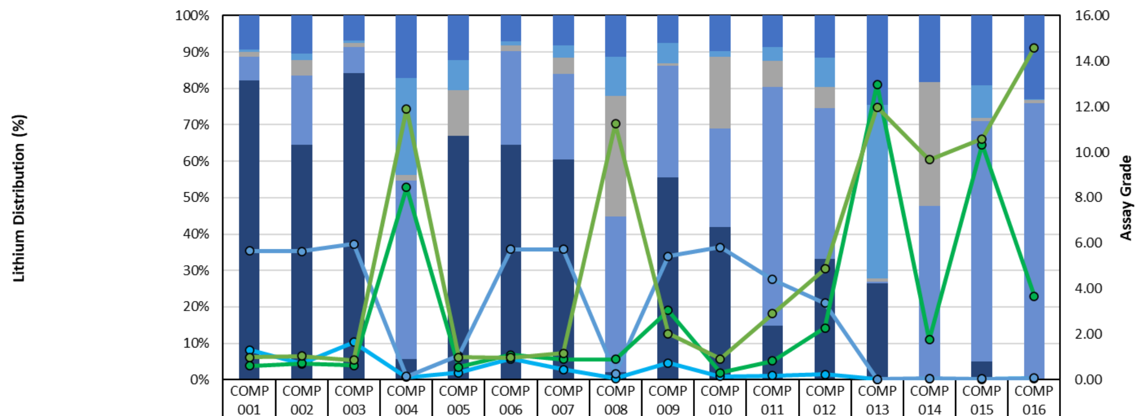



Figure 13-6: Global HLS results for variability composite samples

## SGS - 19005-02A

HLS tests were conducted on all 16 composites at a crush size of 9.50 mm and a bottom size of 0.60 mm. Dry magnetic separation was then performed on the sink products to remove iron-rich material. Figure 13-7 illustrates the subsequent lithium distributions and assays.




| | COMP 001 | COMP 002 | COMP 003 | COMP 004 | COMP 005 | COMP 006 | COMP 007 | COMP 008 | COMP 009 | COMP 010 | COMP 011 | COMP 012 | COMP 013 | COMP 014 | COMP 015 | COMP 016 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Li Dist -0.6 mm Bypass | 9.25 | 10.52 | 6.88 | 17.17 | 12.21 | 7.16 | 8.19 | 11.30 | 7.51 | 9.79 | 8.58 | 11.64 | 24.63 | 18.19 | 19.24 | 22.94 |
| Li Dist Magnetics | 0.66 | 1.74 | 0.60 | 26.54 | 8.28 | 1.01 | 3.34 | 10.64 | 5.54 | 1.55 | 3.88 | 7.95 | 47.53 | 0.16 | 8.91 | 0.18 |
| Li Dist HLS Floats | 1.51 | 4.13 | 1.19 | 1.67 | 12.57 | 1.59 | 4.53 | 33.32 | 0.63 | 19.65 | 7.03 | 5.74 | 1.00 | 33.89 | 0.82 | 0.92 |
| Li Dist Middlings | 6.48 | 19.16 | 7.04 | 49.08 | 0.00 | 25.78 | 23.49 | 42.57 | 30.86 | 27.04 | 65.69 | 41.38 | 0.48 | 47.65 | 66.02 | 75.91 |
| Li Dist Concentrate | 82.11 | 64.45 | 84.29 | 5.55 | 66.94 | 64.46 | 60.45 | 2.17 | 55.46 | 41.97 | 14.82 | 33.28 | 26.37 | 0.12 | 5.01 | 0.05 |
| Li2O Feed Grade | 1.31 | 0.69 | 1.65 | 0.10 | 0.31 | 0.91 | 0.44 | 0.06 | 0.72 | 0.14 | 0.18 | 0.23 | 0.01 | 0.03 | 0.01 | 0.05 |
| Li2O Concentrate Grade | 5.66 | 5.64 | 5.96 | 0.14 | 1.05 | 5.73 | 5.73 | 0.26 | 5.42 | 5.82 | 4.41 | 3.37 | 0.02 | 0.06 | 0.03 | 0.07 |
| Fe2O3 Feed Grade | 0.61 | 0.71 | 0.62 | 8.46 | 0.55 | 1.10 | 0.90 | 0.89 | 3.04 | 0.30 | 0.82 | 2.27 | 12.98 | 1.75 | 10.33 | 3.67 |
| Fe2O3 Concentrate Grade | 0.98 | 1.04 | 0.85 | 11.91 | 0.99 | 0.97 | 1.17 | 11.24 | 2.02 | 0.91 | 2.90 | 4.87 | 11.97 | 9.67 | 10.58 | 14.60 |

**Figure 13-7: Zeppelin HLS test work results**

The composites (Zeppelin COMP-001 to COMP-003) demonstrated sufficient liberation at a 9.50 mm crush size, producing spodumene concentrates with >5.50% $Li_2O$ and <1.20% $Fe_2O_3$ while achieving 64% to 85% global lithium recovery (including -0.60 mm fines bypass). Specifically, Zeppelin COMP-001 and COMP-003 showed uniform spodumene crystal sizes and excellent liberation, with only 6% to 7% of global lithium distribution in the middlings fraction. In contrast, Zeppelin COMP-002 (low-grade pegmatite) exhibited less uniform spodumene crystals sizes, with 19% of global lithium distribution in the middlings. The host rock composite (Zeppelin COMP-004) indicated that approximately 49% of global lithium distribution reported to the HLS middlings.

The variability samples were tested to understand the impact of different lithologies on the process responded with high degree of variability, as seen in Figure 13-7. Zeppelin COMP-006, 007, 009, and 010 achieved >5.50% $Li_2O$ with 42% to 64% global lithium recovery. The lithium reporting to middlings increased from 6% to 19% (global lithium distribution) for the samples (Zeppelin COMP-001 to 003) to upwards of 30%, indicating that the lithium grain size in the variability samples may be smaller and are less uniformed in size, further highlighting the sensitivities identified in the first four composites.

### 13.1.2.5 Magnetic Separation

Magnetic separation was carried out on HLS sink products for Var Comp 1, 3, 5, and 8 with a dry belt magnetic separator at a field strength of 10,000 Gauss. Sinks products were screened at 3.3 mm with magnetic separation performed separately on the +3.3 mm and -3.3 mm fractions to increase separation efficiency. The magnetic and non-magnetic +3.3 mm and -3.3 mm fractions were then combined and assayed.

Results indicate all four of the variability composite samples achieved the target grades of >5.5% $Li_2O$ and <1.2% $Fe_2O_3$. Up to 3.2% Li was reported to the Magnetic Separation Mags across the four tests.

**Table 13-5: Magnetic separations results for variability composite samples 1, 3, 5 & 8**

| HLS Products | Weight (g) | % | $Li_2O$ | $Fe_2O_3$ | Distribution (%) | |
|---|---|---|---|---|---|---|
| | | | | | Li | $Fe_2O_3$ |
| Var Comp 1 Sink Before Mag | 208 | 23.6 | 5.53 | 1.79 | 92.2 | 43.4 |
| Var Comp 1 Sink Non-Mag | 181.1 | 20.54 | 6.15 | 0.61 | 89.29 | 12.9 |
| Var Comp 1 Sink Mag | 27 | 3.1 | 1.35 | 9.67 | 2.9 | 30.5 |
| Var Comp 1 Float | 673 | 76. | 0.14 | 0.72 | 7.78 | 56.6 |
| **Feed (Calc.)** | **881** | **100** | **1.41** | **0.97** | **100** | **100** |
| Var Comp 3 Sink Before Mag | 146 | 15.7 | 5.35 | 1.58 | 90.1 | 31.9 |
| Var Comp 3 Sink Non-Mag | 132 | 14.2 | 5.74 | 1.14 | 87.0 | 20.7 |
| Var Comp 3 Sink Mag | 14.7 | 1.58 | 1.87 | 5.55 | 3.16 | 11.2 |
| Var Comp 3 Float | 784 | 84.3 | 0.11 | 0.63 | 9.89 | 68.1 |
| **Feed (Calc.)** | **931** | **100** | **0.93** | **0.78** | **100** | **100** |
| Var Comp 5 Sink Before Mag | 230 | 25.2 | 5.93 | 1.10 | 91.4 | 43.5 |
| Var Comp 5 Sink Non-Mag | 215 | 23.7 | 6.17 | 0.71 | 89.2 | 26.4 |
| Var Comp 5 Sink Mag | 14.4 | 1.58 | 2.26 | 6.90 | 2.17 | 17.1 |
| Var Comp 5 Float | 680 | 74.8 | 0.19 | 0.48 | 8.64 | 56.5 |
| **Feed (Calc.)** | **910** | **100** | **1.64** | **0.64** | **100** | **100** |
| Var Comp 8 Sink Before Mag | 205 | 22.1 | 5.81 | 0.97 | 85.5 | 36.1 |
| Var Comp 8 Sink Non-Mag | 193 | 20.9 | 6.04 | 0.62 | 83.9 | 21.7 |
| Var Comp 8 Sink Mag | 11.5 | 1.24 | 1.89 | 6.94 | 1.56 | 14.4 |
| Var Comp 8 Float | 721 | 77.9 | 0.28 | 0.49 | 14.5 | 63.9 |
| **Feed (Calc.)** | **926** | **100** | **1.50** | **0.60** | **100** | **100** |

### 13.1.2.6 Dense Media Separation

#### SGS - 19005-02

Dense media separation was carried out on a single 143 kg sample of CV5 Spodumene Pegmatite material with a head grade of 1.05% $Li_2O$ and 0.55% $Fe_2O_3$ (the sample was the combination of sample CF21-001Met and CF21-002Met). The material was tested through a two-stage DMS flow sheet twice with better performance being achieved with a first pass cut point of 2.70 SG and a second pass cut point of 2.85 SG. Second pass DMS sinks (spodumene concentrate) was passed over a magnetic separator for iron removal. The flowsheet is displayed in Figure 13-11.

The DMS test returned a spodumene concentrate grading 5.77% $Li_2O$ and 0.62% $Fe_2O_3$ and a 79% Li recovery. DMS spodumene concentrate from this test work is shown in Figure 13-8 and Figure 13-9.


**Figure 13-8: Spodumene concentrate (DMS + non-magnetic fractions)
5.8% $Li_2O$ and 0.60% $Fe_2O_3$ at 79% recovery**


**Figure 13-9: Close-up of spodumene concentrate (DMS + non-magnetic fractions) 5.8% $Li_2O$ and 0.60% $Fe_2O_3$ at 79% recovery**

## SGS - 19005-02A

Dense media separation ("DMS") was conducted on the master composite sample (~373 kg) with a head grade of 1.05% $Li_2O$ and 1.88% $Fe_2O_3$ (the sample was composed of Zeppelin Comp-001, 002, 003, and 004 at 65%,10%, 10%, and 15% respectfully). The material was processed through a two-stage DMS flowsheet, with a first pass cut point of 2.65 SG and a second pass cut point of 2.88 SG. Dry magnetic separation was performed on the second pass sinks to remove iron-rich material. Figure 13-10 presents the tested flowsheet.

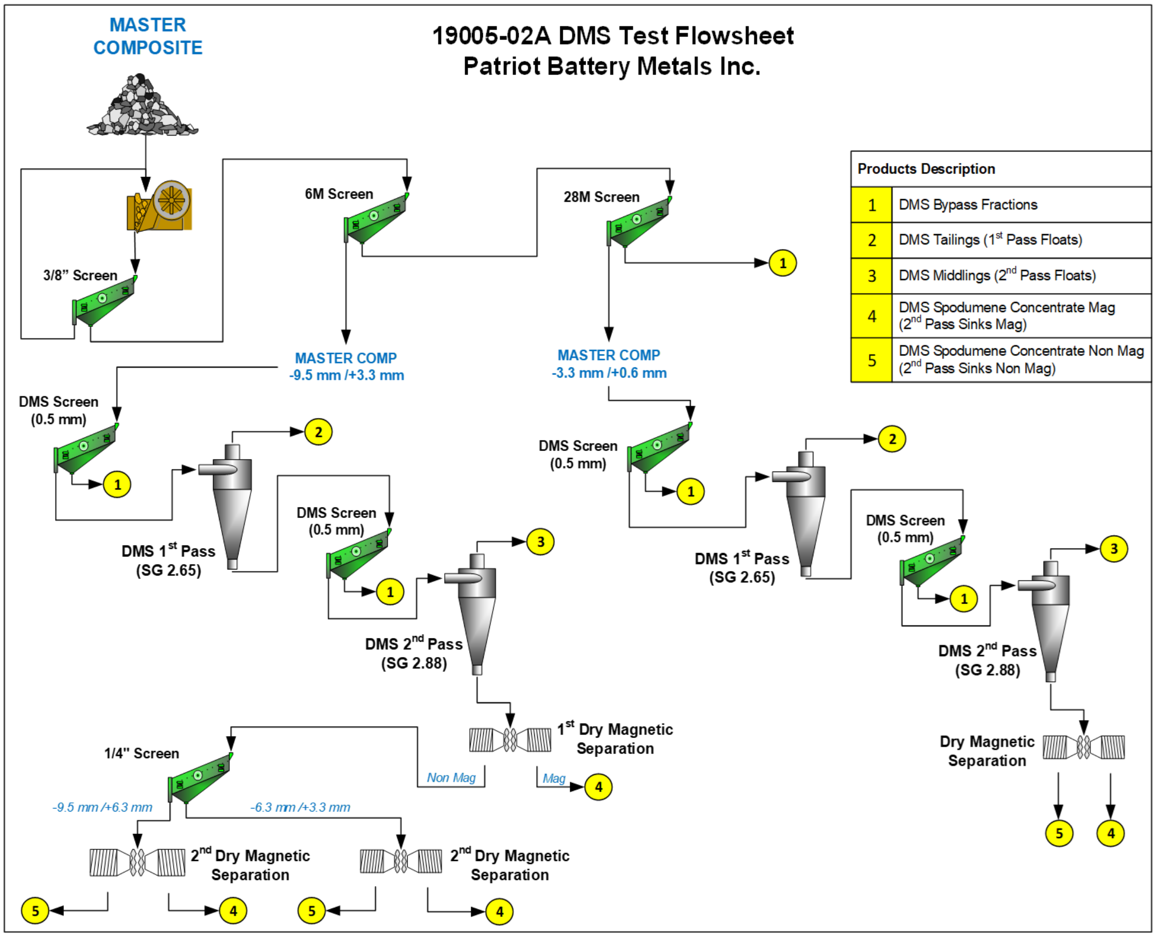



**Figure 13-10: Zeppelin DMS test work flowsheet**

The test results achieved the final concentrate grade of 6.21% $Li_2O$ and 0.60% $Fe_2O_3$ at 69% global lithium recovery. Table 13-6 summarizes the test results for the master composite.

**Table 13-6: Zeppelin master comp DMS test work results**

| Description | Mass Distribution | $Li_2O$ Grade | $Fe_2O_3$ Grade | $Li_2O$ Distribution | $Fe_2O_3$ Distribution |
|---|---|---|---|---|---|
| DMS Feed | 100.00 | 1.05 | 1.80 | 100.00 | 100.00 |
| -0.6 mm Fines Bypass | 15.91 | 0.67 | 2.38 | 10.07 | 21.00 |
| DMS Floats | 37.14 | 0.06 | 0.26 | 1.98 | 0.26 |
| DMS Middlings | 27.79 | 0.51 | 1.86 | 13.51 | 28.73 |
| Magnetic Tailings | 7.39 | 0.72 | 10.02 | 5.05 | 41.07 |
| DMS Concentrate | 11.77 | 6.21 | 0.60 | 69.39 | 3.94 |

Table 13-6 shows that ~23% of the global lithium distribution is accounted for by fines bypass and middlings, with only minor losses in the DMS floats. These results align with the HLS findings and support the use of a DMS flowsheet moving forward.

Additionally, dry magnetic separation was used to remove iron from DMS sinks in this test work program, demonstrating ideal separation efficiency. Further testing is recommended to identify the best available and economical technology for DMS iron removal, as dry magnetic separation typically requires the use of a dryer to achieve <1% moisture. It is also recommended to better define iron feed grades in the future mine plan, enhancing the understanding of iron's implications in the current flowsheet.

#### 13.1.2.7 Flotation

Although a DMS-only flowsheet is the preferred process route for CV5, preliminary flotation test work was conducted to understand the amenability of CV5 material to flotation.

Four 2-kg sample of second stage DMS floats (commonly referred to as the DMS middlings) combined with the bypass fraction (i.e., the -0.85 mm fraction screened out prior to DMS) was ground to 100% passing 300 µm. The material was de-slimed, processed through a magnetic separator with mica flotation of non-magnetic fraction, de-slimed again (to also increase solids concentration for spodumene conditioning), then processed through spodumene flotation consisting of a rougher cell and two stage cleaning cells, with a final magnetic separator to remove iron from second cleaner concentrate.

The bench scale flotation tests increased the global lithium recovery by 10.1% above the results achieved by the DMS test work alone (DMS alone achieved 79.0% while the hybrid circuit achieved 89.1%). Flotation spodumene concentrate returned a grade of 5.49% $Li_2O$ and 0.40% $Fe_2O_3$. The overall DMS and flotation test work flowsheet is shown in Figure 13-11.

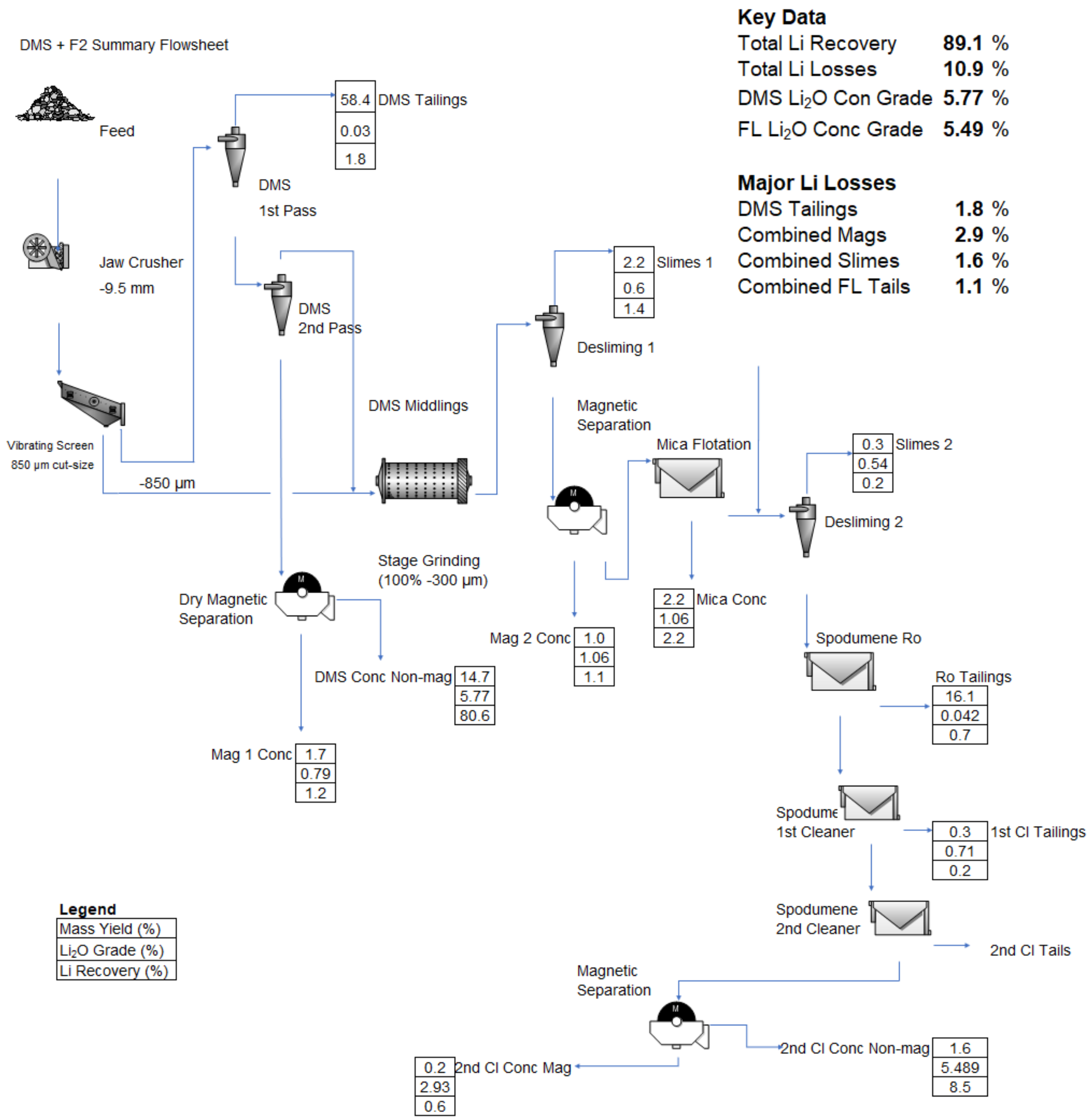



**Figure 13-11: Combined DMS and flotation test work flowsheet**

A flotation circuit and the corresponding recovery results are not considered for the PEA. This opportunity exists for a later date in the Project (i.e., after successful start-up of the DMS only concentrator).

## 13.2 Basis for Recovery and Throughput Estimates

The CV5 HLS variability test work was used as the basis for determining a feed grade vs. recovery trend to be used to assist with Mineral Resource Estimate cut-off grades.

To allow for changes in recovery that may be exhibited when scaling up from laboratory test work to expected recovery in an operating DMS plant, the HLS test work data was adjusted.

Recovery via HLS is "ideal" compared to recovery by a DMS cyclone in an operating plant. A reduction in recovery is expected and an "offset" of 2% to 10% from HLS results is typically observed. This "offset" is dependent on factors such as lithology, liberation, and quantity of near SG composite particles.

Specific items that account for scale down are the following:

- The laboratory crush size is typically coarse compared to the benchmark modelled and operating crushed mineralized material PSDs. Test work particle sizing indicates 8% to 12% passing 0.65 mm, with 14% to 18% passing 0.65 mm typically expected in operation. This increase in bypass material results in a loss of recovery.
- HLS results are based solely on the density of the particle. The density of the particle is still an important factor in estimating performance in a DMS processes; however, the size of the particle is also a factor. As such, if the size range of the material reporting a DMS processes is too large, the risk of the smaller heavy particles reporting to the floats is increased. Common practise is to split the material into multiple size fractions to mitigate this fact, but even so, there are some in recovery losses associated to this phenomenon.

The predicted grade vs. recovery curve in Figure 13-12 considers the test work recovery values from each variability composite sample and leverages the results to offset the ideal HLS test work results. Taking into consideration the scale-up inefficiencies from HLS to DMS and finer size distribution changes within the plant compared to laboratory results, Primero can utilize its extensive experience in DMS operations to model the predicted recovery curve.

The predicted grade vs. recovery data for the HLS results is shown in the equation below.

This trend indicates that recoveries of approximately 70%–75% $Li_2O$ at feed grades above 1.4% $Li_2O$, recoveries above approximately 60% $Li_2O$ are possible at feed grades above 0.9% $Li_2O$ and recoveries of approximately 50% $Li_2O$ up to 60% $Li_2O$ are possible at feed grades above 0.7% $Li_2O$.

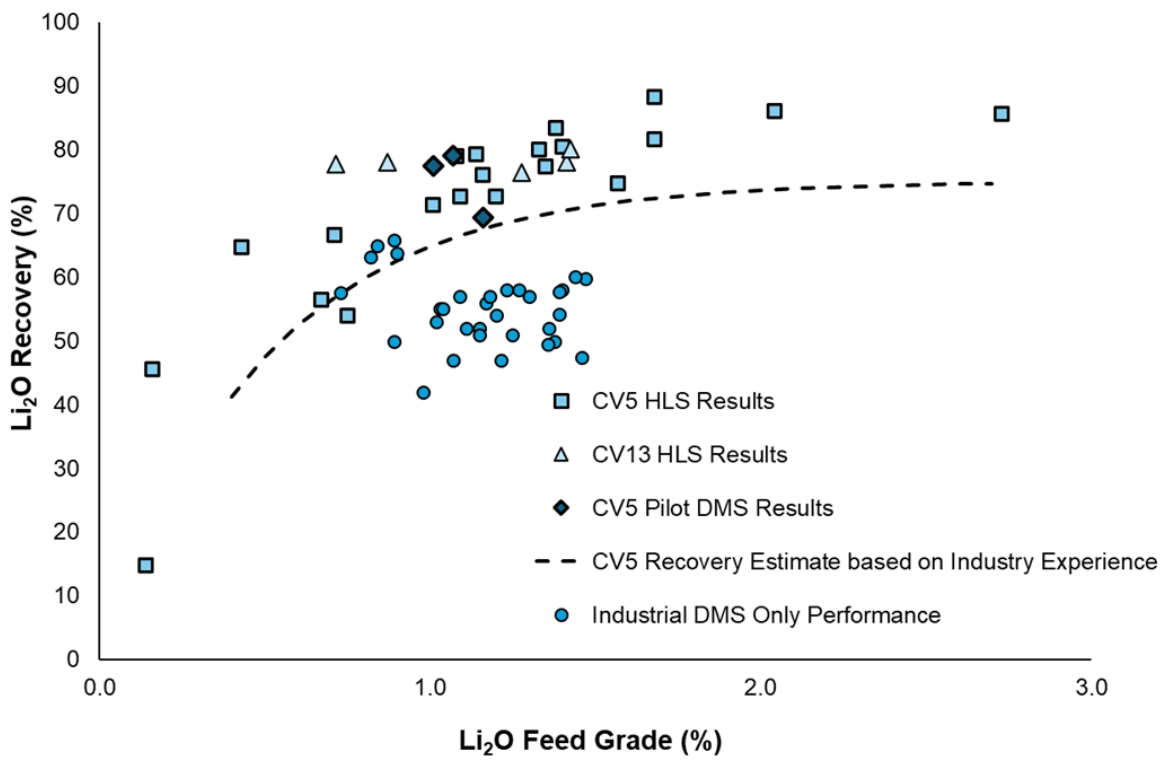



**Figure 13-12: Metallurgical test work recovery results and industry-based recovery estimates for 3x size range DMS process plant**

Future work will further develop this relationship. This relationship is dependent on both the spodumene grain size and grain size distribution in the deposit. Mineralogy with finer grained and/or wider grain size distributions will have less spodumene reporting to the concentrate stream at a given size. To date, the Shaakichiuwaanaan Deposit has demonstrated a crystal size and distribution that shows good liberation characteristics at 9.5 mm.

Of important note that higher iron content in plant feed can lower the global recoveries of the plant. Future test work will integrate the impact of feed iron grade on the global recovery.

## 13.3 Processing Factors and Deleterious Elements

The variability samples tested to date indicate that the CV5 and CV13 pegmatites are amenable to a DMS-only spodumene concentrator flowsheet fed at a coarse crush size. To be amenable to this style of flowsheet, spodumene needs to be the predominant mineral that hosts lithium, and it needs to generally exhibit coarse crystal sizes so that it can successfully be liberated and recovered at coarse particle sizes (i.e., approximately 4 mm to 10 mm).

Data to date indicates that coarse spodumene lithology dominates CV5 and CV13, predominately at grades above 1.0% $Li_2O$. However, if significant quantities of finer lithology, alternate mineralogy, or low-grade material (<0.6% $Li_2O$) are identified, this material will require testing to confirm its expected behaviour in a DMS plant. Lithology with finer spodumene crystals may not liberate successfully, which may result in reduced recovery or grade.

Some of the drilling and samples tested to date have been identified to have low levels of lepidolite. If samples are identified with higher quantities of lithium in non-spodumene mineral species, such as lepidolite or petalite, lower recoveries to DMS concentrate may be expected. This is due to the SG of minerals such as petalite being closer to gangue mineral SG when compared to the SG of spodumene.

High concentrations of some gangue minerals can complicate spodumene concentration by DMS. Higher concentrations of iron bearing minerals from within the pegmatite such as tourmaline or some micas can result in higher iron grades in the final DMS concentrate. For most of the HLS tests conducted so far, iron grades in the concentrate were satisfactorily low or able to be controlled using magnetic separation.

Higher iron can also potentially come from host rock species such as amphibolite, anorthosite, or meta-sediment. If unacceptable levels of host rock dilution are encountered, they can be mitigated by conservative mining methods to reduce dilution, ROM blending, or magnetic separation. Ore sorting to reject dilution is also potentially an option if required. The bulbous structure of the CV5 Pegmatite is fortunate and may help when aiming to maintain low concentrations of host rock in the DMS plant feed.

Mica can misreport to the concentrate in the DMS due to its platelike shape. High concentration of mica in the process feed can result in recoveries or grades being lower than expected. To mitigate this, levels of mica will be tracked and, if required, up flow classification can be added to the flowsheet to reject mica ahead of DMS.

The crushed mineralized material PSD is important for global recovery estimates. It is typical to expect 14% to 18% of mass to report to the -0.65 mm and not be processed by DMS. If finer PSDs are generated due to the manner in which mining or crushing is conducted, the quantity of fines produced can increase significantly to as high as 30% passing -0.65 mm, resulting in reduced global DMS recovery. This risk can be reduced by appropriate mining and crushing circuit design and operation.

Like the point raised prior, an alternative mechanism for higher proportion of -0.65 mm can come from the nature of the rock. In cases where the rock exhibits high friability (the size of particles that a rock breaks into, high friability results is many fine particles), the amount of bypass is higher. This is typical of materials that have experienced large degrees of weathering. To date, there has been little evidence of high amounts of weathering in the Shaakichiuwaanaan Deposit. Samples from the surface of the deposit and/or from around faults can be tested for their friability in the future.

## 13.4 Conclusions

Mineralogical, DMS and HLS test work was carried out by SGS Canada at their Lakefield, Ontario, facility across 13 drill core composite samples from the CV5 Pegmatite. The following conclusions have been made:

- Test work supports a DMS-only process flowsheet to produce a spodumene concentrate grade of >5.5% $Li_2O$ and <1.2% $Fe_2O_3$. Test work $Li_2O$ recoveries of 70% to 85% were achieved for HLS test work (for feed grade in the range 1.0% to 1.5% $Li_2O$ respectfully).
- Test work completed on CV5 includes three DMS tests and 24 Heavy Liquid Separation ("HLS") and magnetic separation tests. The HLS and magnetic separation tests were conducted using 24 composites from across the CV5 Deposit.
- Coarse spodumene was found to be the dominant lithium mineral species across all samples with minor quantities of lepidolite (values range between 0% to 4.3% with an average of 0.98%) and moderate quantities of mica (values range between 0% to 17.1% with an average of 6.50%) observed.
- Three pilot DMS tests (cyclone diameter of 250 mm) were completed. Table 13-7 summarises the global $Li_2O$ feed grades (before fines screening), global lithium recoveries and the $Li_2O$ and $Fe_2O_3$ grades of the concentrates achieved. These results strongly support adopting a DMS-only process flowsheet.

**Table 13-7: Pilot DMS results**

| DMS Feed $Li_2O$ Grade (%) | Global DMS Lithium Recovery (%) | Concentrate $Li_2O$ Grade (%) | Concentrate $Fe_2O_3$ Grade (%) |
|---|---|---|---|
| 1.01 | 77.4 | 5.64 | 0.55 |
| 1.07 | 79.0 | 5.77 | 0.62 |
| 1.16 | 69.4 | 6.21 | 0.60 |

- $Fe_2O_3$ grades in HLS concentrates were in the range 0.52%–1.79% and after magnetic separation was applied to 15 of the 24 composites, all concentrates were <1.2% $Fe_2O_3$.
- The 24 CV5 HLS variability test results were adjusted to more appropriately represent recoveries expected in an operating DMS plant. After fitting a trend to this data, it indicates:
  - Recoveries of 70%–75% $Li_2O$ expected at feed grades above 1.4% $Li_2O$;
  - Recoveries of 60%–70% $Li_2O$ expected at feed grades of 0.9%–1.4% $Li_2O$;
  - Recoveries of 50%–60% $Li_2O$ are possible at feed grades of 0.7%–0.9% $Li_2O$.

- Flotation was performed on sample composed of DMS middlings (second stage DMS floats) combined with the DMS bypass fraction (i.e., -0.85 mm). The global $Li_2O$ recovery was improved from 79.0% (the DMS only recovery) to 89.1% (DMS followed by flotation). Flotation spodumene concentrate returned a grade of 5.49% $Li_2O$ and 0.40% $Fe_2O_3$. Flotation shows promise to potentially be added to a DMS only plant at some stage in the future once operational.
- Some samples assayed contained elevated grades of $Ta_2O_5$ (with values as high as 300 ppm). There is further work warranted to assesses if tantalum can be recovered from any of the non-product streams of the DMS plant.

## 13.5 Recommendations

As the Project advances, further test work will be required to develop a DMS only flowsheet. These tests are:

- Comminution test work for crushing (i.e., Bond Crushing Work Index "CWi"). This work serves to confirm the crusher sizing and provides an indication of the size distribution feeding the plant.
- Dewatering test work including vacuum filter test work and thickening test work. The feed stream of particular interest is the material that bypasses the DMS circuit.
- Further magnetic separation test work, particularly in the coarse concentrates. Testing the effectiveness of coarser particles in wet belts separators is required for estimating final iron specification.
- Testing alternative magnetic separation technologies for the coarse DMS concentrate (i.e., 9.5 mm to 3.3 mm size range) is recommended.
- Up flow (Teeter bed type) classification test work, in conjunction with DMS test work, on higher mica feed samples to determine the impact to the circuit if a mica removal step is implemented to the circuit.
- Due to the width and orientation of the CV5 Pegmatite lenses, the expected dilution of the plant feed is expected to be relatively low. However, there may be opportunities to maximize the extraction of spodumene concentrate from the deposit if parts of the deposit with higher dilution are directed to an ore sorting processing solution. Ore sorting test work is planned for the next phase of test work.

Opportunities exist for processing the bypass fraction of the DMS circuit (i.e., the minus 0.65 mm). As such, the following test work is recommended to assess these opportunities:

- Gravity recovery test work to determine if a tantalite recovery circuit should be included in the initial flowsheet to recover the high values of tantalum in the feed.

- Fines bypass processing can increase the recovery of the project (i.e., via flotation). Due to the high recovery of the DMS-only process, further assessment of the recovery improvement and its associated costs (i.e., Capex and Opex) would need to be assesses to ascertain the feasibility of this processing step. If determined to be attractive, the process step would be added after start-up of the DMS-only flowsheet as to not hinder the typically fast start-ups associated with DMS-only operations. Further flotation test work is planned within the next phase of study.
- Processing of the 0.65 mm to 0.25 mm fraction without grinding can generate higher global recoveries. It is recommended to test technologies that can processes this size range such as coarse flotation (upflow/tetter-bed settlers with flotation modifying the settling characteristics of the spodumene) or gravity technologies (e.g., spirals).

# 14. Mineral Resource Estimates

## 14.1 Resource Estimate

The QP completed a Mineral Resource Estimate of the CV5 and CV13 pegmatites at the Shaakichiuwaanaan Property. The effective date of the resource is August 21, 2024.

### 14.1.1 Database

Patriot maintains all drill data for the Shaakichiuwaanaan Property in MX database. Header, surveys, assays, lithology, and geotechnical logging information are saved in the database. The final database information in CSV format was provided to the QP on June 27, 2024.

The MRE for the CV5 Pegmatite area is supported by 344 diamond drill holes ("DDH") of NQ (predominant) or HQ size, totalling a collective 129,673 m, and 11 outcrop channels, totalling 63 m. At CV13, the MRE is supported by 132 DDH (29,059 m) and 54 outcrop channels (340 m). The drilling includes programs in 2021, 2022, 2023, and 2024 (through the end of April 2024; CV24-526). The resource estimation was conducted using Leapfrog Edge™ version 2023.2.3.

### 14.1.2 Specific Gravity

Up to hole CV24-526, Patriot collected a total of 18,443 samples from 480 drill holes for specific gravity ("SG") measurements. The same methodology and regression function was used for CV5 and CV13.

Patriot used the following procedure to determine the average SG for each mineral domains:

- Sample selected for SG measurement after the core was cut;
- Full sample length was measured for SG;
- After scale was calibrated, the sample was weighted dry;
- The sample was then weighted submerged saturated in tab water;
- The specific gravity is determined using the following equation:

*Wd = Dry Weight, Ws = Submerged Weight*

Figure 14-1 illustrates the SG measuring set up employed by Patriot during this round of SG data collection. Results are presented in Table 14-1. A linear regression formula based on the $Li_2O$ percentage was used to calculate the density for all the pegmatite Figure 14-2). The regression function is: $SG = 0.0688*Li_2O\%+2.625$. Non-pegmatite blocks were assigned a fixed SG based on the field measurement median value of their respective modelled lithology.

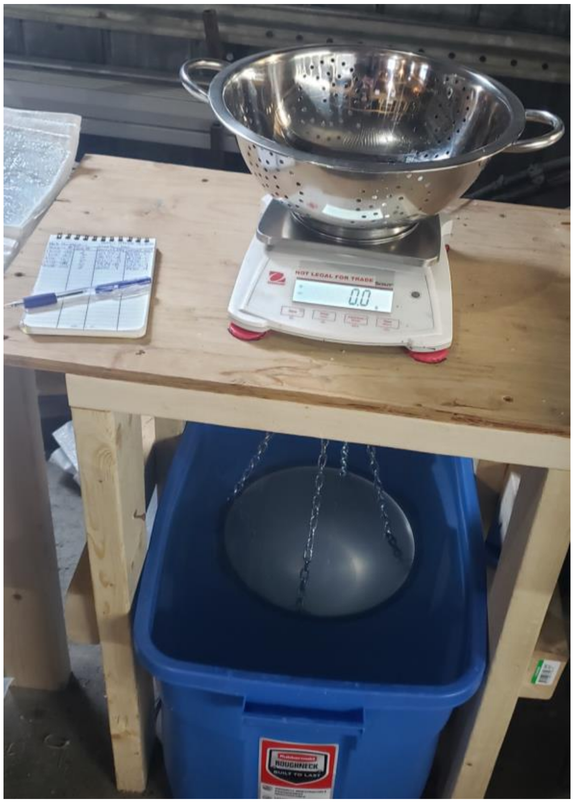


**Figure 14-1: SG measurement set up employed by Patriot**

**Table 14-1: MRE specific gravity summary**

| Lithology | Rock Density |
|---|---|
| Pegmatite | Linear regression curve |
| Amphibolite Group | 2.98 |
| Ultramafic | 2.95 |
| Diabase | 2.94 |
| Metasediment | 2.76 |
| Wacke | 2.71 |
| Overburden | 2.0 |

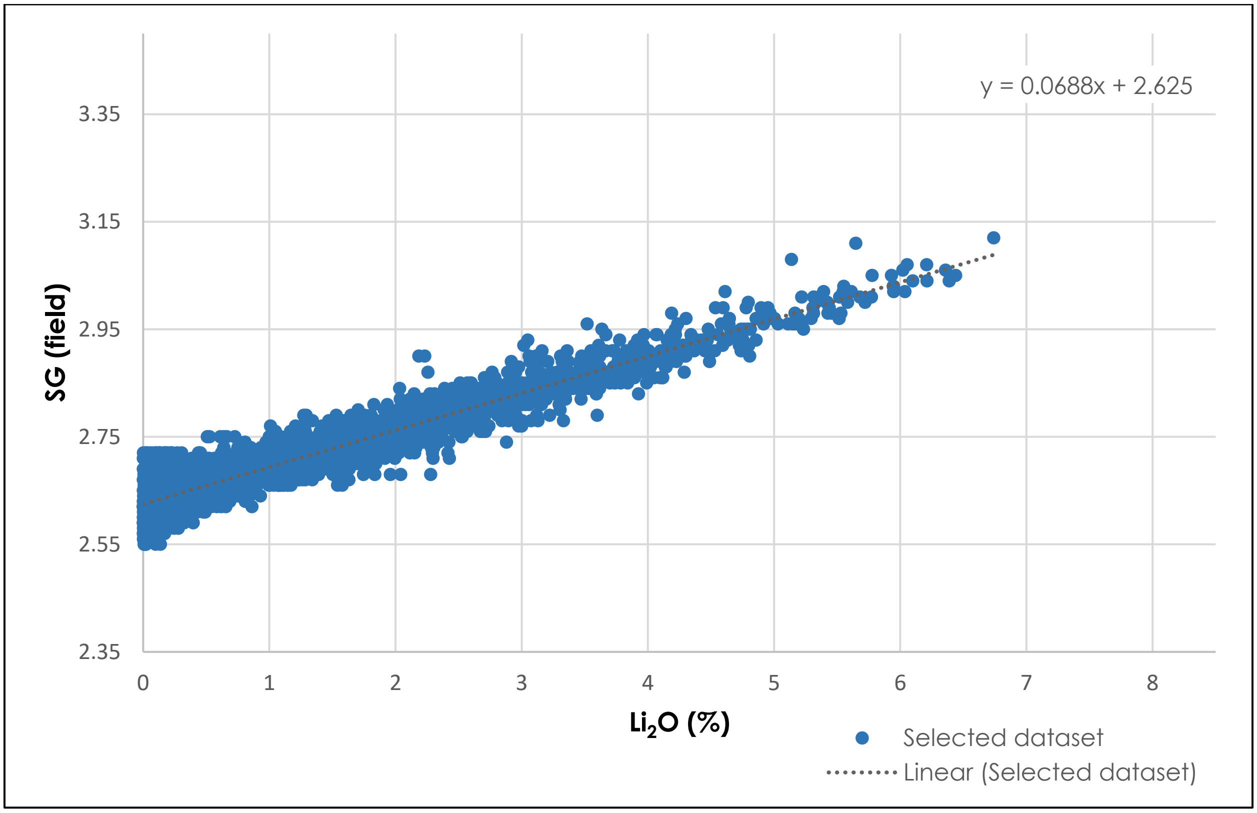



**Figure 14-2: Derivation of SG from the regression function**

### 14.1.3 Topography Data

Patriot completed a property-wide LiDAR and orthophoto survey in August 2022, which provides high-quality topographic control. The quality and accuracy of the topographic controls are considered adequate for advanced stage exploration and development, including an MRE.

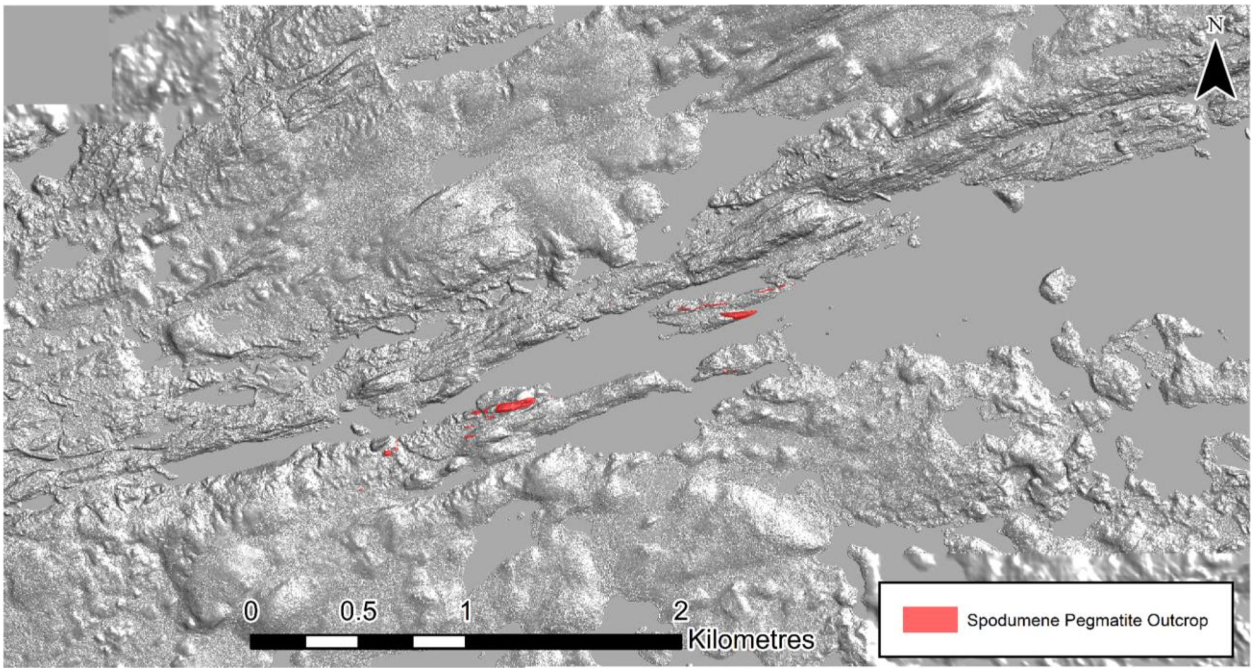



**Figure 14-3: LiDAR topographic image with spodumene pegmatite outcrops at CV5**

### 14.1.4 Geological Interpretation

Three-dimensional wireframe models of mineralization were developed in Leapfrog Geo™ by Patriot and its geological consultants. The wireframes were based on the geological interpretation of the zones as distinct domains and not strictly on grade intervals. 3D modelling of the mineralized zones and interpretation was also based on structural data measurements and the regional trend. Zones were modelled with a combination of implicit and explicit modelling. Control lines were used to constrain the volume in specific orientations.

The wireframes extend at depth, below the deepest DDH and laterally. The resource model did not estimate grades into the full volume of the wireframes due to interpolation parameters constraints.

The non-assayed intervals were assigned half the detection limit value. The QP believes that non-assayed material should not be assigned a zero value, as this does not reflect the true value of the material. Each domain was modelled using the same principal assumptions and methodology.

Patriot and its geological consultants completed the 3D modelling respecting the guidelines and recommendations of the QP.

## CV5

The mineralized zones (Figure 14-4) were broken down into 10 different domains. The CV5 principal pegmatite was divided into two domains (spodumene-rich (1) and feldspar-rich (2)). Eight mostly parallel pegmatite dykes were geologically modelled for the MRE (CV5_110 (3); CV5_120 (4); CV5_130 (5); CV5_140 (6); CV5_150 (7); CV5_160 (8); CV5_170 (9); and CV5_180 (10)).

The other units of the 3D model consist of amphibolite, ultramafic, metasediment, wacke, diabase, overburden, and water.

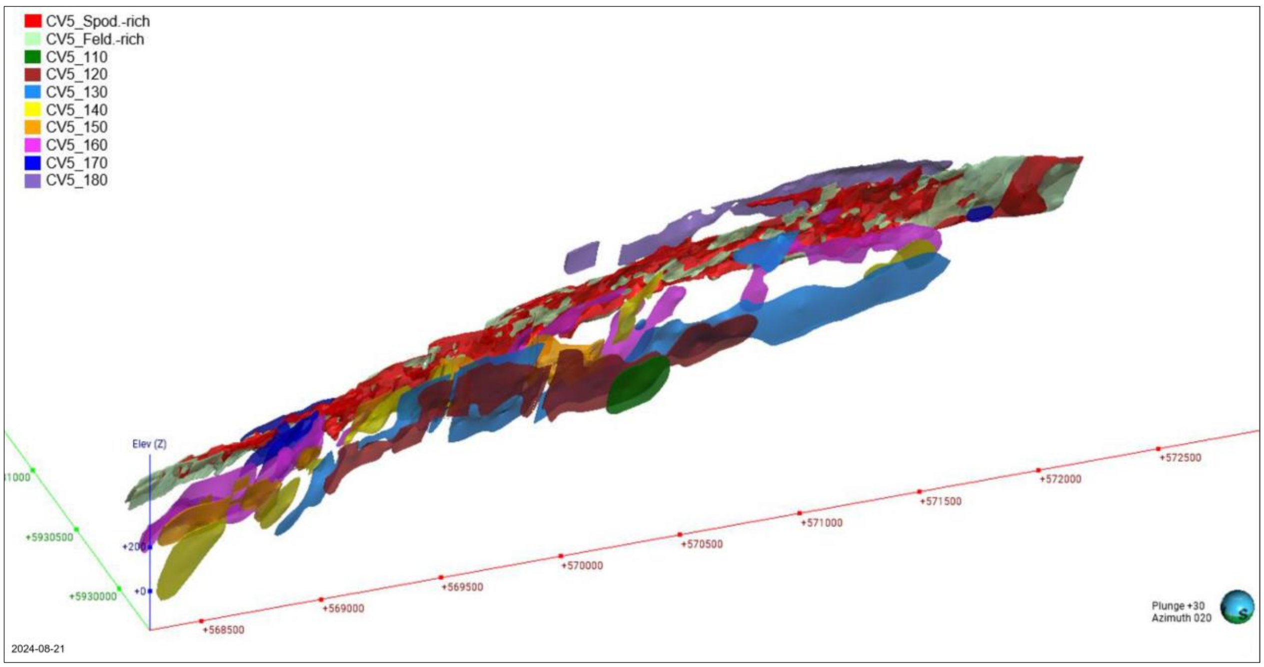



**Figure 14-4: Mineralized zones of CV5 (image not to scale)**

## CV13

The CV13 mineralized zones (Figure 14-5) were broken down into 21 different domains. Domains are mostly subparallel to each other.

The other units of the 3D model consist of amphibolite, ultramafic, and overburden.

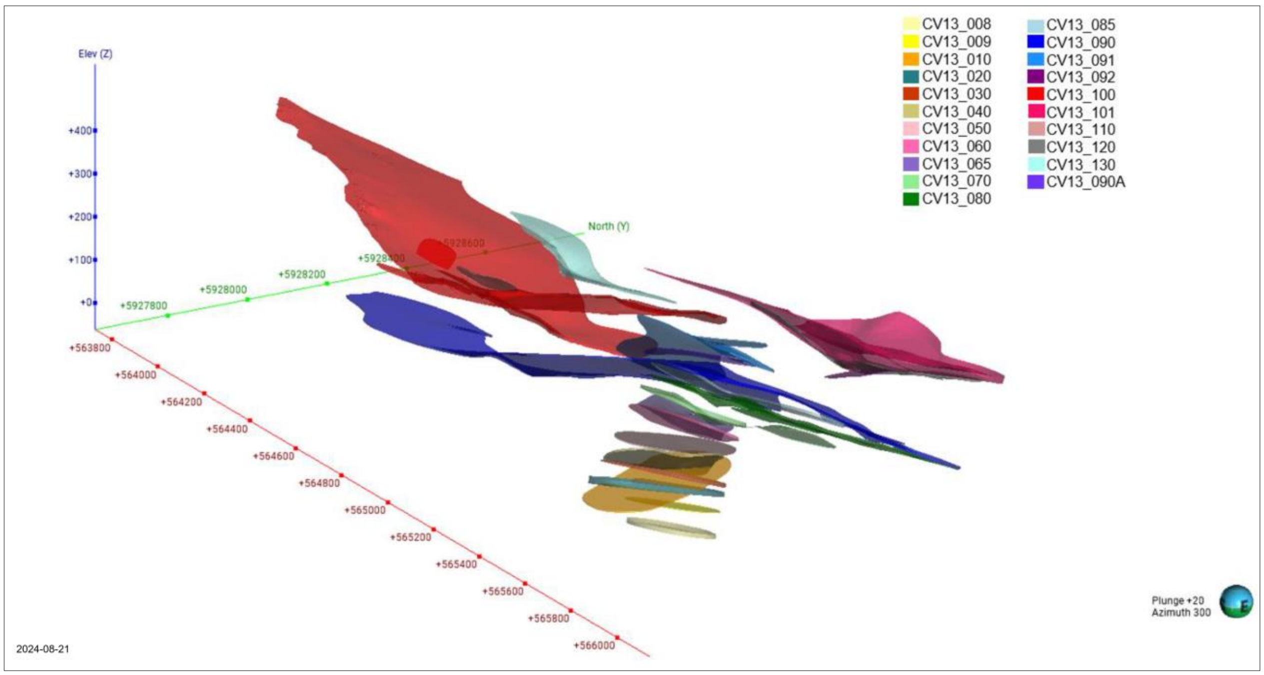



**Figure 14-5: Mineralized zones of CV13 (image not to scale)**

### 14.1.5 Exploratory Data Analysis

#### 14.1.5.1 Assays

##### CV5

The 10 domains included in the MRE were sampled by a total of 16,792 assays. The assay intervals within each mineral domain were captured using the evaluation function in Leapfrog Geo™. These intervals were reviewed to ensure all the proper assay intervals were properly captured. Table 14-2 summarizes the basic statistics for the assays ($Li_2O$% and $Ta_2O_5$ ppm) intervals for each of the mineral domains on the Property.

**Table 14-2: Assays summary by domain (CV5; length-weighted)**

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| Spodumene-rich | $Li_2O$ (%) | 9,352 | 0.00 | 6.88 | 1.51 | 1.29 |
| | $Ta_2O_5$ (ppm) | 9,352 | 0 | 25,521 | 160 | 323 |
| Feldspar-rich | $Li_2O$ (%) | 3,984 | 0.00 | 5.55 | 0.22 | 0.45 |
| | $Ta_2O_5$ (ppm) | 3,984 | 0 | 11,292 | 153 | 311 |
| 110 | $Li_2O$ (%) | 8 | 0.01 | 0.52 | 0.12 | 0.18 |
| | $Ta_2O_5$ (ppm) | 8 | 41 | 232 | 107 | 80 |
| 120 | $Li_2O$ (%) | 210 | 0.00 | 3.78 | 0.36 | 0.71 |
| | $Ta_2O_5$ (ppm) | 210 | 0 | 2,120 | 142 | 206 |
| 130 | $Li_2O$ (%) | 402 | 0.00 | 4.34 | 0.60 | 0.89 |
| | $Ta_2O_5$ (ppm) | 402 | 0 | 2,021 | 126 | 166 |
| 140 | $Li_2O$ (%) | 194 | 0.00 | 4.35 | 0.59 | 0.89 |
| | $Ta_2O_5$ (ppm) | 194 | 0 | 868 | 137 | 111 |
| 150 | $Li_2O$ (%) | 1,165 | 0.00 | 6.84 | 0.99 | 1.09 |
| | $Ta_2O_5$ (ppm) | 1,165 | 0 | 2,314 | 123 | 136 |
| 160 | $Li_2O$ (%) | 725 | 0.00 | 5.19 | 0.86 | 1.11 |
| | $Ta_2O_5$ (ppm) | 725 | 0 | 2,423 | 160 | 174 |
| 170 | $Li_2O$ (%) | 242 | 0.00 | 4.74 | 0.81 | 1.11 |
| | $Ta_2O_5$ (ppm) | 242 | 0 | 2,270 | 167 | 177 |
| 180 | $Li_2O$ (%) | 510 | 0.00 | 4.91 | 0.79 | 1.01 |
| | $Ta_2O_5$ (ppm) | 510 | 0 | 2,015 | 143 | 164 |

## CV13

The 21 domains included in the MRE were sampled by a total of 2,831 assays. The assay intervals within each mineral domain were captured using the evaluation function in Leapfrog Geo™. These intervals were reviewed to ensure that all appropriate assay intervals were correctly captured. Table 14-3 summarizes the basic statistics for the assay ($Li_2O$% and $Ta_2O_5$ ppm) intervals for each mineral domains on the Property.

**Table 14-3: Assays summary by domain (CV13; length-weighted)**

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| CV13_008 | $Li_2O$ (%) | 9 | 0.00 | 0.12 | 0.02 | 0.03 |
| | $Ta_2O_5$ (ppm) | 9 | 20 | 151 | 85 | 39 |
| CV13_009 | $Li_2O$ (%) | 2 | 0.01 | 0.03 | 0.01 | 0.02 |
| | $Ta_2O5$ (ppm) | 2 | 17 | 47 | 31 | 21 |
| CV13_010 | $Li_2O$ (%) | 5 | 0.00 | 0.14 | 0.05 | 0.06 |
| | $Ta_2O_5$ (ppm) | 5 | 0 | 93 | 46 | 38 |
| CV13_020 | $Li_2O$ (%) | 22 | 0.01 | 0.29 | 0.07 | 0.07 |
| | $Ta_2O_5$ (ppm) | 22 | 0 | 243 | 50 | 54 |
| CV13_030 | $Li_2O$ (%) | 10 | 0.01 | 0.11 | 0.06 | 0.03 |
| | $Ta_2O_5$ (ppm) | 10 | 2 | 145 | 60 | 39 |
| CV13_040 | $Li_2O$ (%) | 21 | 0.01 | 0.25 | 0.07 | 0.06 |
| | $Ta_2O_5$ (ppm) | 21 | 1 | 617 | 105 | 138 |
| CV13_050 | $Li_2O$ (%) | 18 | 0.00 | 1.09 | 0.14 | 0.27 |
| | $Ta_2O_5$ (ppm) | 18 | 18 | 198 | 82 | 58 |
| CV13_060 | $Li_2O$ (%) | 16 | 0.01 | 0.18 | 0.05 | 0.05 |
| | $Ta_2O_5$ (ppm) | 16 | 12 | 286 | 96 | 81 |
| CV13_065 | $Li_2O$ (%) | 8 | 0.01 | 0.21 | 0.10 | 0.07 |
| | $Ta_2O_5$ (ppm) | 8 | 57 | 271 | 124 | 74 |
| CV13_070 | $Li_2O$ (%) | 24 | 0.00 | 0.19 | 0.03 | 0.03 |
| | $Ta_2O_5$ (ppm) | 24 | 22 | 441 | 115 | 94 |
| CV13_080 | $Li_2O$ (%) | 104 | 0.00 | 2.25 | 0.19 | 0.40 |
| | $Ta_2O_5$ (ppm) | 104 | 0 | 1,817 | 127 | 222 |
| CV13_085 | $Li_2O$ (%) | 26 | 0.02 | 2.31 | 0.22 | 0.50 |
| | $Ta_2O_5$ (ppm) | 26 | 8 | 253 | 116 | 76 |
| CV13_090 | $Li_2O$ (%) | 289 | 0.00 | 4.05 | 0.47 | 0.86 |
| | $Ta_2O_5$ (ppm) | 289 | 0 | 1,164 | 87 | 115 |
| CV13_090A | $Li_2O$ (%) | 4 | 0.02 | 0.19 | 0.10 | 0.08 |
| | $Ta_2O_5$ (ppm) | 4 | 37 | 178 | 92 | 60 |

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| CV13_091 | $Li_2O$ (%) | 27 | 0.00 | 1.77 | 0.25 | 0.51 |
| | $Ta_2O_5$ (ppm) | 27 | 4 | 1,258 | 183 | 292 |
| CV13_092 | $Li_2O$ (%) | 5 | 0.03 | 0.05 | 0.04 | 0.01 |
| | $Ta_2O_5$ (ppm) | 5 | 164 | 215 | 195 | 22 |
| CV13_100 | $Li_2O$ (%) | 1,484 | 0.00 | 6.82 | 0.94 | 1.07 |
| | $Ta_2O_5$ (ppm) | 1,484 | 0 | 12,455 | 122 | 432 |
| CV13_101 | $Li_2O$ (%) | 655 | 0.00 | 7.01 | 1.04 | 1.65 |
| | $Ta_2O_5$ (ppm) | 655 | 0 | 8,432 | 140 | 429 |
| CV13_110 | $Li_2O$ (%) | 11 | 0.01 | 1.77 | 0.35 | 0.60 |
| | $Ta_2O_5$ (ppm) | 11 | 1 | 266 | 95 | 90 |
| CV13_120 | $Li_2O$ (%) | 56 | 0.01 | 4.60 | 0.67 | 1.26 |
| | $Ta_2O_5$ (ppm) | 56 | 3 | 691 | 168 | 134 |
| CV13_130 | $Li_2O$ (%) | 35 | 0.00 | 2.96 | 0.49 | 0.83 |
| | $Ta_2O_5$ (ppm) | 35 | 0 | 923 | 109 | 170 |

#### 14.1.5.2 Compositing

Compositing of all the assay data within the various domains was completed on downhole intervals honouring the interpretation of the geological solids. Statistics indicate that a majority of the samples were collected at 1 m intervals.

Compositing was done in Leapfrog Edge™ using a 1 m interval. For residual length less than 0.5 m it was redistributed equally within the domain. Table 14-4 summarizes the statistics for CV5 domains after compositing, while the statistics for CV13 are summarized in Table 14-5.

**Table 14-4: Compositing summary by domain for CV5**

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| Spodumene-rich | $Li_2O$ (%) | 10,126 | 0.00 | 6.84 | 1.52 | 1.19 |
| | $Ta_2O_5$ (ppm) | 10,126 | 0 | 18,743 | 161 | 266 |
| Feldspar-rich | $Li_2O$ (%) | 4,363 | 0.00 | 5.55 | 0.22 | 0.41 |
| | $Ta_2O_5$ (ppm) | 4,363 | 0 | 10,856 | 153 | 281 |
| 110 | $Li_2O$ (%) | 11 | 0.01 | 0.49 | 0.12 | 0.16 |
| | $Ta_2O_5$ (ppm) | 11 | 41 | 228 | 107 | 74 |
| 120 | $Li_2O$ (%) | 246 | 0.00 | 3.26 | 0.36 | 0.65 |
| | $Ta_2O_5$ (ppm) | 246 | 0 | 2,028 | 142 | 192 |

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| 130 | $Li_2O$ (%) | 450 | 0.00 | 4.34 | 0.60 | 0.83 |
| | $Ta_2O_5$ (ppm) | 450 | 0 | 1,843 | 126 | 145 |
| 140 | $Li_2O$ (%) | 205 | 0.00 | 4.35 | 0.59 | 0.83 |
| | $Ta_2O_5$ (ppm) | 205 | 0 | 838 | 137 | 102 |
| 150 | $Li_2O$ (%) | 1,344 | 0.00 | 6.40 | 0.99 | 1.00 |
| | $Ta_2O_5$ (ppm) | 1,344 | 0 | 1,290 | 123 | 119 |
| 160 | $Li_2O$ (%) | 765 | 0.00 | 5.12 | 0.86 | 1.03 |
| | $Ta_2O_5$ (ppm) | 765 | 0 | 2,173 | 160 | 160 |
| 170 | $Li_2O$ (%) | 248 | 0.00 | 4.64 | 0.85 | 1.05 |
| | $Ta_2O_5$ (ppm) | 248 | 0 | 1,652 | 175 | 151 |
| 180 | $Li_2O$ (%) | 545 | 0.00 | 4.29 | 0.79 | 0.94 |
| | $Ta_2O_5$ (ppm) | 545 | 0 | 1,641 | 143 | 147 |

**Table 14-5: Compositing summary by domain for CV13**

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| CV13_008 | $Li_2O$ (%) | 10 | 0.00 | 0.08 | 0.02 | 0.02 |
| | $Ta_2O_5$ (ppm) | 10 | 47 | 151 | 85 | 35 |
| CV13_009 | $Li_2O$ (%) | 2 | 0.01 | 0.02 | 0.01 | 0.01 |
| | $Ta_2O_5$ (ppm) | 2 | 17 | 45 | 31 | 19 |
| CV13_010 | $Li_2O$ (%) | 6 | 0.01 | 0.14 | 0.05 | 0.05 |
| | $Ta_2O_5$ (ppm) | 6 | 4 | 93 | 46 | 34 |
| CV13_020 | $Li_2O$ (%) | 25 | 0.01 | 0.29 | 0.07 | 0.06 |
| | $Ta_2O_5$ (ppm) | 25 | 5 | 216 | 50 | 45 |
| CV13_030 | $Li_2O$ (%) | 14 | 0.01 | 0.10 | 0.06 | 0.03 |
| | $Ta_2O_5$ (ppm) | 14 | 12 | 145 | 60 | 36 |
| CV13_040 | $Li_2O$ (%) | 23 | 0.01 | 0.17 | 0.07 | 0.05 |
| | $Ta_2O_5$ (ppm) | 23 | 1 | 611 | 105 | 132 |
| CV13_050 | $Li_2O$ (%) | 17 | 0.00 | 0.75 | 0.14 | 0.24 |
| | $Ta_2O_5$ (ppm) | 17 | 21 | 173 | 82 | 50 |
| CV13_060 | $Li_2O$ (%) | 17 | 0.01 | 0.18 | 0.05 | 0.05 |
| | $Ta_2O_5$ (ppm) | 17 | 12 | 265 | 96 | 73 |
| CV13_065 | $Li_2O$ (%) | 7 | 0.01 | 0.18 | 0.10 | 0.06 |
| | $Ta_2O_5$ (ppm) | 7 | 67 | 271 | 124 | 70 |
| CV13_070 | $Li_2O$ (%) | 29 | 0.00 | 0.10 | 0.03 | 0.02 |
| | $Ta_2O_5$ (ppm) | 29 | 31 | 423 | 115 | 83 |

| Domain | Field | Count | Min. | Max. | Mean | Std Dev. |
|---|---|---|---|---|---|---|
| CV13_080 | $Li_2O$ (%) | 108 | 0.01 | 2.13 | 0.19 | 0.34 |
| | $Ta_2O_5$ (ppm) | 108 | 0 | 1,817 | 127 | 205 |
| CV13_085 | $Li_2O$ (%) | 31 | 0.02 | 2.31 | 0.22 | 0.46 |
| | $Ta_2O_5$ (ppm) | 31 | 11 | 253 | 116 | 71 |
| CV13_090 | $Li_2O$ (%) | 307 | 0.00 | 4.05 | 0.47 | 0.82 |
| | $Ta_2O_5$ (ppm) | 307 | 0 | 1,164 | 87 | 110 |
| CV13_090A | $Li_2O$ (%) | 5 | 0.02 | 0.19 | 0.10 | 0.07 |
| | $Ta_2O_5$ (ppm) | 5 | 37 | 178 | 92 | 52 |
| CV13_091 | $Li_2O$ (%) | 29 | 0.00 | 1.72 | 0.25 | 0.50 |
| | $Ta_2O_5$ (ppm) | 29 | 5 | 1,258 | 183 | 273 |
| CV13_092 | $Li_2O$ (%) | 5 | 0.03 | 0.05 | 0.04 | 0.01 |
| | $Ta_2O_5$ (ppm) | 5 | 164 | 215 | 195 | 21 |
| CV13_100 | $Li_2O$ (%) | 1,311 | 0.00 | 6.82 | 0.94 | 0.97 |
| | $Ta_2O_5$ (ppm) | 1,311 | 0 | 11,093 | 122 | 383 |
| CV13_101 | $Li_2O$ (%) | 668 | 0.00 | 7.01 | 1.04 | 1.51 |
| | $Ta_2O_5$ (ppm) | 668 | 1 | 8,432 | 140 | 386 |
| CV13_110 | $Li_2O$ (%) | 11 | 0.02 | 1.38 | 0.35 | 0.49 |
| | $Ta_2O_5$ (ppm) | 11 | 2 | 211 | 95 | 78 |
| CV13_120 | $Li_2O$ (%) | 66 | 0.02 | 4.19 | 0.67 | 1.14 |
| | $Ta_2O_5$ (ppm) | 66 | 7 | 691 | 168 | 120 |
| CV13_130 | $Li_2O$ (%) | 50 | 0.00 | 2.78 | 0.49 | 0.79 |
| | $Ta_2O_5$ (ppm) | 50 | 0 | 709 | 109 | 151 |

#### 14.1.5.3 Grade Capping

Composited assay data for each domain was examined individually to assess the amount of metal that is bias from high-grade assays. A combination of geostatistical methods, probability plots and cumulative frequency plots was used to assist in the determination if grade capping was required on each element in each domain.

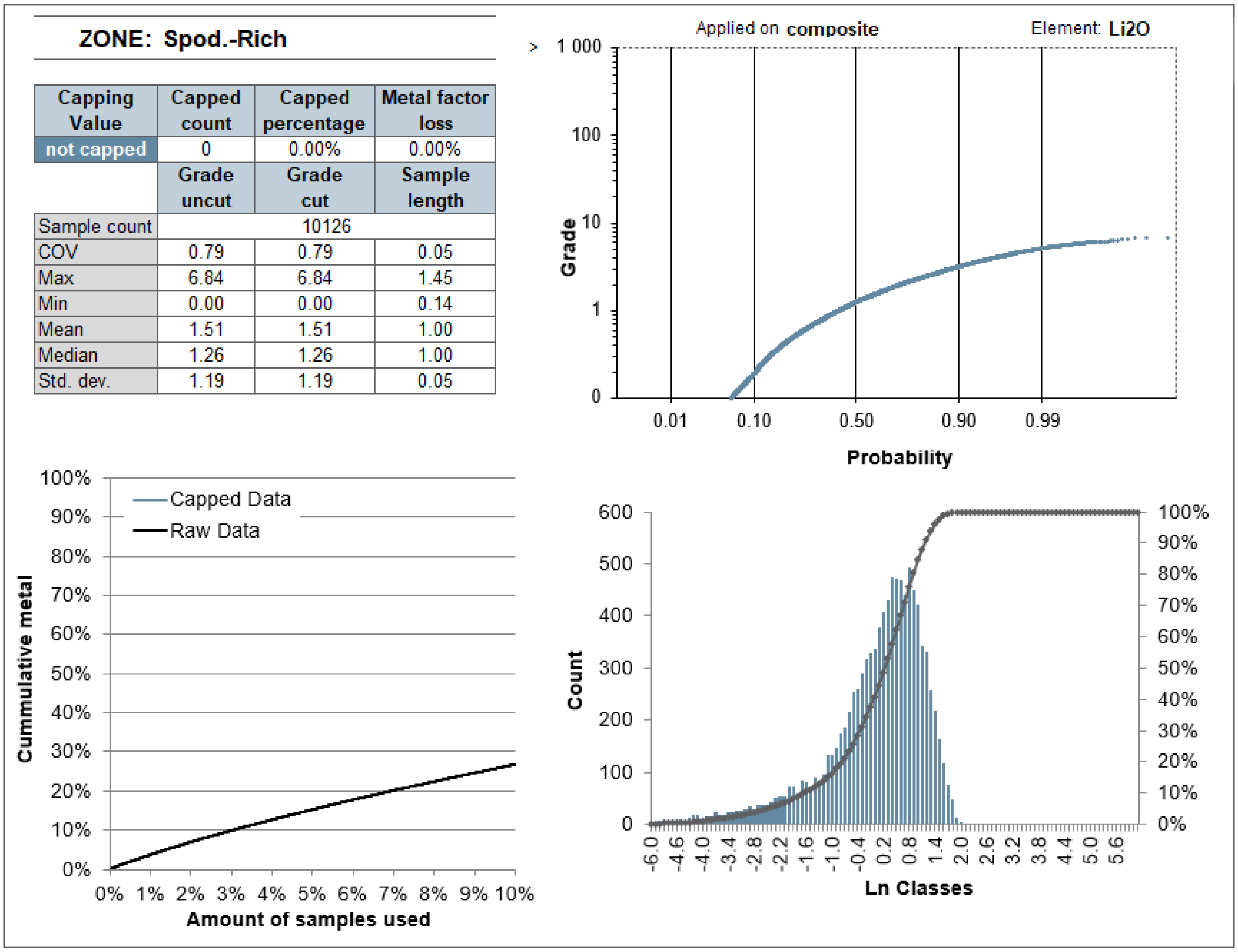
The QP elected to apply a variable top cut by element by domain group. Table 14-6 and Table 14-7 summarize the results of the capping for CV5 and CV13 respectively. Figure 14-6 is an example to show the capping justification for CV5, and Figure 14-7 is an example to show the capping justification for CV13. Capping was done on composites.

**Table 14-6: Grade capping summary by domain for CV5**

| Domain | Field | Sample Count | Uncut Mean | COV | Uncut Median | Max. | Min. | Capping Value | Number Capped | % Capped | Metal loss (%) | Cut Mean | Cut COV | Cut Median |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Spodumene-rich | $Li_2O$ (%) | 10,126 | 1.51 | 0.79 | 1.26 | 6.84 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | $Ta_2O_5$ (ppm) | 10,126 | 161.11 | 1.66 | 114.02 | 18,742.75 | 0.31 | 3,000 | 7 | 0.07 | 1.3 | 159 | 1.15 | 114.02 |
| Feldspar-rich | $Li_2O$ (%) | 4,363 | 0.22 | 1.87 | 0.09 | 5.55 | 0 | 3.5 | 6 | 0.14 | 0.5 | 0.22 | 1.83 | 0.09 |
| | $Ta_2O_5$ (ppm) | 4,363 | 153.29 | 1.83 | 92.36 | 10,856.02 | 0.31 | 1,500 | 17 | 0.39 | 4.19 | 146.92 | 1.27 | 92.36 |
| Veins (110 to 180) | $Li_2O$ (%) | 3,814 | 0.81 | 1.20 | 0.39 | 6.40 | 0 | 5 | 5 | 0.13 | 0.06 | 0.81 | 1.2 | 0.39 |
| | $Ta_2O_5$ (ppm) | 3,814 | 139.00 | 1.02 | 107.74 | 2,172.77 | 0.31 | 1,200 | 10 | 0.26 | 0.89 | 137.79 | 0.94 | 107.74 |

**Table 14-7: Grade capping summary by domain for CV13**

| Domain | Field | Sample Count | Uncut Mean | COV | Uncut Median | Max. | Min. | Capping Value | Number Capped | % Capped | Metal Loss (%) | Cut Mean | Cut COV | Cut Median |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CV13_100 | $Li_2O$ (%) | 1,311 | 0.93 | 1.04 | 0.64 | 6.82 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | $Ta_2O_5$ (ppm) | 1,311 | 123.16 | 3.12 | 65.79 | 11,093.10 | 0.31 | 1,500 | 8 | 0.61 | 11.07 | 109.38 | 1.56 | 65.79 |
| CV13_101 | $Li_2O$ (%) | 668 | 1.04 | 1.45 | 0.20 | 7.01 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | $Ta_2O_5$ (ppm) | 668 | 140.33 | 2.74 | 90.03 | 8,431.70 | 0.85 | 1,500 | 3 | 0.45 | 11.06 | 124.93 | 1.18 | 90.03 |
| Other Domains Combined | $Li_2O$ (%) | 762 | 0.34 | 2.06 | 0.06 | 4.19 | 0 | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| | $Ta_2O_5$ (ppm) | 762 | 106.74 | 1.26 | 70.72 | 1,817.00 | 0.31 | 1,500 | 1 | 0.13 | 0.39 | 106.32 | 1.22 | 70.72 |

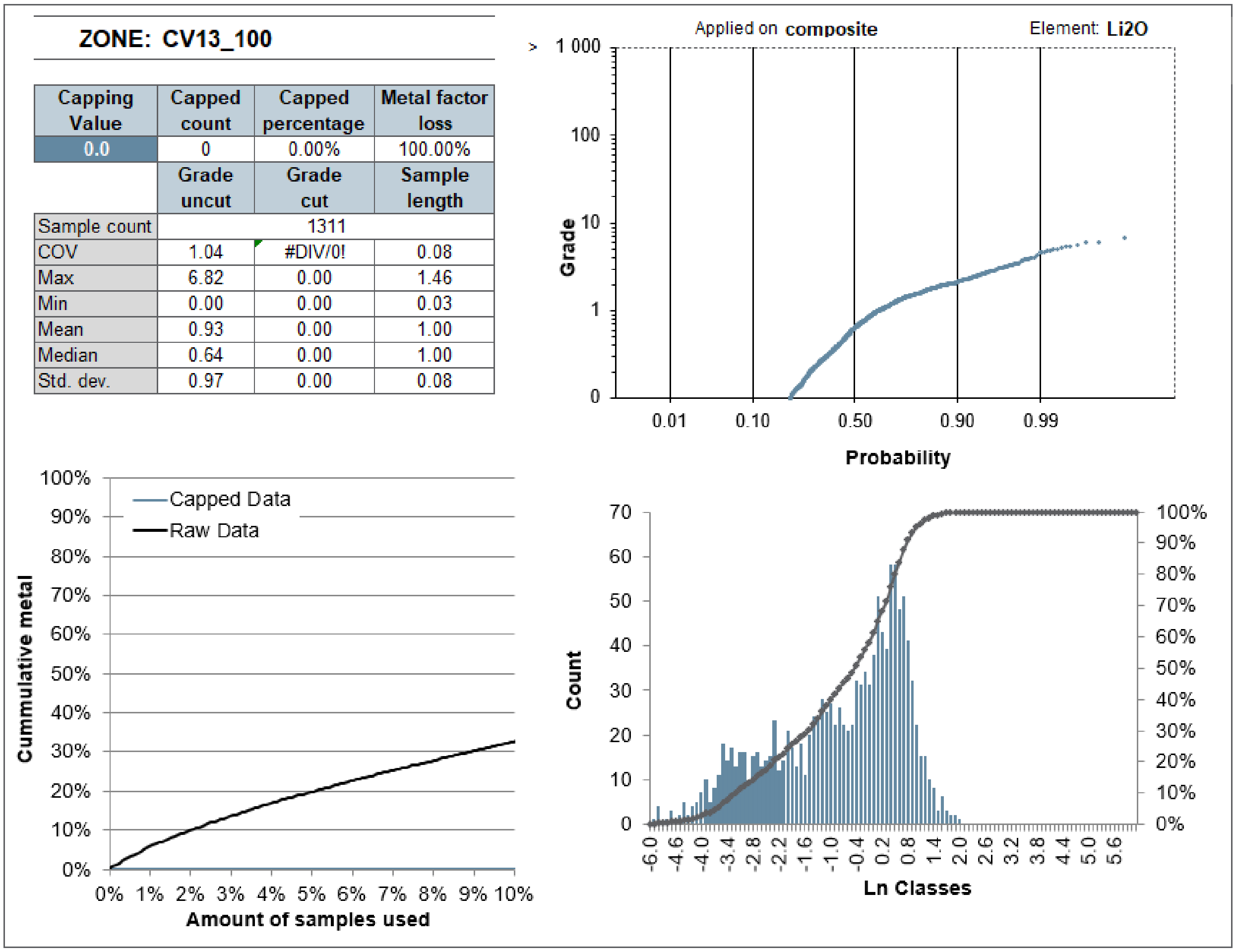


ZONE: Spod.-Rich

| Capping Value | Capped count | Capped percentage | Metal factor loss |
|---|---|---|---|
| not capped | 0 | 0.00% | 0.00% |
| | Grade uncut | Grade cut | Sample length |
| Sample count | 10126 | | |
| COV | 0.79 | 0.79 | 0.05 |
| Max | 6.84 | 6.84 | 1.45 |
| Min | 0.00 | 0.00 | 0.14 |
| Mean | 1.51 | 1.51 | 1.00 |
| Median | 1.26 | 1.26 | 1.00 |
| Std. dev. | 1.19 | 1.19 | 0.05 |



Figure 14-6: CV5 capping justification on $Li_2O$ for the spodumene-rich domain (zone 100)




| Capping Value | Capped count | Capped percentage | Metal factor loss |
|---|---|---|---|
| 0.0 | 0 | 0.00% | 100.00% |
| | Grade uncut | Grade cut | Sample length |
| Sample count | 1311 | | |
| COV | 1.04 | #DIV/0! | 0.08 |
| Max | 6.82 | 0.00 | 1.46 |
| Min | 0.00 | 0.00 | 0.03 |
| Mean | 0.93 | 0.00 | 1.00 |
| Median | 0.64 | 0.00 | 1.00 |
| Std. dev. | 0.97 | 0.00 | 0.08 |

**Figure 14-7: CV13 capping justification on Li2O for CV13_100 domain**

#### 14.1.5.4 Spatial Analysis

### CV5

Variography was done both in Leapfrog Edge™ and Supervisor. For $Li_2O$, a well-structured variogram model (Figure 14-8) was obtained for the CV5 principal pegmatite's spodumene-rich domain. For the CV5 principal pegmatite, both domains (spodumene-rich and feldspar-rich) were estimated using ordinary kriging ("OK") in Leapfrog Edge™.

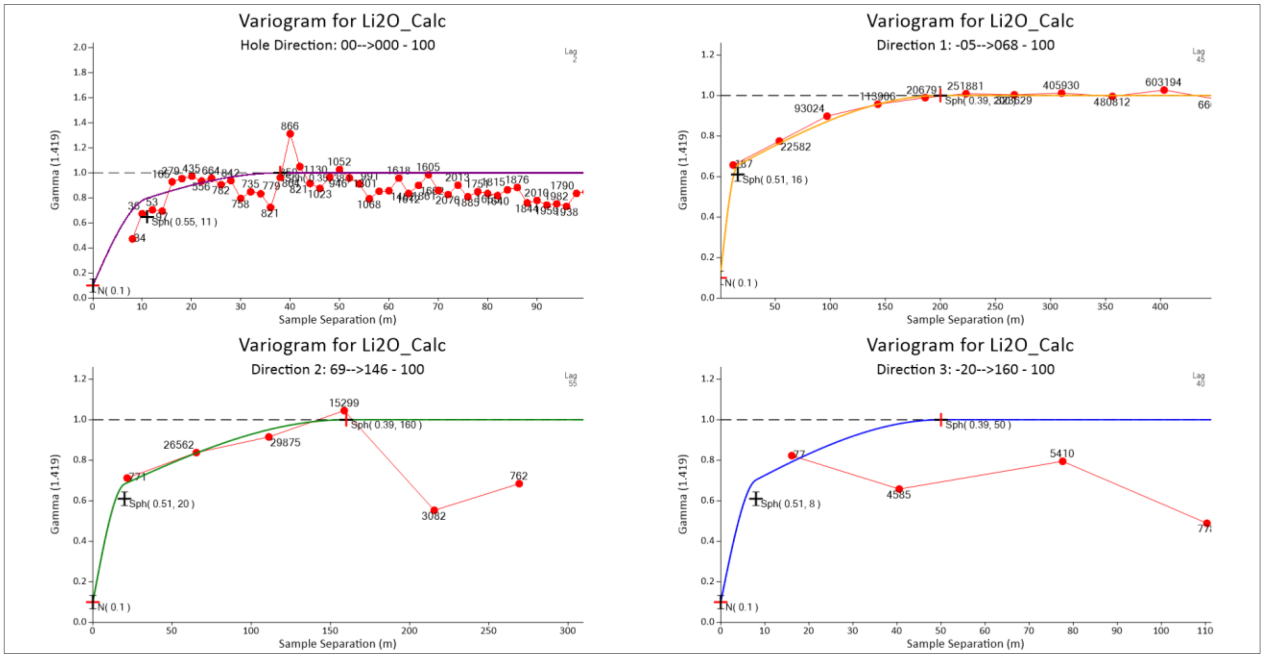



**Figure 14-8: Variogram model for CV5 zone 100 ($Li^{2}O$)**

For $Ta_2O_5$, the spodumene-rich domain and the feldspar-rich domain within CV5 principal pegmatite did not yield well-structured variograms. Therefore, $Ta_2O_5$ was estimated using inverse distance squared ("$ID^2$").

The remaining seven pegmatite dykes domains did not yield well-structured variograms for either $Li_2O$ and $Ta_2O_5$ and, therefore, were estimated using $ID^2$, also using Leapfrog Edge™.

The QP is of the opinion that additional drilling and samples are required before kriging would be an effective estimation method for the other domains.

It was determined that the spodumene-rich variogram of the CV5 principal pegmatite could be used for the feldspar-rich domains. Table 14-8 summarizes the results for the variogram used for the CV5 principal pegmatite domains (spodumene-rich and feldspar-rich).

**Table 14-8: Variogram summary for CV5**

| Rock Code | Nugget | First Structure | | | | Second Structure | | | | Leapfrog Orientation | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sill | Range X (m) | Range Y (m) | Range Z (m) | Sill | Range X (m) | Range Y (m) | Range Z (m) | Dip | Dip Az. | Pitch |
| 100 | 0.1 | 0.44 | 16.2 | 19.8 | 7.7 | 0.46 | 200 | 100 | 60 | 70 | 340 | 175 |
| 200 | 0.1 | 0.44 | 16.2 | 19.8 | 7.7 | 0.46 | 200 | 100 | 60 | 70 | 340 | 175 |

### CV13

Variography analysis did not yield a well-structured variogram. On CV13, $Li_2O$ and $Ta_2O_5$ were estimated using $ID^2$ in Leapfrog Edge™.

## 14.1.5.5 Resource Block Model

For CV5 and CV13, the block model was created in Leapfrog Edge™ for each mineral domain. The block model is rotated around the Z axis (Leapfrog Azimuth 340°) and interpolation was done on the parent cell.

A block size of 10 m x 5 m x 5 m was selected in order to accommodate a large-scale open pit mining potential. Table 14-9 and Table 14-10 summarizes details of the parent block model for CV5 and CV13, respectively.

**Table 14-9: Summary of the CV5 parent block model**

| Parameters | Data |
|---:|---|
| Base Point X | 568,200 |
| Base Point Y | 5,928,850 |
| Base Point Z | 500 |
| Boundary size X | 5,680 |
| Boundary size Y | 1,890 |
| Boundary size Z | 750 |
| Block size (m) | 10 x 5 x 5 |
| Rotation (Z) | 340° |
| Sub-block count | 4 x 4 x 4 |
| Size in blocks | 568 x 378 x 150 |
| Total No. Blocks | 32,205,600 |

**Table 14-10: Summary of the CV13 parent block model**

| Parameters | Data |
|---|---|
| Base Point X | 563,900 |
| Base Point Y | 5,926,800 |
| Base Point Z | 550 |
| Boundary size X | 2,800 |
| Boundary size Y | 1,800 |
| Boundary size Z | 700 |
| Block size (m) | 10 x 5 x 5 |
| Rotation (Z) | 340° |
| Sub-block count | 4 x 4 x 4 |
| Size in blocks | 280 x 360 x 140 |
| Total No. Blocks | 14,112,000 |

### 14.1.5.6 Estimate Parameters for CV5

#### $Li_2O$

As mentioned previously, for $Li_2O$ in the CV5 principal pegmatite, both domains (spodumene-rich and feldspar-rich domains) were estimated using OK. The remaining eight pegmatite dykes domains were estimated using $ID^2$. Table 14-11 shows the search ellipse parameters by domains.

Three orientated search ellipsoids were used to select data and interpolate $Li_2O$ grades in successively less restrictive passes. The ellipse sizes and anisotropies were based on the variography, drill hole spacing, and pegmatite geometry. Estimations were completed using a multi-pass ellipse with a minimum / maximum composite required and maximum composites per drillhole. Table 14-12 shows the estimation criteria.

Variable search ellipse orientations (dynamic anisotropy) were used to interpolate for the eight parallel dykes. Spatial anisotropy of the dykes is respected during estimation using the Leapfrog Edge™ Variable Orientation tool. The search ellipse follows the trend of the central reference plane of each dyke.

## $Ta_2O_5$

For $Ta_2O_5$, all the domains were estimated using $ID^2$.

Three orientated search ellipsoids were used to select data and interpolate $Ta_2O_5$ grades in successively less restrictive passes. The ellipse sizes and anisotropies were based on the variography, drill hole spacing, and pegmatite geometry. Estimations were completed using a multi-pass ellipse with a minimum / maximum composite required and maximum composites per drillhole. Variable search ellipse orientations (dynamic anisotropy) were used to interpolate the eight parallel dykes. Spatial anisotropy of the dykes is respected during estimation using the Leapfrog Edge™ Variable Orientation tool. The search ellipse follows the trend of the central reference plane of each dyke.

**Table 14-11: CV5 Search ellipse summary**

| Domain | Element | Ellipsoid Direction | | | Ellipsoid Ranges 1st Pass | | | Ellipsoid Ranges 2nd Pass | | | Ellipsoid Ranges 3rd Pass | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dip | Dip Azi. | Pitch | Max. | Int. | Min. | Max. | Int. | Min. | Max. | Int. | Min. |
| 100 | $Li_2O$ | 70 | 340 | 175 | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | 70 | 340 | 175 | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 110 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 120 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 130 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 140 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 150 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 160 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 170 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_6$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 180 | $Li_2O$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | Var. | Var. | Var. | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| 200 | $Li_2O$ | 70 | 340 | 175 | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |
| | $Ta_2O_5$ | 70 | 340 | 175 | 100 | 50 | 30 | 200 | 100 | 60 | 400 | 200 | 120 |

**Table 14-12: CV5 Estimation criteria summary**

| Domain | Pass | Min. Number of Composites | Max. Number of Composites | Max Number of Composites per DDH |
|---|---|---|---|---|
| 100 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 110 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 120 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 130 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 140 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 150 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 160 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 170 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 180 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| 200 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |

### 14.1.5.7 Estimate Parameters for CV13

#### $Li_2O$

As mentioned previously, all domains in CV13 were estimated using $ID^2$. Table 14-13 shows the search ellipse parameters by domains. The estimation methodology used for CV13 was the same as CV5. Table 14-14 shows the estimation criteria.

#### $Ta_2O_5$

For $Ta_2O_5$, all the domains were estimated using $ID^2$. The estimation methodology used for CV13 was the same as CV5.

**Table 14-13: CV13 Search ellipse summary**

| Domain | Element | Ellipsoid Direction | | | Ellipsoid Ranges 1st pass | | | Ellipsoid Ranges 2nd pass | | | Ellipsoid Ranges 3rd pass | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dip | Dip Azi. | Pitch | Max. | Int. | Min. | Max. | Int. | Min. | Max. | Int. | Min. |
| CV13_008 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_009 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_010 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_020 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_030 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_040 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_050 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_060 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_065 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_070 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_080 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_085 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |

| Domain | Element | Ellipsoid Direction | | | Ellipsoid Ranges 1st pass | | | Ellipsoid Ranges 2nd pass | | | Ellipsoid Ranges 3rd pass | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Dip | Dip Azi. | Pitch | Max. | Int. | Min. | Max. | Int. | Min. | Max. | Int. | Min. |
| CV13_090 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_090 A | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_091 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_092 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_100 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_101 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_110 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_120 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| CV13_130 | $Li_2O$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |
| | $Ta_2O_5$ | var. | var. | var. | 80 | 60 | 10 | 160 | 120 | 20 | 320 | 240 | 40 |

**Table 14-14: CV13 Estimation criteria summary**

| Domain | Pass | Min. Number of Composites | Max. Number of Composites | Max Number of composite per DDH |
|---|---|---|---|---|
| CV13_008 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_009 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_010 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_020 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |

| Domain | Pass | Min. Number of Composites | Max. Number of Composites | Max Number of composite per DDH |
|---|---|---|---|---|
| CV13_030 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_040 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_050 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_060 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_065 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_070 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_080 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_085 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_090 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_090A | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_091 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_092 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_100 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |

| Domain | Pass | Min. Number of Composites | Max. Number of Composites | Max Number of composite per DDH |
|---|---|---|---|---|
| CV13_101 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_110 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_120 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |
| CV13_130 | 1 | 5 | 12 | 4 |
| | 2 | 3 | 12 | - |
| | 3 | 3 | 12 | - |

### 14.1.6 Resource Classification

The Shaakichiuwaanaan resource classification has been completed in accordance with the NI 43-101, and CIM Definition Standards for Mineral Resources and Reserves reporting guidelines. All reported Mineral Resources have been constrained by conceptual open pit or underground mineable shapes to demonstrate reasonable prospects for eventual economic extraction ("RPEEE"). As the company is duel listed on the ASX in Australia, the QP also considered the definitions of JORC 2012.

Other factors considered for the classification are:

- The QP's experience with spodumene pegmatites;
- Spatial continuity based on assays within the drill holes;
- Understanding of the geology of the deposit;
- Drill hole and channel spacing, and the estimation runs required to estimate the grades in a block.

Blocks in the model were classified as Indicated when:

- They demonstrated geological continuity and minimum thickness of 2 m;
- The drill spacing was 70 m or less and when they met the minimum parameters of the estimation criteria;
- There was grade continuity at the reported cut-off grade.

Blocks in the model were classified as Inferred when:

- The drill spacing was between 70 m and 140 m and when they met the minimum parameters of the estimation criteria.
- Geological continuity and a minimum thickness of 2 m were also mandatory.
- There was grade continuity at the reported cut-off grade.

There are no measured classified blocks. Pegmatite dykes or extensions with lower level of information/confidence were also not classified.

Classification shapes are created around contiguous blocks at the stated criteria with consideration for the selected mining method. The Mineral Resource Estimate appropriately reflects the view of the QP.

No environmental, permitting, legal, title, taxation, socio-economic, marketing, political or other relevant issues are known to the author that may affect the estimate of Mineral Resources. Mineral Reserves can only be estimated on the basis of an economic evaluation that is used in a preliminary feasibility study or a feasibility study of a mineral project; thus, no reserves have been estimated. According to NI 43-101, Mineral Resources, which are not Mineral Reserves, do not have demonstrated economic viability.

### 14.1.7 Mineral Resource Tabulation

The resource reported is effective as of August 21, 2024, and has been tabulated in terms of a pit and underground mining shapes. Both underground and open pit conceptual mining shapes were applied as constraints to demonstrate reasonable prospects for eventual economic extraction. Cut-off grades for open pit constrained resources are 0.40% $Li_2O$ for both CV5 and CV13, and for underground constrained resources, cut-off grades are 0.60% $Li_2O$ for CV5 and 0.80% $Li_2O$ for CV13.

**Table 14-15: Shaakichiuwaanaan Mineral Resource Estimate**

| Pegmatite | Classification | Tonnes | $Li_2O$ (%) | $Ta_2O_5$ (ppm) | Contained $Li_2O$ (Mt) | Contained LCE (Mt) |
|---|---|---|---|---|---|---|
| CV5 & CV13 | Indicated | 80,130,000 | 1.44 | 163 | 1.15 | 2.85 |
| | Inferred | 62,470,000 | 1.31 | 147 | 0.82 | 2.03 |

## CV5 – MRE Details

The Mineral Resource constrained within the open pit and underground mining shapes meets the definition of "Reasonable Prospect of Eventual Economic Extraction", even though a portion of the open pit is under a lake. The QP took the following factors into account when considering the RPEEE:

- The depth of water where a coffer dam would be required is less than 20 m;
- There is no commercial fishery on the lake;
- There are no houses, cottages, or lodges on the lake.

The detailed CV5 MRE is presented in Table 14-16.

**Table 14-16: Detailed CV5 Mineral Resource Estimate**

| Classification | Scenario | Mass (t) | $Li_2O$ (%) | $Ta_2O_5$ (ppm) | Contained $Li_2O$ (Mt) | Contained LCE (Mt) |
|---|---|---|---|---|---|---|
| Indicated | OP | 78.14 | 1.44 | 162 | 1.12 | 2.78 |
| | UG | 0.48 | 0.91 | 169 | 0.00 | 0.01 |
| | **Total** | **78.62** | **1.43** | **162** | **1.13** | **2.79** |
| Inferred | OP | 29.91 | 1.34 | 168 | 0.40 | 0.99 |
| | UG | 13.43 | 1.04 | 145 | 0.14 | 0.35 |
| | **Total** | **43.34** | **1.25** | **161** | **0.54** | **1.34** |

Table 14-17 summarize the parameters used to develop the constraints and cut-off grades (UG and OP) for a reasonable prospect of economic extraction. The constraint parameters are provided primarily through benchmarking of similar projects and, therefore, are largely conceptual in nature and may change as development of the CV5 Pegmatite is studied.

**Table 14-17: CV5 parameters for reasonable prospects of economic extraction – OP & UG**

| Parameters | Unit | Open Pit | Underground |
|---|---|---|---|
| Mining Cost | $/t | 5.47 | 62.95 |
| Mining Cost OVB | $/t | 5.47 | |
| Processing Cost | $/t milled | 14.17 | |
| Tailing Management Cost | $/t milled | 2.62 | |
| G&A Cost | $/t milled | 20.41 | |
| Transport Cost | $/t conc | 287.70 | |
| Mill Recovery | % | 75*(1-EXP(-1.995*($Li_2O$feed Grade%))) | |
| Concentrate Grade | % | 5.5 | |
| Exchange Rate | CA$/US$ | 0.76 | |
| Concentrate Price | US$/t | 1,500 | |
| Royalty | % | 2 | |
| Revenue Factor | | 1 | |
| Production Rate | Mtpa | 0.8 | |
| Discount Rate | % | 8 | |
| Pit Slope | ° | 45 to 53 | |
| $Li_2O$ Cut-off Grade | % | 0.4 | 0.6 |
| $Li_2O$ Conversion | | Li x 2.153 | |
| LCE (i.e., $Li_2CO_3$) Conversion | | $Li_2O$ x 2.473 | |
| $Ta_2O_5$ Conversion | | Ta x 1.221 | |

Open pit constrained MRE for the CV5 block model is shown in Figure 14-9.

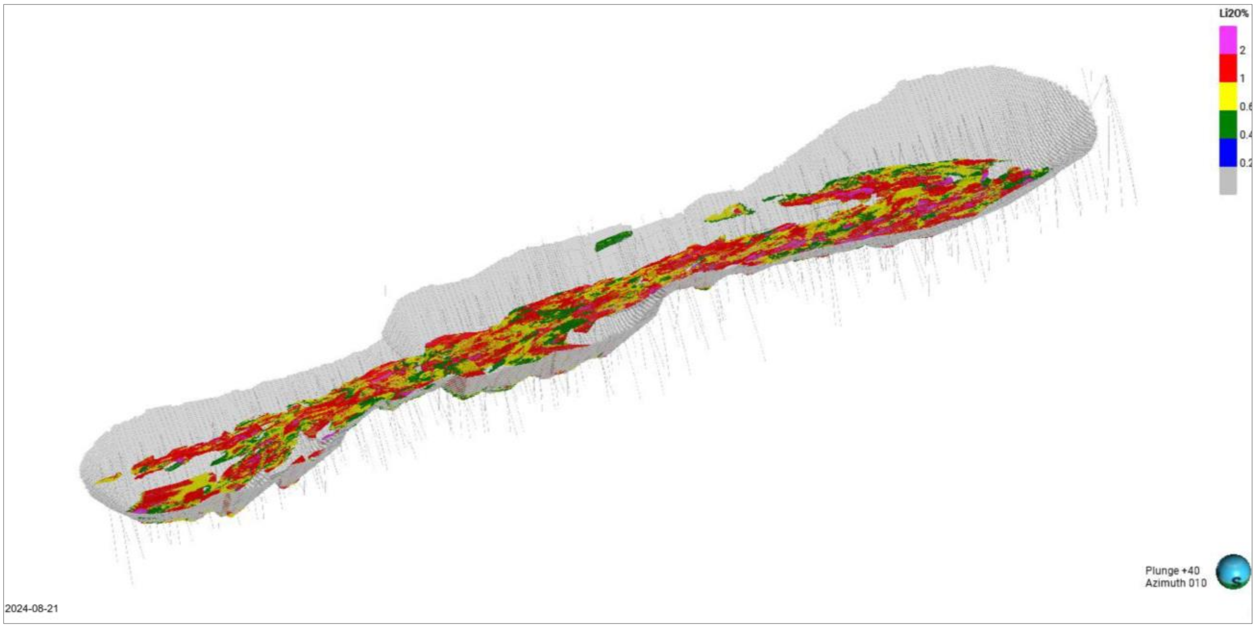



**Figure 14-9: CV5 Open pit MRE block model (not to scale)**

Underground mining shape constrained MRE for the CV5 block model is shown in Figure 14-10.

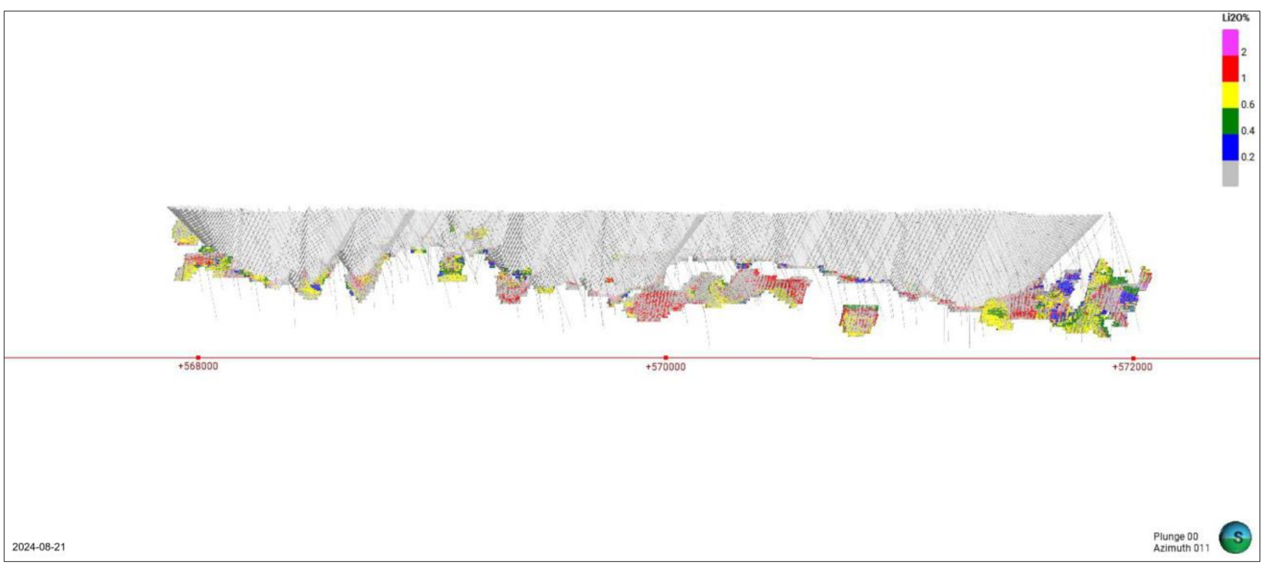



**Figure 14-10: CV5 Underground MRE block model (not to scale)**

## CV13 – MRE Details

The Mineral Resource constrained within the open pit and underground mining shapes meets the definition of the RPEEE. The detailed CV13 MRE is presented in Table 14-18.

**Table 14-18: Detailed CV13 Mineral Resource Estimate**

| Classification | Scenario | Mass (t) | $Li_2O$ (%) | $Ta_2O_5$ (ppm) | Contained $Li_2O$ (Mt) | Contained LCE (Mt) |
|---|---|---|---|---|---|---|
| **Indicated** | OP | 1.51 | 1.62 | 195 | 0.02 | 0.06 |
| | **Total** | **1.51** | **1.62** | **195** | **0.02** | **0.06** |
| **Inferred** | OP | 17.73 | 1.50 | 118 | 0.27 | 0.66 |
| | UG | 1.40 | 1.05 | 73 | 0.01 | 0.04 |
| | **Total** | **19.13** | **1.46** | **115** | **0.28** | **0.69** |

Table 14-19 summarize the parameters used to develop the constraints and cut-off grades (OP and UG) for a reasonable prospect of economic extraction. The constraint parameters are provided primarily through benchmarking of similar projects and, therefore, are largely conceptual in nature and may change as development of the CV13 Pegmatite is studied.

**Table 14-19: Parameters for reasonable prospect of economic extraction – OP & UG**

| Parameters | Unit | Open Pit | Underground |
|---|---|---|---|
| Mining Cost | $/t | 7.47 | 100 |
| Mining Cost OVB | $/t | 5.47 | - |
| Processing Cost | $/t milled | 14.17 | |
| Tailing Management Cost | $/t milled | 2.62 | |
| G&A Cost | $/t milled | 20.41 | |
| Transport Cost | $/t conc | 287.70 | |
| Mill Recovery | % | (75*(1-EXP(-1.995*($Li_2O$feed Grade%))) | |
| Concentrate Grade | % | 5.5 | |
| Exchange Rate | CA$/US$ | 0.76 | |
| Concentrate Price | US$/t | 1,500 | |
| Royalty | % | 2.0 | |
| Revenue Factor | | 1 | - |

| Parameters | Unit | Open Pit | Underground |
|---|---|---|---|
| Production Rate | Mtpa | 0.8 | |
| Discount Rate | % | 8.0 | |
| Pit Slope | ° | 45 | - |
| $Li_2O$ Cut-off Grade | % | 0.6 | 0.8 |
| $Li_2O$ Conversion | | Li x 2.153 | |
| LCE (i.e., $Li_2CO_3$) Conversion | | $Li_2O$ x 2.473 | |
| $Ta_2O_5$ Conversion | | Ta x 1.221 | |

Open pit constrained MRE for the CV13 block model is shown in Figure 14-11.

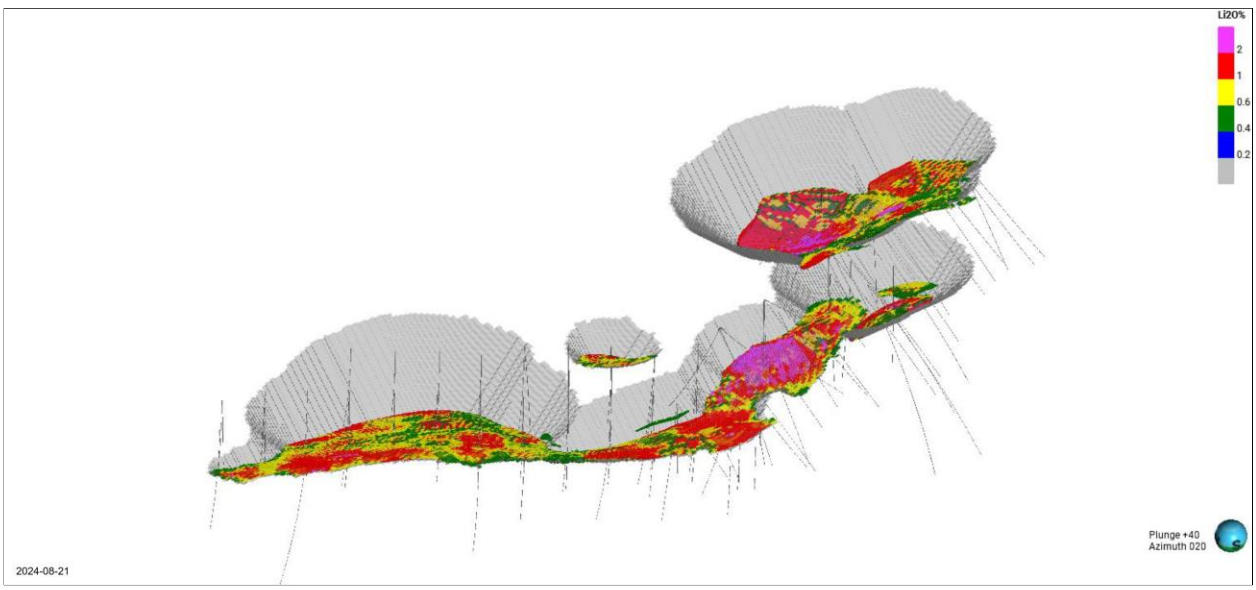



**Figure 14-11: CV13 Open Pit MRE block model (not to scale)**

Underground mining shape constrained MRE for the CV13 block model is shown in Figure 14-12.

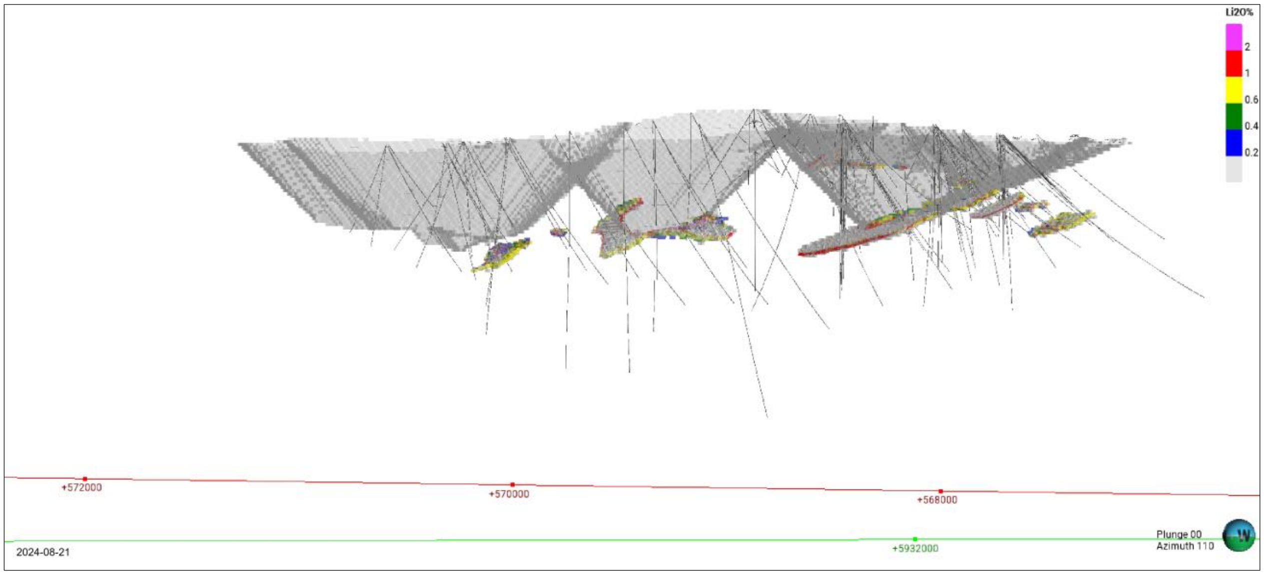



**Figure 14-12: CV13 Underground MRE block model (not to scale)**

### 14.1.8 Model Validation

CV5 and CV13 models were validated using the following three methods:

1. Visual comparison of colour-coded block model grades with composite grades on section;
2. Comparison of the global mean block grades for OK (when applicable), ID², nearest neighbor ("NN"), and composites;
3. Swath plots.

#### 14.1.8.1 Visual Validation

Visual comparisons of block model grades with composite grades for each zone show a reasonable correlation between values (Figure 14-13, Figure 14-14). No significant discrepancies were apparent from the sections reviewed.

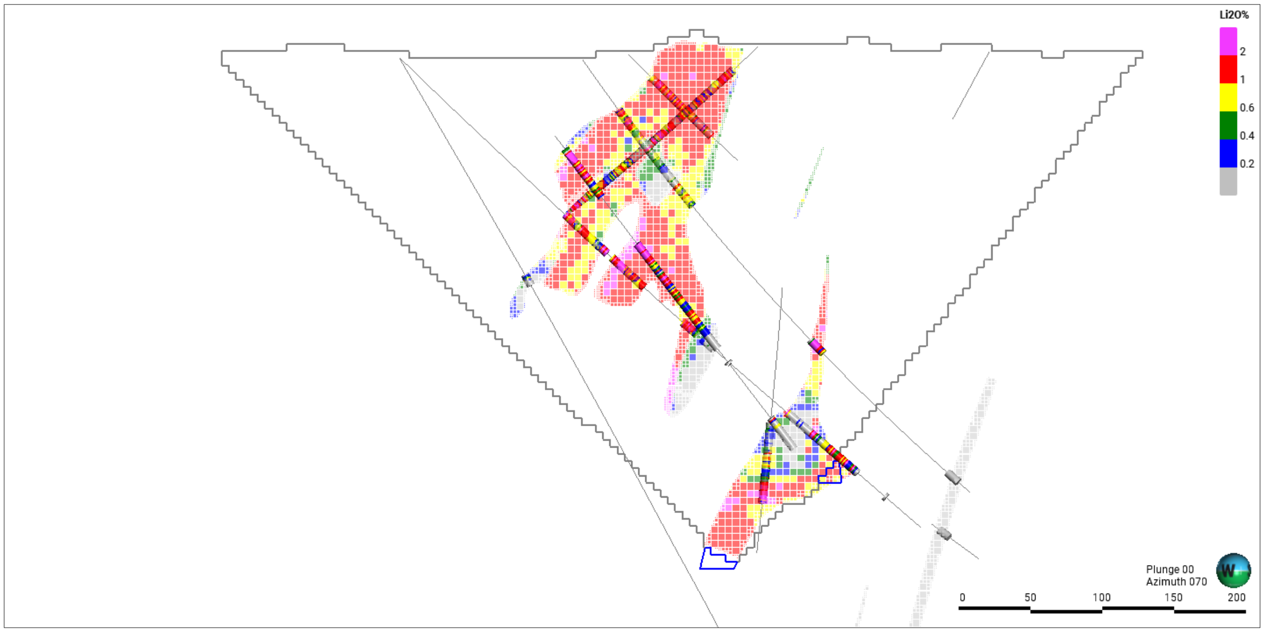



**Figure 14-13: CV5 comparison (composites vs block model $Li_2O$; central portion)**

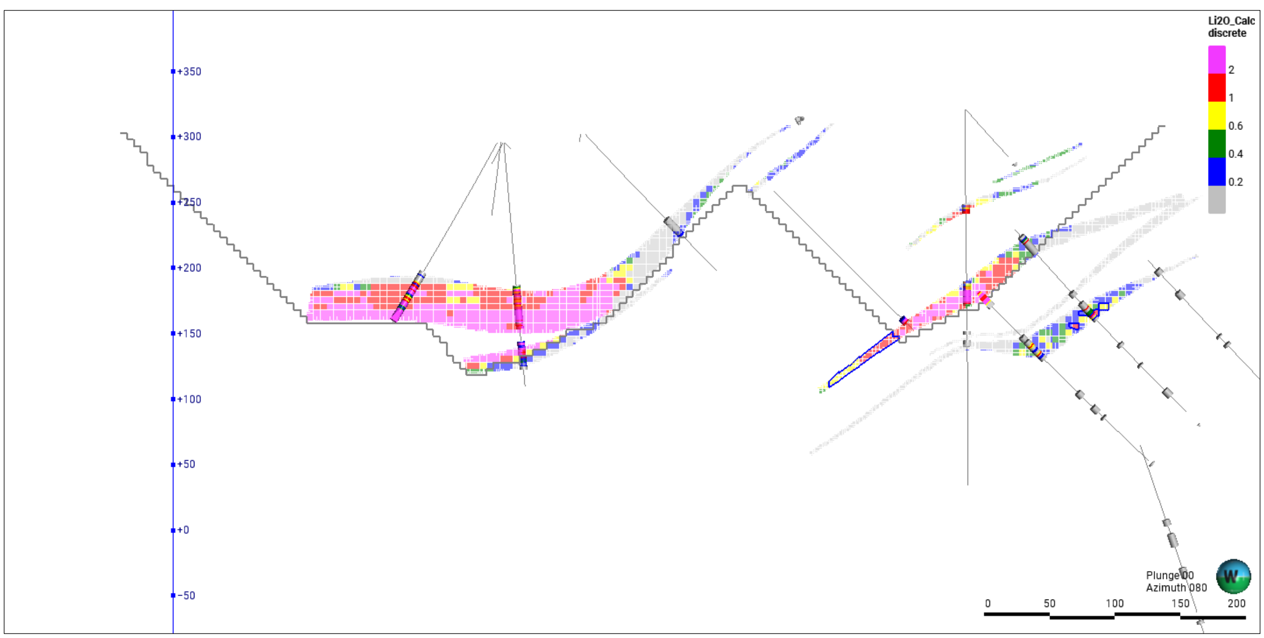



**Figure 14-14: CV13 comparison (composites vs block model $Li_2O$)**

#### 14.1.8.2 Statistics Comparison

CV5 and CV13 block model statistics were compared between estimation methods, OK, NN, and $ID^2$ model values and the capped composite of the drill hole data. Table 14-20 shows this comparison of the estimates for the three estimation method calculations for each zone 100 (CV5 and CV13). All three estimation methods yield similar results for $Li_2O$ with the anticipated smoothing resulting from the estimation process. Comparisons were made using all blocks without a cut-off grade.

**Table 14-20: Comparison of estimation method statistics between composites, NN, $ID^2$ and OK on $Li_2O$ (%) for CV5 and CV13**

| | CV5 (zone 100) | | | | CV13 (zone 100) | | |
|---|---|---|---|---|---|---|---|
| | Comp ($Li_2O$) | NN ($Li_2O$) | ID2 ($Li_2O$) | OK ($Li_2O$) | Comp ($Li_2O$) | NN ($Li_2O$) | $ID^2$ ($Li_2O$) |
| **Number** | 10,126 | 1,578,409 | 1,619,407 | 1,619,407 | 1,311 | 465,913 | 465,913 |
| | | | | | | | |
| | | | | | | | |
| **Mean** | 1.52 | 1.42 | 1.46 | 1.43 | 0.94 | 0.64 | 0.84 |
| **Median** | 1.26 | 1.15 | 1.31 | 1.31 | 0.65 | 0.27 | 0.78 |
| **CV** | 0.79 | 0.83 | 0.49 | 0.45 | 1.04 | 1.28 | 0.70 |

### 14.1.8.3 Swath Plots

Swath plots comparing the estimation results for each domain in three orientations (X, Y, and Z) were generated and reviewed. Figure 14-15 is an example of a swath plot in the X direction. There are good correlations of the results between the three estimation methods with the expected smoothing of the kriging results.

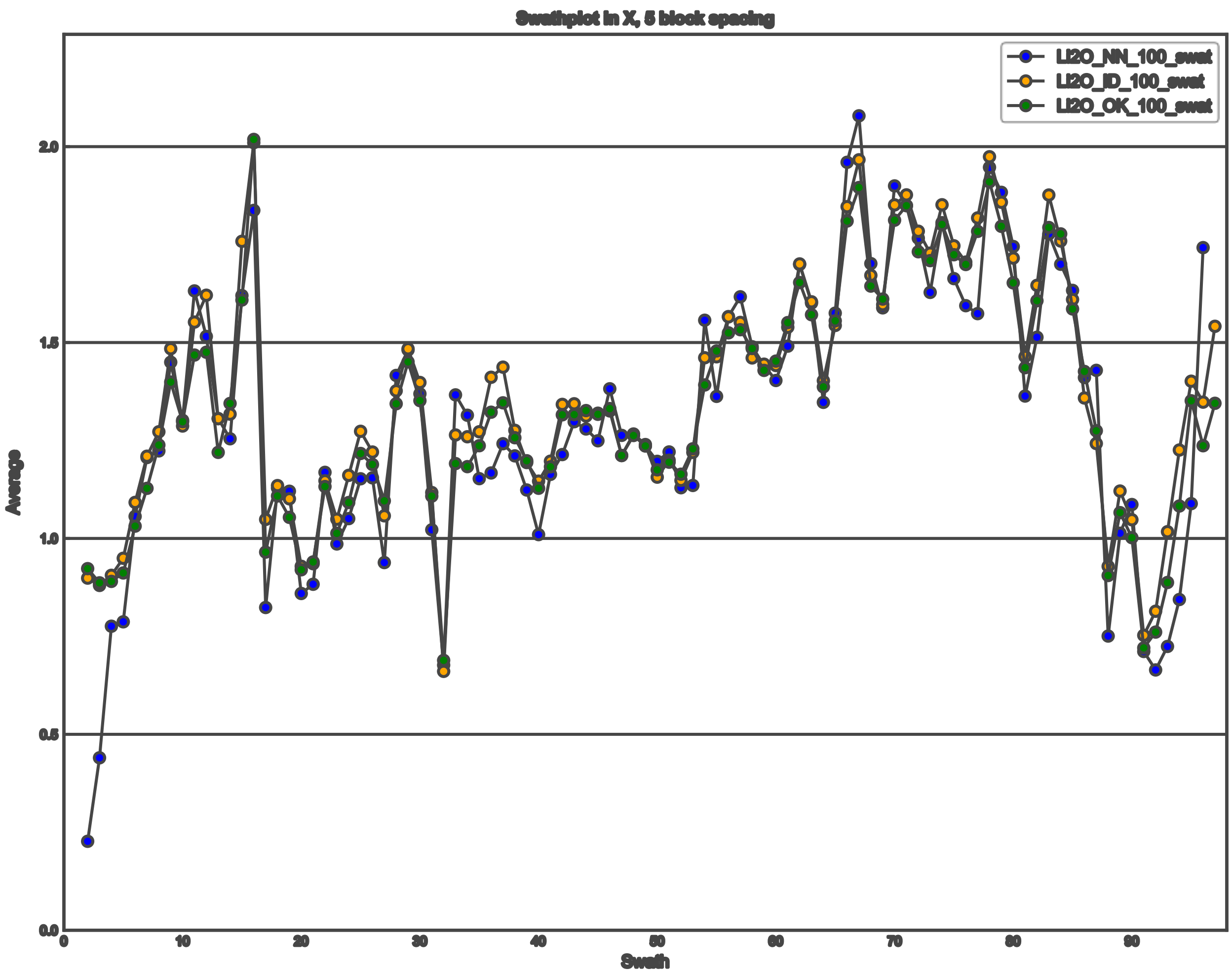



**Figure 14-15: $Li_2O$ swath plot in the X direction (CV5 zone 100)**

### 14.1.9 Sensitivity Analysis

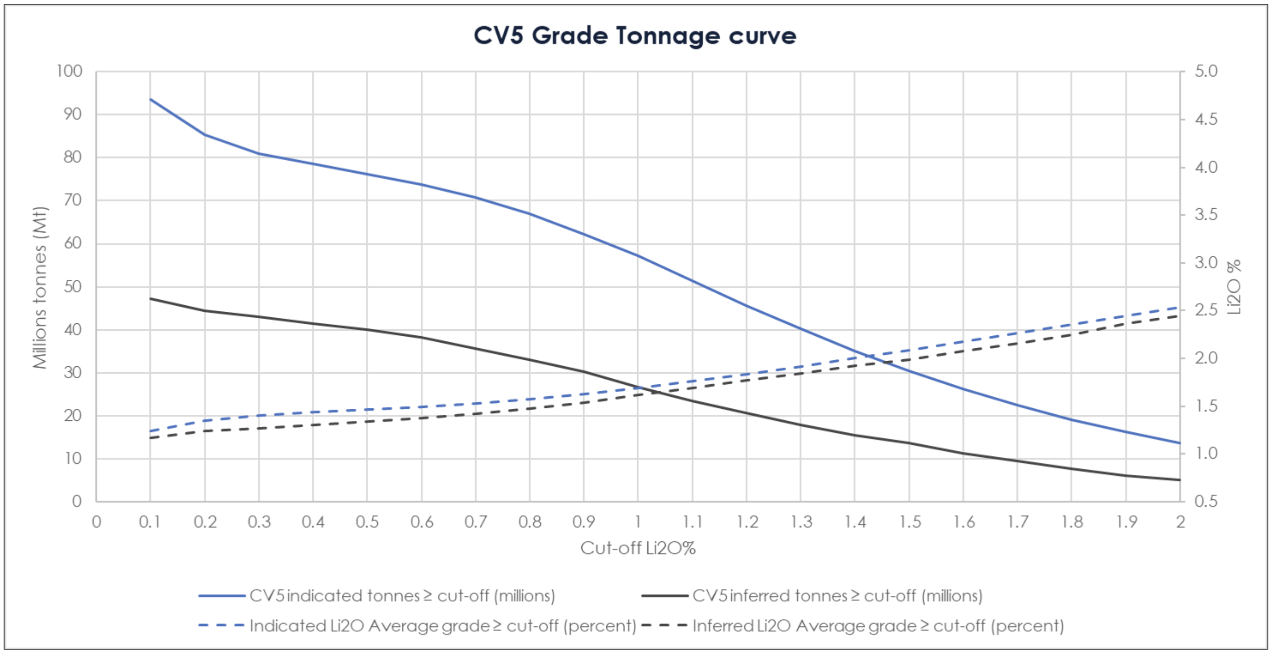
The sensitivity analysis for the Shaakichiuwaanaan MRE is presented as the sum of the open pit and underground constrained and classified resources at the same cut-off (Table 14-21, and Figure 14-16). The sensitivity analysis by cut-off grade ("COG") defines significant tonnage at very high-grade, primarily reflecting the Nova Zone at CV5 and Vega Zone at CV13.

Table 14-21 should not be interpreted as a Mineral Resource. The table presents the sum of the open pit and underground constrained and classified resources at the same cut-off. The data is presented to demonstrate the Mineral Resource tonnage and grade sensitivity to various cut-off grades.

**Table 14-21: Sensitivity analysis for the Shaakichiuwaanaan MRE**

| Cut-off grade (%) | CV5 Spodumene Pegmatite | | | | CV13 Spodumene Pegmatite | | | |
|---|---|---|---|---|---|---|---|---|
| | Indicated | | Inferred | | Indicated | | Inferred | |
| | Tonnes ≥ cut-off | Average grade ($Li_2O$) ≥ cut-off (%) | Tonnes ≥ cut-off | Average grade ($Li_2O$) ≥ cut-off (%) | Tonnes ≥ cut-off | Average grade ($Li_2O$) ≥ cut-off (%) | Tonnes ≥ cut-off | Average grade ($Li_2O$) ≥ cut-off (%) |
| 0.1 | 93,530,000 | 1.24 | 47,240,000 | 1.17 | 1,540,000 | 1.59 | 21,490,000 | 1.33 |
| 0.2 | 85,290,000 | 1.34 | 44,450,000 | 1.24 | 1,530,000 | 1.60 | 20,650,000 | 1.38 |
| 0.3 | 81,040,000 | 1.40 | 43,000,000 | 1.27 | 1,520,000 | 1.61 | 19,830,000 | 1.42 |
| 0.4 | 78,560,000 | 1.43 | 41,470,000 | 1.30 | 1,510,000 | 1.62 | 19,060,000 | 1.47 |
| 0.5 | 76,260,000 | 1.46 | 39,940,000 | 1.34 | 1,490,000 | 1.63 | 18,120,000 | 1.52 |
| 0.6 | 73,820,000 | 1.49 | 38,190,000 | 1.37 | 1,460,000 | 1.65 | 17,040,000 | 1.58 |
| 0.7 | 70,760,000 | 1.53 | 35,620,000 | 1.42 | 1,430,000 | 1.68 | 15,920,000 | 1.65 |
| 0.8 | 66,940,000 | 1.57 | 33,000,000 | 1.48 | 1,380,000 | 1.71 | 14,650,000 | 1.73 |
| 0.9 | 62,290,000 | 1.63 | 30,200,000 | 1.53 | 1,320,000 | 1.75 | 13,340,000 | 1.81 |
| 1.0 | 57,130,000 | 1.69 | 26,590,000 | 1.61 | 1,270,000 | 1.78 | 12,020,000 | 1.91 |
| 1.1 | 51,360,000 | 1.76 | 23,460,000 | 1.69 | 1,180,000 | 1.84 | 10,730,000 | 2.01 |
| 1.2 | 45,690,000 | 1.84 | 20,540,000 | 1.77 | 1,080,000 | 1.90 | 9,600,000 | 2.11 |
| 1.3 | 40,170,000 | 1.92 | 17,910,000 | 1.84 | 950,000 | 1.98 | 8,470,000 | 2.23 |
| 1.4 | 35,070,000 | 2.00 | 15,520,000 | 1.92 | 830,000 | 2.08 | 7,410,000 | 2.35 |
| 1.5 | 30,400,000 | 2.09 | 13,590,000 | 1.99 | 700,000 | 2.20 | 6,570,000 | 2.47 |
| 1.6 | 26,160,000 | 2.17 | 11,290,000 | 2.07 | 550,000 | 2.37 | 5,820,000 | 2.59 |
| 1.7 | 22,360,000 | 2.26 | 9,390,000 | 2.16 | 420,000 | 2.59 | 5,220,000 | 2.69 |
| 1.8 | 19,040,000 | 2.35 | 7,720,000 | 2.25 | 350,000 | 2.77 | 4,790,000 | 2.78 |
| 1.9 | 16,140,000 | 2.44 | 6,040,000 | 2.36 | 290,000 | 2.97 | 4,430,000 | 2.85 |
| 2.0 | 13,570,000 | 2.53 | 4,990,000 | 2.45 | 250,000 | 3.12 | 4,070,000 | 2.93 |

Note: Errors may occur in totals due to rounding.



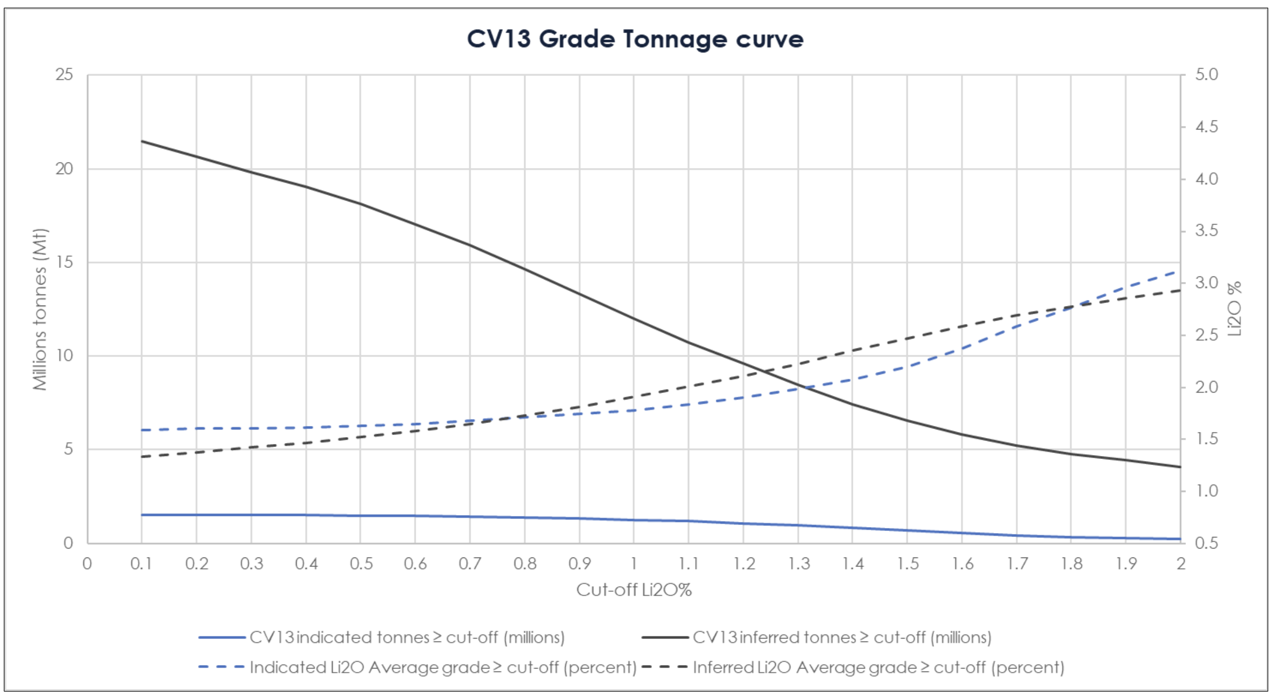




**Figure 14-16: Shaakichiuwaanaan Mineral Resource grade-tonnage curves for the CV5 and CV13**

### 14.1.10 Previous Estimates

The previous MRE with an effective date of June 25, 2023, is no longer considered valid. It was pit constrained with a $Li_2O$ cut-off grade of 0.40% and included only the CV5 Spodumene Pegmatite. (McCracken, T. and Cunningham, R., 2023) The change in the current Mineral Resource is attributed to a number of factors:

- A 0.9-km increase in strike length of the CV5 with additional diamond drilling;
- Additional inf-fill drilling on CV5 to further understand the deposit and increase confidence;
- The addition of the CV13 as a new Mineral Resource;
- The addition of an underground mining constraint at CV5 and CV13.

**Table 14-22: 2023 Mineral Resource Statement**

| Cut-off | Resource Classification | Tonnes | $Li_2O$ (%) | $Ta_2O_5$ (ppm) | Contained $Li_2O$ (Mt) | Contained LCE (Mt) |
|---|---|---|---|---|---|---|
| 0.4 | Inferred | 109,242,000 | 1.42 | 160 | 1,551,000 | 3,835,000 |

# 15. Mineral Reserve Estimates

Not applicable.

# 16. Mining Methods

## 16.1 Summary

The CV5 Shaakichiuwaanaan Deposit is composed of one large pegmatite dyke with several smaller dykes with a strike going from east to west. The deposit has a length of approximately 4.6 km and is partially located under Lake 001. The pegmatite dyke has a dip of approximately 80 degrees-oriented north.

For this study, both open pit ("OP") mining method and underground ("UG") are evaluated. A trade-off between a full open pit scenario and a hybrid scenario (OP/UG) has been performed and since the economical results were similar, other components were considered to select the preferred scenario. The hybrid scenario was selected as the optimal mining method for the deposit for the following technical and non-technical parameters:

- Reduced impact on Lake 001;
- Reduced fish habitat compensation;
- Water diversion is kept in the same watershed (which is not possible with only open pit scenario);
- No requirement for a big dam on Lake 001, only a small one, which reduces technical complexity and risks;
- Approximately 400 Mt less waste rock will need to be mined compared to an open pit only scenario, hence reducing the footprint area impacted by waste rock stockpiles;
- Developing an underground mine gives access to the higher-grade Mineral Resources earlier than with an open pit only method balancing the feed grade to the mill and the concentrate produced.

The main pegmatite dyke has a thickness up to 130 m and contains most of the Mineral Resources that are present in the CV5 Deposit.

The selected pit contains 239 Mt of material, including 50.5 Mt of mineralized material, 172.5 Mt of waste rock and 16 Mt of overburden ("OVB") material, which equates to a strip ratio of 3.7. The underground mining method contains 46.4 Mt of material, including 39.8 Mt of mineralized material and 6.6 Mt of waste rock from the development. The average grade of the Mineral Resources is approximately 1.31% $Li_2O$ after dilution and mining recovery where the mineralized material from the pit provides a grade of 1.11% $Li_2O$ and 1.54% $Li_2O$ from the underground. The pit is 2.8 km long, 425 m wide at its widest point and about 200 m deep at its deepest point.

The open pit will start with a pre-production year followed by 18 years of operation. Stockpiled material will be rehandled during Years 19 and 20.

The CV5 Open Pit will be mined in four distinct phases:

- **Phase 1:** Years -1 to 2 – Avoiding Lake 001
  - The goal of Phase 1 is to start the CV5 pit on dry land without requiring a dam or dewatering Lake 001. While mining begins in Phase 1, the construction of the dam will begin on Lake 001 so that drainage activities can begin to allow Phase 2 to proceed in Year 1.
- **Phase 2:** Years 1 to 8
  - Phase 2 Dam and drainage activities of Lake 001 are to be completed before starting Phase 2 mining activities. Phase 2 targets high-grade, low-strip ratio mineralized material for maximum profitability.
- **Phase 3:** Years 1 to 9 – Pushback of Phase 2 towards the west.
- **Phase 4:** Years 5 to 18 – Final pushback of Phase 3 and linking the pits from Phases 1 and 3.

Refer to Figure 18-2 (Main site infrastructure) in Chapter 18 for reference.

For this study, it is considered that the open pit mine development and production will be completed by the Company.

The underground mine contains 39.8 Mt of mineralized material, of which 36.8 Mt come from 1,965 longhole stopes and 3.0 Mt from the draw point development. Approximately 120 km of underground development will be necessary to access and mine the stopes.

The initial development and construction of the underground mine will start on Year 1 and will continue throughout the first 4 years until it reaches full production in Year 5. The LOM of the underground mine will extend over 24 years, and the development and production will be completed by a contractor.

The underground development will occur from Year 1 to Year 23 and the underground production will be effective between Years 3 and 24 and will be operated by a specialized mining contractor.

The underground production target has been set at 2 Mtpa and the open pit production is completing the mineralized material feed to achieve the concentrate production.

## 16.2 Geotechnical Considerations

### 16.2.1 Open Pit Geotechnical Considerations

The highwalls of the pit are located primarily within Amphibolite rock, with additional lithologies including Ultramafic, Wacke (Guyer), Wacke (Marbot) and Paragneiss.

Rock mass characterization and laboratory testing data was obtained from geotechnical diamond drilling performed in April 2024. The results of the field investigation are summarized in (Henning, Gonzalaz, & Hamediazad, 2024). Rock mass characterization has been assessed with the standard criteria, i.e., Rock Quality Designation ("RQD"), the modified Rock Tunneling Quality Index (Q'), Geological Strength Index ("GSI"), and Rock Mass Rating (RMR76). Figure 16-1 shows the distribution of RMR76 values for common lithologies encountered in the CV5 pit walls.

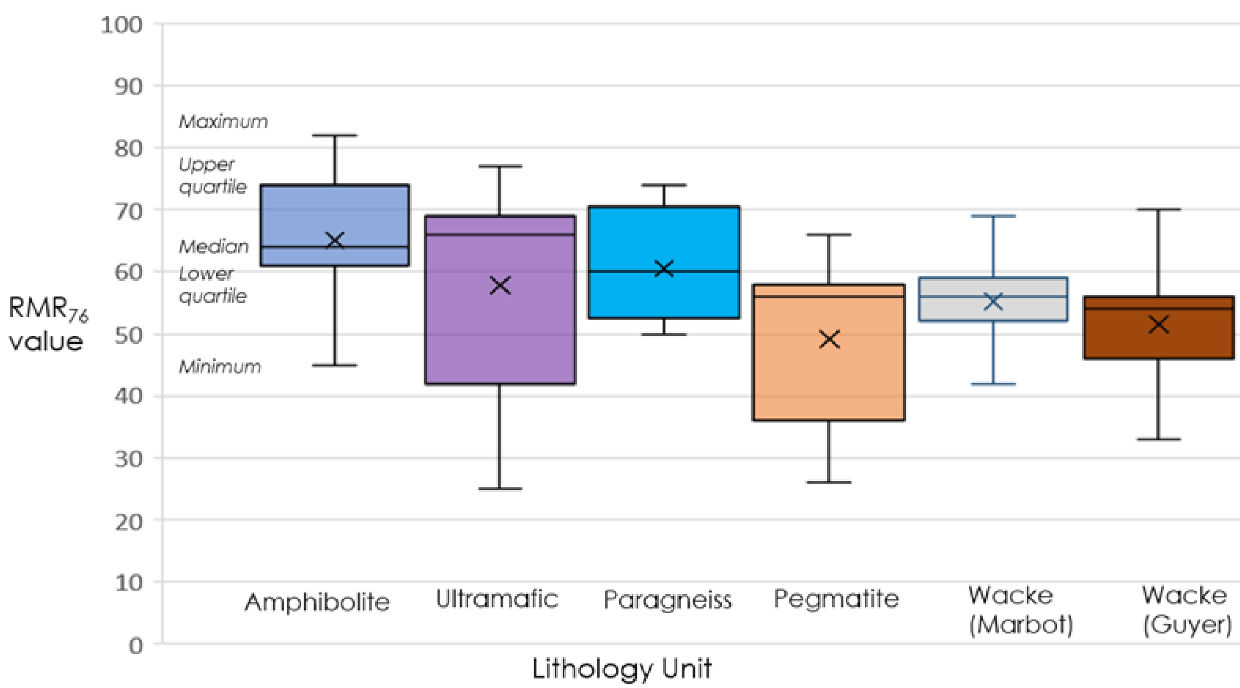



**Figure 16-1: Rock mass quality (RMR76) per lithology**

Based on the preliminary geotechnical assessment, which considered rock mass characteristics and kinematic stability of lithologies expected to be encountered in the pit walls, a highwall inter-ramp slope of 45° to 47° is recommended for the final pit walls. The recommended bench height is 10 m with bench face angle of 70° to 75°. The parameters used for the pit design for each of the zones are presented on Table 16-2. Additionally, a geotechnical berm, representing a double-wide catch bench is anticipated for highwalls with ~180 m vertical wall height, not crossed by a ramp.

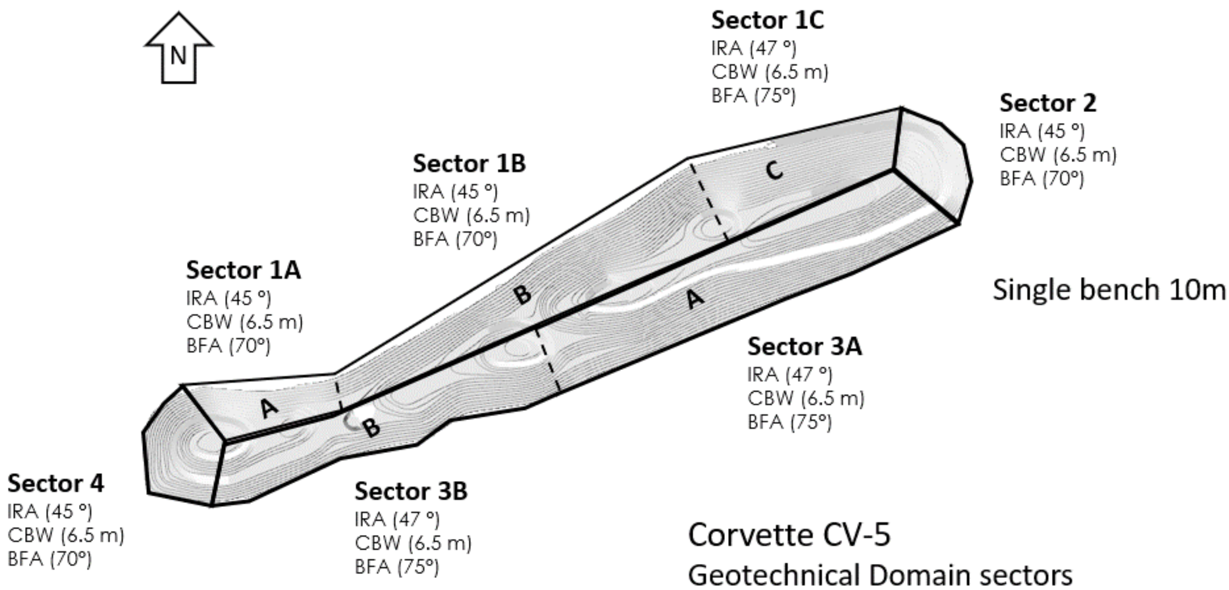



**Figure 16-2 Geotechnical parameters by pit sector**

### 16.2.2 Underground Geotechnical Considerations

The underground workings will be accessed via ramps, developed from the north of the CV5 Deposit. The primary lithologies associated with underground workings are (i) amphibolite and minor ultramafic lithologies encountered in the hanging wall, and (ii) pegmatite mineralized zone. The pegmatite zone dips towards the northwest at an inclination of approximately 70° below horizontal.

## Rock Mass Conditions

Rock mass characterization and laboratory testing data was obtained from geotechnical diamond drilling. Characterization data per lithology is summarized below:

- Amphibolite:
  - Uniaxial compressive strength, 161.5 MPa; Young's Modulus, 64 GPa;
  - Rock mass characterization: Rock mass rating (RMR76) = 65; NGI Q' value = 16.4; GSI = 66.
- Ultramafic:
  - Uniaxial compressive strength, 55 MPa; Young's Modulus, 34.2 GPa;
  - Rock mass characterization: Rock mass rating (RMR76) = 58; NGI Q' value = 9.5; GSI = 60.
- Pegmatite:
  - Uniaxial compressive strength, 57.7 MPa; Young's Modulus, 32.2 GPa;
  - Rock mass characterization: Rock mass rating (RMR76) = 49; NGI Q' value = 7.4; GSI = 57.

## Stress Assumptions

At present time, no in situ stress measurements were performed. The regional stress trend suggests a northeast orientation of principal stress. As a result, principal stress may trend sub-parallel to the strike of CV5 Deposit.

## Anticipated Rock Mass Behaviour

Based on the available information, it is anticipated that the rock mass behaviour of the host rock and mineralized material zone will be controlled by rock mass quality, rock mass fabric (rock jointing), and stress.

At depth and increased extraction of the CV5 underground stopes, mining induced stresses are expected to concentrate around the stope abutments. Damage in the weaker and lower rock mass quality of ultramafic and pegmatite units may include unravelling along discontinuities.

## Stope Design

Longhole stopes, following a primary/secondary stoping sequence are anticipated. Due to the anticipated thickness of the pegmatite mineralized zone, the stopes will be mined as panels, retreating from the footwall towards the access development located on the hanging wall.

Empirical stope design suggests primary stope dimensions of 30 m (H) x 15 m (W) x 26 m (L).

Secondary stope dimensions are 30 m (H) x 15 m (W). The length of secondary stopes will be influenced by the strength and quality of placed backfill.

### Ground Support Strategy

Ground support system designs are based on anticipated ground control demands, using practical experience, empirical rules of thumb, kinematic analysis, numerical modelling and rock mass classification guidelines.

Preliminary support design is based on established empirical approaches using anticipated rock mass quality. Development in pegmatite is expected to encounter fair rock mass quality. Development in amphibolite is anticipated to be in a good quality rock mass.

Anticipated primary (first-pass) ground support requirements, assuming 5.5 m (H) x 5.5 m (W) development, are:

- Resin grouted rebar (20 mm Ø) of 2.1 m long, installed across the roof, upper corners and down the walls up to approximately 1.5 m above floor;
- Roof spans exceeding 7 m (wide spans) will require longer reinforcement;
- Typical bolt pattern: 1.2 m x 1.2 m;
- Surface covering: Install a weldmesh screen (#6-gauge, 100 mm x 100 mm, galvanized) across the roof and down both walls up to 1.5 m above floor.

### Crown Pillar Design

The crown pillar represents the vertical distance between the overlying bedrock/overburden contact and the upper-most mining horizon. A 100 m-thick crown pillar is assumed for the initial underground design based on Québec's mining regulations. Further geotechnical studies will be conducted to determine the minimum crown pillar between the surface and stopes. A smaller crown pillar could allow the underground mine to recovery more mineralized material in the upper part of the mine.

## 16.3 Open Pit Optimization

### 16.3.1 Block Model

Optimization was conducted using the "*PRELIM_BM_CV5_2024_MRE_20240702_rev01.dm*" block model produced by BBA. The latest drilling assays included in the model are from June 27, 2024.

The difference between this block model and the official MRE block model is the addition of the tantalum, which is not used in the pit optimization.

### 16.3.2 Cut-off Grade Calculation

The cut-off grade ("COG") calculation used for the pit optimization process has been estimated from preliminary trade-off work, benchmark of similar lithium projects or from assumptions. Consideration for the DMS process, remote location, and material handling for the DMS tailings produced are part of the preliminary input cost adjustment.

The breakeven COG is calculated considering costs for processing, G&A, and other costs related to concentrate production and transport. The COG has been evaluated based on the processing plant recovery using the formula in Chapter 13 and considering a 2% royalty. Based on a 5.5% $Li_2O$ concentrate selling price of US$1,375/t, the calculated COG is 0.34% $Li_2O$ for the open pit. However, this COG is below the resource COG previously established at 0.40% $Li_2O$. Therefore, the COG used for the pit was 0.40% $Li_2O$.

### 16.3.3 Mining Dilution and Mining Recovery Estimation

Before proceeding with the pit optimization, mining dilution and mining recovery were estimated.

The mining dilution refers to any material below the COG that is mixed with the mineralized material and sent to the processing plant. This usually occurs when shovels are mining some waste material with the mineralized material at the dyke's boundaries or when blast movements cause the mineralized material to mix with waste rock.

The mining recovery is defined as the portion of the mineralized material above the COG that will be successfully sent to the processing plant. Any material that exceeds the cut-off grade but is not sent to the mill is considered as a loss. This can happen when a small vein cannot be mined selectively enough to be mined with a significant amount of waste, and the mixed materials falls below the COG.

An estimation of the mining dilution and mining recovery using Deswik's stope optimizer ("DSO") was conducted for the pit. The stope optimizer, a tool primarily used to create stopes for underground mines, can be used to create mineable shapes of a minimum size, usually based on the shovel's bucket size, around the mineralized dykes. This tool was used to flag each block in block model as either mineralized material if the blocks were included in the stope's shapes, or as waste if the blocks were outside the shapes. The stopes created by the stope optimizer were considered as minable shapes that could be selectively mined by a shovel.

For this study, Patriot decided to optimize for maximum mineralized material recovery. For this reason, a minimum of 1 m of dilution will be added on each side of the dykes and vein boundaries. The minimum mining shape width was set at 5 m, wider than the expected bucket width. The minimum width between two mining shapes was also set at 5 m to leave a minable space between the mining shapes. The cut-off grade used for the open pit's stope optimizer was 0.4% $Li_2O$. The stope optimizer re-evaluated the $Li_2O$ grade with the added dilution to determine if the "stope" is still above the cut-off grade. For optimization purposes, all mineralized material inside the shapes, whether above or below the cut-off grade, was flagged as "mineralized material". The non-mineralized blocks included in the minable shapes, flag as mineralized material, were considered as the mining dilution. The blocks above the cut-off grade, excluded from the stopes, were considered as the losses, thus decreasing the mining recovery. Figure 16-3 shows an example of mineralized block losses and mining dilution, where only the blocks above cut-off grade are displayed.

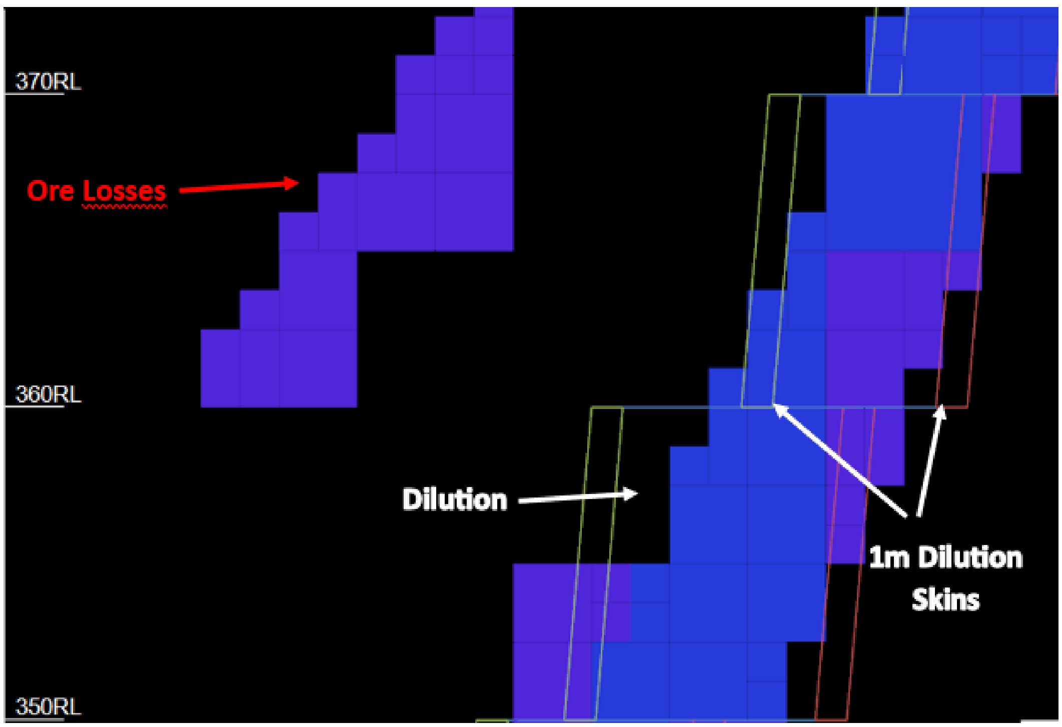



**Figure 16-3: Mining dilution & losses**

Using this method, it is estimated that the overall dilution is estimated to be 16%, where 7% comes from internal pegmatite dilution and 9% comes from the external host rock dilution. The mining recovery is estimated at 97%.

Mineralized material and waste flags determined by the stope optimizer were used to complete the pit optimization.

### 16.3.4 Pit Optimization Parameters

The optimization was completed using the Pseudoflow function in Deswik. The Pseudoflow is similar to the traditional Lerchs-Grossmann ("LG") algorithm but is more efficient and requires less processing time. Using the input parameters, the Pseudoflow algorithm progressively applies an economic value to all the blocks in the block model. It then progressively identifies which blocks are profitable to mine, considering waste rock stripping. The result is a pit shell producing the highest possible total value mined from the open pit, subject to specified pit slope constraints. The following parameters (Table 16-1) have been used based on preliminary work completed on the CV5 Deposit and input from Dahrouge, Primero and Patriot.

**Table 16-1: Optimization parameters**

| Parameter | Unit | Value |
|---|---|---|
| **Geotechnical Parameters** | | |
| Pit slope | deg. | Geotech zone (range between 45 and 47 overall slope angle) |
| **Operating Costs** | | |
| Mining Cost - Rock | $/t mined | 7.46 |
| Mining Cost - Overburden | $/t mined | 5.00 |
| Processing Cost | $/t milled | 14.17 |
| Tailings Management Cost | $/t milled | 1.59 |
| G&A Cost | $/t milled | 20.41 |
| **Total Mineralized Material Based Cost (exclusive of mining cost)** | **$/t milled** | **36.17** |
| Transport Cost | $/t conc | 287.70 |
| **Recovery Parameters** | | |
| Mill Recovery | % | =(75*(1-EXP(-1.995*($Li_2O$feed Grade%))100 |
| Concentrate Grade | % | 5.50 |
| Production Rate | Mtpa | 0.8 |
| **Economic Parameters** | | |
| Exchange Rate | US$/CA$ | 0.76 |
| Concentrate Price | US$/t | 1,375 |
| Concentrate Price | $/t | 1,809 |
| Royalty | % | 2 or 0, see royalties map in Section 4.4 |
| Discount Rate | % | 8 |

#### 16.3.4.1 Geotechnical Parameters

Overall slope angles from 45° to 47° were used as seen on Figure 16-2. This is based on preliminary work performed by BBA.

#### 16.3.4.2 Operating Costs

The mining, DMS tailings and General and Administration ("G&A") costs were based on BBA's preliminary work on the Project and experience with remote mining operations in Québec. Higher than average operating costs were selected to take a conservative approach for the pit optimization. Processing costs were provided by Primero, a processing consultant for Patriot). The costs for the concentrate transportation were estimated based on Craler's report (Craler, 2023) and BBA's work. These numbers were updated for the economic analysis based on quotations, but for the pit optimization, the preliminary information was used.

#### 16.3.4.3 Recovery Parameters

Processing parameters were provided by the processing consultant Primero. These parameters are based on HLS testing and the QP's opinion and are described in more detail in Chapter 13.

#### 16.3.4.4 Economic Parameters

Economic parameters were suggested by BBA and reviewed by Patriot.

### 16.3.5 Pit Optimization Results

The CV5 pit optimization produces different pit shells by varying the revenue factor ("RF"), or the metal price. The RF 1 for this optimization was US$1,375 per tonne of 5.5% $Li_2O$ concentrate. The optimization results are presented in Table 16-2.

**Table 16-2: CV5 pit optimization results**

| Revenue Factor | Selling Price | Mineral Resource | | Waste | Total Material | Overall Stripping Ratio | Incremental Stripping Ratio | Best Case DCF | Worst Case DCF | Average Case DCF |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Tonnes | $Li_2O$ grade | Tonnes | Tonnes | | | | | |
| | (US$/t) | (Mt) | (%) | (Mt) | (Mt) | | | ($) | ($) | ($) |
| 0.30 | 413 | 0.16 | 1.84 | 0.10 | 0.26 | 0.6 | 0.6 | 50,430,627 | 50,430,627 | 50,430,627 |
| 0.35 | 481 | 3.77 | 1.37 | 2.55 | 6.32 | 0.7 | 0.7 | 791,991,537 | 791,511,741 | 791,751,639 |
| 0.40 | 550 | 12.33 | 1.28 | 18.37 | 30.70 | 1.5 | 1.8 | 2,172,139,082 | 2,138,632,279 | 2,155,385,680 |
| 0.45 | 619 | 33.68 | 1.17 | 74.13 | 107.81 | 2.2 | 2.6 | 4,268,043,281 | 3,964,322,693 | 4,116,182,987 |
| 0.50 | 688 | 43.68 | 1.16 | 114.89 | 158.57 | 2.6 | 4.1 | 4,992,294,636 | 4,259,482,597 | 4,625,888,616 |
| 0.55 | 756 | 47.45 | 1.14 | 133.04 | 180.49 | 2.8 | 4.8 | 5,198,049,519 | 4,238,205,270 | 4,718,127,394 |
| **0.60 (2)** | **825** | **50.78** | **1.13** | **150.56** | **201.34** | **3.0** | **5.3** | **5,333,089,593** | **4,153,788,277** | **4,743,438,935** |
| **0.65 (3)** | **894** | **52.28** | **1.13** | **160.60** | **212.89** | **3.1** | **6.7** | **5,383,749,632** | **4,083,849,577** | **4,733,799,605** |
| 0.70 | 963 | 55.76 | 1.12 | 195.55 | 251.31 | 3.5 | 10.1 | 5,486,902,058 | 3,874,663,430 | 4,680,782,744 |
| 0.75 | 1,031 | 56.75 | 1.12 | 204.11 | 260.86 | 3.6 | 8.6 | 5,505,954,399 | 3,796,401,291 | 4,651,177,845 |
| 0.80 | 1,100 | 59.38 | 1.11 | 233.13 | 292.51 | 3.9 | 11.0 | 5,539,785,932 | 3,499,090,987 | 4,519,438,460 |
| 0.85 | 1,169 | 63.29 | 1.10 | 287.70 | 350.99 | 4.5 | 14.0 | 5,569,377,021 | 3,183,227,370 | 4,376,302,195 |
| 0.90 | 1,238 | 64.15 | 1.10 | 297.92 | 362.07 | 4.6 | 11.8 | 5,573,893,308 | 3,101,888,460 | 4,337,890,884 |
| 0.95 | 1,306 | 64.85 | 1.10 | 305.60 | 370.45 | 4.7 | 10.9 | 5,575,828,599 | 3,049,783,485 | 4,312,806,042 |
| **1.00 (1)** | **1,375** | **70.16** | **1.09%** | **408.05** | **478.22** | **5.8** | **19.3** | **5,556,420,125** | **2,264,320,260** | **3,910,370,193** |

(1) RF = 1.00: Max undiscounted value – Best Case
(2) RF = 0.60: Max undiscounted value – Worst Case
(3) RF = 0.65: Recommended Pit

The QP recommends using the RF 0.65 as a basis for the pit design. The RF 0.60 is the average best case, but is almost similar to RF 0.65, which provides an additional 1.5 Mt of mineralized material with a reasonable incremental strip ratio of 6.7. Using the RF 0.65 is a conservative approach, and it reduces the mining costs per tonne of mineralized material compared to a pit with a higher strip ratio. All incremental pits above RF 0.65 (except one) have an incremental strip ratio above 10, which increases mining costs and the environmental footprint of the waste rock management stockpiles.

The selected pit shell, RF 0.65, contains 52 Mt of mineralized material at an average grade of 1.13% $Li_2O$ with a strip ratio of 3.1. Figure 16-4 shows the evolution of the NPV of the worst and best case scenarios as the RF increases. The worst case assumes that the pit would be mined level by level without any consideration for prioritizing the mineralized material. The best case assumes that the pit would be mined pit shell by pit shell, which is technically not possible. The RF 0.65 pit offers a balanced approach between the worst and best cases.

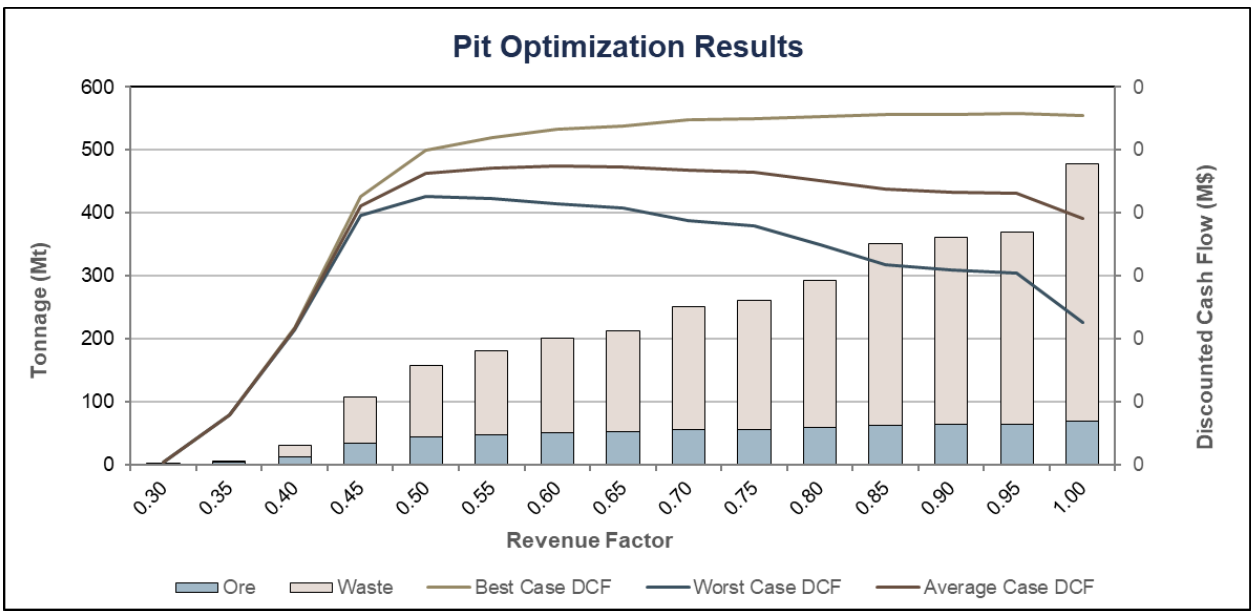



**Figure 16-4: Pit optimization results**

### 16.3.6 Pit Shell Overview

Figure 16-5: to Figure 16-7 show the plan and isometric views of the RF 0.65 and RF 1.00 shells produced by the optimization.

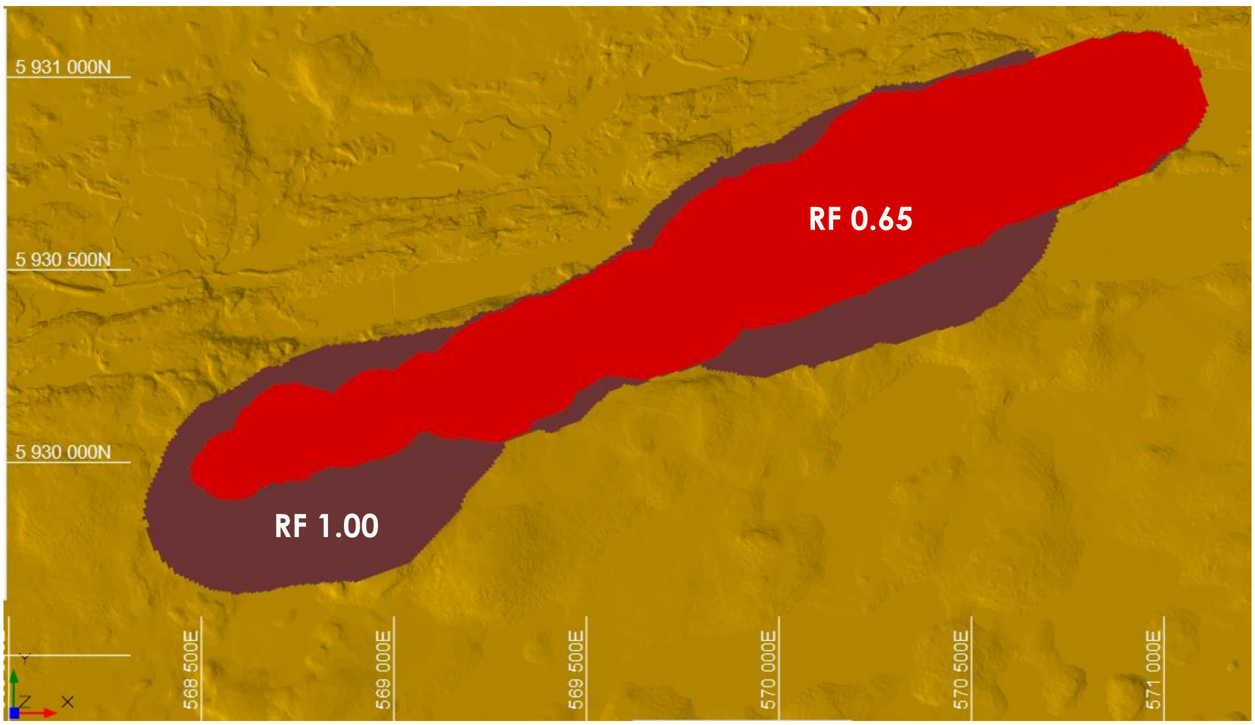



**Figure 16-5: Pit shell comparison - Plan view**

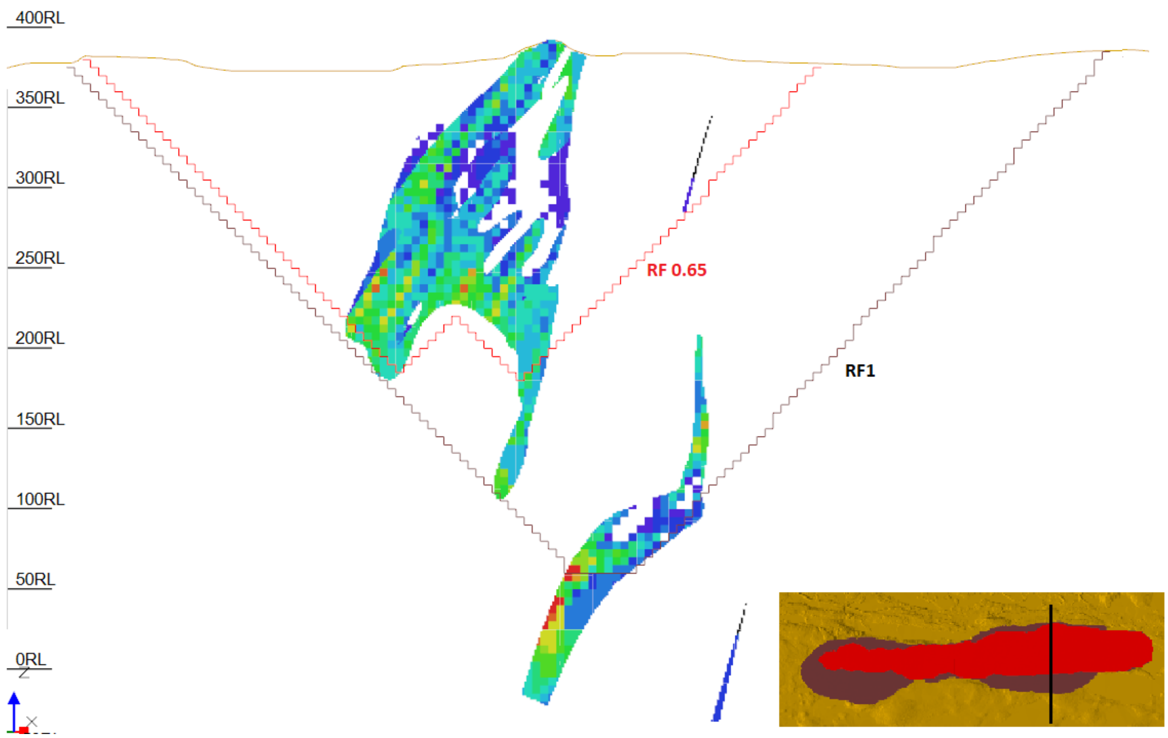



Figure 16-6: Pit shell isometric view cross-section - East side

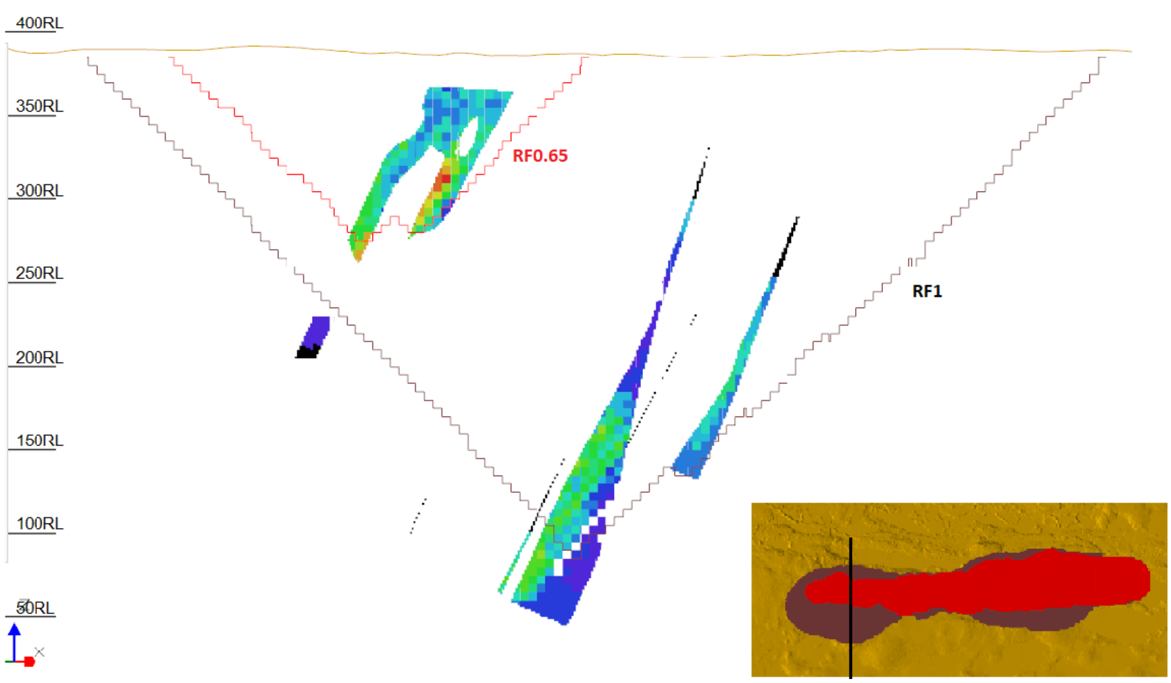



Figure 16-7: Pit shell isometric view cross-section - West side

## 16.4 Open Pit Mine

The previous section (16.3 - Open Pit Optimization) describes the pit optimization process that gives the pit shell through the Pseudoflow algorithm. However, the pit shell does not include ramps, berms that are described in this section.

### 16.4.1 Pit Design Parameters

Based on geotechnical recommendations outlined in Section 16.2, the pit design parameters described in Table 16-3 were used.

**Table 16-3: Pit design parameters**

| Design Sector | Unit | Value |
|---|---|---|
| **Wall Parameters** | | |
| Bench Height | m | 10 |
| Berm Width | m | 6.5 |
| Bench Face Angle | ° | 70-75 |
| Inter Ramp Angle | ° | 45-47 |
| Maximum Vertical without Ramp or Geotechnical Berm | m | 180 |
| Geotechnical Berm Width | m | 18 |
| **Ramp Parameters** | | |
| Ramp Width – Single Lane | m | 20 |
| Ramp Width – Double Lane | m | 28 |
| Minimum Mining Width | m | 40 |
| Maximum Vertical with Single Lane | m | 50 |

Geotechnical recommendations stated that double benching could be possible in certain areas of the pit, but to simplify the design process, it was decided to use only single benches, which is a conservative approach. No geotechnical berms were necessary for the design.

The pit is designed with a 28-m wide double lane ramp to accommodate 200-ton class haul trucks. To minimize waste stripping, 20 m wide single lane ramps will be used near the bottom of the pit. The maximum length of the single lane ramps was 50 vertical metres, or five benches, to minimize the traffic caused by a single lane ramp. The minimum mining width between phases and throughout most of the pit was 40 m, which is the turning radius of the 200-ton trucks plus a catch berm, which is based on the industry's standard. However, a goodbye cut of approximately 30 m wide will be mined at the bottom of Phase 4 to recover high-grade mineralized material at the bottom of the pit.

### 16.4.2 Pit Designs

The designs for the CV5 pit were completed using Deswik's Strategic Pit Design tool ("SPD"). This software can produce fast and accurate pit designs from the generated pit shells. The parameters described in Section 16.4.1 were used as inputs in the software to produce the desired pit designs. One final pit and three phases were produced using the SPD tool. The designs were then manually modified to correct imperfections and recover additional mineralized material at the bottom of the pit.

#### 16.4.2.1 Pit Phasing

The main factor for designing the initial pit phases was the Lake 001 drainage constraints. The first pit phases are usually designed to reach the highest-grade mineralized material as soon as possible to optimize the pit's NPV. However, the CV5 pit being partially under a lake, this approach would delay the concentrate production by at least 1 year, as the lake's dewatering would need to be completed before the mining activities could begin.

The first phase of the pit was therefore designed to be mined without having to drain any part of Lake 001, enabling mining operations to begin as soon as possible on dry land. The pit boundaries of the first phase are at least 40 m away from any large body of water.

The second phase was designed to mine the shallow mineralized material at a low strip ratio to have access to large quantities of mineralized material early to be able to feed the mill.

The third phase represents a pushback to the west of the second phase.

The fourth and final phase is a global pushback of Phase 3 and also joins Phase 1 to the large Phase 3 pit. Table 16-4 shows the tonnage contained in each phase and Figure 16-8 to Figure 16-11 present each phase design.

**Table 16-4: Tonnage contained in each phase**

| OP Designs | Mineralized Material Tonnes (Mt) | Waste Tonnes (Mt) | OVB Tonnes (Mt) | Avg $Li_2O$ Grade (%) | Total Material (Mt) | Strip Ratio (t/t) |
|---|---|---|---|---|---|---|
| Phase 1 | 2.7 | 11.2 | 7.1 | 1.15% | 21.1 | 6.69 |
| Phase 2 | 8.9 | 19.8 | 0.3 | 1.05% | 29.0 | 2.25 |
| Phase 3 | 8.4 | 27.7 | 2.3 | 1.08% | 38.4 | 3.58 |
| Phase 4 | 30.5 | 113.8 | 6.4 | 1.14% | 150.9 | 3.94 |
| **Total** | **50.5** | **172.5** | **16.0** | **1.11%** | **239.3** | **3.74** |

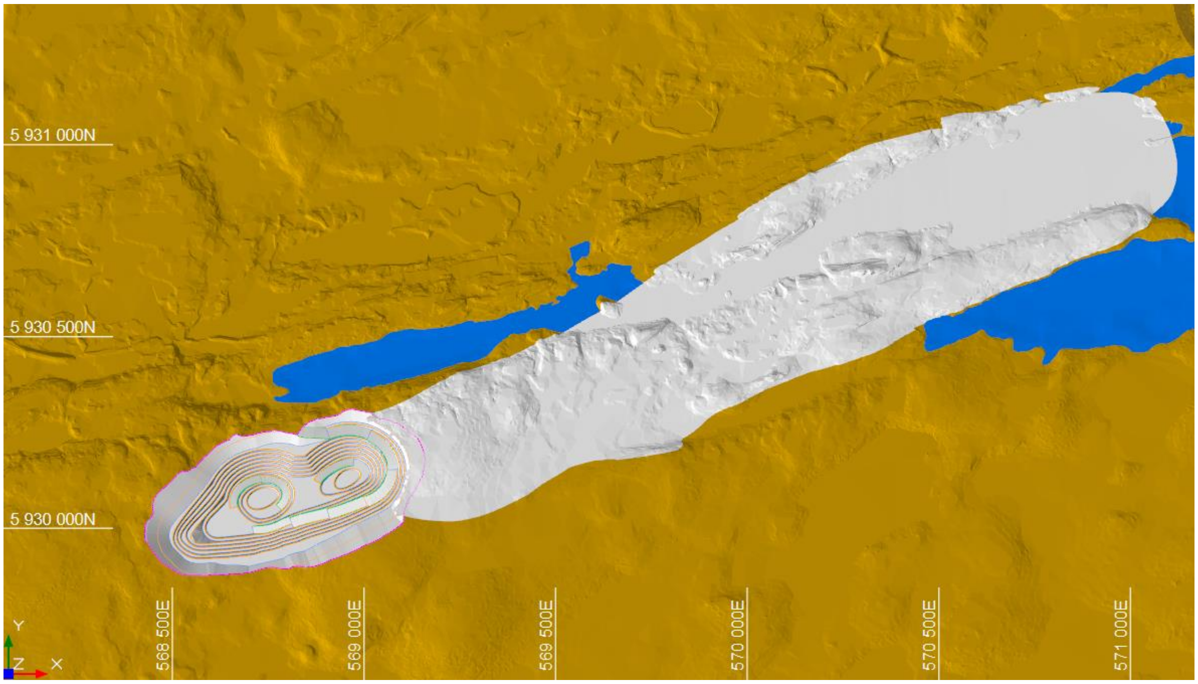



Figure 16-8: Phase 1 pit design

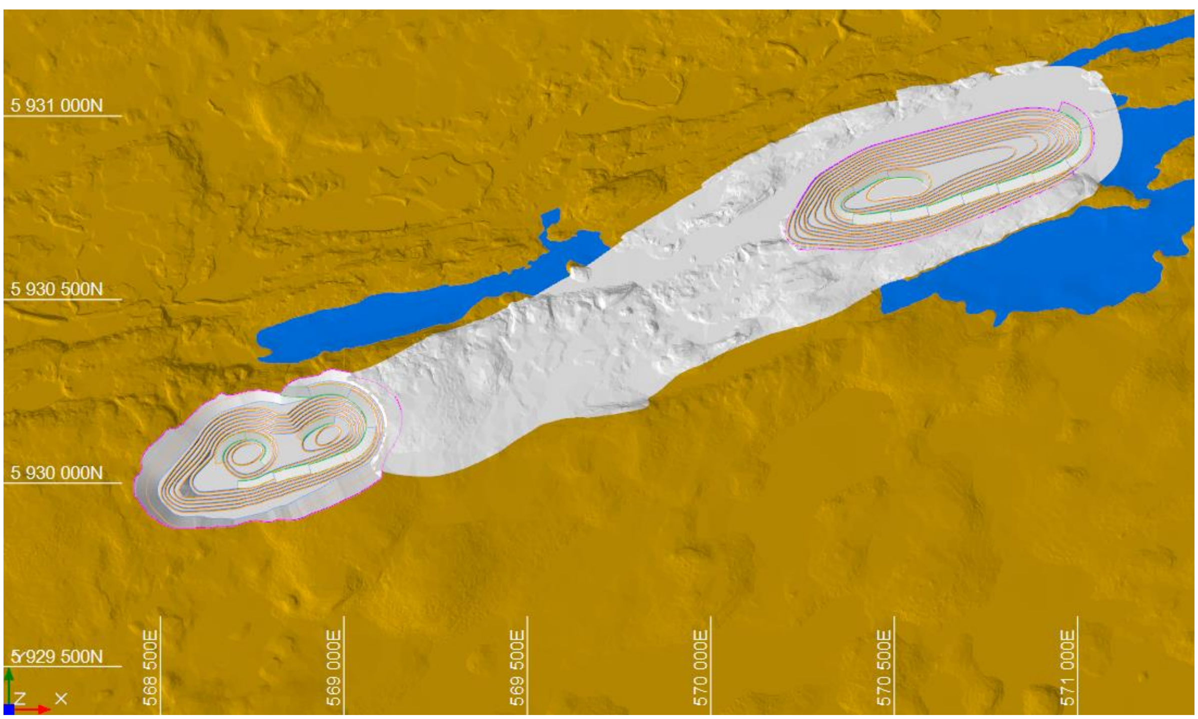



Figure 16-9 Phase 2 pit design


**Figure 16-10: Phase 3 pit design**

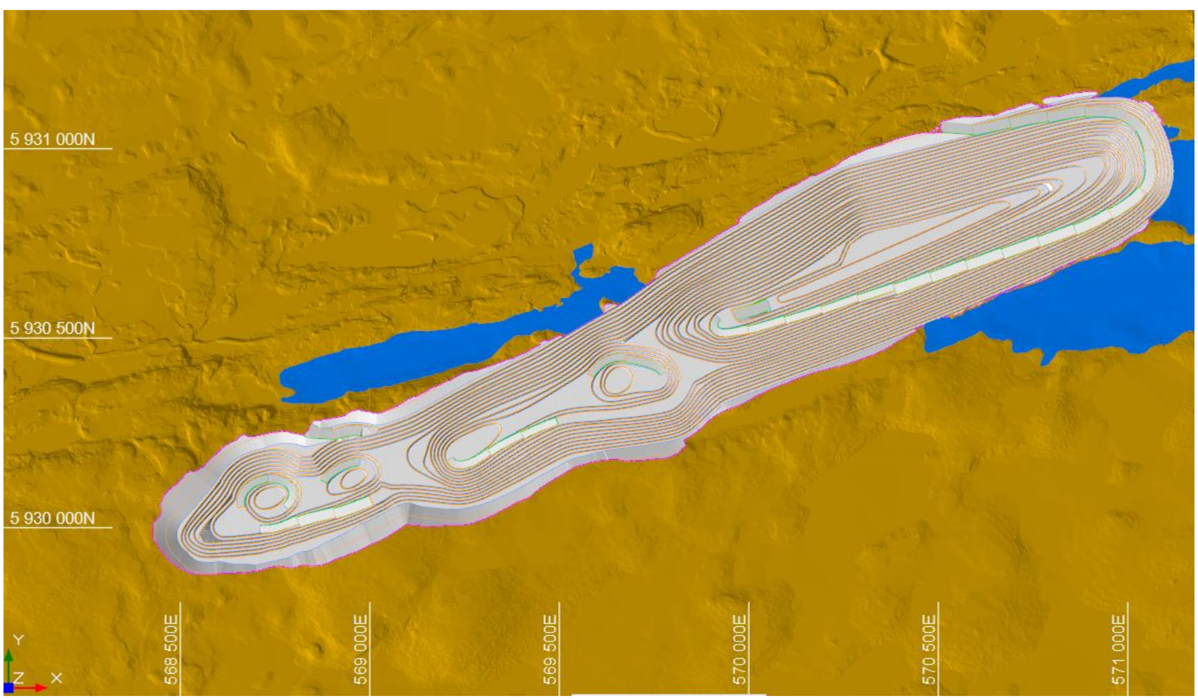



**Figure 16-11: Final pit design**

### 16.4.3 Waste Rock Disposal

Stockpile 002 will be built to store all the waste rock coming from the pit. Stockpile 002 will store a mixture of waste rock and DMS tailings. Over the LOM, a total of 179 Mt of waste rock and 16 Mt of overburden will need to be stored. All the waste rock stockpiles are located north of the pit. Approximately 172 Mt of waste rock is coming from the pit design and 6 Mt from the underground development. The overburden stockpiles are located south of the pit. A 1.3 swell factor was assumed for estimating the required volumes to store the waste rock and the overburden density is considered to be 2 $t/m^3$. The stockpiles were designed to have an overall slope of 3:1. Further details are presented in Chapter 18.

Stockpile 002 is designed to have extra capacity to allow the pit to be extended if more Mineral Resources are found. In-pit waste dumping was not considered in this study since the pit has the potential for several pushbacks to access lower grade and high strip ratio dykes, as seen in the RF 1 pit shell in Section 16.3.6. Dumping waste back into the pit would sterilize the resource next to and below the pit. A summary of the stockpile storage capacities is summarized in Table 16-5.

**Table 16-5: Waste rock stockpile capacities**

| Waste Stockpiles | Total Volume ($M\ m^3$) | Total In Situ Tonnes (Mt) | Stockpile Height (m) |
|---|---|---|---|
| Stockpile 002 | 80(1) | 179 | 125 |
| Stockpile 004 (OVB) | 4 | 8 | 60 |
| Stockpile 005 (OVB) | 4 | 8 | 60 |

(1) The volume considered only the waste disposal, some DMS tailings will be deposited in the same stockpile.

### 16.4.4 Mining Method

The pit will be mined using a traditional drill and blast, truck and shovel mining method. One waste disposal pile north of the pit will be used to store the waste rock. Refer to Figure 18-2 (Main site infrastructure) in Chapter 18 for reference.

#### 16.4.4.1 Waste Loading and Handling

At peak production, 16 Mt of material will be mined from the pit annually. To achieve this target, large 200-ton class trucks were selected to haul the waste. At peak production, nine haul trucks will be required to transport all the waste material.

To load the large haul trucks, a large hydraulic front shovel with a 19 $m^3$ size bucket was selected. The shovel will be able to load the trucks in five passes, which is in the industry's standard. One large front end loader ("FEL") will support the large shovel for loading the trucks while it is on maintenance. The FEL will also be used to clean up the pit's floors for the shovel.

#### 16.4.4.2 Mineralized Material Loading & Handling

Since all the mineralized material is limited to dykes of varying width, the large hydraulic shovel is not the optimal equipment for mining the mineralized material, as it would risk increasing the mining dilution. Therefore, a more selective shovel with a smaller bucket was preferable. A small hydraulic shovel with a 12 $m^3$ size bucket was selected to mine the mineralized material. The smaller and more agile shovel can also be used to mine the overburden at the beginning of the pit. Only one small shovel will be sufficient to mine the mineralized material.

The small shovel was matched with the smaller 100-ton class truck (or 90 metric tonnes) that will haul the mineralized material. The 100-ton class truck will also be used to mine the overburden and haul the consolidated fines and middlings from the processing plant to the waste stockpiles. A maximum of five 100-ton trucks will be required throughout the LOM.

#### 16.4.4.3 Drilling and Blasting

##### Drill Pattern

Two different drilling patterns were designed: one for the mineralized material and one for the waste material.

For the mineralized material, the objective was to achieve a finer overall fragmentation so that it can be loaded by the smaller shovel and reduce the crushing and processing costs. Therefore, the drilling parameters have been established to target a powder factor of around 1.2 kg/$m^3$, based on experience on similar open pit lithium projects. A higher powder factor usually results in a finer overall fragmentation. The blast's fragmentation will usually be in the range of 50 mm to 500 mm mean particle size.

Table 16-6 shows the drilling parameters used for the mineralized material.

Table 16-6: Drill pattern for mineralized material

| Parameters | Unit | Value |
|---|---|---|
| Bench Height | m | 10.0 |
| Subdrilling | m | 1.2 |
| Hole Length | m | 11.2 |
| Hole Diameter | mm | 152.0 |
| Burden | m | 3.8 |
| Spacing | m | 3.8 |

For the waste rock, the objective is to maximize the drilling yield. Fragmentation is less of a concern since the waste material is loaded with a bigger shovel and is not subject to other fragmentation steps. Table 16-7 summarizes the drilling parameters for the waste rock.

Table 16-7: Drill pattern for waste rock

| Parameters | Unit | Value |
|---|---|---|
| Bench Height | m | 10.0 |
| Subdrilling | m | 1.5 |
| Hole Length | m | 11.5 |
| Hole Diameter | mm | 203.0 |
| Burden | m | 6.0 |
| Spacing | m | 6.0 |

To ensure the stability and integrity of the final pit walls, traditional pre-split blasting will be used. Traditional pre-split is done by blasting a single row of smaller angled holes to create a fracture or sheared zone that will create a smooth regular surface along the entire wall. Contrary to a standard production blast, the objective of a pre-split blast is not to fragment the rock, but only to create a fracture along the final pit wall. A pre-split pattern has been established to achieve a borehole pressure to uniaxial compression strength of the rock ratio of around 90%, which is a good guideline based on BBA's experience. Table 16-8 summarizes the parameters for the pre-split.

**Table 16-8: Drill pattern for pre-split**

| Parameter | Unit | Pre-split Pattern |
|---|---|---|
| Bench Height | m | 10.0 |
| Hole Angle | ° | 75 |
| Subdrilling | m | 0.6 |
| Hole Length | m | 11.2 |
| Hole Diameter | mm | 114.3 |
| Spacing | m | 1.2 |

## Drill Selection

The chosen production drill is an electric driven drill available in either a rotary configuration or with a down the hole hammer. The drill can drill holes of 171 mm to 270 mm of diameter to a depth of 12.2 m in a single pass that will ensure a great productivity when drilling the waste rock patterns. A smaller down-the-hole drill able to drill holes of 110 mm to 229 mm in diameter was selected for the mineralized material. However, the smaller drill will need multiple passes to drill to the maximum planned hole depth of 11.2 m.

Having a larger more productive drill and a smaller more agile drill will bring flexibility to the mining operations. The smaller drill will be able to move around the pattern more easily, position itself in the right position for the pre-split holes and will also be used for the first blasts where the terrain, especially in the dried bottom of the lake, will be rough and uneven. On the other hand, the more productive drill is required to have the drilling capacity to be able to mine the yearly planned amount of waste rock.

## Blasting Parameters

The blast parameters have been selected based on BBA's experience and the industry's guidelines. For the main drilling patterns, only the use of bulk-loaded emulsion-based explosives with a density of 1.2 g/cc was considered. Emulsion explosives can be used in wet ground conditions, which will be important given that most of the pit is located under a lake. As emulsion is generally more expensive than ANFO explosives, blasting estimates will be more conservative. The stemming length has been established based on the scaled depth of burial calculations. A minimum scaled depth ratio of 1.2 has been respected to minimize fly-rock generation from the collar. Two detonators and two boosters per hole have been considered for both the mineralized material and waste rock patterns. This will reduce the risk of misfire and ensure a uniform detonation of the explosives along the full length of the hole. The blasting parameters used for this study are summarized in Table 16-9.

**Table 16-9: Blasting parameters for the mineralized material and waste rock patterns**

| Parameters | Unit | Mineralized Material Pattern | Waste Rock Pattern |
|---|---|---|---|
| Explosive Type | n/a | Emulsion | Emulsion |
| Explosive Density | g/cc | 1.2 | 1.2 |
| Stemming Length | m | 3.5 | 4.0 |
| Explosive Weight per Hole | kg | 168.6 | 291.3 |
| Detonators per Hole | n/a | 2 | 2 |
| Boosters per Hole | n/a | 2 | 2 |
| Powder Factor | kg/m³ | 1.17 | 0.81 |

As mentioned previously, the loading parameters for the pre-split have been established based on the borehole pressure to uniaxial compressive strength of the rock ratio. Cartridge explosives will be used to load the pre-split holes to create a decoupled charge to reduce the pressure induced to the drill hole wall. If the induced pressure is too high, fragmentation of the rock will occur around the blast hole and the objective of the pre-split will not be achieved. Table 16-10 shows the blasting parameters for pre-splitting.

**Table 16-10: Blasting parameters for pre-split**

| Parameter | Unit | Pre-split Pattern |
|---|---|---|
| Explosive Type | N/A | Senatel Powersplit |
| Explosive Density | g/cc | 1.14 |
| Charge Diameter | mm | 32.0 |
| Cartridge Length | mm | 400.0 |
| Stemming | m | 3.5 |
| Length of Overlapping Toe Cartridge | m | 0.8 |
| Total Charge Length | m | 7.3 |
| Powder Factor | kg/m² | 0.66 |

### Explosive Contractor

All the explosives will be produced on site by a contractor. The mine will take care of the blasting. Producing the explosives on site usually simplifies the transportation of the product to the site. When the ingredients needed to produce explosives are transported separately, they are much less restricted by legislation than when the explosive is transported in its reactive state. The contractor's services will include the following:

- Workforce:
  - General supervisor;
  - Bulk truck operator;
  - Mechanic;
  - Explosive plant labour.
- Rental of infrastructure:
  - Explosive plant;
  - Explosive magazine of 25,000 kg capacity.
- Equipment:
  - Site mixed emulsion bulk truck of 20,000 kg;
  - Pickup trucks;
  - Front end loader.

### 16.4.4.4 Support Equipment

The following equipment will be required throughout the LOM to support the production fleet:

- Track dozer;
- Road grader;
- Wheel loader – production;
- Wheel loader – ROM Pad;
- Wheel loader – concentrate;
- Utility excavator;
- Water truck;
- Small wheel loader;
- Light plant.

### Track Dozer

Track dozers are necessary to handle the rock dumped at the waste stockpiles and on the stockpile. It can also be used for various other tasks. A D9 class dozer will be used for the waste material, and a D8 class dozer for the DMS tailings.

### Road Grader

Road graders help maintain the haul roads around the mine and the pit. It can also remove the snow from the roads in winter. A large 18-foot blade grader was selected to maintain the roads.

### Wheel Loader

To avoid negatively affecting the mining production while the hydraulic shovels are not available due to maintenance, a large wheel loader able to load the large 200-ton class trucks will be acquired to fill in for the shovels. The loader will also be able to help the shovels clean their working area.

A smaller wheel loader capable of loading the 100-ton class trucks will also be required to load the material stockpiled on the ROM pad into the crusher. The smaller loader will also be able replace the small hydraulic shovel in the pit while it is under maintenance.

It was assumed that approximately 25% of the mineralized material from the open pit will be rehandled on the ROM pad. The loader will also rehandle 100% of the mineralized material coming from the underground mine. A wheel loader with a 10 $m^3$ bucket capacity was selected for the ROM pad. A wheel loader will also be dedicated to load the concentrate from the processing plant into the shipping trucks of 4-$m^3$ capacity.

### Utility Excavator

Utility excavators are essential for carrying out various tasks around the mine, including digging ditches, cleaning up environmental spills and installing pipes and pumps. It will also be used to clean the wall once the production has excavated most of the material. The utility excavator will be used from time to time to clean the contact between mineralized material and waste rock.

### Water Truck

The water trucks are necessary to spray water with dust suppressant on the haul road to minimize the dusts created by the haul trucks. The water trucks can also be used to spray sand on the roads during the winter months to prevent the haul trucks from sliding.

### Construction Lights

Light plants are used to illuminate the working areas of the pit at night to improve visibility and safety.

#### 16.4.4.5 Service Equipment

The following service equipment will be required at the mine to performance various tasks:

- Fuel & lube truck;
- Mechanic truck;
- Lowboy;
- Transport buses;
- Light vehicles (pick-up trucks);
- Dewatering pumps;
- Emulsion trucks.

#### 16.4.4.6 Tailings Equipment

The processing plant's DMS tailings material will be relatively dry and coarse material that will be stacked and compacted into a large stockpile area, similar to the mine's waste rock. A fleet of equipment will be required to haul and stack the DMS tailings. The following equipment were selected to handle the DMS tailings:

- Wheel loader;
- Track dozer;
- Utility excavator;
- Soil compactor;
- Articulated truck.

The 100-ton trucks will be used mostly to transport consolidated fines and middlings from the processing plant to the stockpile. Articulated trucks will also be used to fill gaps when all 100-ton trucks are occupied in the pit, or when trucks are undergoing maintenance. The articulated truck will also be used for various tasks around the mine or when site conditions are not favourable for a 100-ton class truck. A wheel loader will be used to load the DMS tailings into the trucks.

#### 16.4.4.7 Equipment Quantities

The complete equipment list indicating the number of equipment required each year for the mining department is summarized in Table 16-11.

### Table 16-11: Mobile equipment list summary

| Description | Unit | Pre-production | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 | Y18 | Y19 | Y20 | Y21 | Y22 | Y23 | Y24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MAJOR EQUIPMENT** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Haul Truck - Production Waste | # | 0 | 5 | 7 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 5 | 5 | 5 | 5 | 3 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Haul Truck - Production Ore/OB/Tailings | # | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 2 | 1 | 1 | 1 | 1 |
| Excavator - Production Waste | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Excavator - Production ore/OB | # | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Electric Production Drill - Waste | # | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Production Drill - Ore / PS | # | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| **SUPPORT EQUIPMENT** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Track Dozer | # | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Road Grader | # | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Wheel Loader - Pit | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Wheel Loader - ROM Pad | # | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| Utility Excavator | # | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| Water Truck / Sand Spreader | # | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Small Loader | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Lighting Plant | # | 1 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 4 | 2 | 2 | 2 | 2 | 2 |
| **SERVICE EQUIPMENT** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fuel & Lube Truck | # | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 |
| Mechanic Truck | # | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 |
| Lowboy | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Transport Bus | # | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 |
| Pickup Truck | # | 20 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 20 | 15 | 12 | 12 | 10 | 5 | 5 | 5 |
| Dewatering Pump | # | 1 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 3 |
| Concentrate Loader | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **TAILINGS FLEET** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Wheel Loader - Tailings | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Track Dozer - Tailings | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Utility Excavator - Tailings | # | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Soil Compactor - Tailings | # | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Articulated Truck - Tailings | # | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |

#### 16.4.4.8 Operating Hours

To determine the number of equipment needed over the LOM, assumptions were made regarding the number of operating hours that each equipment can achieve. Table 16-12 describes the overall mine operating schedule. The mine will operate 360 days a year on two shifts of 12 hours each. Since the site is located far north where winters can be harsh, the mine expects having to halt or slow down its operations 10 days per year on average due to weather.

**Table 16-12: Mine's operating schedule**

| Work Schedule | Unit | Value |
|---|---|---|
| Total number of weeks per year | week | 52 |
| Total number of days per week | day | 7 |
| Total number of hours per day | hour | 24 |
| Total number of calendar days per year | day | 365 |
| Planned shutdowns and holidays | d/y | 5 |
| Weather and unplanned shutdowns | d/y | 10 |
| Scheduled days per year | day | 360 |
| Operating days per year | day | 350 |
| Total shifts per day | shift | 2 |
| Hours per shift | h | 12 |
| Non-operating shifts per day | shift | 0 |
| Total working hours per day | hour | 24 |
| Total number of shifts per year | shift | 700 |

For the main production equipment, the total operating hours per year were estimated with the methodology outlined in Table 16-13. The assumptions made to estimate the yearly operating hours were based on BBA's experience and standard industry practices.

**Table 16-13: Main equipment operating hours assumptions**

| Description | Unit | Truck | Truck | Excavator | Excavator | Tailings Loader | ROM Pad Loader | Drill | Drill |
|---|---|---|---|---|---|---|---|---|---|
| | | Waste | MM* | Waste | MM | | | Waste | MM/ Pre-split |
| **Down Time** | | | | | | | | | |
| Average Mechanical Availability | % | 82 | 82 | 75 | 75 | 75 | 75 | 75 | 75 |
| **Total Down Time** | **h/y** | **1,577** | **1,577** | **2,190** | **2,190** | **2,190** | **2,190** | **2,190** | **2,190** |
| **Standby Time** | | | | | | | | | |
| Shift Change | min/shift | 20 | 20 | 20 | 20 | 20 | 20 | 5 | 5 |
| Hot Change for Breaks | min/shift | 30 | 30 | 30 | 30 | 30 | 30 | 5 | 5 |
| Fueling, Lube & Service | min/shift | 15 | 15 | 15 | 15 | 15 | 15 | 30 | 30 |
| Other Delays | min/shift | 7 | 7 | 7 | 7 | 7 | 7 | 10 | 10 |
| **Total Standby Time** | **h/shift** | **1.20** | **1.20** | **1.20** | **1.20** | **1.20** | **1.20** | **0.83** | **0.83** |
| **Total Standby Time** | **h/y** | **1,042** | **1,042** | **981** | **981** | **981** | **981** | **791** | **791** |
| **Operating Efficiency** | | | | | | | | | |
| Tramming / Equipment Relocation | % | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 |
| Queuing / Hang Time | % | 2 | 2 | 4 | 4 | 4 | 4 | 5 | 5 |
| Operator Delays | min/h | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 |
| Other Non-Production Tasks | min/shift | 5 | 5 | 30 | 30 | 15 | 15 | 20 | 20 |
| **Total Operating Delays** | **h/shift** | **0.98** | **0.98** | **1.62** | **1.62** | **1.64** | **1.64** | **2.38** | **2.38** |
| **Total Operating Delays** | **h/y** | **559** | **559** | **836** | **836** | **851** | **851** | **1,232** | **1,232** |
| **Hours Breakdown** | | | | | | | | | |
| Calendar Time | h/y | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 | 8,760 |
| Schedule Time | h/y | 8,640 | 8,640 | 8,640 | 8,640 | 8,640 | 8,640 | 8,640 | 8,640 |
| Available Time | h/y | 7,183 | 7,183 | 6,570 | 6,570 | 6,570 | 6,570 | 6,570 | 6,570 |
| Utilized Time (GOH) | h/y | 6,141 | 6,141 | 5,589 | 5,589 | 5,589 | 5,589 | 5,779 | 5,779 |
| **Operating Time (NOH)** | **h/y** | **5,582** | **5,582** | **4,753** | **4,753** | **4,882** | **4,882** | **4,739** | **4,739** |

* Mineralized material ("MM")

Similar sized mining operations were used as benchmarks to estimate the number of support and service equipment.

#### 16.4.4.9 Workforce

Since it will be a Fly-in Fly-out ("FIFO") site, four crews will rotate between the day, night and off shifts. For the mobile equipment, one operator per crew per machine was assumed. Table 16-14 describes the assumptions made for the employees not directly linked to a mobile equipment.

**Table 16-14: Personnel assumptions**

| Position | # Crew | # per Crew | Total |
|---|---|---|---|
| Pit Supervisor | 4 | 2 | **8** |
| Labourer | 4 | 2 | **8** |
| Driller Helper | 1 | 1 | **4** |
| Maintenance Supervisor | 4 | 2 | **8** |
| Blaster | 2 | 1 | **2** |
| Blaster Helper | 2 | 1 | **2** |

To estimate the number of mechanics required to maintain the fleet of equipment, it was assumed that each mechanic would work effectively on equipment for 1,530 hours per year and that, for each machine, gross operating hours would require 0.25 mechanics hours.

The full list of employees for the mining operation is summarized in Table 16-15.

## Table 16-15: Mine workforce requirements

| Description | Category | Pre-production | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 | Y18 | Y19 | Y20 | Y21 | Y22 | Y23 | Y24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **MINE OPERATIONS** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mining Operation Superintendent | Superintendent | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pit Foreman | Supervisor | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Shovel Operator | Skilled Operator | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Truck Operator | Lower-Skilled Operator | 23 | 27 | 40 | 40 | 40 | 40 | 37 | 40 | 40 | 43 | 43 | 46 | 33 | 33 | 33 | 33 | 27 | 23 | 23 | 10 | 7 | 2 | 2 | 2 | 2 |
| Loader Operator | Skilled Operator | 4 | 12 | 12 | 12 | 12 | 12 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 12 | 8 | 8 | 8 | 6 | 6 | 6 |
| Grader / Dozer Operator | Semi-Skilled Operator | 8 | 8 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 12 | 4 | 4 | 4 | 4 | 4 | 4 |
| Water Truck / Excavator Operator | Semi-Skilled Operator | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 4 | 4 | 0 | 0 | 0 |
| Labourer | Lower-Skilled Operator | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 4 | 4 |
| Driller | Skilled Operator | 8 | 8 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 12 | 12 | 8 | 0 | 0 | 0 | 0 | 0 | 0 |
| Drill Helper | Lower-Skilled Operator | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blaster | Skilled Operator | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Blaster Helper | Lower-Skilled Operator | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| **MINE MAINTENANCE** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Maintenance Superintendent | Superintendent | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Maintenance Foreman | Supervisor | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 2 | 2 | 2 |
| Maintenance Planner | Planner | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 |
| Mechanic | Mechanic | 22 | 36 | 41 | 42 | 43 | 42 | 42 | 43 | 43 | 44 | 45 | 45 | 40 | 40 | 40 | 39 | 37 | 34 | 27 | 16 | 9 | 10 | 8 | 8 | 8 |
| **TECHNICAL SERVICES** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Technical Services Superintendent | Superintendent | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| Mining Engineer and Project Engineer | Mining Engineer | 4 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 6 | 6 | 4 | 2 | 0 | 0 | 0 | 0 | 0 |
| Geologist | Geologist | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sampler | Technician | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| Surveyor | Technician | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| **TAILINGS OPERATIONS** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Tailings Foremen | Supervisor | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Tailings Planner | Planner | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Tailings Loader Operator | Semi-Skilled Operator | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Tailings Dozer Operator | Semi-Skilled Operator | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Tailings Excavator Operator | Semi-Skilled Operator | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 0 | 0 | 0 | 0 |
| Tailings Articulated truck Operator | Semi-Skilled Operator | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 |
| **TOTAL MINE WORKFORCE** | | **122** | **199** | **233** | **234** | **235** | **234** | **235** | **239** | **239** | **243** | **244** | **247** | **229** | **229** | **229** | **225** | **211** | **204** | **171** | **94** | **78** | **57** | **46** | **46** | **46** |

## 16.5 Underground

### 16.5.1 Underground Mining Method

The proposed underground mine includes two longhole mining methods. Transverse is used for the wider part of the body and longitudinal for the narrower dykes. The proportion of tonnes that comes from both mining methods are:

- Transverse: 96%;
- Longitudinal retreat: 4%.

The mining steps are the same for both mining methods and are divided as follow:

1. Stope preparation
    - 1.1. Cable drilling and installation
    - 1.2. Slot raise drilling
    - 1.3. Production drilling
    - 1.4. Loading and blasting
2. Mucking
3. Backfilling
    - 3.1. Fence
    - 3.2. Plug pouring and cure
    - 3.3. Residual pouring and cure

#### 16.5.1.1 Longhole Transverse

Although the transverse sequence requires more development than the longitudinal sequence, it is more productive and efficient for this type of wide mineral deposit. A strict pyramid sequence was planned to distribute stress evenly. All sequences are bottom-up to avoid any development in the paste backfill.

Primary access at the top and bottom is required to take the first stope in the center of the sequence. Then, the pyramid can extend further east and west, always taking the primary stopes first.

Secondary accesses are developed only when both adjacent primary stopes are fully backfilled to prevent any damage to the drift when the primary stopes are blasted.

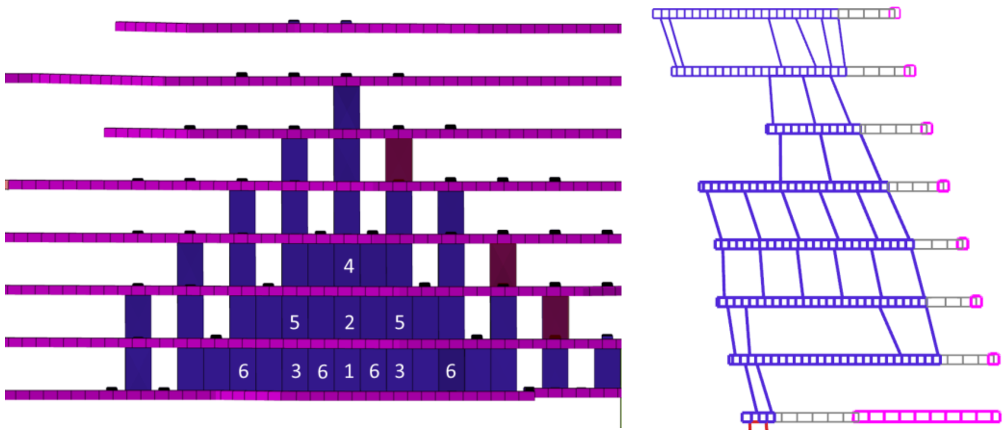



Figure 16-12: Longhole transverse method – longitudinal section and cross-section view

#### 16.5.1.2 Longhole Longitudinal Retreat

The longitudinal retreat sequence is used on isolated and narrow structure that are averaging 6.0 m wide. It is less productive than a transverse sequence but requires less development.

A bottom and top sill must be developed to take the first stope. It is advised to take two stopes at the bottom before going one level above to avoid any interference between them.

No upper stope is currently present in the mine plan.

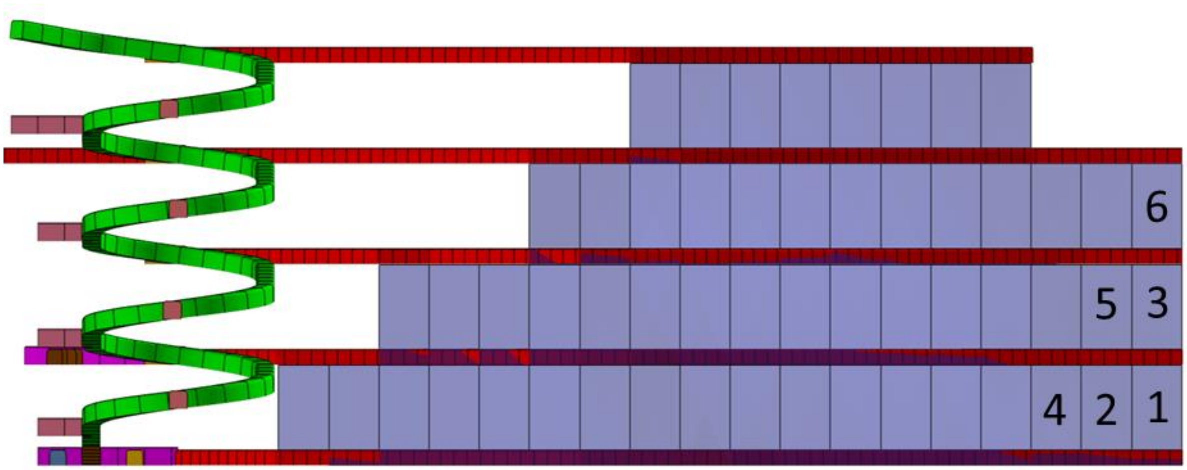



Figure 16-13: Longhole longitudinal retreat mining method – longitudinal section and sequence

### 16.5.2 Underground Design Criteria

#### 16.5.2.1 Minimum Mining Width

A minimum width of 3.0 m is used for all the longhole stopes along with a height of 4.7 m to allow longhole production drills to fit. An ore sill of 5.0 m is designed to match the average 6.0 m width for longitudinal stopes. For transverse stopes, a 6.5-m width tunnel is excavated both at the bottom and top of the stopes to maximize the efficiency of production drilling and mucking. The average size of the transverse stopes is 18.0 m.

**Table 16-16: Mining method stope dimensions**

| Activity | Level Intervals (m) | Minimum Mining Width (m) | Maximum Length (m) | Average Mining Width (m) |
|---|---|---|---|---|
| Transverse Stopes | 30 | 3.0 | 15 | 18.0 |
| Longitudinal Stopes | 30 | 3.0 | 15 | 6.0 |

#### 16.5.2.2 Development Dimension and Advance Rates

The lateral development dimensions were designed to accommodate large, mechanized equipment used throughout the mine. The haulage ramp was designed to be 1 metre higher than the other development to accommodate the trolley assist line for the trucks.

The ventilation raises dimensions were determined with a ventilation simulation using the software Ventsim to ensure that the required airflows could be pushed into the mine. The ore passes and egress dimensions were based on industry's standard for underground mines in Québec.

The maximum advance rates and daily development meters were estimated based on the productivity of the mobile equipment fleet and typical rates for underground mine operations. One dedicated development fleet will be assigned to each ramp (service and haulage) to achieve faster advance rates. Except for the first 3 years where three crews will be active, two development crews will develop the mine. Each crew can drive up to 10 m per day, working on five active headings simultaneously. In 2040, only one crew will remain active due to a lack of available headings.

Table 16-17 shows the dimensions and advance rates used in the design and schedule for each type of development.

**Table 16-17: Dimension and advance rate for development**

| Type | Activity | Dimension (m) | Maximum Advance Rate (m/d) |
|---|---|---|---|
| Decline | Service Ramps | 5.5 W x 5.5 H | 5.0 |
| | Haulage Ramps | 6.5 W x 5.5 H | 5.0 |
| | All Other Lateral Developments | 5.5 W x 5.5 H | 5.0 |
| Level | Level Access | 5.5 W x 5.5 H | 2.0 |
| | Sump, Electrical Station, Refuge, Egress Access | 5.0 W x 4.7 H | 2.0 |
| | Draw Point | 5.0 W x 4.7 H | 2.0 |
| | Drilling Tunnel (transverse) | 6.5 W x 4.7 H | 2.0 |
| | Ore Sills | 5.0 W x 4.7 H | 2.0 |
| | Ore Pass Access | 5.5 W x 5.5 H | 2.0 |
| | Haulage Drift | 5.5 W x 5.5 H | 2.0 |
| Vertical | Ore Passes | 3.7 m diameter | 3.0 |
| | Ventilation Raises | 3.7 m diameter | 3.0 |
| | Egress Raises | 2.4 m diameter | 3.0 |

### 16.5.2.3 Production Rate

Transverse and longitudinal sequence have the same production rates.

Table 16-18 shows an example of a typical cycle time for a transverse stope. Table 16-19 presents the production rates and durations that were used for scheduling. Most of the assumptions are based on BBA's experience with similar underground mine operations in Québec.

**Table 16-18: Example of a typical cycle time for a transverse stope**

| Typical Transverse Stopes | |
|---|---|
| Stope Width | 20.0 m |
| Stope Height (minus drilling drift) | 25.3 m |
| Stopes Length | 15.0 m |
| Stopes Tonnes (diluted and recovered) | 25,681 t |

**Table 16-19: Production rates and lead times for stope mining**

| Task | Sub task | Rate | Duration (days) |
|---|---|---|---|
| Stope Preparation | Survey, plans, etc. | 5 days | 5.0 |
| | Cable drilling and installation | 265 m @ 120 m/d | 2.2 |
| | Slot raise drilling | 25.3 m @ 12 m/d | 2.1 |
| | Production drilling + redrilling 40% | 1,764 m @ 130 m/d + 706 m @ 195 m/d | 13.6 + 3.6 |
| | Blasting, 3 Blasts | 2 days/blast | 6 |
| | **Subtotal duration** | **32.5 days** | |
| Mucking | **25,681 t @ 1,100 tpd** | **23.3 days** | |
| Backfilling | Fence construction | 2 days | 2.0 |
| | Plug pouring (27% volume of the stopes) | 5,088 t @ 3,000 tpd | 1.7 |
| | Plug cure time | 2 days | 2.0 |
| | Residual pouring | 13,757 t @ 3,000 tpd | 4.6 |
| | **Subtotal duration** | **10.3 days** | |
| **Total duration of typical stopes** | | **66.1 days** | |

It was assumed that a maximum of five stopes could be active at the same time resulting in a maximum of 5,500 tpd of production tonnes.

The backfill plant was designed to accommodate two paste backfill lines that can be used simultaneously for a maximum of 6,000 tpd of paste backfill. No other types of backfill such as unconsolidated rockfill or cemented rockfill are used in the mine plan.

#### 16.5.2.4 Recovery and Dilution

For the purpose of this study, three types of dilution for underground stopes were estimated:

##### Internal Dilution

Internal dilution is the amount of waste contained inside each stope. Internal dilution was already accounted for in the grade of each stope and development drift. After interrogating the block model, the estimated overall internal dilution contained in the stopes and development drift is approximately 10%.

### External Dilution

External dilution is the waste located outside the stopes that will fall in the draw points from the hanging wall or footwall after the production blasts. For this mine plan, a flat 3% of waste tonnage was added to all the stopes. However, only the stopes on the hanging and footwall will suffer dilution, which will be higher than 3%, where the internal stope will have no dilution from waste as they will be surrounded by mineralized material.

### Paste Dilution

Paste dilution occurs when a portion of an exposed paste wall falls into the stopes. Only secondary and longitudinal stopes have the set dilution factor of 5% applied.

Recovery and external dilution are calculated as follow for mineralized material tonnes:

**Table 16-20: Recovery and external dilution calculation**

| Excavation Type | Recovery | Internal Dilution | External Dilution | Paste Dilution |
|---|---|---|---|---|
| Lateral Developments | 100% | 10% | 0% | 0% |
| Longhole Stopes | 90% | 10% | 3% | 5% |

## 16.5.2.5 Cut-off Grade

The cut-off grade used for the underground follows the same methodology and parameters as for the open pit in Section 16.3.2, with the exception that the underground mining cost was added to the overall cost for the calculation. It results in a 0.70% $Li_2O$ cut-off grade for the underground component of the Project.

## 16.5.2.6 Stope Optimizer

Deswik's stope optimizer was used to create minable longhole stopes along the whole deposit. No manual manipulation was done subsequently.

The width and height of all stopes is fixed at 15 m and 30 m, respectively, which is based on geotechnical guidance. The minimum waste pillar between two stopes in transverse orientation is 6 m. The minimum dip for a stope is 50 degrees to ensure proper flow of blasted mineralized material. Since the pegmatite dyke has a width of more than 100 m in some areas, the stopes were split every 20 m intervals, again based on geotechnical guidance.

Table 16-21 lists the main DSO parameters.

**Table 16-21: Main DSO parameters**

| | | |
|---|---|---|
| Length and Height | Section (length) U: | 15 m |
| | Fixed: | 30 m (fixed with gradient polyline) |
| Width and Pillar Width | Stope width – min / max: | 3 / 500 |
| | Stope pillar: | 6 |
| Strike and Dip | Width convention: | True width |
| | Default seed dip: | 70 |
| | Default stope seed strike: | -20 |
| | Constraint type: | Equal dip angle ranged for both walls |
| | Minimum dip: | 50 |
| | Maximum dip: | 130 |
| | Maximum change: | 10 |
| | Strike direction – Minimum: | -40 |
| | Strike direction – Maximum: | 0 |
| | Strike direction – Maximum change: | 10 |
| Split | Split by interval | |
| | Split type: | From footwall side |
| | Interval: | 20 |
| | Minimum split size: | 10 |
| | Maximum split size: | 26 |

### 16.5.2.7 Backfill

A paste backfill plant will be constructed beside the processing plant and is further described in Chapter 18. The plant will take a specific size fraction of the non-concentrate middlings and bypass (-0.65 mm) streams emanating from the processing plant to produce the paste backfill to send back underground as fill. The paste backfill will be pumped from the plant through two main pipes in the access ramp to connect with the paste backfill network underground. The assumption for the paste backfill distribution pipes underground are listed in Table 16-22.

**Table 16-22: Paste backfill distribution assumption**

| Item | Assumption |
|---|---|
| Ramp Paste Piping CED80 | Through ramps |
| Lateral level Paste Piping CED40 | Half of the haulage levels |
| Lateral Level Paste Piping HDPE | Other halve level + 1/3 of the draw points |
| Level Access Piping | One per level |
| Backfill Plug | One per draw point |

Further test work is required to define the appropriate recipe and adjust the pumping and piping.

### 16.5.3 Underground Ventilation

#### 16.5.3.1 Summary

The ventilation system envisioned for these mineral deposits will be a pull-type system, i.e., the fresh heated air will be pulled through the mine by using large primary surface exhaust fans. Propane mine air heaters will be located at each main fresh air intakes and used seasonally when required.

The primary system of the main mineral deposit will be designed and staged in such a manner that will allow for the re-use and movement of primary exhaust fans as the mineral deposit migrates further away from the portals. This will save on capital costs when the final system is built. This is illustrated and described in the "Ventilation Stages" section of the ventilation report.

The primary design of the south mineral deposit will also be a pull-type system, receiving air from the main mineral deposit, surface intake raises, and a small unheated quantity from the open pit.

Level ventilation will be accomplished using auxiliary fans equipped ducted systems, with fans located at the level entries, pushing air to the extremities of the mineral deposit, and allowing the air to flow back into the main haulage and exhaust systems. The longer runs will require multiple inline fan installations in the duct.

### 16.5.3.2 Airflow Requirements

The airflow requirements (Table 16-23 and Table 16-24) were calculated based on the equipment lists and comply with Québec's Regulation respecting occupational health and safety in mines, chapter S-2.1, r. 14.

> *"100.1. The minimum rate of ventilation of a diesel engine used in an underground mine shall be that appearing on the certificate of homologation issued by the Mining and Mineral Sciences Laboratories, MMSL-CANMET, in accordance with CAN/CSA-M424.2-M90 Non rail-bound Diesel-powered Machines for Use in Non-gassy Underground Mines or CAN/CSA-M424.1-88 Flameproof Non-Rail-Bound Diesel-OCCUPATIONAL HEALTH AND SAFETY — MINES Powered Machines for Use in Gassy Underground Mines, if applicable and, in accordance with the provisions of Schedule VII, or that provided for in the United States federal certification index, according to Parts 31 and 32, Title 30, Code of Federal Regulations, Mine Safety and Health Administrative or, failing the above, shall be 5.5 $m^3$ per minute per kW 0.0916 $m^3/s/kW$ (144.8 $ft^3$ per minute per HP) at the engine shaft.*
>
> *For the purposes of this section, CAN/CSA-M424.2-M90, Non-Rail-Bound Diesel-Powered Machines for Use in Non-Gassy Underground Mines and CAN/CSA M424.1-88, Flameproof Non-Rail-Bound Diesel- Powered Machines for Use in Gassy Underground Coal Mines shall apply to any diesel motor used underground notwithstanding the field of application specified in those standards.*
>
> *101. An underground mine shall be supplied with fresh air from the atmosphere at a minimum rate of flow equivalent to the more demanding of the following standards:*
>
> *(1) 15 $m^3$ (529.7 $ft^3$) per minute for each worker underground; 0.0142 $m^3/s/kW$ per worker*
>
> *(2) where equipment operated by a diesel engine is used, the rate of ventilation required to meet the requirements of section 100.1 and subparagraphs 1 and 2 of the first paragraph of section 102."*

## Main Mineral Deposit

**Table 16-23: Main mineral deposit airflow requirements**

| Equipment Type | Supplier | Model | Number of Pieces | Steady State ($m^3/s$) |
|---|---|---|---|---|
| Jumbo - 2 Booms | Sandvik | DD 321 | 3 | 6 |
| Bolter | MacLean | 975 omnia | 5 | 4 |
| Production Drill | Sandvik | DL411 | 5 | 4 |
| Cable Bolter | Sandvik | DS 421 | 1 | 9 |
| LHD DEV | Sandvik | LH 410 | 3 | 16 |
| LHD Mucking | Sandvik | LH 621i | 4 | 36 |
| Truck 45 t Level Haulage | Sandvik | TH545i | 2 | 33 |
| Truck 65 t Surface Haulage (BEV) | Sandvik | TH665B | 4 | 47 |
| Explosive Truck (Anfo) | MacLean | AC3 | 1 | 2 |
| Explosive Truck (Emulsion) | MacLean | EC3 | 2 | 10 |

| Equipment Type | Supplier | Model | Number of Pieces | Steady State (m³/s) |
|---|---|---|---|---|
| Scissor Lift DEV | MacLean | SL3 | 2 | 2 |
| Scissor Lift CONST | MacLean | SL3 | 2 | 2 |
| Boom Truck | MacLean | BT3 | 2 | 4 |
| Mechanical Truck | MacLean | MT2 | 1 | 2 |
| Fuel-Lube Truck/Water Truck | MacLean | FL3 | 2 | 7 |
| Underground Grader | Caterpillar UG20M | UG20 | 1 | 3 |
| Light Vehicle | Toyota | Landcruiser | 13 | 40 |
| Mine Rescue - Light Vehicle | Toyota | Landcruiser | 1 | 2 |
| Cassette Carrier CS3 | MacLean | CS3 | 1 | 2 |
| | | | **m³/s** | **239** |
| | | | **15% Leakage** | **36** |
| | | | **Total** | **275** |

## South Mineral Deposit

**Table 16-24: South mineral deposit airflow requirements**

| Equipment Type | Supplier | Model | Number of Pieces | Steady State (m³/s) |
|---|---|---|---|---|
| Jumbo - 2 Booms | Sandvik | DD 321 | 2 | 6 |
| Bolter | MacLean | 975 omnia | 1 | 2 |
| Production Drill | Sandvik | DL411 | 1 | 4 |
| LHD DEV | Sandvik | LH 410 | 2 | 16 |
| LHD MUCKING | Sandvik | LH 621i | 1 | 9 |
| Truck 45 t Level Haulage | Sandvik | TH545i | 1 | 8 |
| Truck 65 t Surface Haulage (BEV) | Sandvik | TH665B | 1 | 12 |
| Scissor Lift DEV | MacLean | SL3 | 1 | 2 |
| Scissor Lift CONST | MacLean | SL3 | 1 | 2 |
| Boom Truck | MacLean | BT3 | 1 | 2 |
| Mechanical Truck | MacLean | MT2 | 1 | 2 |
| Light Vehicle | Toyota | Landcruiser | 5 | 17 |
| Cassette Carrier CS3 | MacLean | CS3 | 1 | 2 |
| | | | **m³/s** | **86** |
| | | | **15% Leakage** | **13** |
| | | | **Total** | **99** |

#### 16.5.3.3 Ventilation Design Stages

A staged ventilation system will be implemented, starting with a temporary decline ventilation system, equipped with temporary heating, when the exhaust raises are not yet available, up to the final system where the final exhaust fans are installed in the main and south mineralized bodies, including permanent mine air heaters located at the main portals and the south fresh air raise ("FAR"). Main fans with variable frequency drive ("VFD") were assumed to optimize the utilization of ventilation.

### Initial Development

Initial decline ventilation will be provided through the use of ducted rigid ventilation until Return Air Raise 1 ("RAR") is commissioned. This system will also use a temporary mine air heater for development during the winter months. The twin ramp will provide heated fresh air down one decline, while the second decline will function as the exhaust. Figure 16-14 shows the flow of air during the initial development phase.

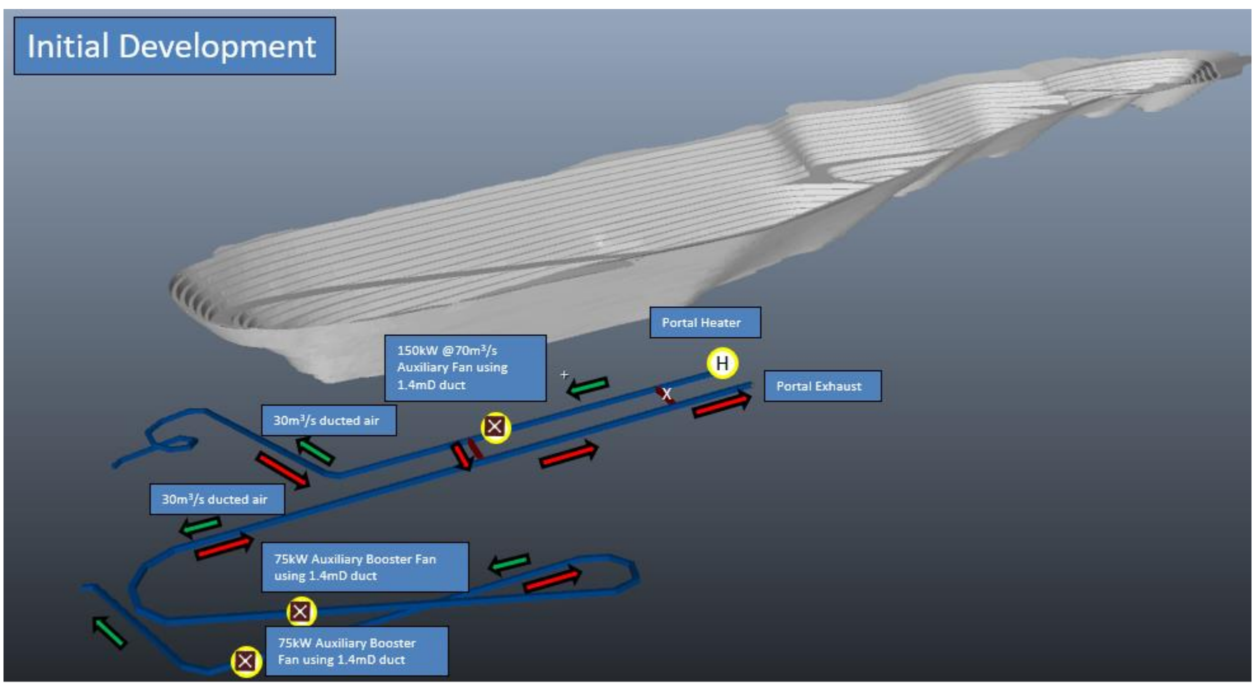



**Figure 16-14: Initial ventilation development**

## Stage 2 Development

For the second stage, the twin decline development reaches RAR1. The first RAR fan will be installed on the top of RAR1. Once commissioned, this will allow for the first permanent ventilation loop to be established. The fan will pull up to 135 $m^3/s$ of heated fresh air through the twin portals and air will be exhausted by the RAR1 raise. Figure 16-15 shows the ventilation network when the RAR1 becomes operational.

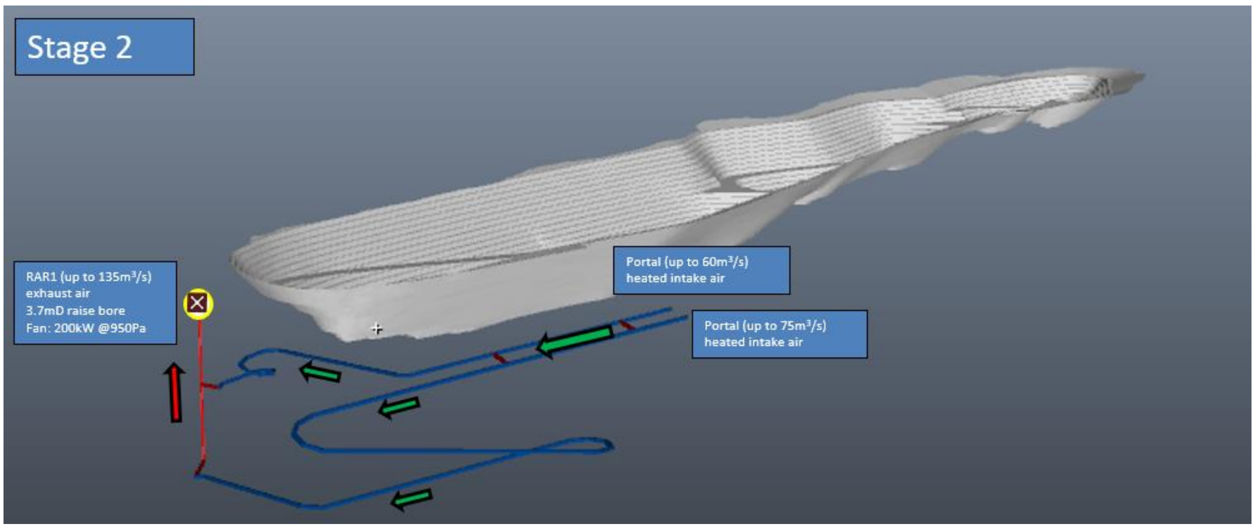



**Figure 16-15: Stage 2 – Ventilation development**

## Stage 3 Development

In this stage, the twin decline development reaches RAR2. The second RAR fan will be installed on the top of RAR2. Once commissioned, this will allow for a longer ventilation loop to be established. This fan will pull up to 200 $m^3/s$ of heated fresh air through the twin portals. RAR1 will be decommissioned, and the fan will be moved to the surface location of RAR3, to be commissioned once RAR3 is ready. Figure 16-16 shows the Stage 3 ventilation loop.

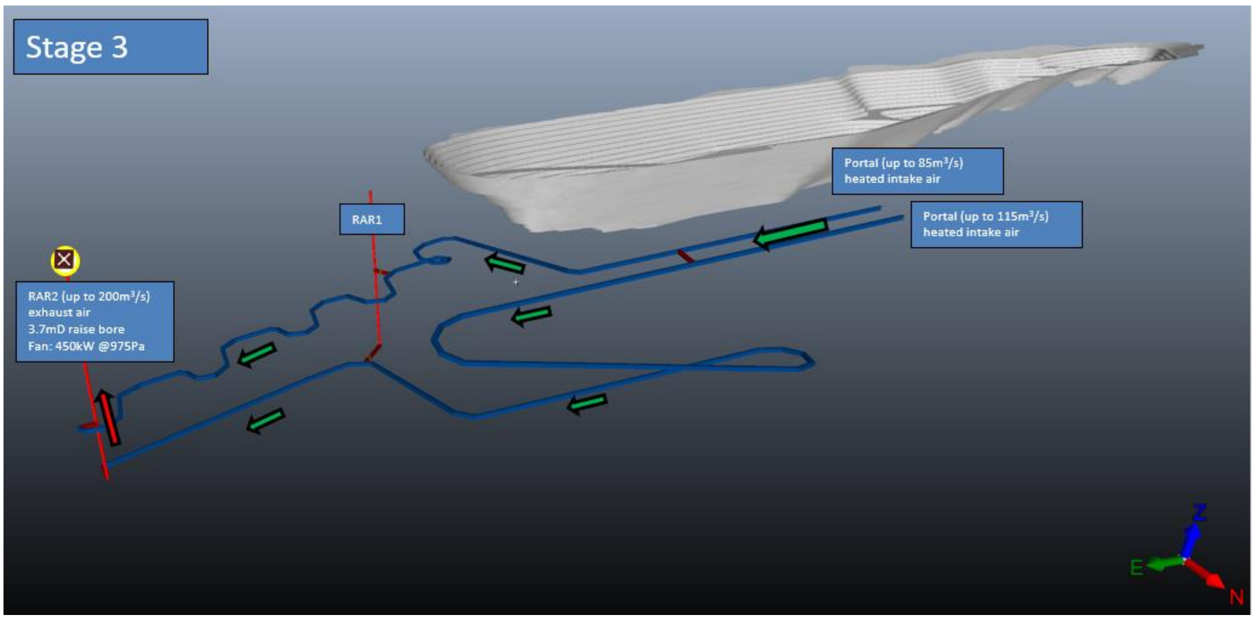



**Figure 16-16: Stage 3 – Ventilation development**

## Stage 4 Development

For Stage 4, the twin decline development reaches RAR3. RAR2 will be decommissioned, and the fan will be moved to the surface location of RAR3, with the RAR1 and RAR2 fans to be installed in a parallel installation at the RAR3. Once commissioned, this fan installation will allow for the final main mineral deposit ventilation loop to be established. These two fans will pull up to 275 m³/s of heated fresh air through the twin portals. Figure 16-17

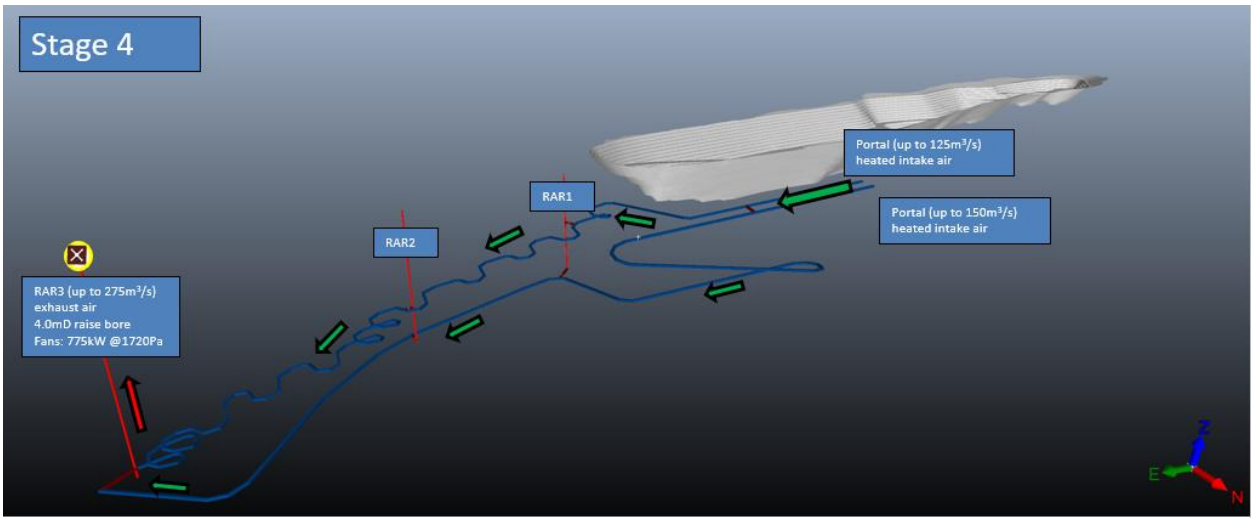



**Figure 16-17: Stage 4 – Ventilation development**

## Stage 5 Development

In this stage, the ventilation system for the main mineral deposit remains the same as in Stage 4. The south mineral deposit exhaust fan is commissioned, and a mine-wide permanent loop is established. The south mineral deposit fan installation will exhaust up to 100 m³/s, from the mine complex, utilizing a combination of the main and south mineral deposits air sources. A mine air heater will be located on top of the south mineral deposit FAR. The main mineral deposit will continue to pull up to 275 m³/s of heated fresh air through the twin portals. A fresh air connection is also established from the bottom of the open pit. This fresh air source will not be required to be heated, as it is a short access and will join the heated air. Figure 16-18 shows the full ventilation circuit including the south zone.

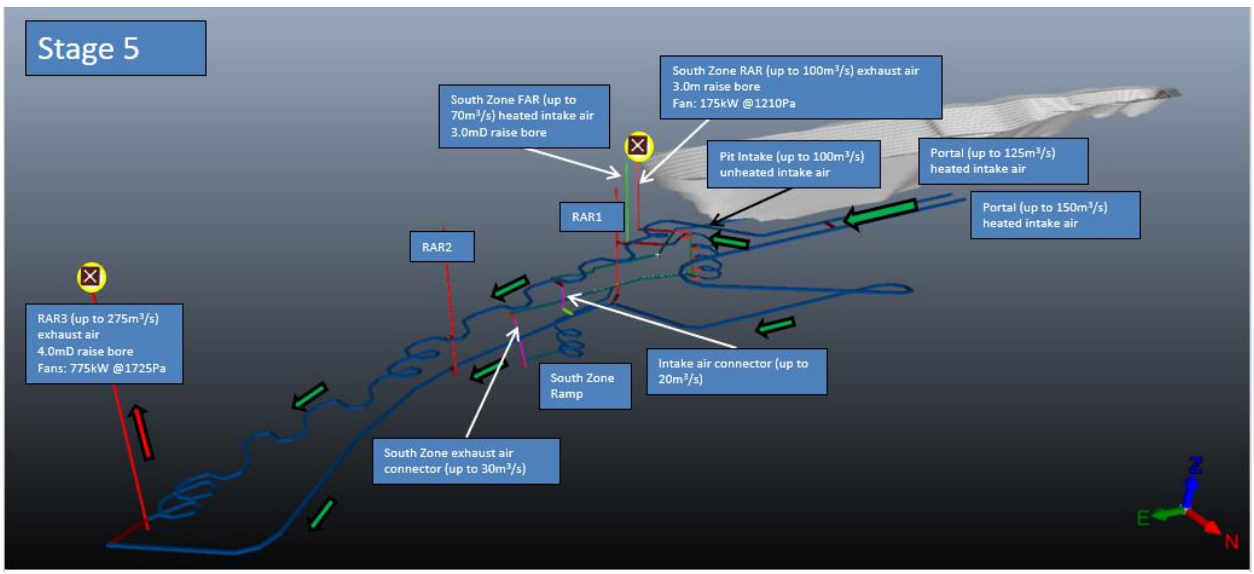



**Figure 16-18: Stage 5 – Ventilation development**

### Stage 5 Development with Mining Activities

Figure 16-19 shows the full ventilation circuit with the air requirements for the mining activities during full production.

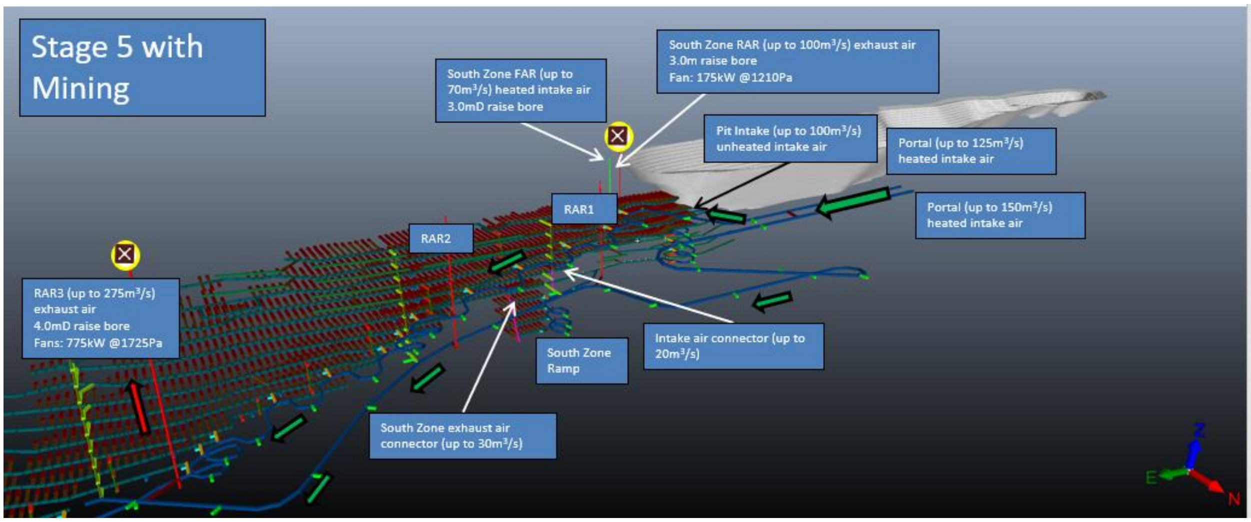



**Figure 16-19: Stage 5 – Ventilation development with mining activities**

## 16.5.4 Underground Mine Design

The mine is relatively shallow with the highest level being 100 m from the surface and the deepest levels located 500 m below the surface. The underground mine is divided into nine pyramids to ensure optimal productivity. Figure 16-21 shows the nine distinct pyramids. The first pyramid is targeting the Nova Zone area, which contains the highest grade of the CV5 Deposit. The bottom of the Nova Zone is located approximately 300 m below the surface. The mining sequence that follows mining of the first pyramid is defined to ensure that the required grade and tonnage to blend with the mineralized material from the open pit are met. The pyramids are mined from bottom to top to ensure geotechnical stability and redistribute ground stress. Levels are designed at 30 m intervals. The underground mine is comprised of 14 levels, 124 km of development and 1,965 longhole stopes. Figure 16-20 to Figure 16-22 show an overview of the mine underground design.

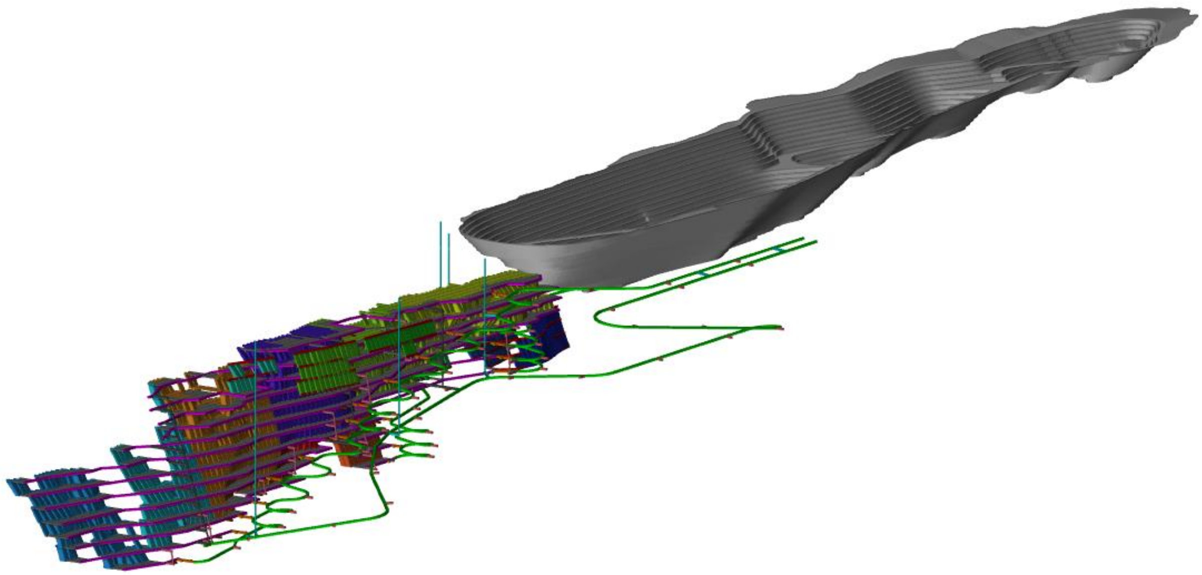


Figure 16-20: Underground mine design overview

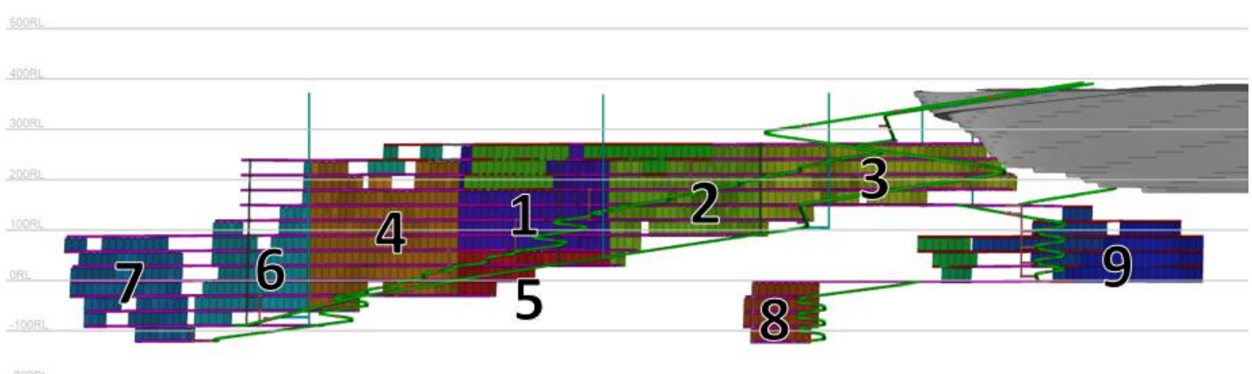



Figure 16-21: Mining pyramids

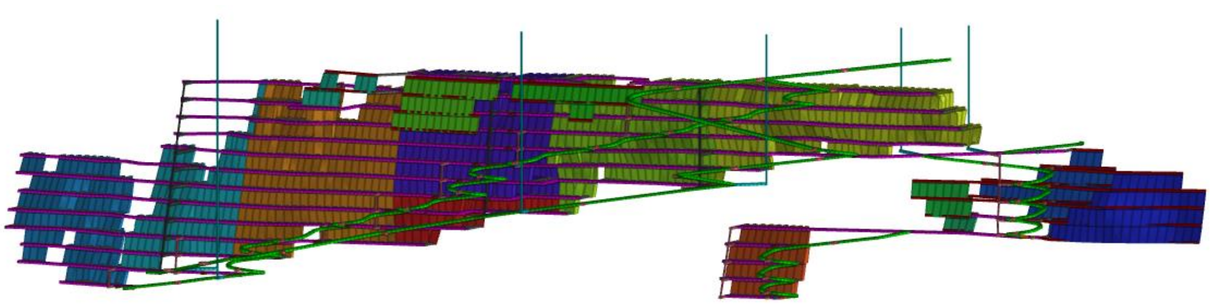


Figure 16-22: View of the south satellite zone

#### 16.5.4.1 Mining Strategy

The strategy includes the development of two ramps: one dedicated to hauling and the other for service access. The two ramps will be developed at the same time by the mining contractor. These ramps are designed to facilitate seamless operations and optimize the flow of material.

## Haulage Ramp

The haulage ramp is the main route for transporting mineralized material from the production areas to the surface. The haulage ramp is strategically connected to three ore passes, which facilitate the gravity-assisted transfer of mineralized material from the production levels to three ore chutes located at the bottom of each ore passe. The automated 65-t trolley assisted trucks will be loaded at the chutes and haul the mineralized material to the surface. Having a dedicated trolley assisted haul ramp has several advantages compared to a standard diesel truck fleet including:

- Higher truck speed going up the ramp;
- Higher fleet productivity;
- Reduces ventilation demand;
- Reduces GHG emissions;
- Isolates the automated trucks for a more effective operation;
- Improves safety.

Only trolley-assisted trucks will have access to it once it is fully operational. The total length of the haulage ramp from the surface to the bottom of the mine is 3.5 km.

## Service Ramp

The service ramp will be used to transport gear and personnel throughout the mine from the surface; it will also connect all the levels. Waste generated by the development will be hauled through the service ramp using diesel powered trucks. The total length of the ramp from the surface to the bottom of the mine is 3.8 km.

## Mineralized Material Handling

Ore passes are strategically positioned to ensure an optimal distance for the underground loaders (“LHD) to maintain high productivity levels. LHDs will muck the mineralized material from the stope’s draw points and dump the material into the ore passes. Diesel haul trucks may be used to support the LHD’s when the tramming distances between the ore passes and the active stopes are too long.

For the south satellite zones, no ore passes will be constructed. A ramp will be established at the bottom of the open pit once it is fully mined. This ramp will function as an emergency safety exit and the main ramp as a haulage route for the mineralized material. Diesel trucks will use the open pit ramp to transport and dump material onto the ROM pad.

#### 16.5.4.2 Underground Mine Infrastructure

Infrastructure included in the underground mine design are listed in Table 16-25. Quantities were based on operational or regulatory requirements.

**Table 16-25: Underground Infrastructure Quantities**

| Infrastructure | Assumptions | Max LOM Quantities |
|---|---|---|
| Portals | One per ramp exit to the surface | 3 |
| Remucks | One remucks every 200 m in haulage ramps and one in the middle of every loop for the service ramp | 44 |
| Refuges | One on every mining level or one every 1 km in single heading | 17 |
| Sumps | One per mining level | 24 |
| Main Pumping Station | One per main level | 3 |
| Electrical Stations | One on every mining level | 24 |
| Light Vehicle Garage | Two for the whole mine | 2 |
| Ventilation Raises | Three raises for the main mineral deposit and two for the south satellite zones. | 5 |
| Egress raise | One egress raise is planned on every mining level | 22 |
| Fuel Bays | One every 2 level | 11 |
| Ore Passes | UG Design | 3 |
| Ore Passes Chutes | One per ore passe | 3 |
| Gear Bay | One per mining level | 23 |
| Paste bay | One per mining level | 23 |
| Explosives & Detonator Depot (permanent & temporary) | One per mining level | 23 |

### Trolley System

A trolley system will be installed along the whole length of the haulage ramp. The trolley system consists of metal rails installed on the roof of the haulage ramp. The trucks will connect to the rail when entering the haulage ramp and will use the power from the line. To give room for the trolley line, the haulage ramp was designed 1 m higher than the service ramp (6.5 m x 5.5 m).

## 16.5.4.3 Underground Mining Equipment

The underground mining equipment fleet was estimated from the operational need for the mine's development and production. Table 16-26 shows the minimum requirements for each type of equipment.

## 16.5.4.4 Underground Labour

Labour requirements for the underground miners, maintenance and technical services were estimated based on BBA's experience with similar projects and projections made from a reputable underground contractor. Table 16-27 shows the workforce requirements over the LOM.

## Table 16-26: Equipment fleet requirements for underground mining

| UG Equipment List | Powertrain | Manifacturer | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Development Equipement** | | | **2** | **3** | **3** | **3** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **0** |
| Jumbo | Electric | Sandvik | 2 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 0 |
| LHD - 18t | Diesel | Sandvik | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 1 | 1 | 0 |
| Truck - 50t | Diesel | Sandvik | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 0 |
| Boltec Omnia | Electric | MacLean | 2 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 0 |
| ANFO Truck | Electric | MacLean | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Jumbo Bolter | Electric | Sandvik | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Production Equipment** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Trolley Truck - 65t | Electric | Sandvik | 0 | 0 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 |
| LHD - 18t | Diesel | Sandvik | 0 | 0 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 2 |
| Production Drill | Electric | Sandvik | 0 | 1 | 2 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 2 | 2 | 1 |
| Emulsion Truck EV | Electric | Maclean | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| Cabletec | Electric | MacLean | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Support Equipment** | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Boom Truck | Electric | MacLean | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| Utility LHD - 9t | Electric | Sandvik | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Scissor Lift | Electric | MacLean | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 |
| Telehandler | Diesel | Manitou | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Water truck | Electric | MacLean | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Fuel Truck | Electric | MacLean | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Grader - 14ft | Diesel | CAT | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Backhoe | Diesel | CAT | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| Landcruiser | Electric | Toyota | 5 | 10 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 10 | 8 |
| Tractor | Diesel | Kubota | 2 | 4 | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 2 |
| Transmixer + Shotcrete sprayer | Electric | MacLean | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 0 |
| Forklift | Electric | MacLean | 0 | 0 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |

### Table 16-27: Labour requirements for the underground miners

| Teams | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 | Y18 | Y19 | Y20 | Y21 | Y22 | Y23 | Y24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Development Team** | **2** | **3** | **3** | **3** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **2** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** | **1** |
| Jumboman | 8 | 16 | 16 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 0 |
| Scoop Operator | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 4 | 4 | 4 | 0 |
| Truck Operator | 8 | 12 | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | 12 | 12 | 12 | 12 | 12 | 0 |
| Bolter | 8 | 24 | 24 | 24 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 8 | 8 | 8 | 0 |
| Blasters Developement | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 0 |
| **Production Team** | | | | | | | | | | | | | | | | | | | | | | | | |
| Driller | 0 | 4 | 8 | 12 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 16 | 8 | 8 | 4 |
| Blasters | 0 | 0 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| Scoop Operator | 0 | 0 | 8 | 12 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 12 | 12 | 8 | 8 | 8 |
| Cableman | 0 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Truck Remote Operator | 0 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **Construction Team** | | | | | | | | | | | | | | | | | | | | | | | | |
| Construction Miner | 4 | 16 | 16 | 16 | 16 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 0 | 0 |
| **Service Team** | | | | | | | | | | | | | | | | | | | | | | | | |
| Service Miner Operator | 14 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 10 | 8 | 8 |
| Service Miner | 14 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 10 | 8 | 8 |
| **Supervision** | | | | | | | | | | | | | | | | | | | | | | | | |
| Project Manager | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| Operation Superintendent | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mine Captain | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mine Operation Technician | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 0 |
| Supervisor | 4 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 4 |
| **Mine Maintenance** | | | | | | | | | | | | | | | | | | | | | | | | |
| Maintenance Superintendent | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Maintenance Planner | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 0 |
| Maintenance Supervisor | 4 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 |
| Mobile Mechanic | 6 | 12 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 12 | 10 | 8 | 8 |
| Shop Mechanic | 6 | 12 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 14 | 12 | 10 | 8 | 8 |
| Electrical Superintendent | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Electrical Supervisor | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Electrician | 4 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 4 | 4 |
| Programmer | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 0 |
| Fixed Equipment Mechanic | 4 | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 4 | 4 | 4 |
| **Technical Services** | | | | | | | | | | | | | | | | | | | | | | | | |
| Technical Services Superintendent | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mining Engineer and Project Engineer | 7 | 7 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 4 | 4 | 4 |
| Mine Technician | 8 | 8 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 8 | 8 | 2 |
| Geologist | 3 | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 2 | 2 | 2 |
| Surveyor | 4 | 4 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 4 | 4 | 4 |

## 16.6 Mine Production Schedule

The main objective of the mining schedule was to produce a steady stream of 800,000 tonnes of concentrate using the mineralized material coming from the open pit and underground mines. The mining schedule for both mines were synchronized so that the grade and tonnes fed to the processing plant would meet this objective. Given that it will take 3 years to develop the underground mine and start producing a significant amount of mineralized material, the open pit will feed the processing plant during the ramp-up period. Once the underground mine reaches full production, the higher-grade mineralized material from the underground mine will be blended with the material from the open pit to produce a steady stream of concentrate. The concentrate production cannot be exceeded due to contractual and logistical constraints linked to the sale and shipping of concentrate.

As both mines will feed the same processing plant, both mining schedule used the same assumptions for the processing plant to guide the schedule. The following assumptions were used as inputs in the software for both mining plans:

- Production ramp-up is scheduled to meet these processing plant throughputs:
  - Year 1: 74% of Stage 1 processing plant capacity (1.85 Mt);
  - Year 2: 99% of Stage 1 processing plant capacity (2.48 Mt);
  - Year 3: 100% of Stage 1 and 74% of Stage 2 expansion (4.35 Mt);
  - Year 4: 100% of Stage 1 and 99% of Stage 2 expansion (4.98 Mt);
  - Year 5 onwards: 100% Production capacity (5.0 Mt).
- Target concentrate production at 800,000 t per year with a maximum deviation of 5%;
- Target concentrate production has priority on the feed throughput;
- Maximum mill feed of 5.0 Mt per year.

### 16.6.1 Open Pit Mine Schedule

The schedule was created using Deswik Blend software. The following assumptions and objectives were used to establish the mine plan:

- Stage 2 of the open pit can only start 12 months after starting Stage 1;
- Mine production is to ramp-up over 3 to 4 years;
- Minimize the mining rate to produce the required mineralized material;
- Minimize stockpiling during the LOM;
- The mineralized material tonnes and grade to complement the material from the UG mine;
- Maximum yearly vertical advance rate of 80 m.

The resulting mining schedule for the open pit is displayed on Figure 16-23 and Figure 16-24. The open pit is mined over 19 years reaching its maximum production rate of 16 Mtpa (44,000 tpd) after 4 years. The production significantly decreases during the 13th year when the strip ratio plummets due to the stripping in Stage 4 being mostly completed. Once mining is complete, the remaining 4.5 Mt stockpile will be feed to the mill for 1.5 full years.

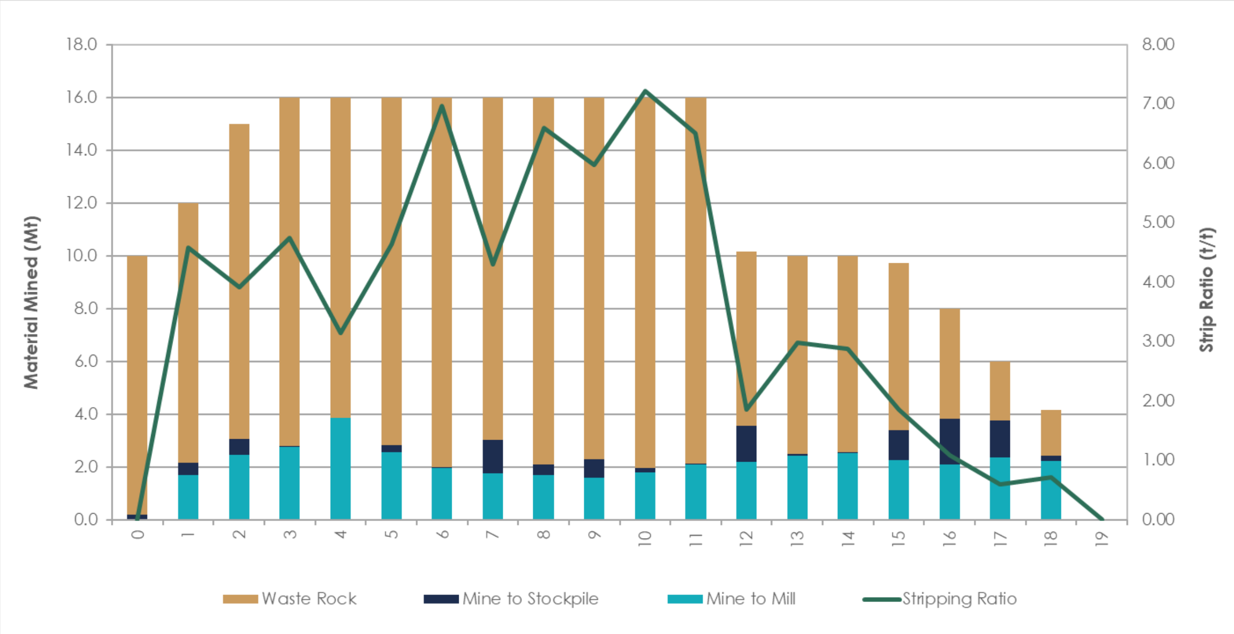



**Figure 16-23 CV5 Open Pit – Total material mined**

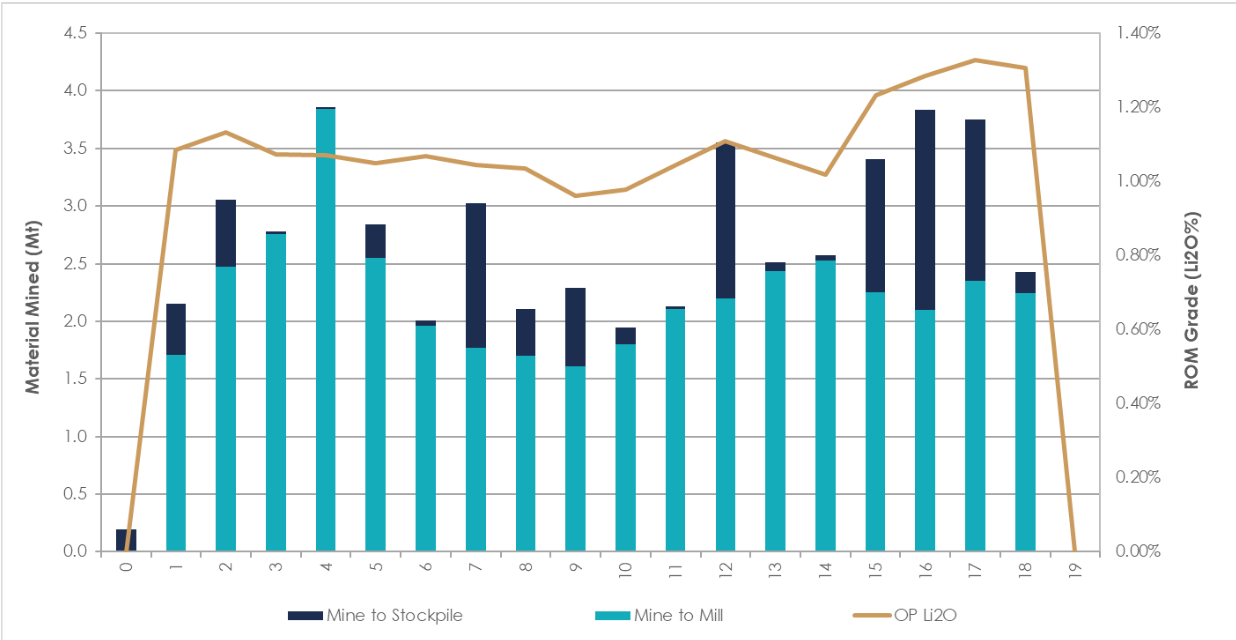



**Figure 16-24 CV5 Open Pit – Mineralized material mined**

### 16.6.2 Underground Mine Schedule

The underground schedule was completed using Deswik.Sched software. The parameters and assumptions shown in Table 16-17 to Table 16-19 produce the schedule.

The underground mine initial development will take approximately 16 months before the first stope is available for production. Production will then ramp-up over a period of 4 years to reach a maximum production rate of approximately 5,500 tpd, or approximately 2 Mtpa. The mine will produce mineralized material for an estimated 22 years, starting production at Year 3 and ending at Year 24. Full production will start in Year 5 until Year 19. Production will decrease significantly in the last 3 years, as the last stopes will be mined using the longhole longitudinal retreat mining method, which is a less productive method. Also, as the ramp system of the pit is used to haul material from the south satellite zone, the last stopes near the pit's wall will have to be mined last once the south zone is completed. Figure 16-25 and Figure 16-26 show the underground schedule metrics.

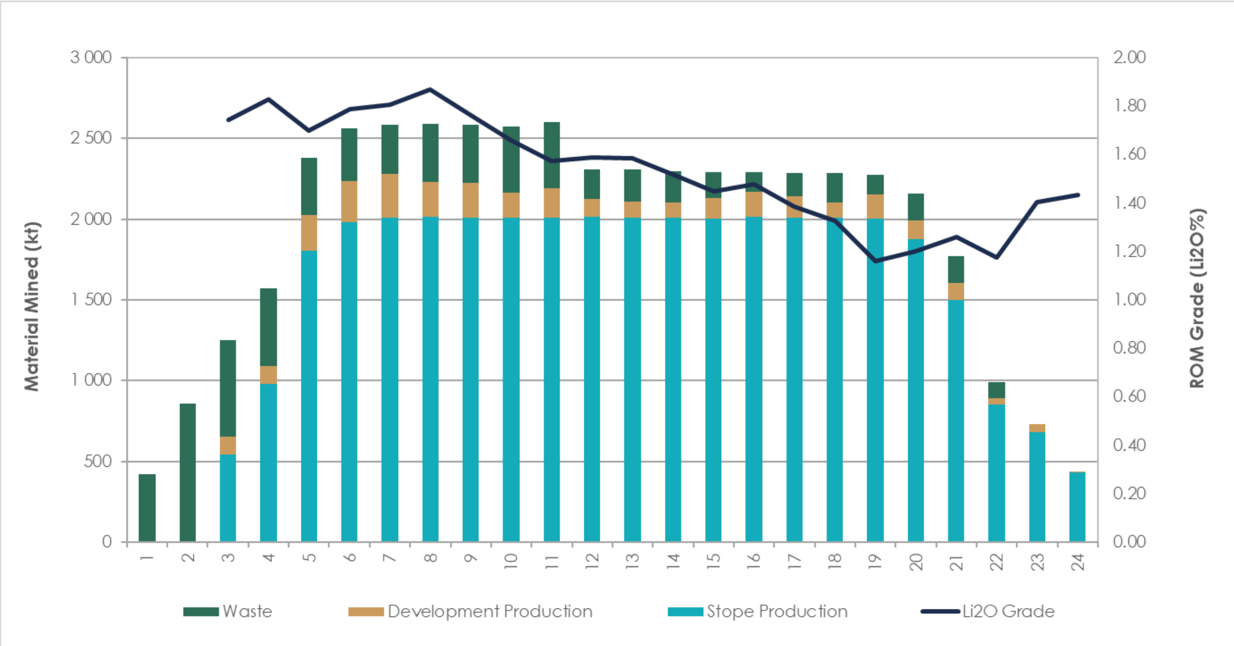



Figure 16-25 CV5 Underground mine – Material mined

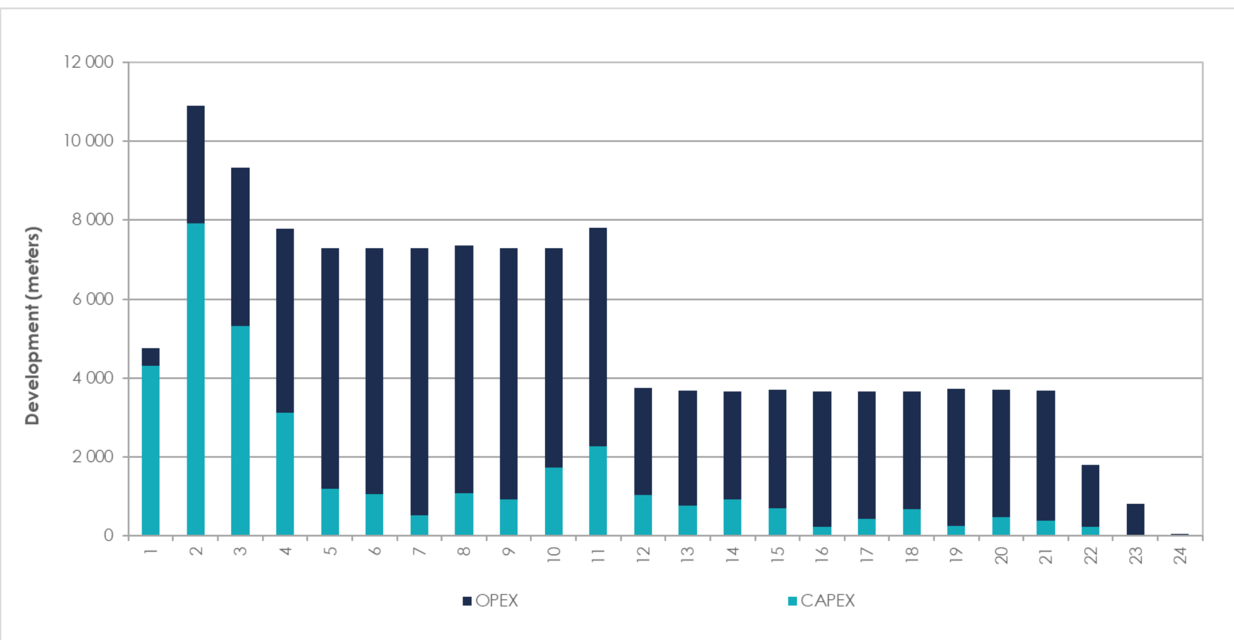



Figure 16-26 Underground mine development schedule

### 16.6.3 Processing and Concentrate Schedule

The combination of the two mines has the benefit of accessing high grade from the underground while having access to plenty of resource from the surface at a low strip ratio. The two mines provide a more balance feed grade that could be modify at anytime if market condition changes. The synergy of the two mines allows the site to produce a steady stream of concentrate at full production starting on Year 4 and lasting 16 years as seen on Figure 16-29. Concentrate output starts dropping on Year 20 as the pit's mineralized material is exhausted and the underground mine production decreases. Figure 16-27 shows the combine mineralized material mining schedule.

When the average grade of the mill feed going above 1.26% $Li_2O$, the mill's throughput needs to be reduced to keep the concentrate production at 800,000 t of concentrate. Mill throughput needs to be reduced between Years 5 and 9 when the high grade from the Nova Zone is being mined and between Years 15 and 18 when higher grade from the bottom of the pit is being mined as seen in Figure 16-28.

Figure 16-26 shows the concentrate production schedule. The mill feed and concentrate production slowly increases from Year 0 to Year 3 as the site's processing plant is being expended. The small dip in concentrate production in Years 10 and 11 is due to the underground mine average grade decreasing as the Nova Zone is exhausted. The open pit is also in a period of heavy waste stripping, which decreases mineralized material mining.

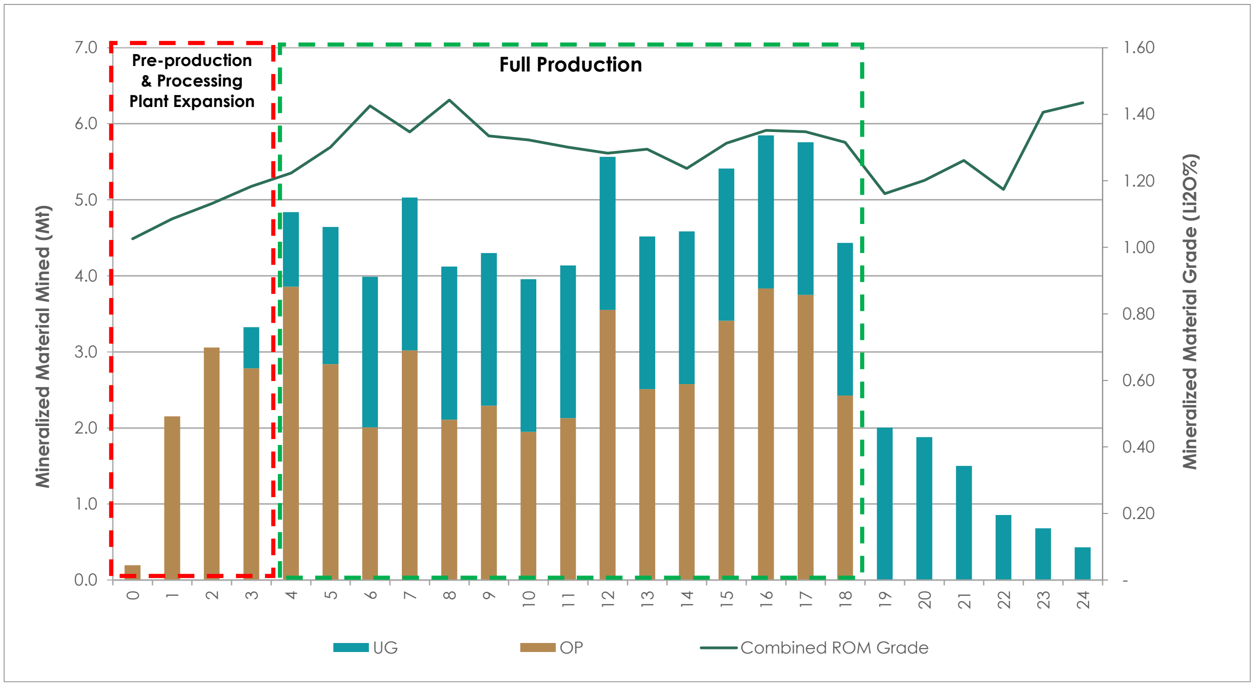



Figure 16-27 Mineralized material mined

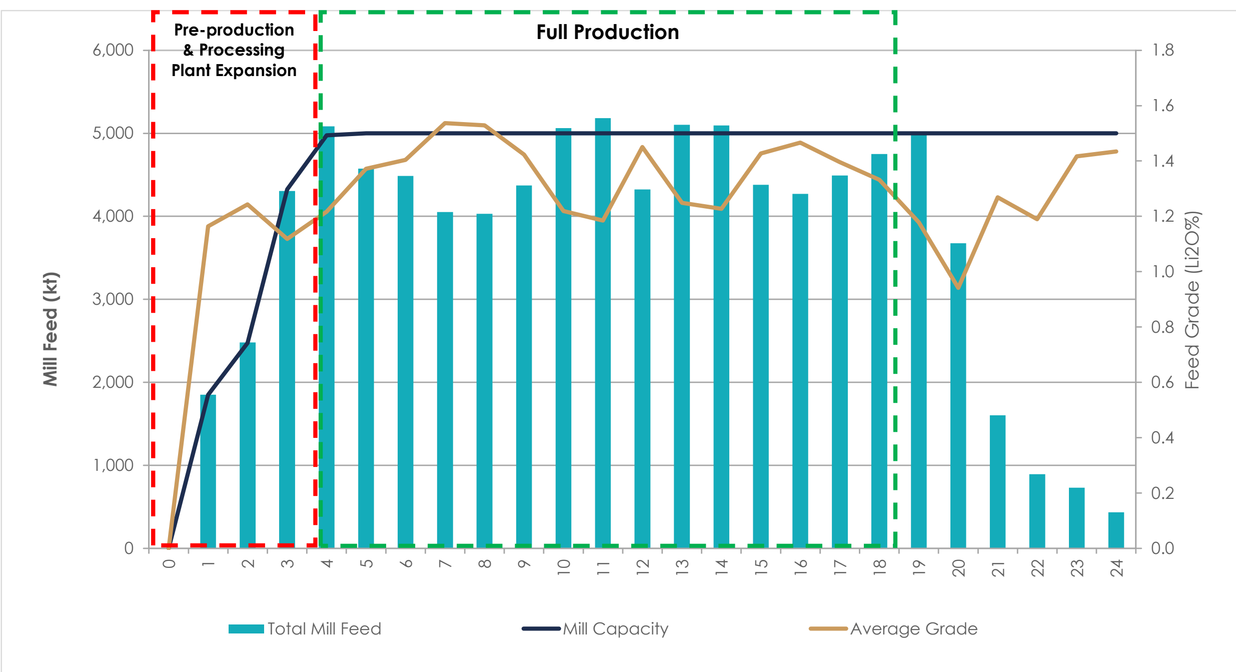



Figure 16-28 Processing plant feed and grade

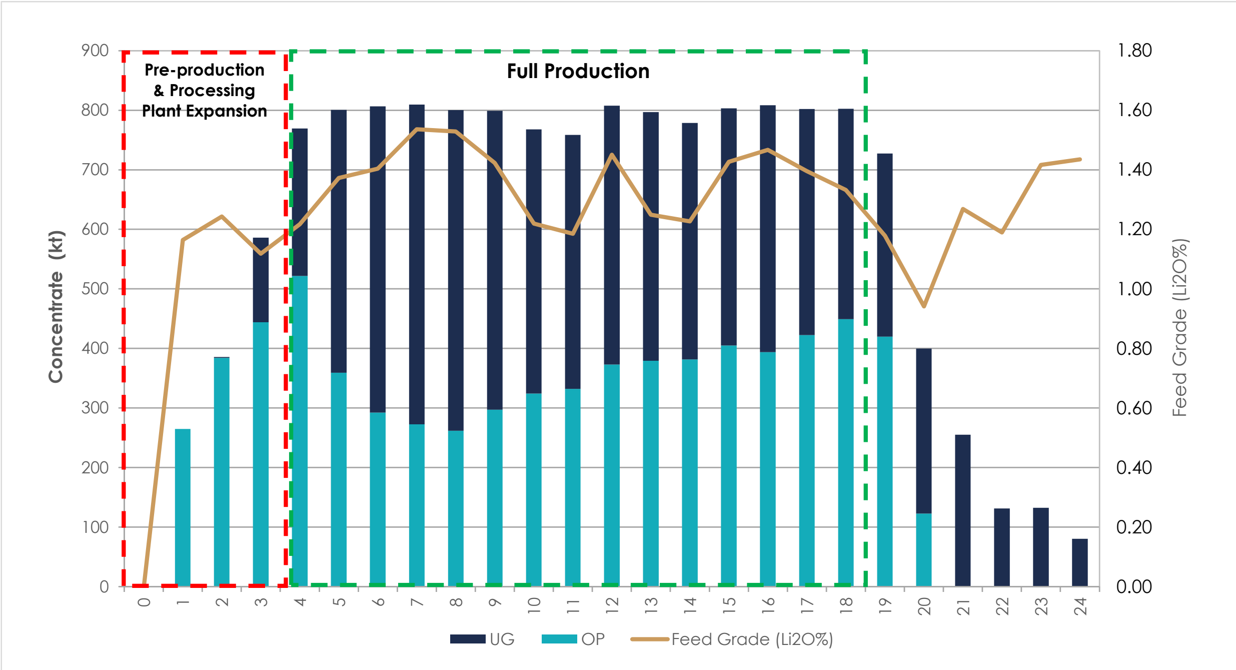



Figure 16-29 Concentrate production schedule

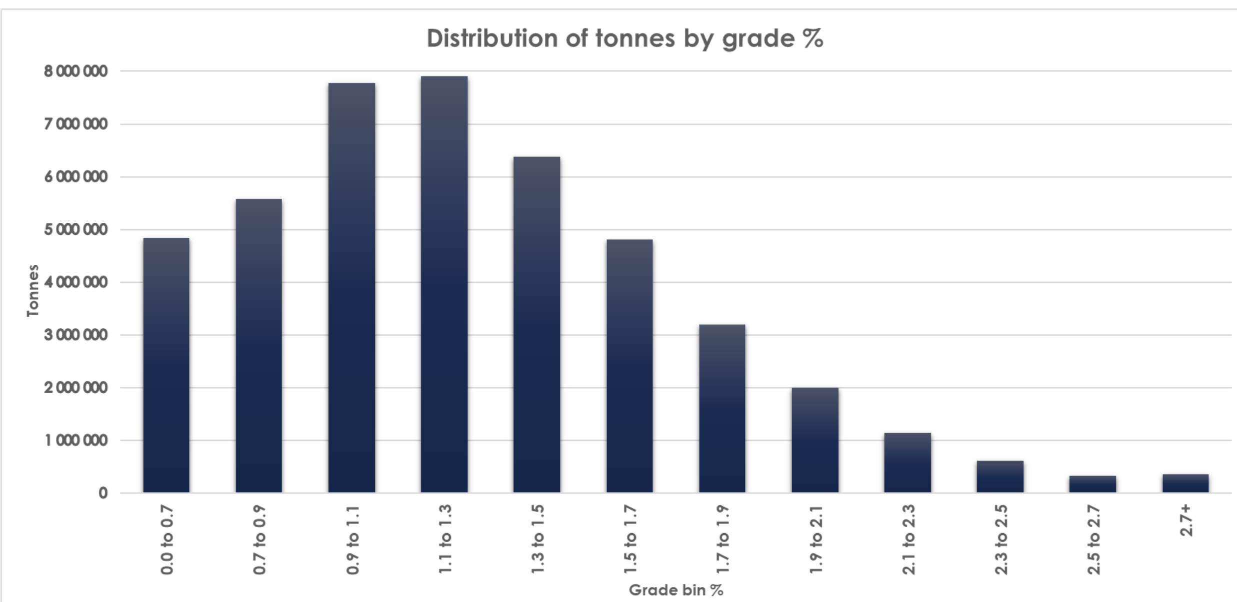



Figure 16-30: Tonnage distribution from the open pit by grade

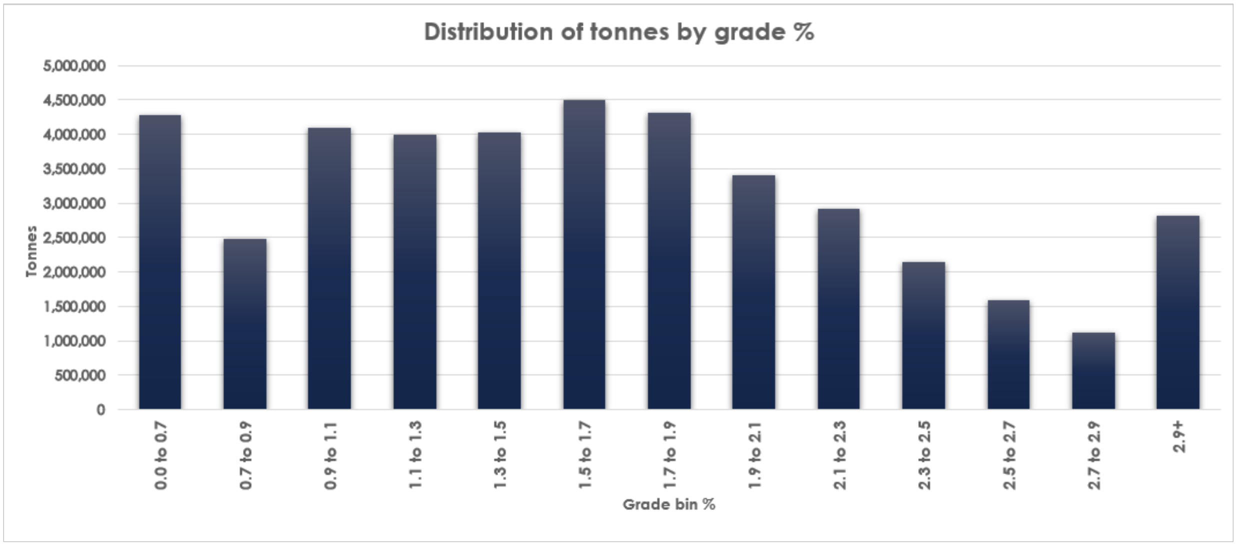



**Figure 16-31: Tonnage distribution from the underground by grade**

**Table 16-28: Mine production schedule summary**

| Description | Unit | Y0 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11 | Y12 | Y13 | Y14 | Y15 | Y16 | Y17 | Y18 | Y19 | Y20 | Y21 | Y22 | Y23 | Y24 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Material Mined OP** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Overburden | Mt | 7.1 | 1.2 | 1.4 | 0.0 | 0.0 | 4.8 | 1.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **16** |
| Waste | Mt | 2.7 | 8.7 | 10.6 | 13.2 | 12.1 | 8.4 | 12.4 | 13.0 | 13.9 | 13.7 | 14.1 | 13.9 | 6.6 | 7.5 | 7.4 | 6.3 | 4.2 | 2.3 | 1.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **172** |
| Mineralized Material | Mt | 0.2 | 2.2 | 3.1 | 2.8 | 3.9 | 2.8 | 2.0 | 3.0 | 2.1 | 2.3 | 1.9 | 2.1 | 3.6 | 2.5 | 2.6 | 3.4 | 3.8 | 3.7 | 2.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **50** |
| Mine to Mill | Mt | 0.0 | 1.7 | 2.5 | 2.8 | 3.8 | 2.5 | 2.0 | 1.8 | 1.7 | 1.6 | 1.8 | 2.1 | 2.2 | 2.4 | 2.5 | 2.3 | 2.1 | 2.3 | 2.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **40** |
| Mine to Stockpile | Mt | 0.2 | 0.4 | 0.6 | 0.0 | 0.0 | 0.3 | 0.0 | 1.3 | 0.4 | 0.7 | 0.1 | 0.0 | 1.4 | 0.1 | 0.0 | 1.2 | 1.7 | 1.4 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **10** |
| Total Material Mined | Mt | 10.0 | 12.0 | 15.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 10.2 | 10.0 | 10.0 | 9.7 | 8.0 | 6.0 | 4.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | **239** |
| **Material Mined UG** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stope Mining | Mt | 0.0 | 0.0 | 0.5 | 1.0 | 1.8 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 | 1.9 | 1.5 | 0.9 | 0.7 | 0.4 | 0.0 | **36.8** |
| Dev Mineralized Material | Mt | 0.0 | 0.0 | 0.1 | 0.1 | 0.2 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | **3.0** |
| Dev Waste | Mt | 0.4 | 0.9 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.4 | 0.4 | 0.4 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 | 0.1 | 0.0 | 0.0 | 0.0 | **6.6** |
| Total Dev Distance | km | 4.8 | 10.9 | 9.3 | 7.8 | 7.3 | 7.3 | 7.3 | 7.4 | 7.3 | 7.3 | 7.8 | 3.7 | 3.7 | 3.6 | 3.7 | 3.7 | 3.6 | 3.6 | 3.7 | 3.7 | 3.7 | 1.8 | 0.8 | 0.1 | 0.0 | **123.9** |
| **Material Moved** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Rehandle | Mt | 0.0 | 0.5 | 0.5 | 2.1 | 2.0 | 2.5 | 2.9 | 2.6 | 2.7 | 3.1 | 3.6 | 3.5 | 2.6 | 3.2 | 3.1 | 2.6 | 2.6 | 2.6 | 3.0 | 5.0 | 3.7 | 1.6 | 0.9 | 0.7 | 0.4 | **57** |
| Total Material Moved | Mt | 10.0 | 12.5 | 15.5 | 18.1 | 18.0 | 18.5 | 18.9 | 18.6 | 18.7 | 19.1 | 19.6 | 19.5 | 12.7 | 13.2 | 13.1 | 12.3 | 10.6 | 8.6 | 7.1 | 5.0 | 3.7 | 1.6 | 0.9 | 0.7 | 0.4 | **296** |
| **Mill Production** | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Mill Feed | kt | 0 | 1,850 | 2,481 | 4,305 | 5,085 | 4,573 | 4,485 | 4,052 | 4,030 | 4,373 | 5,064 | 5,182 | 4,324 | 5,102 | 5,095 | 4,381 | 4,270 | 4,492 | 4,751 | 5,004 | 3,676 | 1,603 | 894 | 730 | 435 | **90,236** |
| Average Grade | % | 0.00 | 1.16 | 1.24 | 1.12 | 1.22 | 1.37 | 1.40 | 1.54 | 1.53 | 1.42 | 1.22 | 1.18 | 1.45 | 1.25 | 1.23 | 1.43 | 1.47 | 1.40 | 1.33 | 1.18 | 0.94 | 1.27 | 1.19 | 1.42 | 1.43 | **1.31** |
| Mill Recovery | % | 0.0 | 67.6 | 68.7 | 66.9 | 68.4 | 70.1 | 70.4 | 71.5 | 71.4 | 70.6 | 68.4 | 67.9 | 70.8 | 68.8 | 68.5 | 70.6 | 71.0 | 70.4 | 69.7 | 67.9 | 63.5 | 69.0 | 68.0 | 70.6 | 70.7 | **69.5** |
| Concentrate produced | kt | 0 | 265 | 386 | 586 | 769 | 800 | 806 | 809 | 800 | 799 | 768 | 758 | 808 | 797 | 779 | 803 | 808 | 802 | 803 | 727 | 400 | 255 | 131 | 133 | 80 | **14,873** |

**Note:** The reader is cautioned that the mineralized material outlined in the table above includes Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would allow them to be categorized as Mineral Reserves. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability.

## 16.7 Dewatering

### 16.7.1 Pit Dewatering

Dewatering of the CV5 Open Pit will be achieved with diesel pumps directly installed near the bottom of the mine pit. Pumps will be moved and lowered following the progress of each new bench.

Each pump will be connected to the next pump's sump transfer basin via HDPE pipes. The water will go from one pump to the other until it reaches the accumulation basin beside the main site water treatment plant.

### 16.7.2 Underground Dewatering

Underground dewatering will be managed by a pumping station at each level of the underground mine. Water will be sent to the accumulation basin beside the main site water treatment plant.

Dewatering the underground reduces the water table, which minimizes the dewatering rate of the open pit as the underground mine goes deeper.

The combined dewatering rate for the open pit and underground reaches a maximum of 8,230 $m^3$/d (see hydrogeology Section 20.1.1.2 in Chapter 20) coming from groundwater. Water from the rain in the pit is added on top of that for the dewatering capacity.

# 17. Recovery Methods

## 17.1 Mineral Processing Facility Design

The mineral processing facility is designed to produce spodumene concentrate from the run of mine ("ROM"). The facility will be in Jamésie, Québec, Canada. The facility will include ROM stockpiling, crushing, beneficiation, dewatering, and load-out areas. Crushing, beneficiation, and dewatering will be performed using two identical parallel process trains that could be operated independently of one another. Each process train will account for half (50%) of the crushing, beneficiation, and dewatering capacity.

Each process train will be inside three main buildings: the primary crushing building, the secondary and tertiary crushing building, and the main process plant. The crushed mineralized material will be stored under domes located on a concrete pad. The process trains may have shared or separate buildings.

The mineral processing facility is designed to produce spodumene concentrate at 5.50% lithium oxide grade (% $Li_2O$) from mineralized material containing 1.31% $Li_2O$. The ROM will be transported by truck either to the crushing area or to the ROM stockpiles. The comminution and beneficiation processes include crushing, dense media separation ("DMS"), magnetic separation, and dewatering. The facility will also perform thickening, filtration, product load-out, and tailings handling.

## 17.2 Design Criteria

The mineral processing facility is designed to nominally process 5,000,000 dry tonnes per year ("tpa") of mineralized material with a grade of 1.31% $Li_2O$ producing 827,530 tpa of spodumene concentrate with a grade of 5.50 wt.% $Li_2O$ achieving 69.5% $Li_2O$ recovery (these values are based on the years of full production, i.e., Years 4 to 18). These figures are based on current and historical test work results and may change depending on the composition of the mineralized material. All unit-process performances have been compared with benchmarked data from similar projects and mineralized material.

The crushing plant will have an overall availability and utilization of 68%, equivalent to 5,947 h/y of operation. The concentrator has an overall availability and utilization of 81%, equivalent to 7,096 h/y of operation. Bins have been planned to handle the differences in availability and utilization between the different areas.

Crushing, beneficiation, and dewatering will be performed via two identical parallel mineral process trains that could be operated either individually or simultaneously. Each process train will account for half (50%) of crushing, beneficiation, and dewatering capacity.

The mineral processing facility design criteria are summarized in Table 17-1. The design criteria include both process trains.

**Table 17-1: Mineral processing facility design criteria**

| Parameter | Unit | Nominal |
|---|---|---|
| **Crushing Plant** | | |
| **Run of Mine (ROM)** | | |
| Specific Gravity (solids) | - | 2.70 |
| Moisture Content | w/w % | 5.0 |
| Crushing Work Index | kWh/t | 12.0 |
| Bond Abrasion Index | g | 0.4 |
| Uniaxial Compression Tests | MPa | 60 |
| $Li_2O$ Composition | % | 1.31 |
| $Fe_2O_3$ Composition | % | 0.29-1.10 |
| $Ta_2O_5$ Composition | ppm | 0-300 |
| $F_{100}$ Sizing | mm | 1,000 |
| $F_{80}$ Sizing | mm | 300 |
| **Throughput** | | |
| ROM Processed Annually | Mtpa | 5.0 |
| Overall Availability and Utilization | % | 68 |
| Annual Operating Hours | h | 5,957 |
| ROM Processed Hourly (during operation) | tph | 839.4 |
| **Crushed Mineralized Material** | | |
| $P_{100}$ Sizing | mm | 9.5 |
| $P_{85}$ Sizing | mm | 6.3 |
| **DMS Plant** | | |
| **Throughput** | | |
| Annually Plant Tonnage | Mtpa | 5.0 |
| Overall Availability and Utilization | % | 81 |
| Annual Operating Hours | h | 7,096 |
| Hourly Feed Tonnage (during operating hours) | tph | 704.7 |
| Course DMS Fraction | wt.% of plant feed | 35.2 |

| Parameter | Unit | Nominal |
|---|---|---|
| Fine DMS Fraction | wt.% of plant feed | 43.0 |
| Ultrafine DMS Fraction | wt.% of plant feed | 12.0 |
| DMS Bypass Fraction | wt.% of plant feed | 9.8 |
| Spodumene Concentrate Produced Annually[(1)] | tpa | 827,530 |
| Spodumene Concentrate Produced Hourly (during operating hours) | tph | 125.5 |
| **Spodumene Concentrate** | | |
| Specific Gravity (solids) | - | 3.00 |
| Moisture Content | w/w % | 10 |
| $Li_2O$ Composition | % | 5.50 |
| $Fe_2O_3$ Composition | % | <1.20 |
| $Li_2O$ Recovery (with 1.31% feed grade)[(1)] | % of $Li_2O$ in plant feed | 69.5% |

[(1)] Production value and average feed grade are based on the years of full production, i.e., Years 4 to 18.

### 17.2.1 Recovery

The concentrator has a recovery that is a function of the feed lithia grade (i.e., % $Li_2O$). The recovery can be estimated with the following function:

Where the Recovery is the recovery of lithium, Max Recovery is the theoretical maximum recovery attainable set to 75%, and C is a curve shape factor constant (it was found that in this case C is equal to 2).

The lithium recovery expected from a three-size range, DMS concentrator treating material 9.5 mm to 0.65 mm is shown in Figure 13-12. The recovery is deemed to be a relationship to the concentrators $Li_2O$ feed grade. Expected concentrator recoveries are lower than test work results based on scale-up factors that are driven by the effects of both larger diameter cyclones and the crowding effect seen in the DMS sinks. This variation between laboratory test work results and those achieved in operating plants has, to date, been observed within the industry with respect to operating spodumene DMS concentrators. For reference, lithium recoveries achieved by other DMS-only concentrators are shown for reference ('Industrial DMS Only Performance') in Figure 13-12. The Project's higher expected recovery is due both the quality of the material (large spodumene grains with a narrow grain size distribution) and the three size range DMS plant, which lessens the impact of particle size effect in the DMS process.

### 17.2.2 Mass Balance

A simplified mass balance for the mineral processing facility at its nominal capacity (i.e., 5 Mtpa at 68% and 81% utilization and availability for the crushing plant and concentrator respectfully) is shown in Figure 17-1.

### 17.2.3 Water Balance

A simplified water balance for the mineral processing facility at its nominal capacity (i.e., 5 Mtpa at 68% and 81% utilization and availability for the crushing plant and concentrator respectfully) is shown in Figure 17-2. The balance shows the raw water requirements for items such as gland seal water, filter belt wash and flocculant preparation as well as the excess of process water from the process.

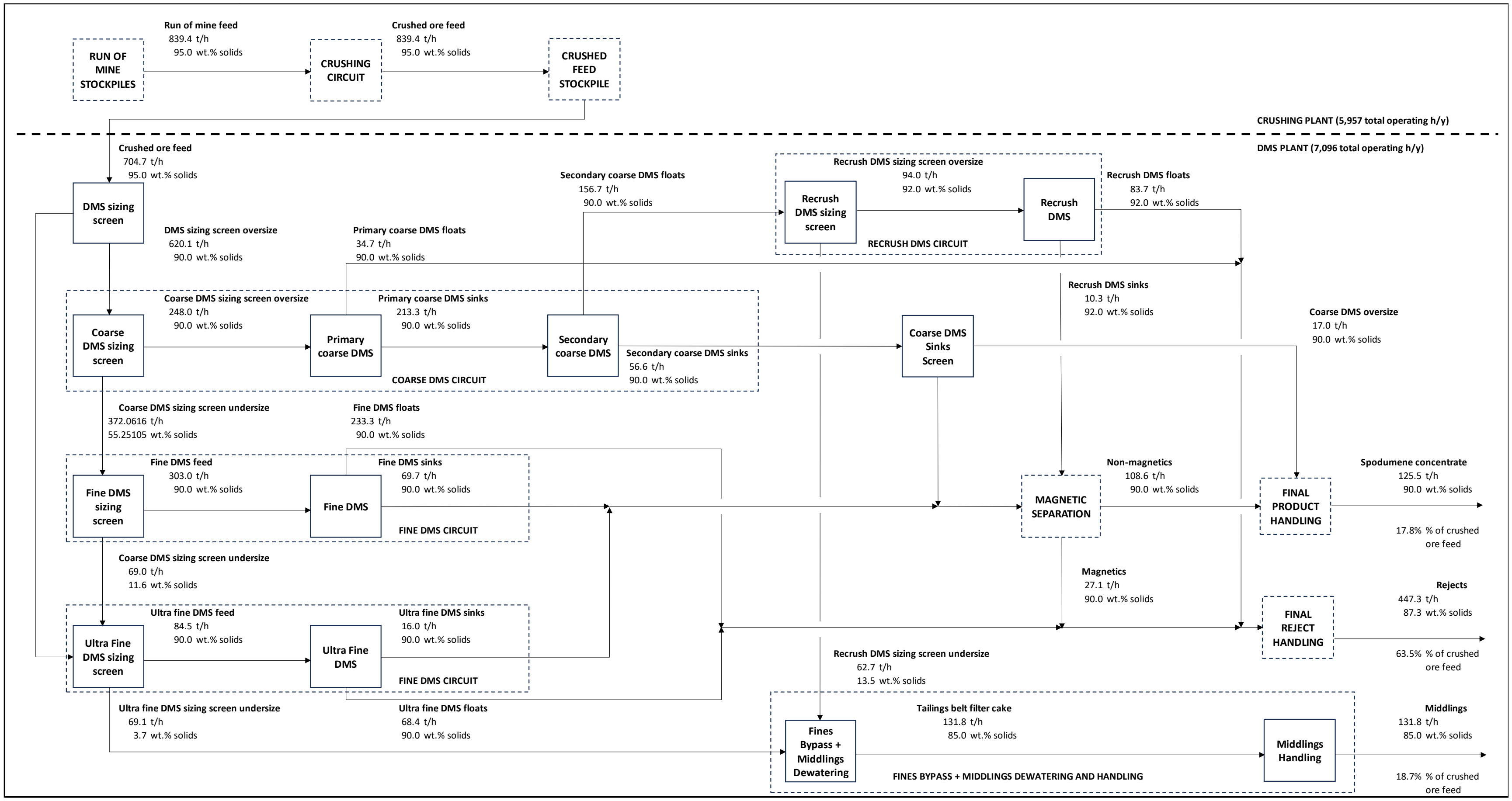



**Figure 17-1: Mineral processing facility simplified mass balance**

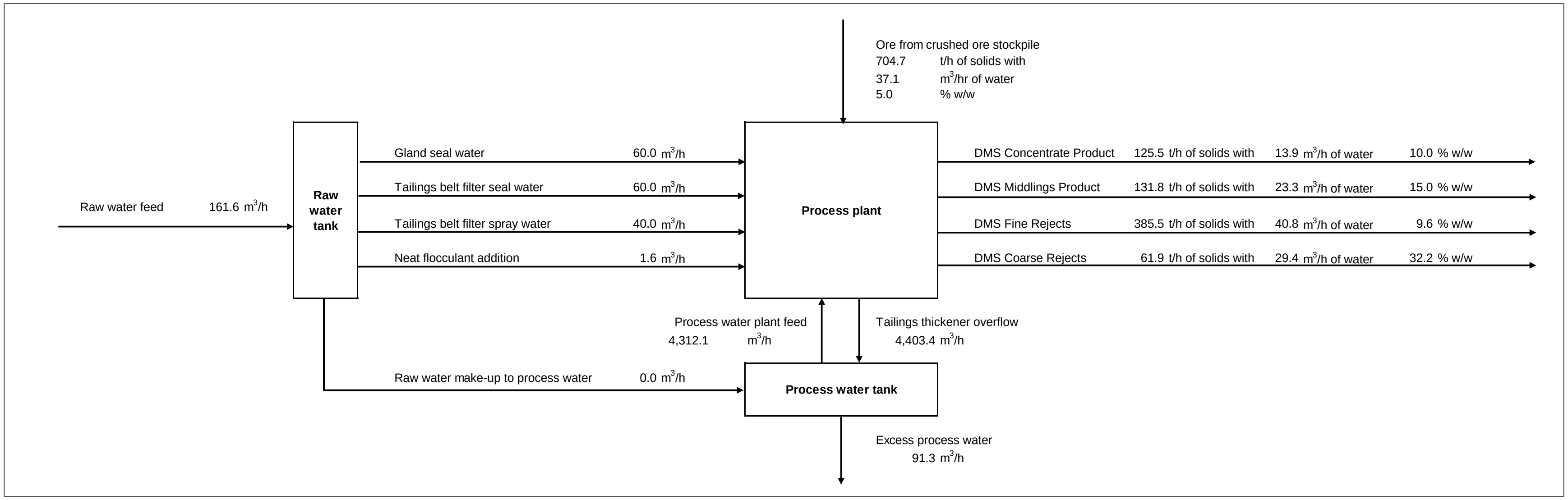



**Figure 17-2: Mineral processing facility simplified water balance**

### 17.2.4 Reagents

The reagents required for the mineral processing facility are in Table 17-2.

**Table 17-2: Mineral processing facility reagent requirements**

| Operation | Consumable | Usage | Delivery form | Distribution method |
|---|---|---|---|---|
| DMS | Ferrosilicon 270D | Dense media | Bulk bags | Bag breaker and mixing hopper |
| Thickening and dewatering | Magnafloc 10 | Anionic flocculant | 25-kg bags | Dilute with raw and process water |

Fresh ferrosilicon ("FeSi") will be added to a mixing hopper, which will then be fed continuously via screw feeders to each DMS's respective medium header box. Flocculant mixing will be completed in a designated area within the plant with a dedicated sump pump which recycles spillage to the thickener feed tank.

### 17.2.5 Utilities

#### 17.2.5.1 Raw Water

Within the concentrator, the raw water system will include a raw water storage tank and distribution pumps to deliver the water as needed. Raw water will be used for process makeup, gland seal and vacuum pump seal water, belt filter cloth wash, and fire protection.

#### 17.2.5.2 Process Water

The process water circuits provide process water to the DMS circuit. Water will be recovered from thickener overflows with raw water as makeup, if necessary.

#### 17.2.5.3 Water Treatment

The concentrator will have a dedicated bleed/purge stream that transfers excess process water to a site-wide multi-stage water treatment facility for contaminant removal.

## 17.3 Mineral Processing Facility Description

The key process areas of the mineral processing facility are:

- ROM stockpiles;
- Crushing circuit (with primary, secondary, and tertiary crushing);
- Crushed feed stockpile;
- Coarse DMS circuit;
- Fine DMS circuit;
- Ultrafine DMS circuit;
- Recrush DMS circuit;
- Magnetic separation and final product handling;
- Fines bypass + middlings dewatering and handling;
- Final tailings handling.

The mineral processing facility simplified process flow diagram is in Figure 17-3. This figure summarizes the process flows among the major sections of the mineral processing facility. Figure 17-3 shows only one of the two identical process trains. Similarly, the process descriptions below describe only one of the two identical process trains.

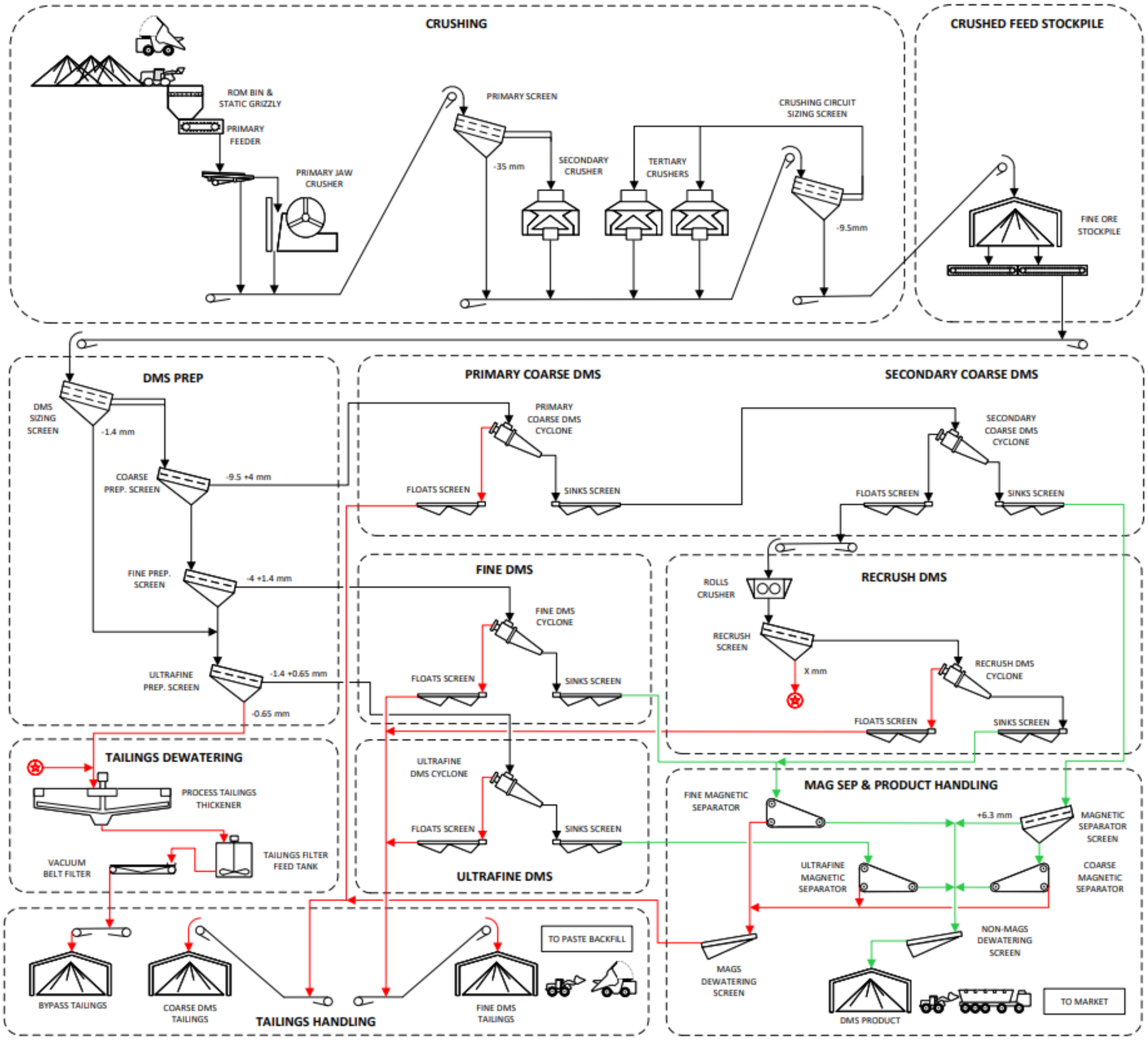



**Figure 17-3: Mineral processing facility simplified process flow diagram**

### 17.3.1 Run of Mine Stockpiles

The ROM will be transported from the mine to the mineral processing facility using 100 t trucks. It is assumed that 75% of the ROM will be transported to the ROM bins feeding the primary crusher in the crushing circuit and 25% of the ROM will be transported to the ROM stockpiles.

Two ROM stockpiles will be located near the primary crusher. The minimum capacities of the two stockpiles will be 5 Mt and 1 Mt respectively. The ROM will be rehandled from the ROM stockpiles to the ROM bins in the crushing circuit using a front-end loader ("FEL").

### 17.3.2 Crushing Circuit

ROM feed with a top size of 750 mm and an 80% passing of 300 mm will be crushed by a single primary jaw crusher, producing a product with an 80% passing size of 150 mm.

The primary crusher product will be conveyed to the double deck vibrating secondary crushing screen with a top deck opening of 75 mm and a bottom deck opening of 35 mm. The screen oversize from both decks will be directed to the secondary cone crusher with a product 80% passing size of 40 mm. The screen undersize will be conveyed to the crushed feed stockpile.

The secondary crusher product will be conveyed to a double deck vibrating tertiary crushing screen with a top deck opening of 16 mm and a bottom deck opening of 9.5 mm. The tertiary crushing screen will be in a closed circuit with two tertiary crushers. The screen oversize from both decks will be directed to the tertiary cone crusher. The tertiary crusher will have a product size of 80% passing 16 mm. The tertiary crusher product will be redirected to the tertiary crushing screen. The screen undersize will be conveyed to the crushed feed stockpile.

### 17.3.3 Crushed Feed Stockpile

The material from the crushed feed stockpile with a top size of 9.5 mm will be fed via conveyor atop a storage pile. This crushed feed stockpile will act as a buffer between the crushing circuit and the processing plant. The crushed mineralized material will be stored under domes located on a concrete pad. The pile will be reclaimed via three vibrating feeders located in a concrete reclaim tunnel under the pile. The tunnel will be equipped with two exits and proper sumps as per the code. Feeders will move the material from the storage pile to a conveyor that will feed the dense media separation preparation circuit.

### 17.3.4 Dense Media Separation Preparation Circuit

Material is conveyed from the crushed feed stockpile to the concentrator building. The material is received with a double deck DMS sizing screen. The bottom screen deck has a cut size of 1.4 mm. The oversize from both screens report to the coarse preparation screen. The screen undersize reports to the ultrafine preparation screen. The 9.5 mm to 1.4 mm fraction reporting to the coarse preparation screen is screened on a single screen at a cut size of 4 mm. The screen oversize (i.e., 9.5 mm to 4 mm) feeds the coarse DMS circuit. The screen undersize (i.e., -4 mm) reports to the fine preparation screen. The fine preparation screen has a single screen deck with a 1.4 mm cut size. The oversize (i.e., -4 mm to +1.4 mm) reports to the fine DMS circuit. The screen undersize (i.e., -1.4 mm) reports to the ultrafine preparation screen. The undersize fractions from both the DMS preparation screen and the fine preparation screen report to a single deck ultrafine preparation screen. The screen cut size is 0.65 mm. The screen oversize reports to the ultrafine DMS cyclones. The screen undersize (i.e., -0.65 mm) is the plants "bypass fraction", the material from the plants feed that is too fine for DMS processing. This material reports to dewatering thickener.

### 17.3.5 Coarse Dense Media Separation Circuit

The -9.5 mm to +4 mm size fraction from the preparation circuit is processed in a two stage DMS circuit (referred to as primary and secondary coarse DMS). The primary coarse DMS stage will have a density cut point of approximately 2.65, which will generate a feed for the second stage (the denser fraction known as the sinks) and a reject stream sent to 'final reject handling' (the lower density material, known as the floats). The secondary coarse DMS stage will have a density cut point of approximately 2.90. The denser material (the sinks) will be sent to the magnetic separation and product handling circuit while the less dense fraction (the floats) will report to the recrush DMS circuit for further processing.

### 17.3.6 Fine Dense Media Separation Circuit

The fine DMS circuit is fed with a -4 mm to 1.4 mm material. Unlike the coarse circuit, the fine DMS circuit has a single DMS stage at a specific gravity cut point at approximately 2.9. The floats are a final reject stream while the sinks are a concentrate. The concentrate reports to magnetic separation and product handling circuit. The rejects are conveyed to a tailings storage pile.

### 17.3.7 Ultrafine Dense Media Separation Circuit

The ultrafine DMS circuit is fed with material having a size fraction of -1.4 mm to 0.65 mm. In the same fashion as the fine DMS circuit, the ultrafine DMS circuit has a single DMS stage at a specific gravity cut point at approximately 2.9. The floats are a final reject stream while the sinks are a concentrate. The concentrate reports to the magnetic separation and product handling circuit. The rejects are conveyed to a tailings storage pile.

### 17.3.8 Recrush Dense Media Separation Circuit

The floats material from the second stage of the coarse DMS circuit (material with an SG of -2.9 to +2.65) will be directed to a double roll crusher. The crushed product will have an 80% passing of 3.30 mm. The material will be fed to a vibrating screen with cut size of 0.65 mm. The screen oversize will be sent to the recrush DMS circuit. The circuit will have one stage with a density cut point of 2.90. The sinks will be combined with the final product from the fine DMS circuit and fed to the magnetic separation circuit. The floats from the process will be treated as final tailings and combined with the rejects from the fine DMS circuit. The screen undersize (i.e., the 0.65 mm material) will be sent to the bypass dewatering circuit.

### 17.3.9 Tailings (Bypass) Dewatering

The screen undersize (i.e., -0.65 mm) from the DMS preparation circuit and the recrush DMS circuit report to a thickener. The thickener settles and thickens the solids. The thickener underflow is pumped to a belt filter. The thickener overflow will report to the facility's process water. The belt filter's filter cake will be discharged onto a conveyor belt. The cake is conveyed to a covered stockpile in the tailings handling area.

### 17.3.10 Tailings Handling

The filtered bypass fraction (i.e., -0.65 mm), and the rejects fractions from the three DMS size fractions (i.e., the -2.65 SG from the coarse DMS circuit and the -2.9 SG from the fine, ultrafine and recrush DMS circuits) report to the tailings handling area. The primary use of the material is to act as a feed to a paste backfill plant. The current design separates the piles separately so that a front-end loader can be used to generate a specific ratio of material of different sizes for the backfill recipe. If the recipe does not require any of the rejects, a front-end loader will fill a mine truck for final stacking in a tailings area.

### 17.3.11 Magnetic Separation and Final Product Handling

The magnetic separation circuit removes the minerals with iron contaminants by using high intensity magnetic fields to ensure that the final concentrate specification does not exceed the final iron impurity value (i.e., $Fe_2O_3$ < 1.2 wt.%). The +2.9 SG material from all three DMS circuit (i.e., coarse, fine and ultrafine) are conveyed to the magnetic separation circuit. The coarse concentrate is fed to a screen with a 6.3 mm cut size. The screen oversize (+9.5 mm to 6.3 mm), too coarse in size to effectively be processed with wet belt separators, is directed to the final concentrate. The screen undersize is fed to the coarse wet belt magnetic separator. The DMS concentrates from the fine and ultrafine circuits report to a dedicated wet belt magnetic separator (the fine and ultrafine magnetic separators respectively). The magnetic fractions from the three units are dewatered via a screen. The dewatered screen oversize is conveyed to the tailings handling piles. The non-magnetic fractions, considered final concentrates, are dewatered with a dewatering screen. The dewatered concentrate is conveyed to a covered storage pile and will be loaded via a front-end loader into the product transport trucks.

## 17.4 Recommendations

The following opportunities exist for advancing the Project:

- The iron specification of <1.2% $Fe_2O_3$ based on typical value as of the time of the study. Investigating the future implications of a +/-0.1% $Fe_2O_3$ on sales price of the concentrate will determining the feasibility of certain project options. For example, depending on the sensitivity of iron contamination on spodumene, sales price will determine whether the Project should install ore sorting or not.
- With the current understanding of the geological body (i.e., its substantial width and its vertical orientation), an integrated ore sorting plant within the crushing circuit is not required. However, there is an opportunity to target blocks that contact the host rock to be directed to a distinct storage pile. Spodumene can recovered from this pile via a modular ore sorting plant. This would allow for more recovery of spodumene from the deposit without feeding high amounts of external dilution (the main source of final iron contamination) to the plant.
- The concentrator design at project start-up is recommended to be a DMS only plant (as currently described in this study). The start up of DMS-only plants for both feed tonnages and recovery has consistently been shown to be very quick. Installing a processing plant for the lithium contained in the bypass fraction (i.e., the -0.65 mm fraction) as a phase 2 later in the Project's life cycle is an opportunity for the Project. Test work will ultimately dictate the nature of this processing plant.
- Currently, the tailings (i.e., the DMS bypass fraction and the DMS tailings) are being stored in separate piles. This is to offer maximum flexibility to the generation of a correct mixture of material for the paste backfill plant. As the correct recipe of paste backfill feed material is ascertained, there will be an opportunity to optimize the tailings handling area.

# 18. Project Infrastructure

## 18.1 Overview

The Shaakichiuwaanaan Project infrastructure extends in two different physical locations, as illustrated on Figure 18-1:

- **Main Site:** Mine, Process Plant, TMF, Camp.
- **Matagami Transshipment Centre ("MTC"):** Spodumene concentrate truck unloading and train loading facilities.

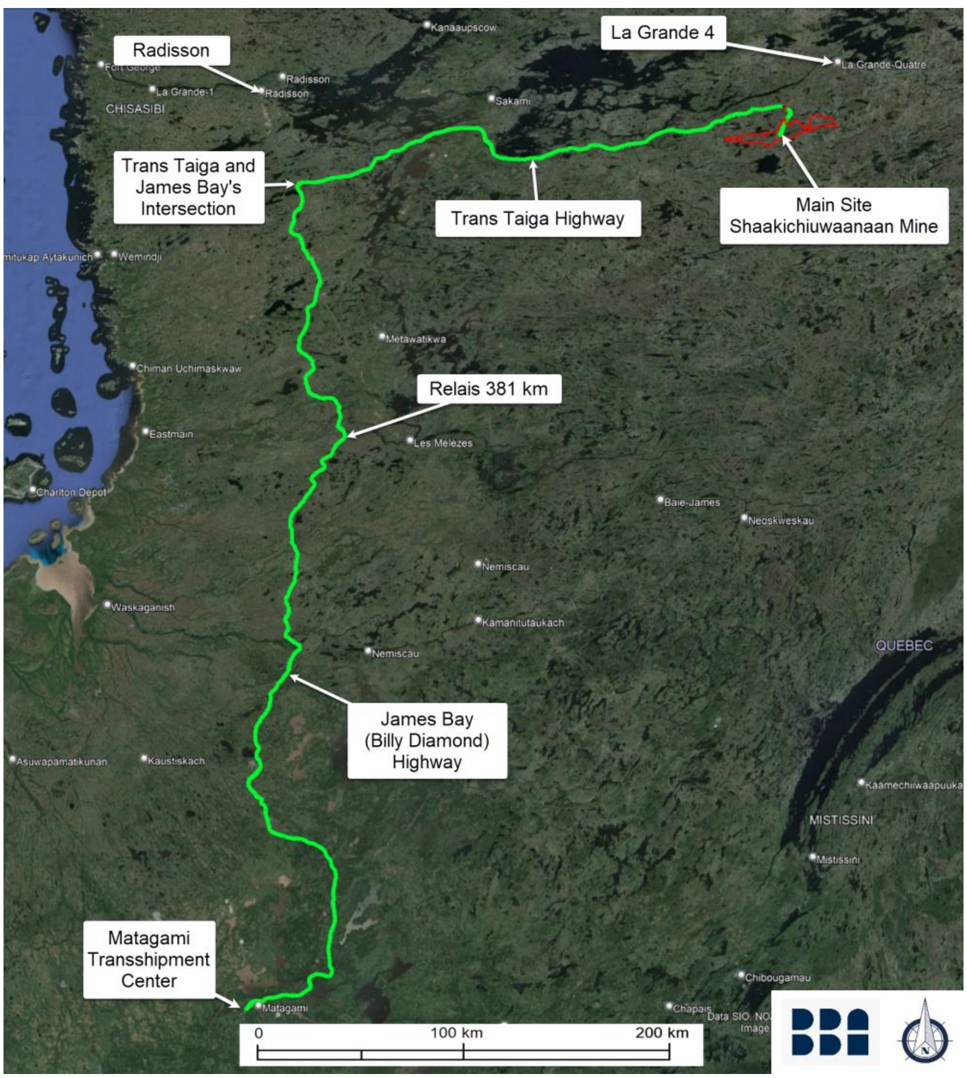



Figure 18-1: Project infrastructure locations

## 18.2 Main Site Infrastructure Overview

The main site infrastructure includes the following:

- Open pit mine;
- Underground mine and portals;
- Process plant (crusher buildings, crushed ROM domes, concentrator, loadout);
- Paste backfill plant;
- Garages for the mining fleet, light vehicles, and highway trucks;
- Administrative offices, dry rooms, warehouses, and auxiliary buildings for the concentrator and the mine areas;
- Waste rock and tailings management facilities with their associated ditching and basin systems for water management;
- Fresh/raw water wells and water treatment plants;
- Electrical substation and overhead electrical powerlines;
- Roads and pads with their associated ditching and culvert systems for drainage, and a bridge;
- Aggregate crushing plant area;
- Emulsion plant and explosive storage magazines buildings;
- Laydown areas;
- Fuel storage pad and refuelling stations;
- ROM pads;
- Water diversion dam on Lake 001;
- Water diversion canal for Lake 001;
- Permanent workers camp for construction and operational needs.

The main site infrastructure is shown on Figure 18-2.

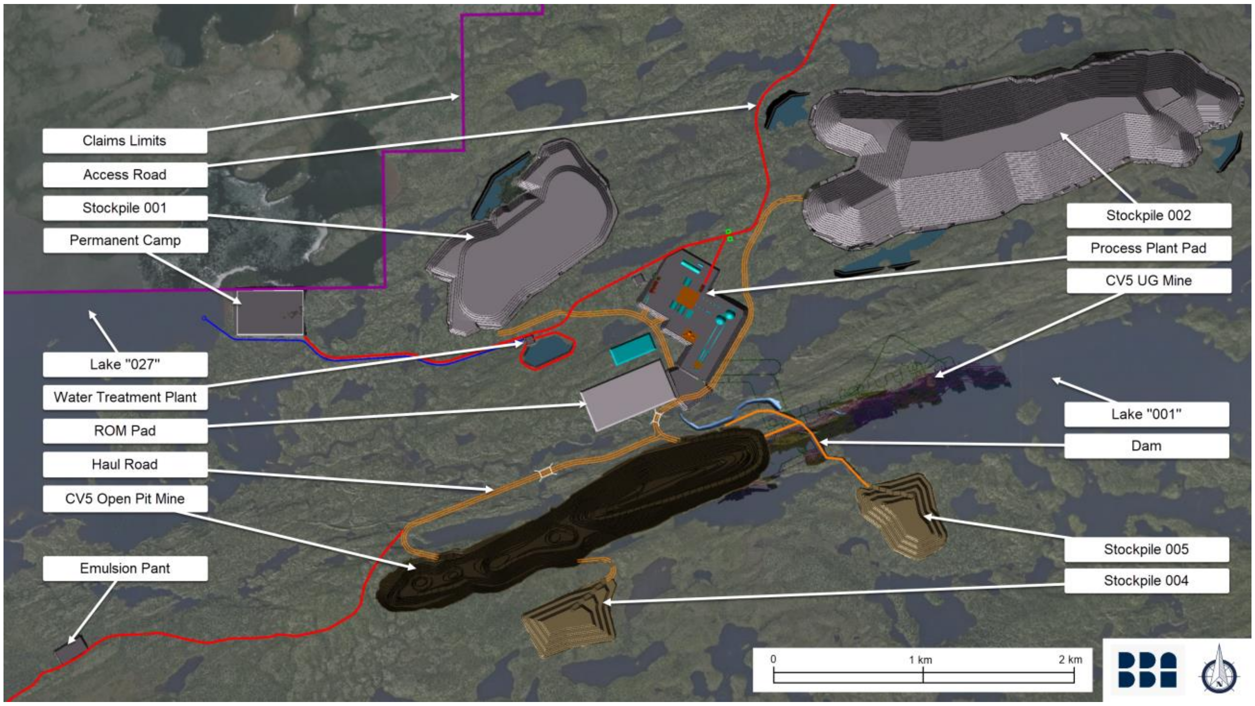



**Figure 18-2: Main site infrastructure**

### 18.2.1 Layout

Locations of the main site infrastructure were established according to the following criteria:

#### 18.2.1.1 General

Based on environmental studies, the layout was oriented to minimize disruption to natural habitats.

#### 18.2.1.2 Permanent Buildings Location

Permanent buildings are located outside the 500 m mine blast radius to minimize flying rock and vibration risks, thus limiting downtime risks.

All buildings are within the Property's limits.

#### 18.2.1.3 Emulsion Plant and Explosive Storage Location

Emulsion plant and explosive storage to be located outside the 2 km blast radius to minimize risks.

#### 18.2.1.4 ROM Pads Location

ROM pads are located near the open pit access ramp and underground portals while being close to the crushers to minimize ROM haulage distances. The first ROM pad has a capacity of 1 Mt and the second one has a capacity of 5 Mt.

#### 18.2.1.5 Operation Camp Location

A construction and operations camp will be established 2.5 km west of the processing area, adjacent to Lake 027, for the following reasons:

- To maximize workers' experience at this remote area;
- Close to the concentrator to minimize workers' commuting times;
- Upwind from blasting and mining activities to minimize dust and noises;
- Far enough from the mine and concentrator to minimize exposure to vibrations and noises.

#### 18.2.1.6 Site Preparation

Tree clearing and topsoil removal is expected to be required for all traffic areas and future building footprints. A mobile crusher will produce granular materials and aggregates for road and pad structures during construction using borrow source material.

When possible, material from the pit would be recycled to be used as construction material.

### 18.2.2 Site Access and On-site Roads

The new main access road for the main site is under construction (August 2024) and will be about 17 km in length. This road connects to the Trans-Taiga Highway, an all-season gravel road.

The main site access road provides direct access to the process plant and administration building area as well as the water treatment plant, workers camp facilities, emulsion plant, and explosive storage. The road is 10 m wide. It is constructed with suitable granular material structure for regular and light traffic (CL-625 load class) with drainage ditches on each side as required by the topography.

### 18.2.3 Haul Roads

Haul roads are designed for 100-ton and 200-ton trucks. They provide access to the open pit mining area, mine infrastructure such as the crusher, garage and fuel bay, and all stockpiles.

Haul roads are 30 m wide. They are constructed with suitable granular material structure for the heavy-duty mine traffic, with drainage ditches on each side as required by the topography. Safety rock-berms are required where the difference in elevation between road surface and natural ground elevation is greater than 3 m.

Two built in place bridges of 240t capacity each are required.

### 18.2.4 Domestic Water Wells and Water Treatment

Two sets of water wells, storage, and distribution systems will be installed at the main site to provide domestic water. One will be installed at the permanent camp and another in the concentrator area.

The raw water will be pumped to a pre-built filtration and disinfection system. Potable water will then be brought to the facilities via an underground distribution system. Well water quality is assumed to require only filtration due to turbidity levels and disinfection. Additional treatments (not included in this study) might be required if other contaminants are found in the water wells.

Three wells for the permanent camp and two wells for the concentrator will be needed to meet the water requirements.

Sewage will be collected from the different buildings via an underground collection system and sent to a skid-mounted sewage treatment system. All the sludge produced by the domestic wastewater treatment system will be removed and stored in a tank and trucked away by a specialized company to an authorized site.

The treated effluent will be released into the environment.

### 18.2.5 Fuel Storage and Distribution

For mining operations, a fuel storage area with 20 double-walled 50,000-L distribution tanks will be installed. High-flow and low-flow dispensers will be installed.

A gasoline storage and distribution system will also be installed.

The distribution area will have secondary containments with a concrete slab to ease spill collection. Bollards will be installed to protect equipment and tanks.

The fuel storage infrastructure will be located 30 m away from any proposed building to eliminate fire hazards.

Fuel and gasoline will be delivered to the site by trucks.

### 18.2.6 Propane

Heating for the concentrator and auxiliary buildings will be using 100% propane. Propane will be delivered to site by a third party and there will be enough tanks to store 10 days of peak utilization.

Propane will preheat the air intake for ventilation in the underground mine.

### 18.2.7 Renewable Energy

Hydro-Québec renewable electrical energy was the energy of choice for the Project. No windmill or solar panels were considered.

### 18.2.8 Mine Garage and Wash Bay

A mine garage with a maintenance shop will be built to accommodate all mobile equipment. It will be equipped with an overhead crane. The mine garage will have offices and will be connected to the concentrator's water well and sewage system. The shop and storage areas will be provided with an automatic fire suppression system.

The garage will be able to service five 200-ton class haul trucks at a time.

One wash bay will be included in the mine garage (six doors total) and used to thoroughly clean the vehicles in preparation for maintenance activities and for the operator's regular equipment cleaning. The wash bay will have a concrete floor graded towards an oil/water separator that will be attached to the mining garage.

### 18.2.9 Highway Trucks and Trailers Garage

Spodumene concentrate will be transported from the mine site to Matagami using highway trucks and trailers operated by a contractor.

Trucks and trailers fleet maintenance garages are required at both the mine site and Matagami.

A dedicated 50,000-L double-walled fuel tank distribution system will be installed near the trucks and trailers fleet maintenance garage at site to refuel the trucks.

### 18.2.10 Process and Auxiliary Buildings

The process buildings will be stick-built with concrete foundations. Most buildings and belt conveyor galleries will be enclosed, insulated, made of structural steel, and heated to prevent freezing.

The concentrator building will include a boiler room, maintenances shops, dry for operators end of shift cleaning, laboratory, warehouse, reagents, climate-controlled vehicle garage to house the site fire truck, ambulance, and other emergency equipment.

### 18.2.11 Paste Backfill Plant

The paste plant will span from the concentrator stockpiles to the exit of the paste pump and the associated underground piping distribution system. Material movement from the concentrator stockpiles to the backfill process plant will be managed by a front-end loader. The fines bypass and fines recrush processes take precedence, with fine middlings used only when additional material is needed. Although the particle size distribution ("PSD") of the material is assumed to be suitable for creating paste, test work will be necessary to confirm this. All fines bypass and recrush bypass material will flow to the tailings belt filter, avoiding direct bypass into the paste plant. Currently, the backfill paste consists solely of cement, but future optimization could explore alternative reagents such as dry ashes or slag to reduce cement content and lower operating expenses (Opex).

### 18.2.12 Load-out and Truck Scale

Spodumene concentrate, middlings and tailings are the three streams that will exit the concentrator. These products will be stockpiled outside on a concrete slab protected by semi-open structures. Design of the load-out area will allow mining and transport trucks to be loaded with a front-end loader.

A spodumene concentrate truck scale will be installed near the truck loading infrastructure.

#### 18.2.12.1 Operation Camp

The camp will be used for the operation of the mine and process plant.

Camp capacity requirements (including contingency) have been calculated based on the expected number of employees on site at the same time, according to the following:

**Table 18-1: Required camp capacity**

| Workforce Requirements | Y-1 | Y1 | Y2 | Y5 | Y10 | Y15 | Y20 | Y24 |
|---|---|---|---|---|---|---|---|---|
| OP Total Mine Workforce (14/14 mainly) | 124 | 201 | 235 | 236 | 246 | 227 | 80 | 46 |
| UG Total Mine Workforce (14/14 mainly) | 0 | 135 | 243 | 329 | 321 | 277 | 270 | 103 |
| Process Plant (14/14 mainly) | 4 | 179 | 179 | 179 | 179 | 179 | 179 | 179 |
| Explosives Contractor (14/14 mainly) | 4 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| **Total on Rotation 14/14** | **132** | **523** | **665** | **752** | **754** | **691** | **537** | **336** |
| G&A Labour & Camp Services Total | 158 | 158 | 158 | 158 | 158 | 158 | 158 | 158 |
| G&A Labour and Camp Services Total (off site) | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| G&A Labour and Camp Services Total (on site and on duty) | **71** | **71** | **71** | **71** | **71** | **71** | **71** | **71** |
| Concentrate Transportation Contractor | **0** | **25** | **25** | **25** | **25** | **25** | **25** | **25** |
| Contractor For Miscellaneous Work/Vendors | **0** | **10** | **10** | **10** | **10** | **10** | **10** | **10** |
| **Total Workforce Including Contractor** | **290** | **716** | **858** | **945** | **947** | **884** | **730** | **529** |
| **Existing Exploration Camp Rooms** | **150** | **150** | **150** | **-** | **-** | **-** | **-** | **-** |
| **Camp Capacity Required for Operation (Not Including Construction)** | **137** | **368** | **439** | **482** | **483** | **452** | **375** | **274** |
| **Operation Camp Rooms – Installed Capacity** | **400** | **400** | **500** | **500** | **500** | **500** | **500** | **500** |

Initially, the camp will have 400 rooms (Year -1 to Year 1). At Year 2, another 100 rooms will be added.

The existing exploration camp, with its 150 rooms, will be used during initial construction activities (Year -1 to Year 2) of the main site infrastructure. The exploration camp is approximately 17 km away from the main site.

The operations camp will offer private dormitories, a kitchen, dining area, recreation space, infirmary, utility room, parking, and administrative and security services. It will also include a raw water well with integrated treatment and distribution systems, a comprehensive underground sanitary sewer system with water treatment facilities, and an underground fire water network.

### 18.2.13 Telecommunication

The telecommunication and industrial IT infrastructure part of this study is aligned with the design of a modern mine with all the services required for an Industry 4.0 style operation, such as short interval control, predictive maintenance, VOD, on-site teleoperation, and a local integrated operation centre.

The equipment, accessories, and installation services to supply the following systems/services throughout the site facilities have been considered in the study estimate, including redundant fibre-optic backbone, a private 4G/5G LTE system covering the mine site, redundant satellite WAN links (Starlink), wired and wireless networking, physical security system (video surveillance and access control), accommodation camp TV, cybersecurity systems, high-performance hyperconverged servers, office/operation workstations, laptops and tablets, as well as PoC (PTT-over-Cellular, and Wi-Fi) as a more modern type of two-way radio using rugged smartphones.

### 18.2.14 Middlings and Tailings Management

Middlings and Tailings produced during process operations exit the concentrator via two different streams. They will be transported and stockpiled (dry stacking deposition) separately from each other. The anticipated total processing rejects production during the 24-year LOM is evaluated at 75.0 Mt and the split is as follows:

- Consolidated fines and middlings (referred to as middlings in this chapter);
  - Total production: 49.3 Mt;
  - Material with mineral content that could be profitably recovered in the future;
  - Suitable for paste backfill: 27.2 Mt will feed the paste backfill plant and be pumped underground to backfill the stopes;
  - 22.1 Mt will remain on Stockpile 001.
- DMS tailings:
  - DMS tailings total production: 26 Mt;
  - These tailings have no valuable mineral, are considered barren, and have no potential for reprocessing.
  - The material is composed of different by-products of the process at different proportions: coarse DMS, fines reject, recrush DMS and magnetics.

A conceptual design of the tailings management component includes:

- LOM tailings storage area layout;
- Related water management infrastructure.

#### 18.2.14.1 General Design Considerations

Limited information is available regarding DMS tailings characterization as well as factual geotechnical conditions for the Shaakichiuwaanaan Project site, particularly on the middlings and DMS tailings storage areas. The conceptual design performed considers information from different sources. The principal references for the conceptual design of the tailings management facility are:

- Technical note – Environmental, social, and hydrological surveys (NIIGAAN, 2022).
- Corvette PEA – Process Design Criteria (Primero, 2024).
- Available baseline data such as environmental constrains, sensitive and unique ecosystems, surface water bodies, property limits, Mineral Resources, and mining claims. All this information was integrated into a geographic information system.
- Area LiDAR provided by Patriot and extracted from government websites.

Design assumptions were made and will need to be confirmed in the future stage of the Project. The following considerations have been identified:

- Middlings and DMS tailings produced in the concentrator are conditioned to a dry state.
- Mining trucks will transport middlings and DMS tailings from the concentrator to the final disposal area or will feed the paste backfill plant with a front-end loader.
- Middlings and DMS tailings stockpiles will be constructed in an ascending fashion, from the bottom to the top.
- Runoff from the stockpile's footprint is to be managed by perimeter ditches and collection basins. Total suspended solids ("TSS") will be removed from water by sedimentation, then treated water will be rejected to the environment.
- Middlings are considered non-acid generating and non-metal leaching material.
- DMS tailings are considered non-acid generating, but the metal leaching aspect is still being tested, no official results are available. This notwithstanding, they have been considered as non-metal leaching for purposes of this study.
- The DMS materials' geochemistry is being evaluated. Test work and geochemical analysis is required for advancing the Project to FS level in a subsequent study.
- At closure, middlings and DMS tailings stockpile surfaces will be covered with overburden and topsoil before hydroseeding and tree planting.
- Once the geochemical testing results will be available, the need or not, for more elaborate final cover design can be determined

#### 18.2.14.2 Material Production and Characteristics

DMS tailings production will ramp up from Year 0 to Year 3, and then production is expected to be relatively constant from Year 4 to Year 19, followed by a decrease in production until Year 24. Average production (Years 4-19) will be ~2.5 Mtpa of middlings and ~1.3 Mtpa of DMS tailings material.

The following assumptions were made for the preliminary volumetric analysis of the facilities:

- Middlings:
  - Stockpile with a continuous slope of 3H:1V;
  - Designed without intermediate benches at this stage;
  - Particle size distribution (by Primero):
    - Identical PSD for fines bypass and recrush bypass;
    - Middlings represent 54% of the process rejects production;
    - Around 20% of particle sizes are smaller than 80 microns;
    - At least 20% considered silt, the rest fine sand;
    - Average expected moisture content around 10%;
    - Assumed compacted in-place dry density of 1.7 t/m³ for volumetric design.
- A quantity of 27.2 Mt will be returned to the underground stope as backfill material;
- The resulting required facility capacity on Stockpile 001 is 22.1 Mt or 13 Mm³;
- DMS tailings:
  - Dry-stack with a global slope of 3H:1V;
  - Intermediate benches 7.5 m wide and 5 m high;
  - Particle size distribution (by Primero):
    - Identical PSD for fines DMS, recrush DMS and magnetic tailings;
    - 61% of production could be considered coarse sand to fine gravel. The rest is medium to coarse sand;
    - 1% of material particle sizes are smaller than 80 microns.
- Expected average moisture content of 6%;
- Assumed compacted in-place dry density of 1.7 t/m³ for volumetric design;
- The resulting required facility capacity is 15.3 Mm³.

Table 18-2 and Table 18-3 shows the expected daily, yearly, and cumulative production for the middlings and streams.

**Table 18-2: Middlings production – Stockpiled and backfill**

| Period | Produced Middlings | Middlings to Paste Backfill Plant for Underground | Remaining Middlings to Stockpile 001 per Period | Middlings Cumulative Tonnage to Stockpile 001 | Middlings Cumulative Volume at Storage Area |
|---|---|---|---|---|---|
| (year) | (Mt) | (Mt) | (Mt) | (Mt) | (Mm³) |
| Y1 | 1.0 | 0.0 | 1.0 | 1.0 | 0.6 |
| Y2 | 1.4 | 0.0 | 1.4 | 2.4 | 1.4 |
| Y3 | 2.4 | 0.4 | 2.0 | 4.4 | 2.6 |
| Y4 | 2.8 | 0.7 | 2.1 | 6.5 | 3.8 |
| Y5 | 2.5 | 1.4 | 1.1 | 7.6 | 4.4 |
| Y6 | 2.4 | 1.5 | 0.9 | 8.4 | 5.0 |
| Y7 | 2.1 | 1.6 | 0.6 | 9.0 | 5.3 |
| Y8 | 2.1 | 1.5 | 0.6 | 9.6 | 5.6 |
| Y9 | 2.3 | 1.5 | 0.8 | 10.4 | 6.1 |
| Y10 | 2.8 | 1.5 | 1.3 | 11.7 | 6.9 |
| Y11 | 2.9 | 1.5 | 1.4 | 13.1 | 7.7 |
| Y12 | 2.3 | 1.5 | 0.8 | 14.0 | 8.2 |
| Y13 | 2.8 | 1.4 | 1.4 | 15.4 | 9.0 |
| Y14 | 2.8 | 1.4 | 1.4 | 16.7 | 9.8 |
| Y15 | 2.3 | 1.5 | 0.9 | 17.6 | 10.4 |
| Y16 | 2.3 | 1.5 | 0.8 | 18.4 | 10.8 |
| Y17 | 2.4 | 1.5 | 1.0 | 19.4 | 11.4 |
| Y18 | 2.6 | 1.4 | 1.1 | 20.5 | 12.1 |
| Y19 | 2.8 | 1.5 | 1.3 | 21.8 | 12.8 |
| Y20 | 2.2 | 1.4 | 0.8 | 22.6 | 13.3 |
| Y21 | 0.9 | 1.1 | -0.2 | 22.4 | 13.2 |
| Y22 | 0.5 | 0.6 | -0.1 | 22.3 | 13.1 |
| Y23 | 0.4 | 0.5 | -0.1 | 22.2 | 13.1 |
| Y24 | 0.2 | 0.3 | -0.1 | 22.1 | 13.0 |
| **Total** | **49.3** | **27.2** | **22.1** | **-** | **-** |

Table 18-3: DMS tailings production – Required capacity of storage area

| Period | Produced DMS Tailings | Cumulative DMS Tailings Tonnage to Stockpile 002 | Cumulative DMS Tailings Volume at Stockpile 002 |
|---|---|---|---|
| (year) | (Mt) | (Mt) | ($Mm^3$) |
| Y1 | 0.5 | 0.5 | 0.3 |
| Y2 | 0.7 | 1.3 | 0.7 |
| Y3 | 1.3 | 2.6 | 1.5 |
| Y4 | 1.5 | 4.0 | 2.4 |
| Y5 | 1.3 | 5.4 | 3.1 |
| Y6 | 1.3 | 6.6 | 3.9 |
| Y7 | 1.1 | 7.7 | 4.6 |
| Y8 | 1.1 | 8.9 | 5.2 |
| Y9 | 1.2 | 10.1 | 5.9 |
| Y10 | 1.5 | 11.6 | 6.8 |
| Y11 | 1.5 | 13.1 | 7.7 |
| Y12 | 1.2 | 14.3 | 8.4 |
| Y13 | 1.5 | 15.8 | 9.3 |
| Y14 | 1.5 | 17.3 | 10.2 |
| Y15 | 1.2 | 18.5 | 10.9 |
| Y16 | 1.2 | 19.7 | 11.6 |
| Y17 | 1.3 | 21.0 | 12.4 |
| Y18 | 1.4 | 22.4 | 13.2 |
| Y19 | 1.5 | 23.9 | 14.0 |
| Y20 | 1.1 | 25.0 | 14.7 |
| Y21 | 0.5 | 25.5 | 15.0 |
| Y22 | 0.3 | 25.7 | 15.1 |
| Y23 | 0.2 | 25.9 | 15.2 |
| Y24 | 0.1 | 26.0 | 15.3 |
| **Total** | **26.0** | - | - |

#### 18.2.14.3 Site Location for Middlings and DMS Tailings Storage

Sites for middlings and DMS tailings storage were defined based on the available land characteristics and transport distance from the concentrator load-out area. Two sites were identified:

- Stockpile 001:
  - Northwest of the plant;
  - Built with middlings.
- Stockpile 002:
  - Northeast of the plant;
- Built with DMS tailings and waste rock both non leaching and potentially metal leaching materials.

The selected sites offer the following characteristics:

- Foundation soil characteristics remain unknown; investigation is currently ongoing at the selected sites. Official data from the Québec government indicates that soil on defined footprints is mostly composed of undifferentiated till of variable thickness. Wetlands are very common over the footprint; the organic layer thickness is variable. For a portion of the footprint, it is assumed that bedrock could be near the terrain surface.
- Footprints are not located over natural streams, lakes, or inferred fish habitats.
- Footprints are located north of the pit, over areas which do not appear to be encroaching on the trend of mineralized outcrops. This needs to be confirmed later with condemnation drilling.
- Sites topography offers the possibility to achieve runoff drainage by gravity.

The proposed location, potential soils composition and area characteristics are presented in Figure 18-3 to Figure 18-6.

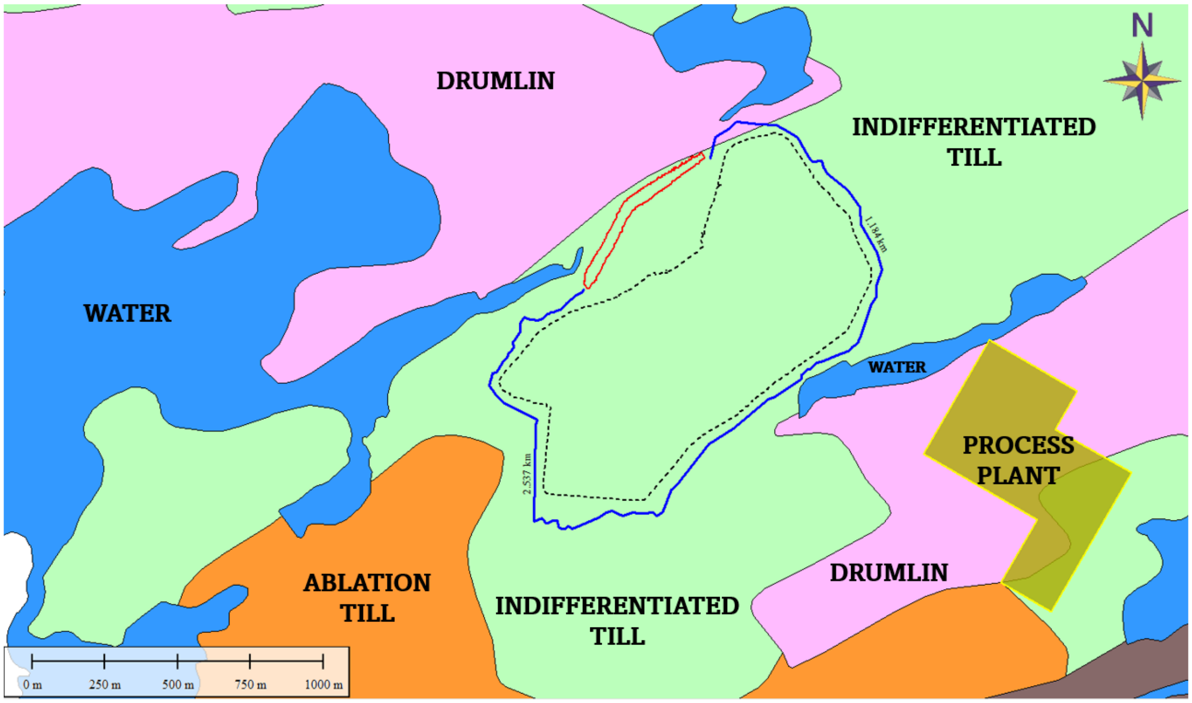



Figure 18-3: Stockpile 001 location – Area characteristics – Foundation soils

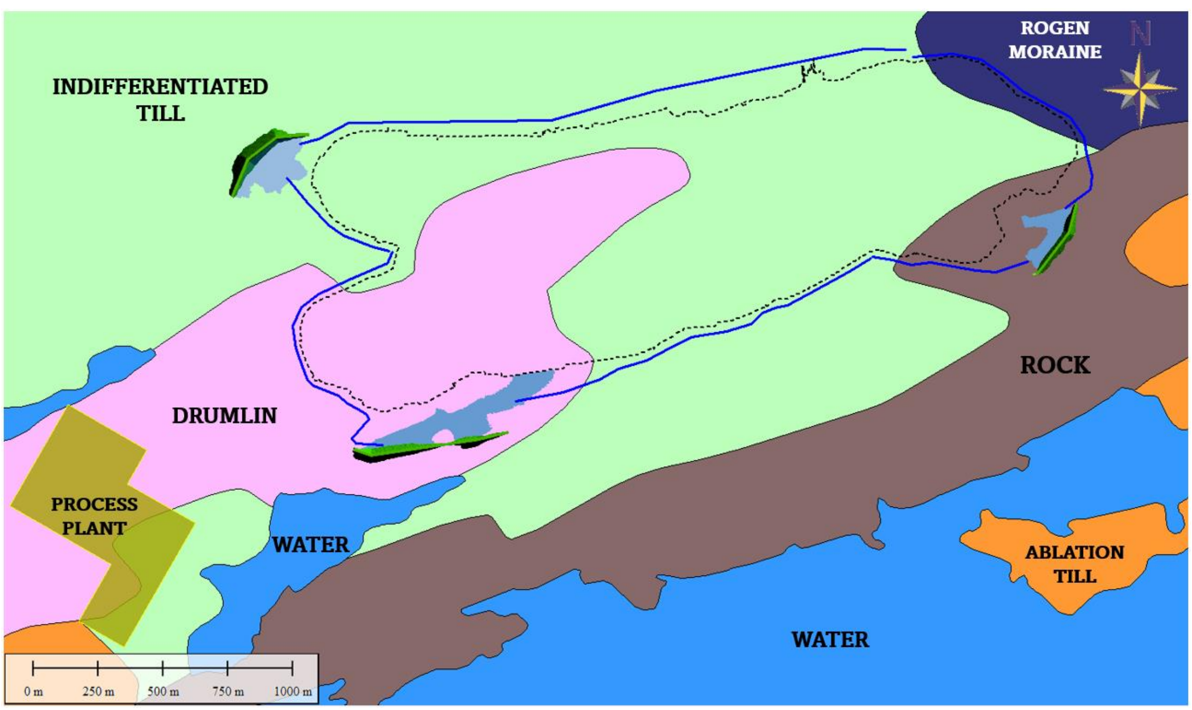



Figure 18-4: Stockpile 002 location – Area characteristics – Foundation soils

#### 18.2.14.4 Middlings, DMS Tailings Stockpiles and Related Infrastructure

Water management is achieved by enclosing the stockpiles area with perimeter ditches and directing water into basins. Perimeter roads are required in different sections along drainage ditches. Water in contact with ultramafic waste rock will be pumped to the water treatment plant. Water from the other basin will be monitored and released into the environment; a provision for pumping this water to the water treatment plant has been included, should the water quality fail to meet effluent discharge standards. The water treatment plant has additional capacity to take this water if it does not meet requirements.

The design of the tailings and middlings storage areas is comprised of the following infrastructure:

- Middlings: All this material will be stored in Stockpile 001;
- Stockpile 001: With 91 ha of footprint, this area will be used at the beginning of operations, and will be constructed as part of the early civil works;
- DMS tailings: All this material will be stored in a footprint located in the centre of Stockpile 002;
- From the entire Stockpile 002 footprint, 34 ha (15%) are dedicated to DMS tailings storage. A portion of this area will be required from the beginning of the Project;
- Water from the DMS tailings will be collected along with water from non-leaching waste rock, and separated from potentially metal leaching waste rock.

Due to topography and watershed delimitation, runoff from the DMS tailings-specific area is managed by two basins and two associated ditches.

Figure 18-5 and Figure 18-6 present the resulting arrangement of the proposed infrastructure.

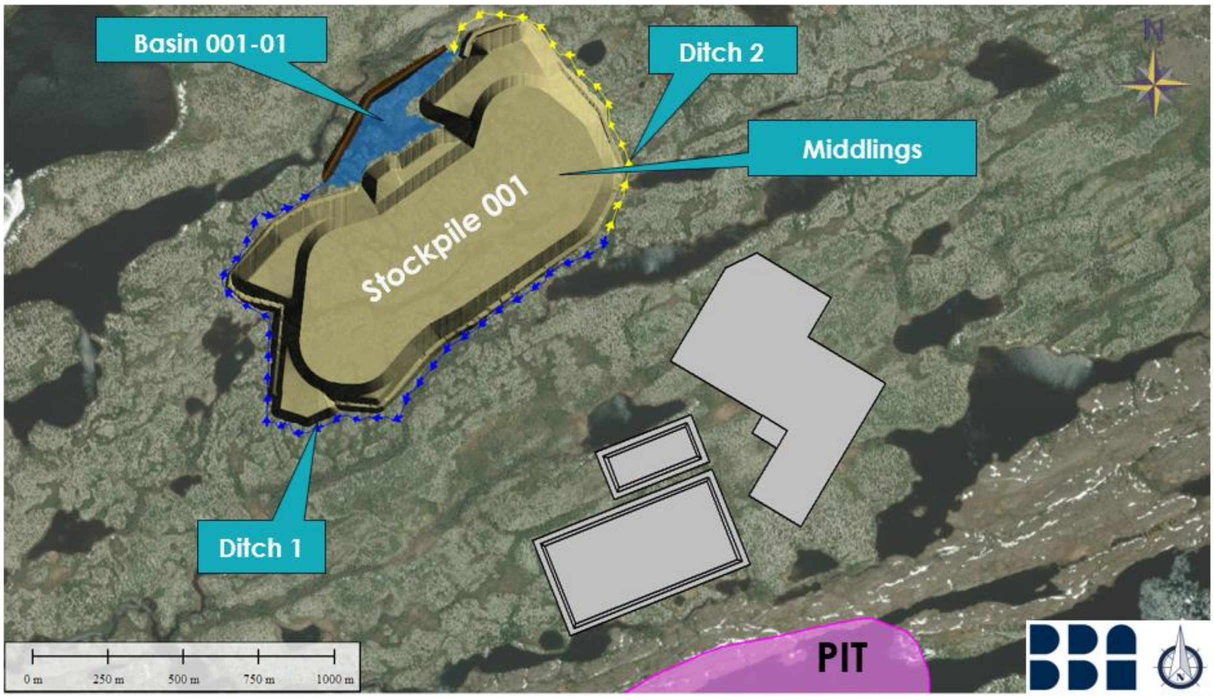



Figure 18-5: Stockpile 001 (middlings) and related infrastructure

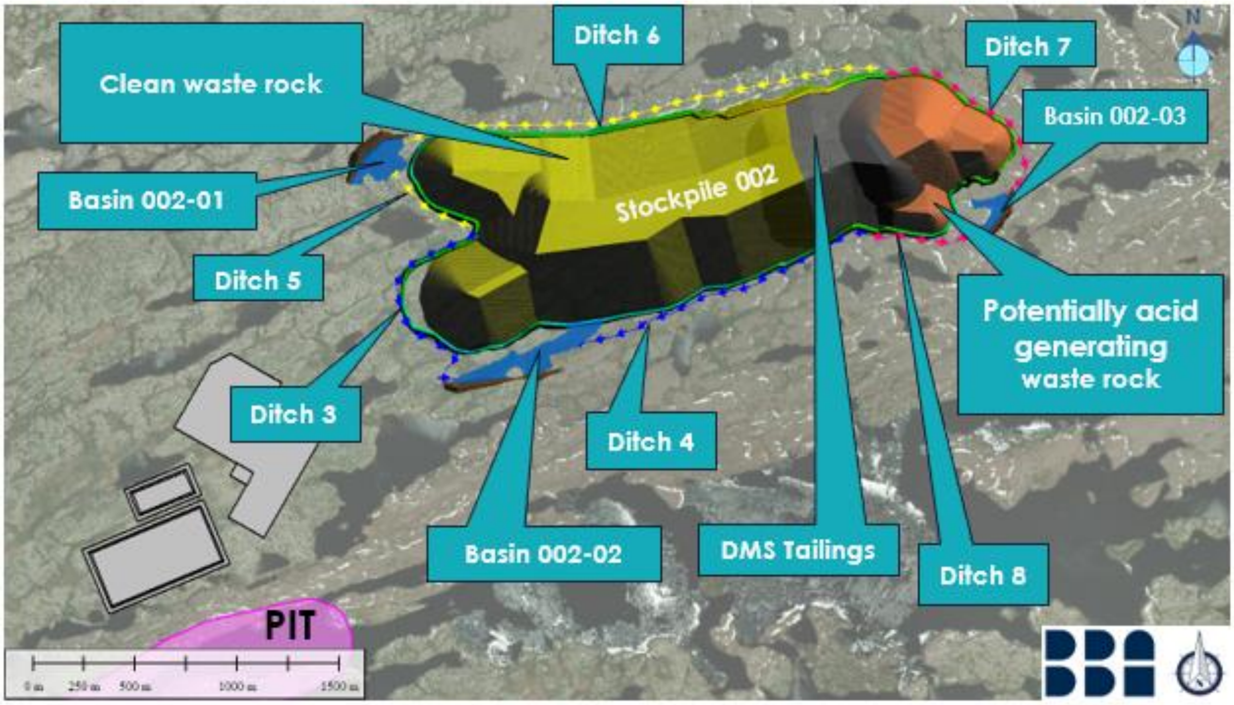



**Figure 18-6: Stockpile 002 (tailings and waste rock) and related infrastructure**

Infrastructure required are presented in Table 18-4.

**Table 18-4: Water management structures**

| Related Stockpile | Area Managed | RB ID | Required Storage Capacity (Mm³) | Associated Ditch |
|---|---|---|---|---|
| Stockpile 001 | Middlings stockpile | Basin-001-01 | 113,000 | Ditch 1 – 2.6 km<br>Ditch 2 – 1.2 km |
| Stockpile 002 | DMS tailings storage area, located between the clean and potentially metal leaching waste rock | Basin 002-02 | 129,000 | Ditch 3 – 1.3 km<br>Ditch 4 – 1.5 km |
| | | Basin 002-01 | 121,000 | Ditch 5 – 0.5 km<br>Ditch 6 – 2.4 km |

Typical cross-sections for the ditches, basin and dams are presented in Figure 18-7 and Figure 18-8. The main characteristics of the required infrastructure are described as follows:

- Basin dams: Cross-section consists primarily of structural fill, with an impervious LLDPE geomembrane on the upstream slope. A filtering feature is included below the geomembrane and continues over the entire dam foundation. Embankments fill is composed by locally sourced materials. A crest width of 10 m has been assumed for dams, and upstream and downstream slopes are established at 3H:1V. Both slopes are protected with riprap. Dam elevations are defined considering a 2 -m freeboard measured between the modelled water level and dam crest.
- Ditches: Cross-section conformed by soil excavation with a trapezoidal geometry, 2.5H:1V slopes, 1-m base width and depth of 1 m for 50% of the system, and 1.5 m for the other 50%. As an additional protection measure, geotextile and riprap are included. A 4 -m service road is included upstream of the ditch cross-section.
- Basin: No major civil works are proposed in the basin area. Only tree cutting is considered.

Material take offs ("MTOs") are estimated assuming that soil and rock used for backfilling are non-metal leaching and non-acid generating, and that quantities are sufficient either from the quarry source or the open pit waste rock.

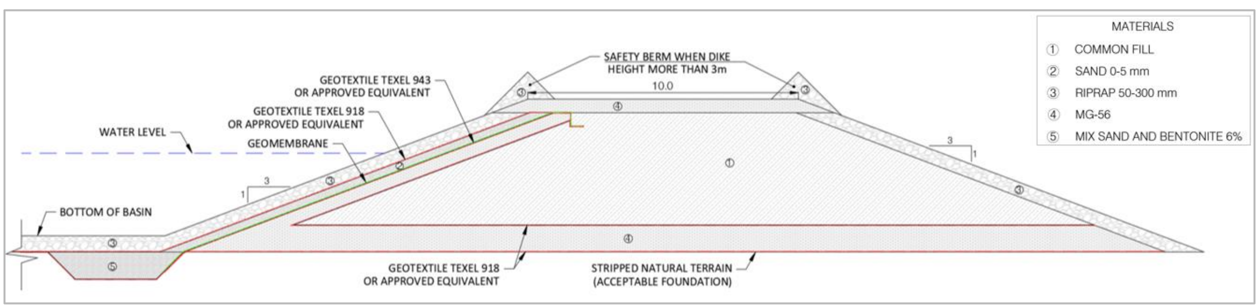



**Figure 18-7: Middlings Stockpile 001 water basin dams**

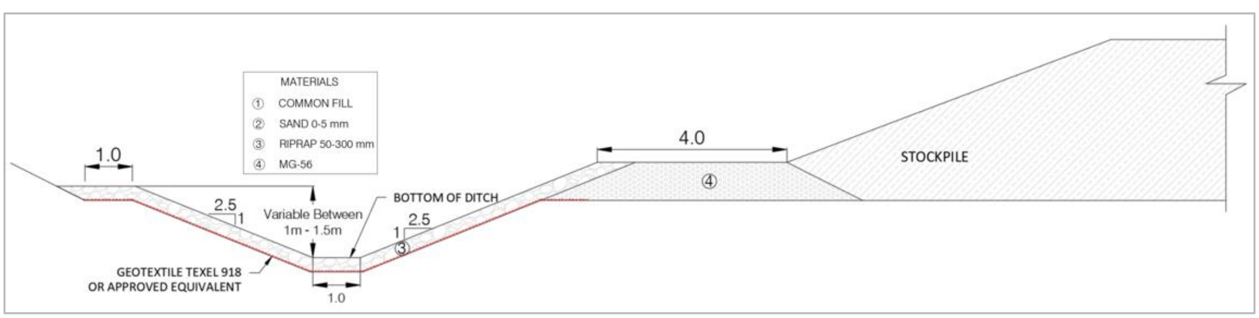



**Figure 18-8: Middlings Stockpile 001 drainage network**

#### 18.2.14.5 Stability Analysis

Stability analysis has been performed in both static and pseudo-static conditions for critical sections at the middlings and DMS tailings storage area (Figure 18-9). Cross-sections used for stability analyses are presented in Figure 18-10 and Figure 18-11.

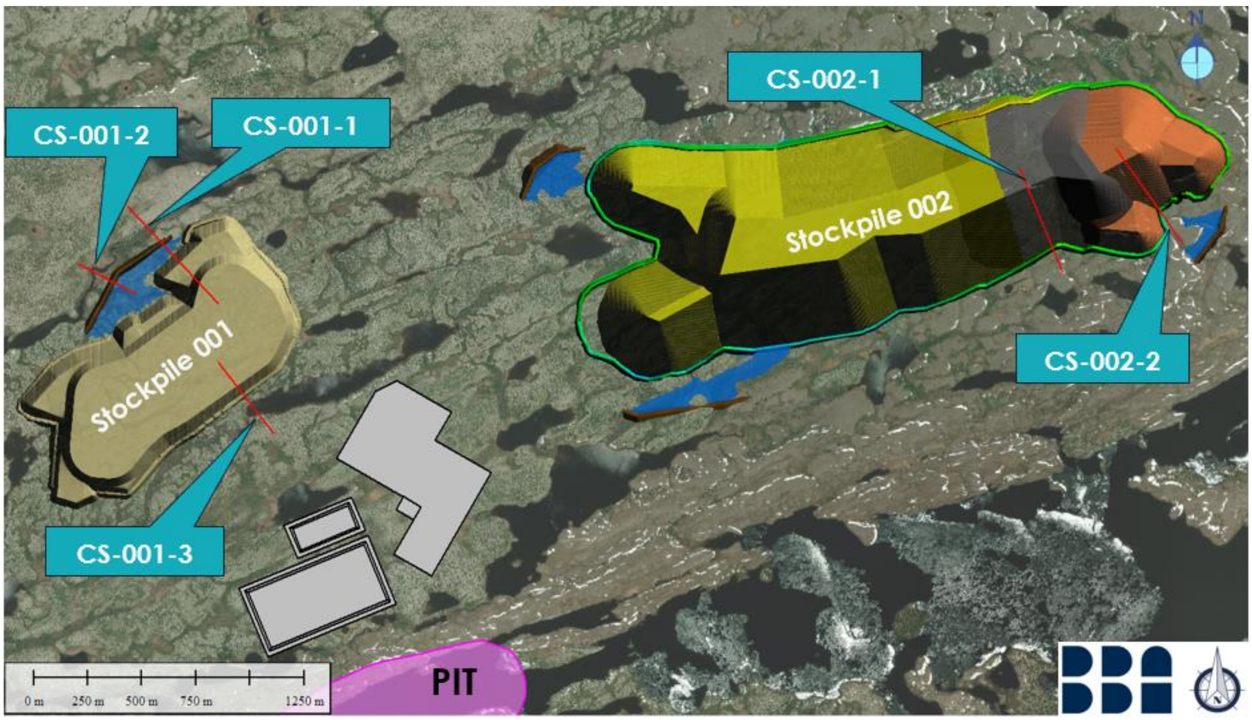
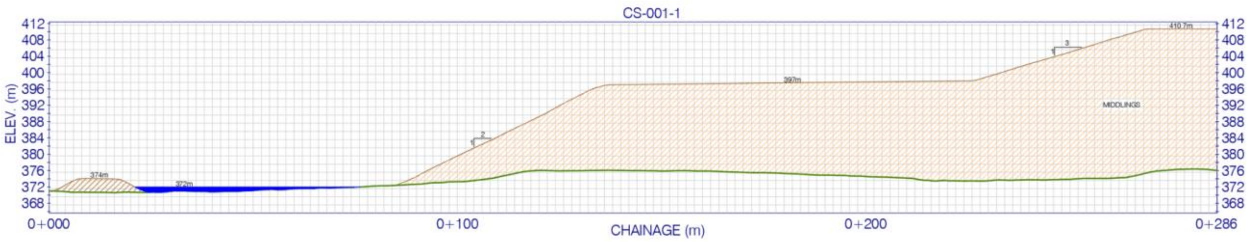
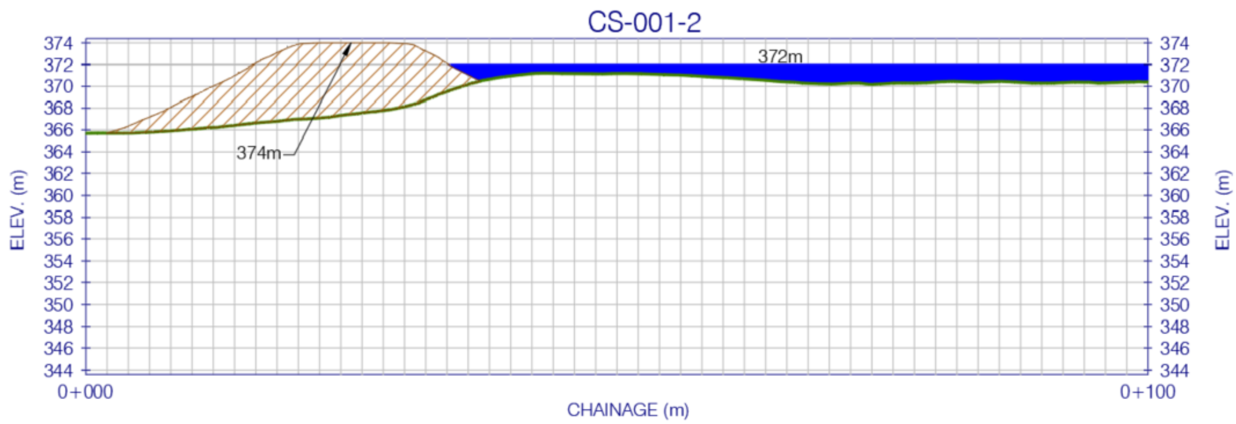



Figure 18-9: Cross-sections for slope stability analysis – Stockpiles 001 and 002



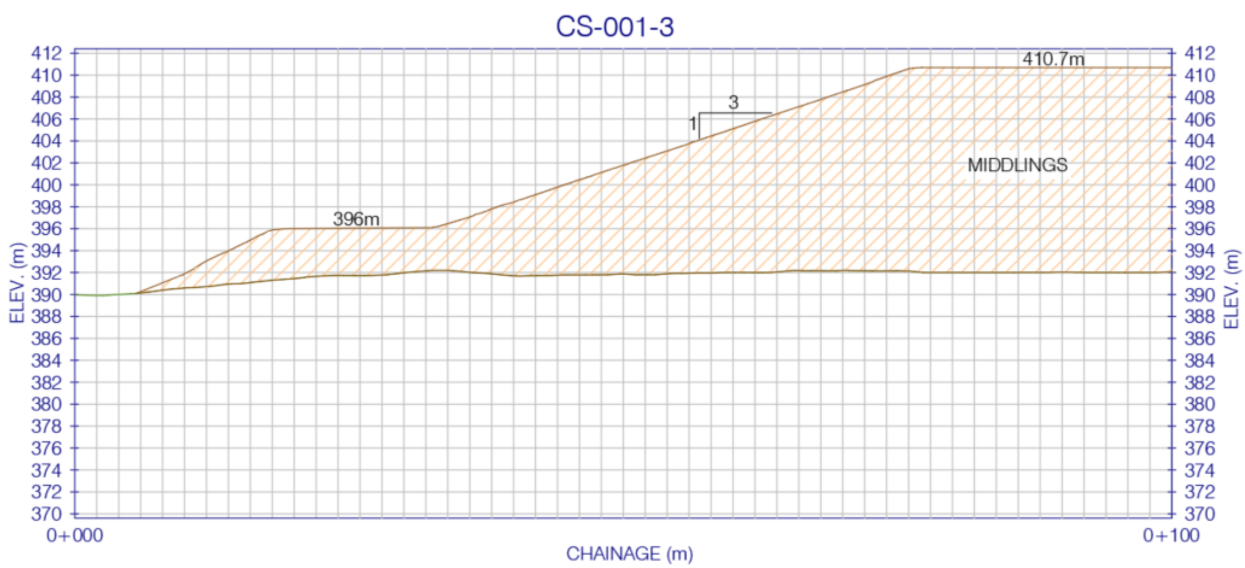




**Figure 18-10: Stockpile 001 (middlings)**
**From top to bottom: Cross-section 1, Cross-section 2, and Cross-section 3**

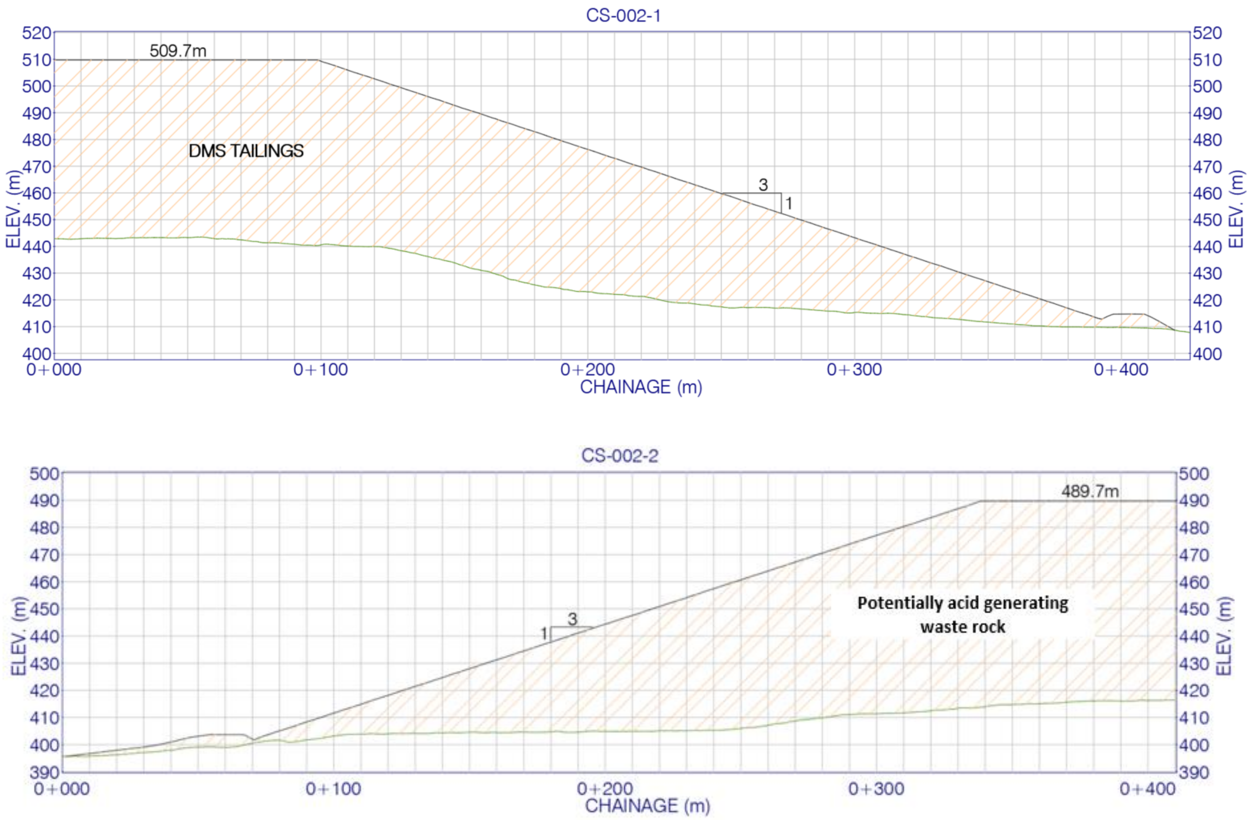



**Figure 18-11: Stockpile 002 (DMS tailings and waste rock)**
**From top to bottom: Cross-section 1, Cross-section 2**

The ongoing geotechnical investigation revealed that the overburden soil includes predominantly till material. At the footprint of Stockpiles 001 and 002, bedrock is shallow. The bedrock depth ranging from 0,6 m to around 2.5 m. Slope stability analyses were performed using the conceptual parameters assumed for the foundation soil, DMS tailings and middlings.

The parameters given in Table 18-5 were used to calculate slope stability. The shear strength parameters for DMS tailings and middlings were selected from available literature and considering conservative values for slope stability analysis. A geotechnical laboratory testing program is nevertheless mandatory to provide shear strength parameters for the site's different infrastructure.

**Table 18-5: Assumed material geotechnical parameters – Middlings and DMS tailings stockpiles**

| Description | γ (kN/m³) | C' (kPa) | Φ' (˚) | $K_{sat}$ (m/s) |
|---|---|---|---|---|
| Waste Rock | 22 | 0 | 37 | - |
| Middlings (reusable tailings) | 18 | 0 | 30 | - |
| Middlings (saturated) | 18 | 0 | 28 | - |
| Tailings | 20 | 0 | 32 | - |
| Tailings (saturated) | 20 | 0 | 30 | - |
| Till (dense) | 18 | 0 | 34 | - |
| Granular Material MG-56 | 22 | 0 | 38 | - |
| Sand/Silty Sand | 21 | 0 | 32 | - |
| Bedrock | - | - | - | - |

The preliminary results of the slope stability analysis are presented in Table 18-6. With the proposed configurations and optimizations, the safety factors obtained show that the stability of both retention structures meets the minimum required values from the *Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs* (MERN, 2022) and Directive 019 (MDDEP, 2012).

**Table 18-6: Factor of safety of the slope stability analysis – Middlings and tailings stockpiles**

| Stockpile | Slope | Section | Static Short/Long-term Criterion 1.3/1.5 | Pseudo-static Short-term Criterion = 1.1 |
|---|---|---|---|---|
| Stockpile 001 (middlings) | 3H:1V | Cross-section 1 | 2.0 | 1.9 |
| | | Cross-section 1 (berm) | 1.3 | 1.3 |
| | | Cross-section 3 | 1.8 | 1.7 |
| | | Cross-section 3 (berm) | 1.7 | 1.1 |
| | 2H:1V | Cross-section 2 (dike upstream) | 1.5 | 1.2 |
| | | Cross-section 3 (dike downstream) | 1.5 | 1.4 |
| Stockpile 002 (DMS tailings and waste rock) | 3H:1V | Cross-section 1 – Tailings | 1.5 | 1.4 |
| | | Cross-section 2 - Middlings | 1.7 | 1.6 |

### 18.2.15 Mine Waste Rock and Overburden Management

Among all sub-products of mining operation, waste rock and overburden materials will be generated over the 24-year LOM. Two waste rock stockpiles and two overburden stockpiles have been conceptualized. Stockpile construction will be continuous over the LOM. It is also considered that the underground will be used as a storage area for middlings. The PEA-level design includes:

- LOM overburden and waste rock storage areas;
- Related water management infrastructure.

The anticipated material production in 24 years LOM is evaluated as follows:

- Waste rock: 180 Mt;
- Non-leaching waste rock: 152 Mt;
- Potentially metal leaching waste rock: 28 Mt;
- Overburden: 16 Mt.

#### 18.2.15.1 General Design Considerations

The conceptual design performed considers information from different sources. The principal references for the conceptual design of waste rock and overburden management facilities are:

- Technical note – Environmental, social, and hydrological surveys (NIIGAAN, 2022);
- Available baseline data such as environmental constrains, sensitive and unique ecosystems, surface water bodies, property limits, Mineral Resources, and mining claims. This information was integrated into a geographic information system;
- Area LiDAR provided by Patriot and extracted from government websites.

Design assumptions were made, and they will need to be confirmed in the future stage of the Project. The following considerations have been identified:

- Overburden and waste rock extracted from the different mining phases are considered as dried material; therefore; materials will have the time to drain between excavation and placement at the stockpile. Mining equipment will transport material from the pit to the final disposal area.
- Stockpiles will be built in ascending lifts and adequate bench heights and widths will be maintained to achieve the overall design slope.
- Runoff from the non-leaching waste rock stockpiles footprint is to be managed by perimeter ditches and basins. From the basins, the water will be either released into the environment or pumped to the site-wide water treatment plant.

- Water from the potentially metal leaching waste rock pile will be collected in a separate basin and pumped to the water treatment plant.
- Runoff from the overburden stockpiles footprint is managed by perimeter ditches and will be directed to the mine pit by gravity.
- The magnitude of waste rock leaching potential is being evaluated by kinetic testing. More geochemical characterization and water quality modelling will be carried out during further project stages. For the PEA, it is assumed that mineralized material, and most of the waste rock and overburden stockpiles will not require geomembranes underneath the stockpiles, with the exception of one waste rock lithology (ultramafic), which represents 16% of the total waste rock, or 28 Mt. The only stockpile that considers the need of an area with a geomembrane over the foundation is Stockpile 002 and 25% of this area has been considered.
- Site water management infrastructure (ditches and basins) are conceptualized with engineered impervious features (geomembrane and protection layers).
- No geomembrane is considered over the final surface of the waste rock stockpiles. For cost estimation purposes, surfaces will be covered with overburden and topsoil before hydroseeding and tree planting. The cost associated with a geomembrane to cover the stockpiles has been identified as a Project risk.

### 18.2.15.2 Material Production and Characteristics

The mining plan indicates a ramp-up period from Year -1 to Year 3, and then production is expected to be relatively constant from Year 3 to Year 12, followed by a decrease in production until Year 24. Overburden is expected only at early stages of the Project, with a peak of 7 Mt at Year 1. The total expected tonnage is about 16 Mt.

The following assumptions were made for the preliminary volumetric analysis of the facilities:

- Waste rock stockpile with a minimum global slope of 2H:1V, with intermediate benches of 13 m in width and 10 m in height. An overall slope of 2.5H:1V has been used for the design to avoid re-sloping of the stockpile for closure.
- The grain size distributions are not established but assumed from literature and experience with different granular material grain sizes, typically 0-1,000 mm. The material is considered self-draining with no relevant moisture content.
- To provide conservative volumetric estimates, the assumed compacted in-place dry density of 2.0 t/m³ has been used for the waste rock. The resulting required facility capacity is 90 Mm³. Different stockpiles are required.
- For the overburden stockpiles, the assumed compacted in-place dry density is 2 t/m³. The resulting required capacity is 8.0 Mm³. A good fraction of this material is assumed to be reused as construction material for the early works of the Project.

Table 18-7 presents the yearly production as well as the cumulative produced tonnes and cubic metres for waste rock and overburden.

**Table 18-7: Waste rock production – Required capacity of storage areas**

| Period | Yearly Produced Waste Rock from OP and UG | Cumulative Produced Waste Rock | Waste Rock Volume to Stockpile 002 (cumulative) | Yearly Overburden Production | Overburden Cumulative Tonnage | Overburden Volume Stockpiles 004 and 005 (cumulative) |
|---|---|---|---|---|---|---|
| (year) | (Mt) | (Mt) | (Mm³) | (Mt) | (Mt) | (Mm³) |
| Pre-production | 2.7 | 2.7 | 1.4 | 7.1 | 7.1 | 3.5 |
| Y1 | 9.1 | 11.8 | 5.9 | 1.2 | 8.2 | 4.1 |
| Y2 | 11.4 | 23.3 | 11.6 | 1.4 | 9.6 | 4.8 |
| Y3 | 13.8 | 37.1 | 18.5 | 0.0 | 9.6 | 4.8 |
| Y4 | 12.6 | 49.7 | 24.8 | - | 9.6 | 4.8 |
| Y5 | 8.7 | 58.4 | 29.2 | 4.8 | 14.4 | 7.2 |
| Y6 | 12.7 | 71.1 | 35.5 | 1.6 | 16.1 | 8.0 |
| Y7 | 13.3 | 84.4 | 42.2 | 0.0 | 16.1 | 8.0 |
| Y8 | 14.3 | 98.6 | 49.3 | - | 16.1 | 8.0 |
| Y9 | 14.1 | 112.7 | 56.3 | - | 16.1 | 8.0 |
| Y10 | 14.5 | 127.1 | 63.6 | - | 16.1 | 8.0 |
| Y11 | 14.3 | 141.4 | 70.7 | - | 16.1 | 8.0 |
| Y12 | 6.8 | 148.2 | 74.1 | - | 16.1 | 8.0 |
| Y13 | 7.7 | 155.9 | 77.9 | - | 16.1 | 8.0 |
| Y14 | 7.6 | 163.5 | 81.8 | - | 16.1 | 8.0 |
| Y15 | 6.5 | 170.0 | 85.0 | - | 16.1 | 8.0 |
| Y16 | 4.3 | 174.3 | 87.1 | - | 16.1 | 8.0 |
| Y17 | 2.4 | 176.7 | 88.3 | - | 16.1 | 8.0 |
| Y18 | 1.9 | 178.6 | 89.3 | - | 16.1 | 8.0 |
| Y19 | 0.1 | 178.7 | 89.3 | - | 16.1 | 8.0 |
| Y20 | 0.2 | 178.9 | 89.4 | - | 16.1 | 8.0 |
| Y21 | 0.2 | 179.0 | 89.5 | - | 16.1 | 8.0 |
| Y22 | 0.1 | 179.1 | 89.6 | - | 16.1 | 8.0 |
| Y23 | 0.0 | 179.1 | 89.6 | - | 16.1 | 8.0 |
| Y24 | 0.0 | 179.1 | 89.6 | - | 16.1 | 8.0 |
| **Total** | **179.1** | **-** | **-** | **16.1** | **-** | **-** |

#### 18.2.15.3 Site Location for Waste Rock and Overburden Storage

Sites for waste rock and overburden storage were defined based mostly on availability and transport distance from the mine pit. A formal site selection process as per Environment Canada Guidelines was not undertaken at this PEA level. Different sites are identified:

- Stockpile 002 (east of the plant): Area dedicated for the storage of different materials. About 85% of the Stockpile 002 volume is dedicated for waste rock storage. This includes the 14% of the stockpiled volume that will be segregated for metal leaching waste rock from ultramafic lithology. The produced waste rock (100%) will be placed in this stockpile.
- Potentially metal leaching waste rock (material stored at the eastern area of Stockpile 002): From the entire Stockpile 002 footprint, 43 ha (19%) are dedicated to potentially metal leaching waste rock storage. Runoff from this area is managed by one basin and two ditches. This water is isolated from the rest of the stockpile. Once collected water will be pump to the treatment plant.
- Clean Waste Rock (material stored in the west area of Stockpile 002): From the entire Stockpile 002 footprint, 148 ha (66%) are dedicated to clean waste rock storage; Runoff from this area is managed by two sedimentation ponds and four ditches.
- Overburden stockpiles identified in the general layout are as follows:
  - Stockpile 004: Area located southwest of the Pit boundary – Years -1 to 1;
  - Stockpile 005: Area located southeast of the Pit-Phase-3 boundary – Years 2 to 7.

The selected sites offer the following characteristics:

- Official data from the Québec government indicates that soil on defined footprints is mostly composed of drumlins (probably composed mostly of glacial till) and undifferentiated till of variable thickness. In general, wetlands are very common over the footprints; the thickness of the organic layer remains unknow. For a portion of the footprint, it is assumed that bedrock could be near the terrain surface. Geotechnical investigations will be required over the identified footprints.
- Footprints are not located over natural streams, lakes, or inferred fish habitats. A buffer distance of at least 60 m is maintained between water bodies and storages areas. Environmental constraints and high-water line are to be defined in further Project study stages.
- Footprints are located far from the pit phase limits, over areas that do not appear to be encroaching on the trend of mineralized outcrops. This need to be confirmed at a later date with condemnation drilling.
- For all stockpiles, the topography of sites offers the possibility to achieve runoff drainage by gravity.

### 18.2.15.4 Waste Rock, Stockpiles and Related Infrastructure

Water management is achieved by enclosing the stockpile areas with perimeter ditches and directing water into water retention basins. Perimeter roads are required in different sections along drainage ditches. The water pumping lines will follow these roads.

The design of the waste rock and overburden storage areas is comprised of the following infrastructure:

- Waste rock: Total stockpiles footprint of 174 ha, within one area named Stockpile 002;
- Three water retention basins;
- A drainage network associated with each basin;
- Overburden: Total stockpiles footprint of 50 ha, with two separate areas:
  - Stockpile 004: With 25 ha of footprint, preparation of this area should start at early works. The related water management consisted in a drainage network of ditches that will discharge in the mine pit by gravity;
  - Stockpile 005: With 25 ha of footprint, preparation of this area should be before the development of the Pit-Phase-2 to final pit. The related water management consisted in a drainage network of ditches that will discharge in the mine pit by gravity.

Figure 18-12 presents the resulting arrangement of the proposed infrastructure.

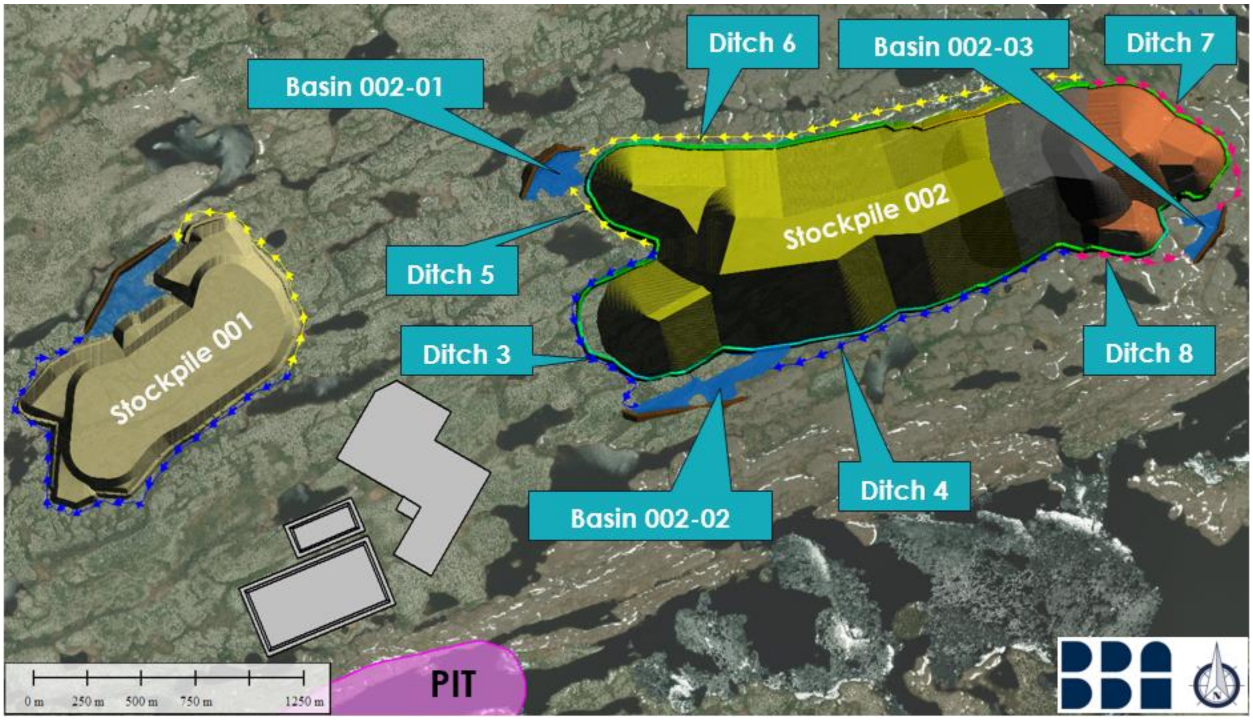



**Figure 18-12: Waste rock stockpiles location – Associated water management infrastructure**

Water retention is achieved by enclosing topography with perimeter dams. Water drainage is done by excavating the ditch network on natural ground. Infrastructure is to be built at different stages of the Project as presented in Table 18-8. Imperviousness features are required on water retention basins and ditches managing water from waste rock stockpiles.

**Table 18-8: Water management structures**

| Related Stockpile | Area Managed | RB ID | Required Storage Capacity ($Mm^3$) | Associated Ditch |
|---|---|---|---|---|
| **Stockpile 002** | Potentially metal leaching waste rock storage area, eastern portion of the stockpile | Basin 002-03 | 61,000 | Ditch 7 – 1.1 km |
| | | | | Ditch 8 – 0.7 km |
| | Clean Waste Rock storage area, western portion of the stockpile | Basin 002-02 | 129,000 | Ditch 3 – 1.3 km<br>Ditch 4 – 1.5 km |
| | | Basin 002-01 | 121,000 | Ditch 5 – 0.5 km<br>Ditch 6 – 2.4 km |

| Related Stockpile | Area Managed | RB ID | Required Storage Capacity (Mm³) | Associated Ditch |
|---|---|---|---|---|
| **Stockpile 004** | Overburden stockpile | Not required | | Ditch 13 - 0.89 km |
| | | | | Ditch 14 - 0.38 km |
| | | | | Ditch 15 - 0.13 km |
| | | | | Ditch 16 - 0.65 km |
| **Stockpile 005** | Overburden stockpile | Not required | | Ditch 17 - 1.23 km |
| | | | | Ditch 18 - 0.71 km |

Typical cross-sections for ditches, basins and dams associated with waste rock water management are presented in Figure 18-13 and Figure 18-14. The main characteristics of the required infrastructure are described as follows:

- Water retention dams: The cross-section consists primarily of structural fill, with an impervious LLDPE geomembrane on the upstream slope. A filtering feature is included below the geomembrane and continues over the entire dam foundation. The embankments fill is composed by locally sourced materials. A crest width of 10 m has been assumed for dams. Upstream and downstream slopes are established at 3H:1V. Both slopes are protected with riprap. Dam elevations are defined considering a 2-m freeboard measured between the modelled water level and dam crest.
- Water retention basin 002-03: The bottom of the area will also be lined; an impervious LLDPE geomembrane is considered. Protection layers below and over the geomembrane are included. Impervious works are also required over the slopes conformed in natural terrain.
- Water retention basins 002-01 and 002-02: No major civil works are proposed in the pond area of basins 002-01 and 002-02. Only tree cutting is considered.
- Ditches: A geomembrane is also included as a liner for drainage infrastructure. The cross--section is confirmed by soil excavation with a trapezoidal geometry, 2.5H:1V slopes, 1-m base width and depth of 1 m for 50% of the system, and 1.5 m for the other 50%. As an additional protection measure, geotextile and riprap are included. A 4-m service road is included upstream of the ditch cross-section.

For waste rock stockpiles water management, the typical cross-sections for ditches are like those presented in Figure 18-14. The Stockpile 002 foundation arrangement is presented in Figure 18-15.

MTOs are estimated assuming that the soil and rock used for backfilling are non-metal leaching and non-acid generating, and that quantities are sufficient either from the quarry source or the open pit waste rock.

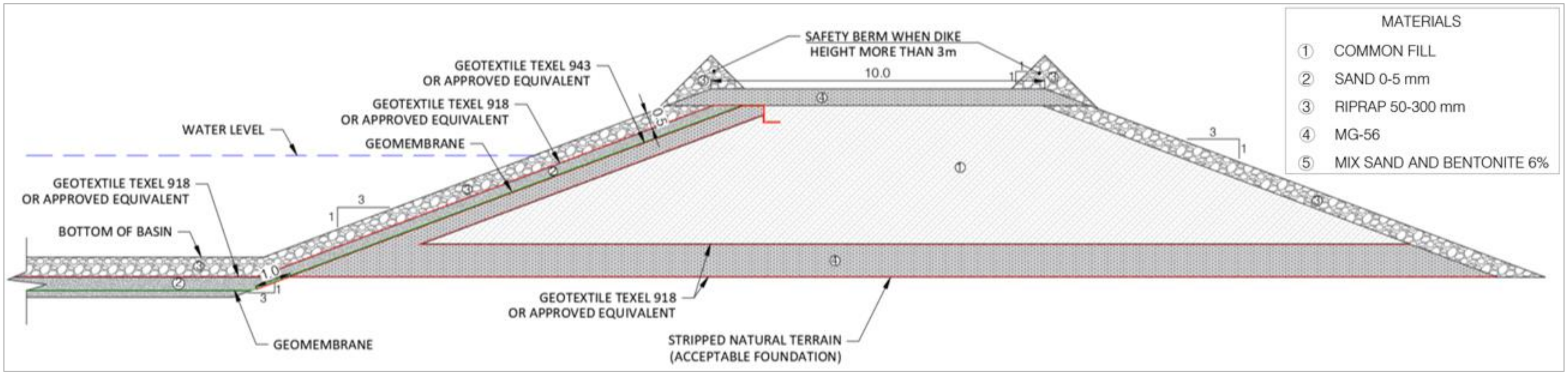



**Figure 18-13: Waste rock stockpile water retention basins**

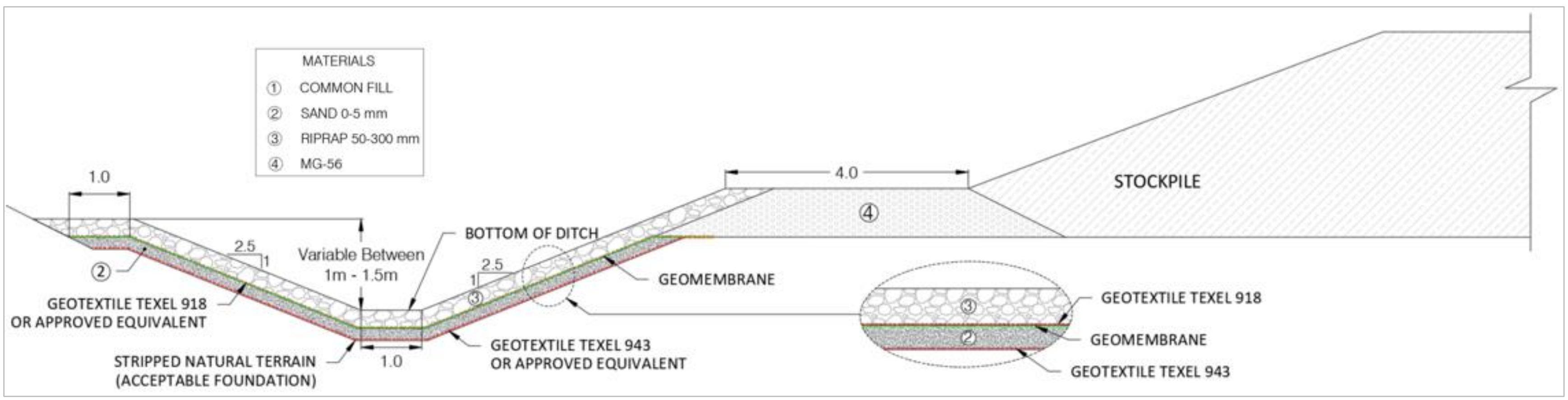



**Figure 18-14: Waste rock stockpile drainage network**

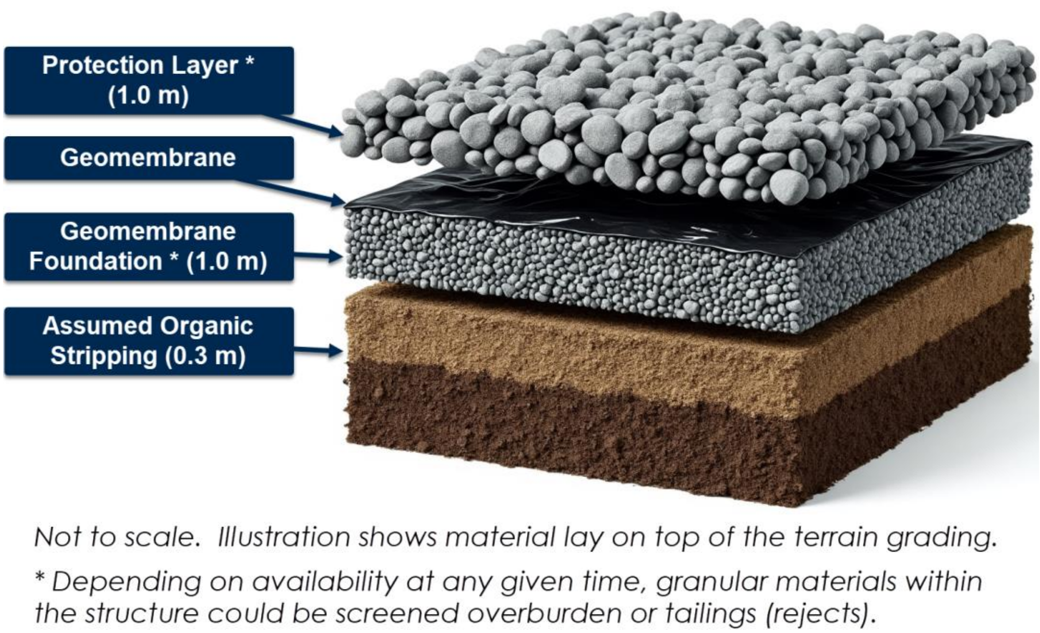



**Figure 18-15: Typical cross-section – Stockpile 002 foundation geomembrane structure**

### 18.2.15.5 Stability Analysis

Stability analysis has been performed in both static and pseudo-static conditions for critical sections at the waste rock stockpiles area (Figure 18-16).

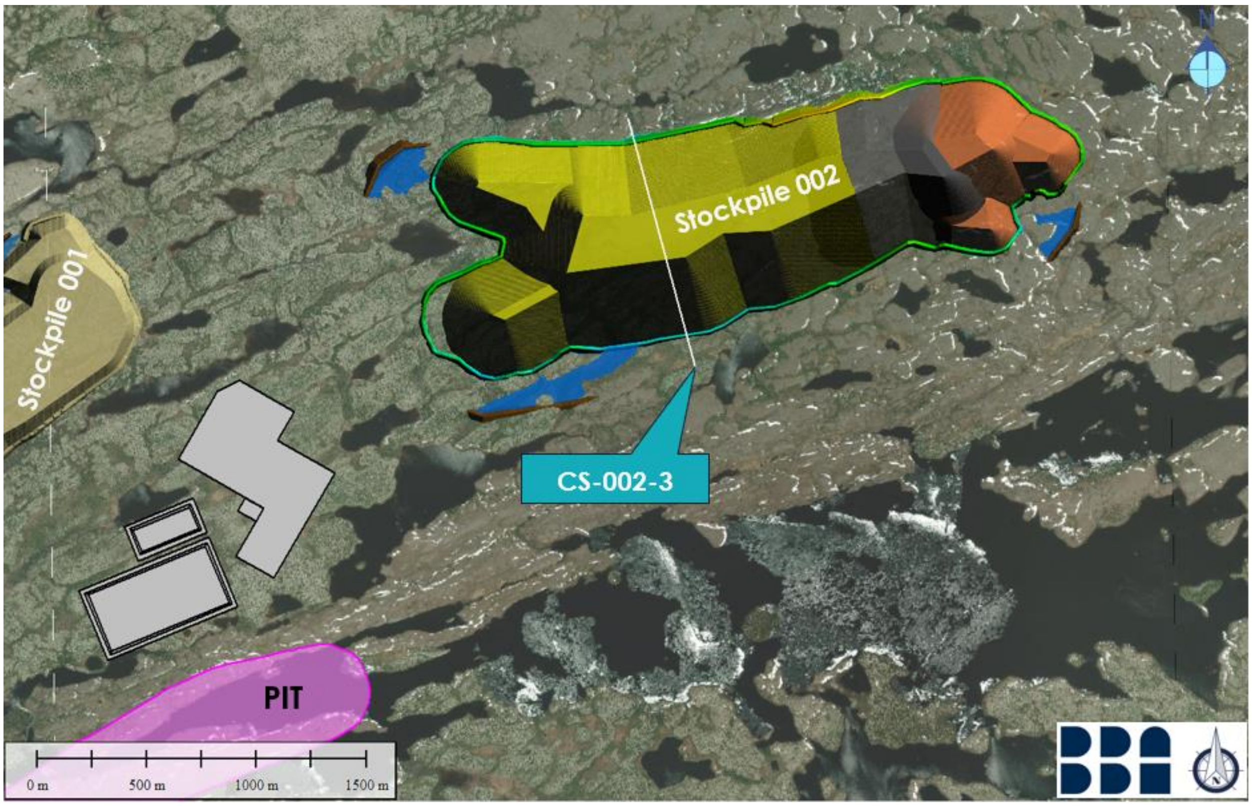



**Figure 18-16: Critical sections for slope stability analysis – Waste rock Stockpile 002 - Cross-section 3**

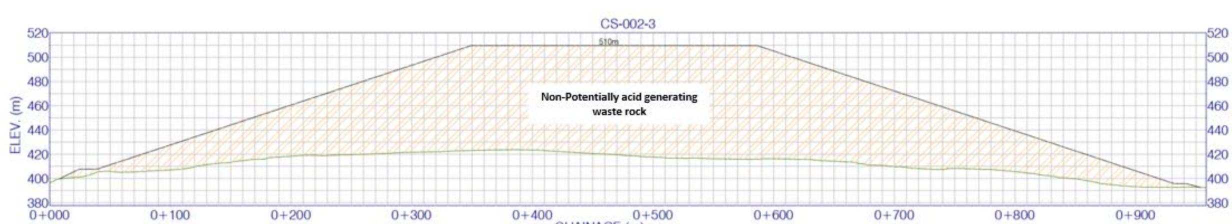



**Figure 18-17: Stockpile 002 – Waste rock Stockpile 002 - Cross-section 3**

Geotechnical data is not available within the footprints of the stockpiles. Exploration drills around the open pit revealed that the overburden soil includes predominantly till material. Slope stability analyses were performed using the conceptual parameters assumed for the foundation soil and for waste rock.

The parameters given in Table 18-6 were also used to calculate slope stability. The shear strength parameters for waste rock were selected from available literature and considering conservative values for slope stability analysis. A geotechnical investigation is nevertheless mandatory to provide more representative stratigraphy and shear strength parameters for the site's different infrastructure.

The preliminary results of the slope stability analysis are presented in Table 18-9. With the proposed configurations and optimizations, the safety factors obtained show that the stability of both retention structures meets the minimum required values from the *Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs* (MERN, 2022) and Directive 019 (MDDEP, 2012).

**Table 18-9: Factor of safety of the slope stability analysis – Waste rock stockpile**

| Stockpile | Slope | Section | Static Short/Long-term Required =1.3 to 1.5 | Pseudo-static Short/Long-term Required = 1.1 |
|---|---|---|---|---|
| Stockpile 002 | 3H:1V | Cross-section 3 - Waste rock | 1.9 | 1.8 |

### 18.2.16 Water Management Infrastructure

The contact water (water with possible contaminants) will be managed according to applicable laws and regulations as well as available best practices and best technologies. The provincial Directive 019 on the mining industry (MDDEP, 2012), the federal Metal and Diamond Mines Effluent Regulation (MDMER, 2024), the Guidelines of the Canadian Dam Association ("CDA") and the Guidelines of the Mining Association of Canada ("MAC") have been used for the design of the projected water management infrastructure. The preliminary design complies with the PEA cost level estimation.

All runoff water from projected infrastructure including roads, stockpiles, ROM pads, and the CV5 mine pit will be collected through ditches and retention basins.

- Water meeting discharge criteria will be directly released to the environment, in the vicinity of the ditches or collection basins.
- The water requiring treatment to meet discharge criteria will be pumped through pipelines up to the water treatment basin. The water will be pumped from the water treatment basin to the water treatment plant and then discharged into the final effluent at Lake 027.

Water meeting discharge criteria will be directly released to the environment, in the vicinity of the collection basin. Provisions will be made at each of the water collection basins to pump water to the water treatment plant if required. Excess treatment capacity has been considered, in this PEA, to handle any non-conforming water, which may need to be treated.

Figure 18-18 shows the water management infrastructure of the mine site.

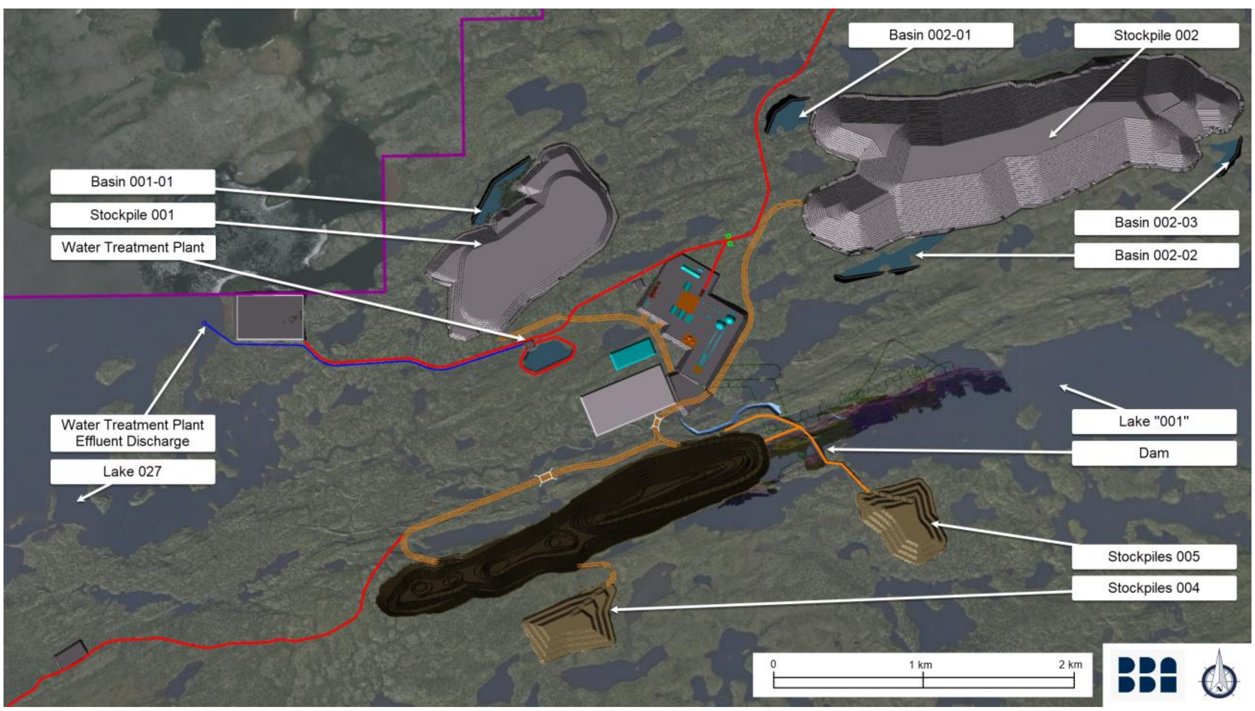



**Figure 18-18: Site layout and projected water management infrastructure**

The following surface water management infrastructure is required:

- Ditches along the overburden, middlings, waste rock and tailings stockpiles;
- One water retention basin for the middling stockpile (Stockpile 001);
- Two water retention basins for the waste rock and DMS stockpiles (002-01 and 002-02), and one water retention basin for the potentially metal leaching waste rock stockpile (002-03);
- One water treatment plant facility with a water treatment basin.

Part of the collected contact water will be made available for processing needs for the concentrator.

Water collected in potentially metal leaching waste rock pile's basin (002-03) will be pumped to the water treatment basin for proper treatment before being released into the environment. Water collected from the three stockpiles basins (001-01, 002-01 and 002-02) will be released into the environment.

The overburden pile will flow by gravity towards the open pit mine.

The water collected in the CV5 Open Pit mine and the CV5 UG mine will be pumped to the water treatment basin.

Figure 18-19 presents the block diagram of the water management infrastructure.

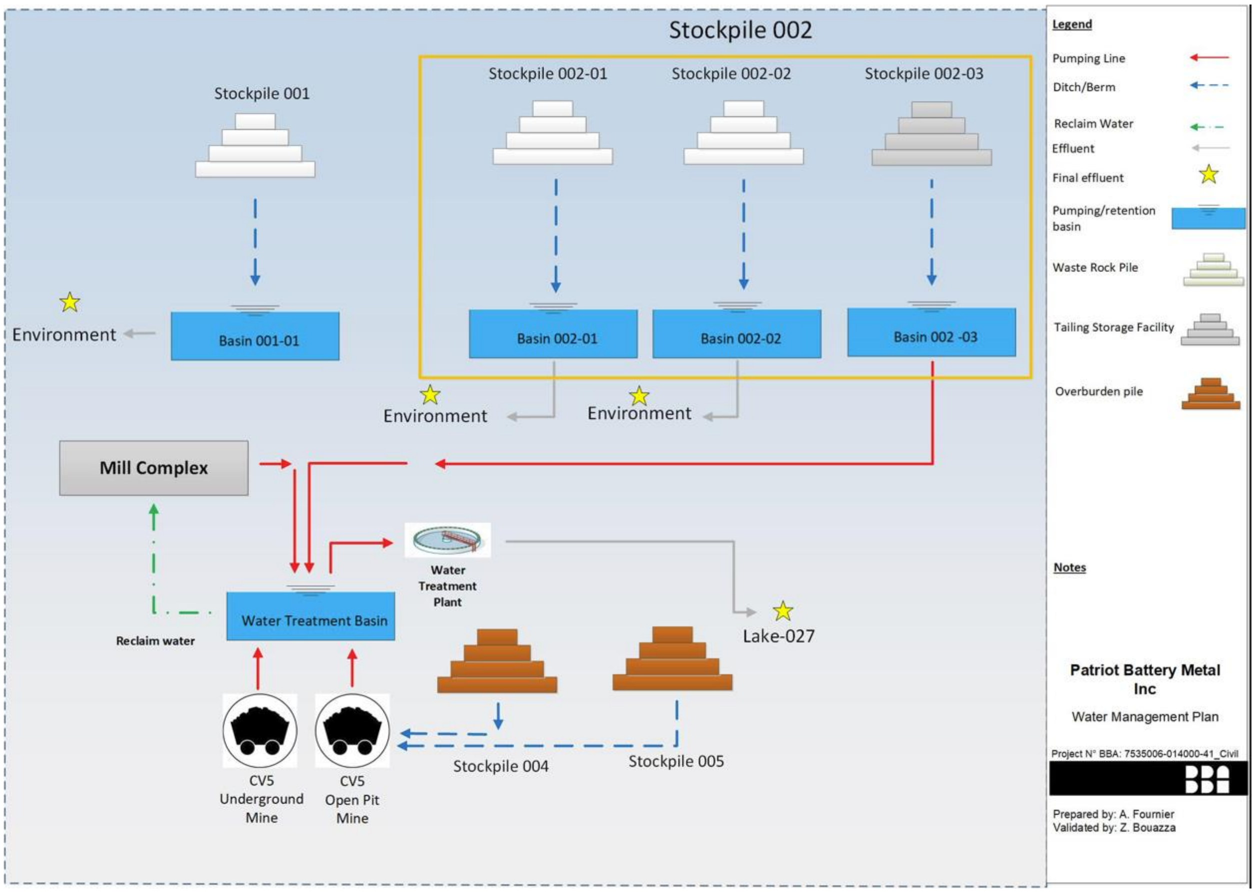



**Figure 18-19: Water management block diagram**

For this Project, the overall design criteria used is the 24 -hour rain with 1:2,000 years' recurrence combined with a 100-year snowmelt over a period of 30 days. Given that the middlings and DMS tailings stockpiles are considered non-leaching and non-acid generating material, the criterion for the rain is reduced to 1:1,000 years' recurrence. This was considered as the water collected from these stockpiles is not contaminated and is assumed to contain sediments only. It should be noted that Stockpiles 001 and 002 were initially assumed to be acid-generating and leachable. Their associated water collection basins were thus designed to store the 2,000-year rainfall. For this Report, the three stockpile basins (001-01, 002-01 and 002-02) were not resized. All the above criteria will be reviewed once geochemistry laboratory tests of waste materials are available. The assumed criteria are considered conservative and should be revisited at future project design stages.

Projected drained area and water volumes are given in Table 18-10. Water storage requirements for basins 001-01, 002-01 and 002-02 have considered a rate of treatment equivalent to the snow melt. As such, this is also the expected flow rate back to the environment or to the treatment plant, should it be required.

**Table 18-10: Retention structure sizing for the Shaakichiuwaanaan site**

| Infrastructure | Drained Area (ha) | Volume to be Managed ($m^3$) |
|---|---|---|
| Stockpile 001 and Basin 001-01 | 104.5 | 113,000 |
| Stockpile 002-01 and Basin 002-01 | 113.0 | 121,000 |
| Stockpile 002-02 and Basin 002-02 | 120.0 | 129,000 |
| Stockpile 002-03 and Basin 002-03 | 57.0 | 61,000 |

Given the above assumptions, available data, and design criteria, the required storage volumes for the mine site water management and associated infrastructure (dams, ditches, basin, and pumping systems) have been designed. The water balances for typical weather and climatic conditions (normal, dry and wet years) have been prepared. Refer to BBA's report (Bouazza, Mahdi, & Fournier, 2024) for additional information related to water management.

### 18.2.17 Water Diversion

The open pit development requires lake diversion infrastructure including dams and an outlet channel at Year 2. The current watershed area of Lake 001 is about 114 $km^2$. Ultimately, the Lake 001 watershed will be reduced to 102 $km^2$.

This infrastructure will maintain the water levels of Lake 001 at the current height (373 m) and will divert the water to one of the lakes located in the northern area of the open pit. The conceptualized infrastructure is presented in Figure 18-20.

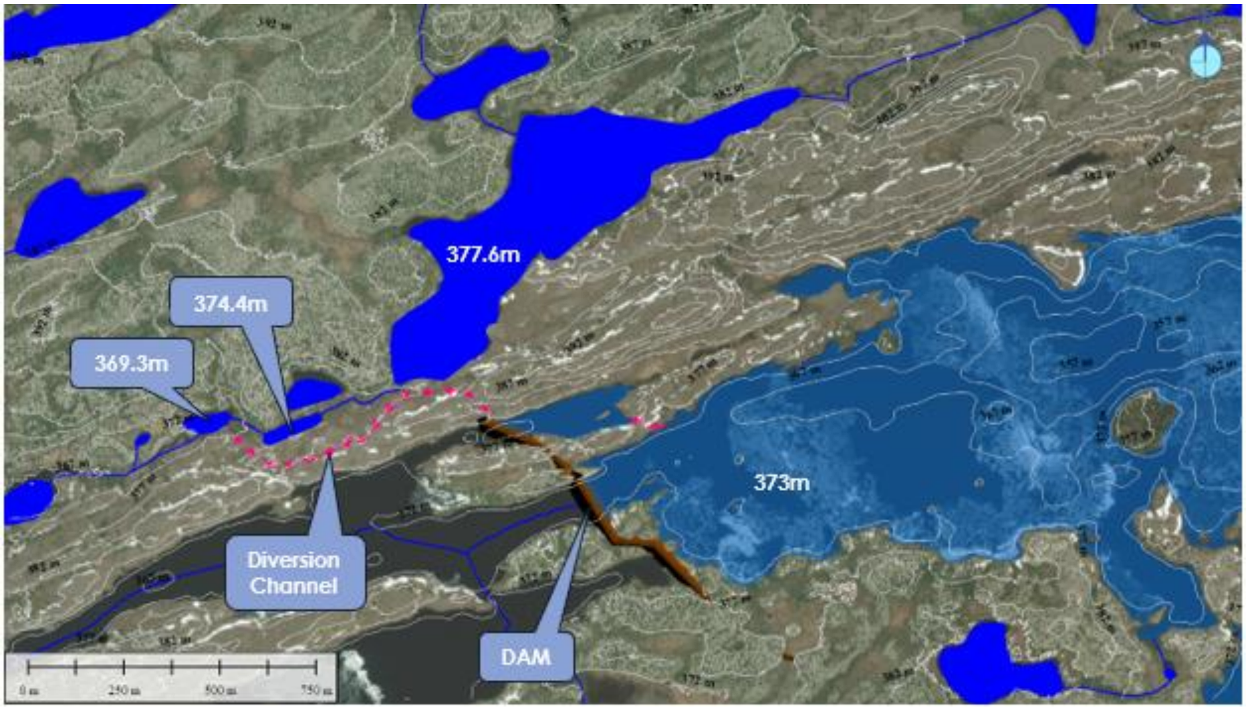



**Figure 18-20: Lake 001 water diversion option**

As part of the initial design, the water diversion spillway should be able to handle the conveyance of the Probable Maximum Flood ("PMF") issued from the Probable Maximum Precipitation ("PMP"). The deviation channel (from the spillway to the receiving lake water elev. 369.3 m) should have a similar geometry to the natural outlet of the lake. Based on the lake's bathymetry, and considering a conservative freeboard, the maximum height of the dam was estimated to be at an elevation of 377 m (this is ~7.0 m in height, from the deepest point of the lake 370 m), while the normal water level in the lake should be maintained at its current level of 373 m. This was taken into consideration to conceptualize the height of the dam. Natural lake elevation may vary over time, with such variation needing to be considered in future design.

The outlet diversion channel is conceptualized as a diversion channel as well as a sluiceway during extreme floods. The extreme high water level elevation during the PMF defines the dam elevation. The 4-m difference between the dam crest and current water level is assumed to be sufficient to ensure a minimum freeboard of 2 m when the highest water level in the lake is expected.

The outlet diversion channel is pre-designed to convey PMF discharge as the full capacity of the emergency spillway. The water level expected during the PMF define the minimum dam elevation. The 4-m difference between the dam crest and current water level is assumed to be sufficient to ensure a minimum freeboard of 2 m when the highest water level in the lake is reached. However, during extreme floods water can escape to the south or to the north through the existing lowest points along the Lake 001 watershed limit. This can be fixed at later engineering stages using some closure dikes.

The lake diversion dam is conceptualized with two main cross-sections: one for the dam below the water level (critical section), and the other for the dam above water, which are required to close the topography and ensure that lake flows only exit at the north outlet channel. For the pit dam, a portion of its length is proposed to be built on the lake, where bathymetry shows depths as high as 7 m. The following features are included (Figure 18-21):

- Coffer dam: The first step of the construction. Rockfill of different grain sizes (0-1,000 mm) is to be disposed from the edges of the lake towards the centre. Note that this material is considered as non-metal leaching and non-acid generating. The height of the coffer dam is about 4 m, with a crest of 20 m and slopes 1.5H:1V. Seepage through this dam is to be expected, but should be manageable through normal construction methods.
- Transition granular fill: To control expected seepage, a layer of crushed stone (0-20 mm) is to be installed on the downstream side of the coffer dam. The thickness of this layer varies from 5.8 m at the crest to 7.9 m at the base. The downstream slope is 2H:1V. Seepage is progressively reduced during this phase to facilitate the construction of subsequent phases, requiring a higher degree of compaction.
- Common fill: The final construction layer consists of mine-sourced till with grain sizes ranging from 0-100 mm. The material is to be installed downstream of the transition granular fill, with 7.1 m width at the crest and 27 m at the base. This material is to be protected by 1 m of waste rock.
- Sheet piles: To ensure the dam's imperviousness, at this stage, sheet piles are included, with the main purpose to mitigate potential seepage and internal erosion issues. The impervious screen is to be installed in sequences, in synchronization with the granular and common backfill operation.

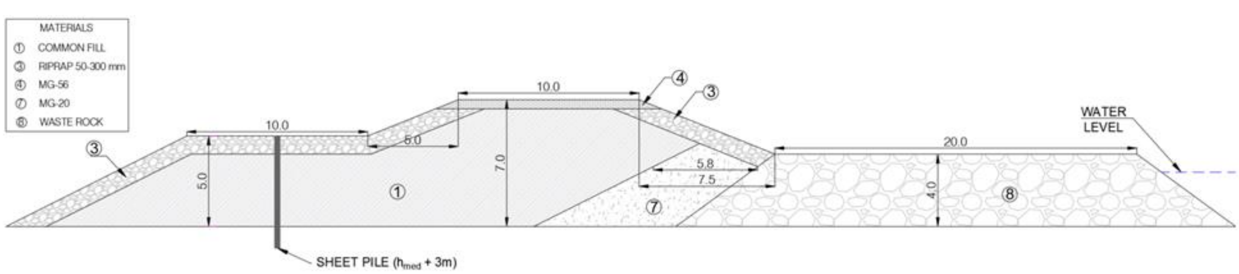



**Figure 18-21: Typical cross-section for diversion dam; critical phase**

#### 18.2.17.1 Seepage and Stability Analysis

Seepage analyses performed assumed a dam composed of different granular materials, as listed below:

- Phase 1: Only rock fill dam (0–1,000 mm);
- Phase 2: Rock fill dam (0–1,000 mm), with a 0–20-mm granular material layer at the downstream side;
- Phase 3: Rock fill dam (0–1,000 mm), with the 0–20-mm granular material as the transition layer, then 0–100-mm common fill at the downstream shell.

The soil hydraulic properties for the seepage analysis are presented in Table 18-11.

**Table 18-11: Hydraulic and mechanical properties for the material, seepage & slope stability analysis**

| Description | γ (kN/m³) | C' (kPa) | Φ' (˚) | $k_{sat}$ (m/s) | Model Type |
|---|---|---|---|---|---|
| Rock fill (0–1,000 mm) | 22 | 0 | 38 | $5\times10^{-4}$ | Saturated/unsaturated |
| Crushed stone (0–20 mm) | 19 | 0 | 32 | $1\times10^{-4}$ | Saturated/unsaturated |
| General fill (0–100 mm) | 19 | 0 | 34 | $1\times10^{-5}$ | Saturated/unsaturated |
| Foundation silt | 17 | 0 | 27 | $1\times10^{-7}$ | Saturated |

Table 18-12 presents the seepage obtained for the different scenarios.

**Table 18-12: Seepage analysis results**

| Phase | Downstream Water Flux Over 232 m Long Dike ($m^3/s$) |
|---|---|
| 1 | 0.017 |
| 2 | 0.007 |
| 3 | 0.0002 |

The slope stability analysis has been completed for the final configuration of the diversion dam. Table 18-13 presents the factor of safety obtained for the diversion dam in the critical phase.

**Table 18-13: Slope stability analysis results, diversion dams**

| Section | Static | Pseudo-static |
|---|---|---|
| Diversion dam-critical phase | 1.8 | 1.4 |

### 18.2.18 Water Treatment

#### 18.2.18.1 General

The following sections summarize the assumptions regarding contact water quantity, quality, and contaminant limits for the effluent water that will be returned into the environment.

#### 18.2.18.2 Contact Water Quantity

Contact water will be collected from numerous sources across the site with most collected water pumped to the water treatment basin. Water collected from Stockpile 001 and part of Stockpile 002 (Basin 002-01, and 002-02) expected to be contaminated with suspended solids will be stored in settling basins prior to be released to the environment. The water from Basin 002-003 is expected to be contaminated with metal leaching and will be conveyed to the water treatment plant. A portion of the water collected in the water treatment basin is pumped back to the concentrator plant facility as process water, with the excess being treated before being released into Lake 027.

Based on the development plan of the mine and pit, there are three periods to be taken into consideration with the corresponding treatment plant requirements. Hence, Table 18-14 provides an overview of these periods and capacity of the water treatment plant's needs. Note that these flows are based on a water management approach that can be optimized in further stages of the Project.

**Table 18-14: WTP design capacity through the years**

| Years | WTP Flowrate ($m^3/s$) | WTP Design Capacity ($m^3/s$) |
|---|---|---|
| 1 to 5 | 0.5 | 1.2 |
| 6 to 10 | 0.5 | 1.2 |
| 11 to 23 | 0.5 | 1.2 |

The water treatment system will treat contact water accumulated in the water treatment Basin. The system is expected to operate year-round, 24 hours/day and 7 days/week. Table 18-15 lists parameters of concern with their corresponding effluent limits. The treated effluent will be discharged into Lake 027, which is the nearest waterway with sufficient flow to ensure that treated water is adequately diluted and that there is no risk of localized accumulation of contaminants.

#### 18.2.18.3 Contact Water Quality and Effluent Water Limits

Assumptions regarding contact water quality are as follows:

- Metals and their anticipated concentrations are listed in Table 18-15.
- Based on some mining operations experience and the use of emulsion rather than ANFO, the concentration of ammonia in dewatering water is not expected to be an issue at the beginning of operations. A careful monitoring of the ammonia is required during the years of operations. However, if ANFO is used instead of emulsion, the water treatment plant system will need to be redesigned to treat higher ammonia content.

Based on these assumptions, the influent water quality is shown in Table 18-15.

The effluent limits into Lake 027 have been determined in accordance with Directive 019 and MDMER regulations, and are listed in Table 18-15.

**Table 18-15: Contact water quality and effluent water limits**

| Parameter | Unit | Assumed Contact Water Quality | Effluent Limits Based on MDMER (Discharge Targets to Lake 027) | Directive 019 - Mthly Avg Concentration | Directive 019 - Maximum Concentration |
|---|---|---|---|---|---|
| pH | S.U. | - | 6.0 - 9.5 | - | 6.0-9.5 |
| Total Suspended Solids(3) | mg/L | > 15 | 15 | 15 | 30 |
| Unionized Ammonia(2) | µg N/L | - | 500 | NS(1) | NS(1) |
| Arsenic(3) | µg/L | > 100 | 100 | 200 | 400 |
| Copper(2) | µg/L | - | 100 | 300 | 600 |
| Cyanide(2) | µg/L | - | 500 | 1,000 | 2,000 |
| Lead(2) | µg/L | - | 80 | 200 | 400 |
| Nickel(2) | µg/L | - | 250 | 500 | 1,000 |
| Zinc(2) | µg/L | - | 400 | 500 | 1,000 |
| Radium(2) | Bq/L | - | 0.37 | NS(1) | NS(1) |
| Hydrocarbons(2) ($C_{10}$-$C_{50}$) | µg/L | - | NS(1) | NS(1) | 2,000 |
| Acute Lethality Test – Rainbow Trout | ATU | - | ≤ 1 | ≤ 1 | ≤ 1 |
| Acute Lethality Test – Daphnia Magna | ATU | - | ≤ 1 | ≤ 1 | ≤ 1 |

(1) NS = No specified target in regulations.
(2) No specific treatment.
(3) Treated by the water treatment plant.

### 18.2.19 Water Treatment Plant Process – Contact Water

The values listed in Table 18-15 indicate that two primary contaminants to be treated are TSS and arsenic removal.

A clarifier will be required to reduce the TSS to less than the 15 mg/L limit. The use of a clarifier will provide additional benefits in that it will remove other contaminants; however, the removal of arsenic, primarily caused by metal leaching from the waste rock, will require the addition of an iron coprecipitation step prior to the effluent being introduced to the clarifier for solid/liquid separation.

An additional polishing step downstream of the clarifier will be required on an occasional basis, as per operating data to adjust pH and remove the remaining TSS.

The process flowsheet is provided in Figure 18-21 and is summarized below:

- Contact water will flow from the water treatment Basin into the arsenic reaction tank, where specific predetermined chemicals will be added to convert arsenic into settleable form. The tank will mix and homogenize the water before the next step.
- The conditioned wastewater will then flow into the next stage where additional chemicals will be added to co-precipitate arsenic with iron coagulant and increase the particles' weight with flocculant to improve the particles' settleability. This conditioned wastewater will flow into the stilling well of a circular mechanical clarifier where liquid-solid separation will take place.
- In the clarifier, the floc formed in the upstream steps will settle out to the bottom, where it will be conveyed by a scraper to a centred discharge point, from where the settled sludge will be removed for dewatering with filter presses and disposed of with potentially metal leaching waste rock Stockpile 002. It is assumed that the sludge quality from the water treatment system will not affect the Stockpile 002 operation. Filtrate liberated by the filter press dewatering process will be returned to the water treatment basin by gravity or by pumping. The clear supernatant produced by the settling process will exit the clarifier and flow into the downstream filtration step and pump tank.
- The clear supernatant will be filtered by a set of disc filters and flow to the pump tank. In the pump tank, the pH will be monitored and adjusted to ensure it is within regulatory limits. The treated water will be discharged into Lake 027.

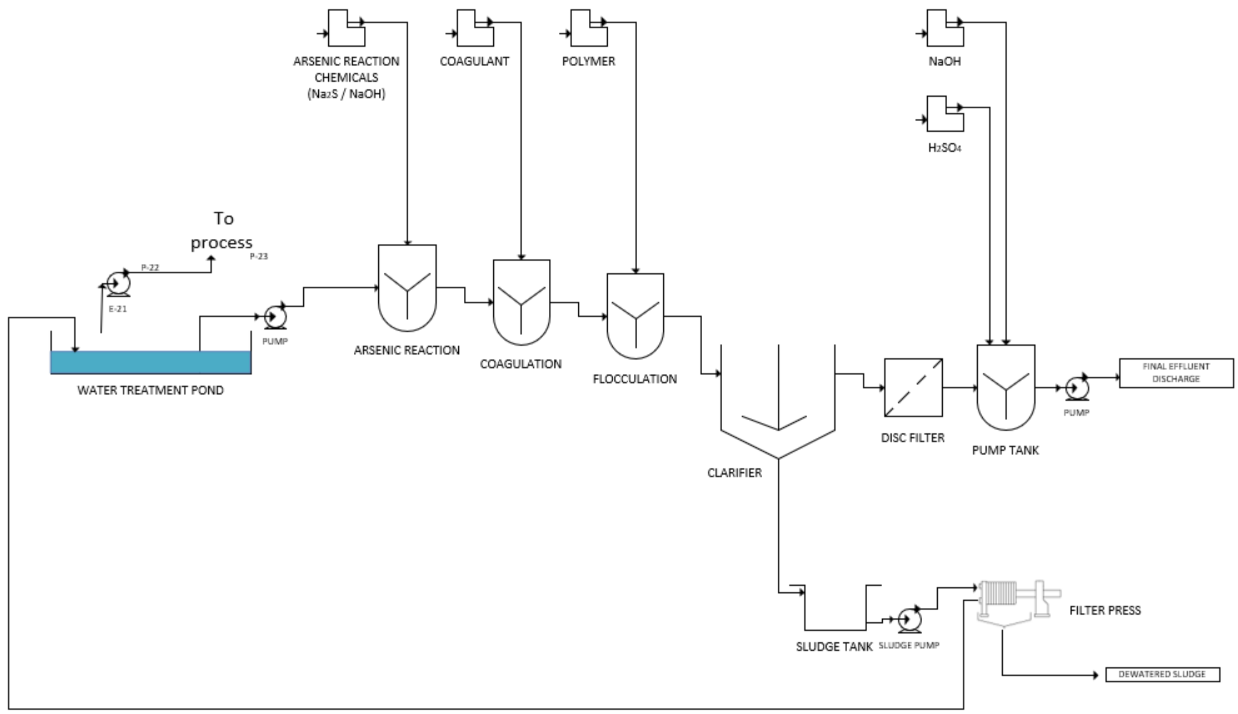



**Figure 18-22: Water treatment plant process - Contact water flowsheet**

The design of the water treatment plant is planned to be modular (or by train). Therefore, each module will have a capacity of 0.6 m³/s. The treatment plant has a total treatment capacity of 1.2 m³/s. Each module will be identical. One module will be required for treating the contact water. A second module is included to have enough capacity to treat water generated during melt events with return periods higher than 100 years. For purposes of Capex estimation both modules have been included in initial capital.

### 18.2.20 Water Treatment Plant – Opportunity

The water management system and treatment capacity were designed to handle underground water, contact water, and water collected from the open pit. If geochemical tests show acceptable results for groundwater quality especially, the design capacity of the water treatment plant could be optimized, hence lowering the Capex and Opex costs of the water treatment plant.

### 18.2.21 Power Line, Substations and Electrical Distribution

The main site electrical substation will be located at approximately 55 km south of the Hydro-Québec ("HQ") Tilly substation. At this location, there are two access points to the HQ network, namely:

- At 25 kV from the HQ distribution network near LG-4 complex airport;
- At 315 kV at the HQ Tilly substation, near LG-4 generating station.

A preliminary estimate evaluated the main site electrical power consumption to be 25.7 MW. Table 18-16 shows the breakdown of electricity consumption by sector.

**Table 18-16: Electricity consumption by sector**

| Description | Power Demand (kW) |
|---|---|
| General - Main Site | 3,32 |
| Mine and Stockpiles | 10,590 |
| Process - Concentrator - General | 10,929 |
| Other Services and Facilities - General | 500 |
| Other Services and Facilities - Water Treatment Plant and Diffuser | 360 |
| **Total** | **25,700 kW** |

Considering that:

- The capacity of HQ's current 25 kV power supply at the airport is not sufficient for the needs of the mining complex requiring a total capacity currently estimated at 25.7 MW;
- The transit capacity of a 25 kV line would not be sufficient for this power over the distance of the transmission line;
- The delays and costs of a 315 kV line would be excessive to supply a load as small as 25.7 MW at 315 kV.

The 315 kV access point has therefore been chosen to provide power to the main site. To do so, a 315-69 kV, 33/44 MVA substation will be built near the 735-315 kV Tilly substation at the LG-4 site to have a final 69 kV power supply at the mine site, where a 69-13.8 kV, 33/44 MVA substation will also be built, with a firm capacity of 30 MVA and more.

To interconnect these two substations, a 69 kV transmission line of 54 km in length on wooden poles will be built, along existing roads where possible.

Electrical distribution at the main site will be done by 13.8 kV overhead distribution lines.

The application for the required power allocation was submitted to Hydro-Québec in June 2023 and is currently under consideration by the Ministry of Economy, Innovation and Energy. Once the power allocation is approved, the selected options will be reviewed with Hydro-Québec and the feasibility of the proposed arrangement verified. In addition, the necessary environmental impact studies and the detailed line routing and land acquisition requirements will be developed.

Line route Option 1 (in green) is presented in Figure 18-23.

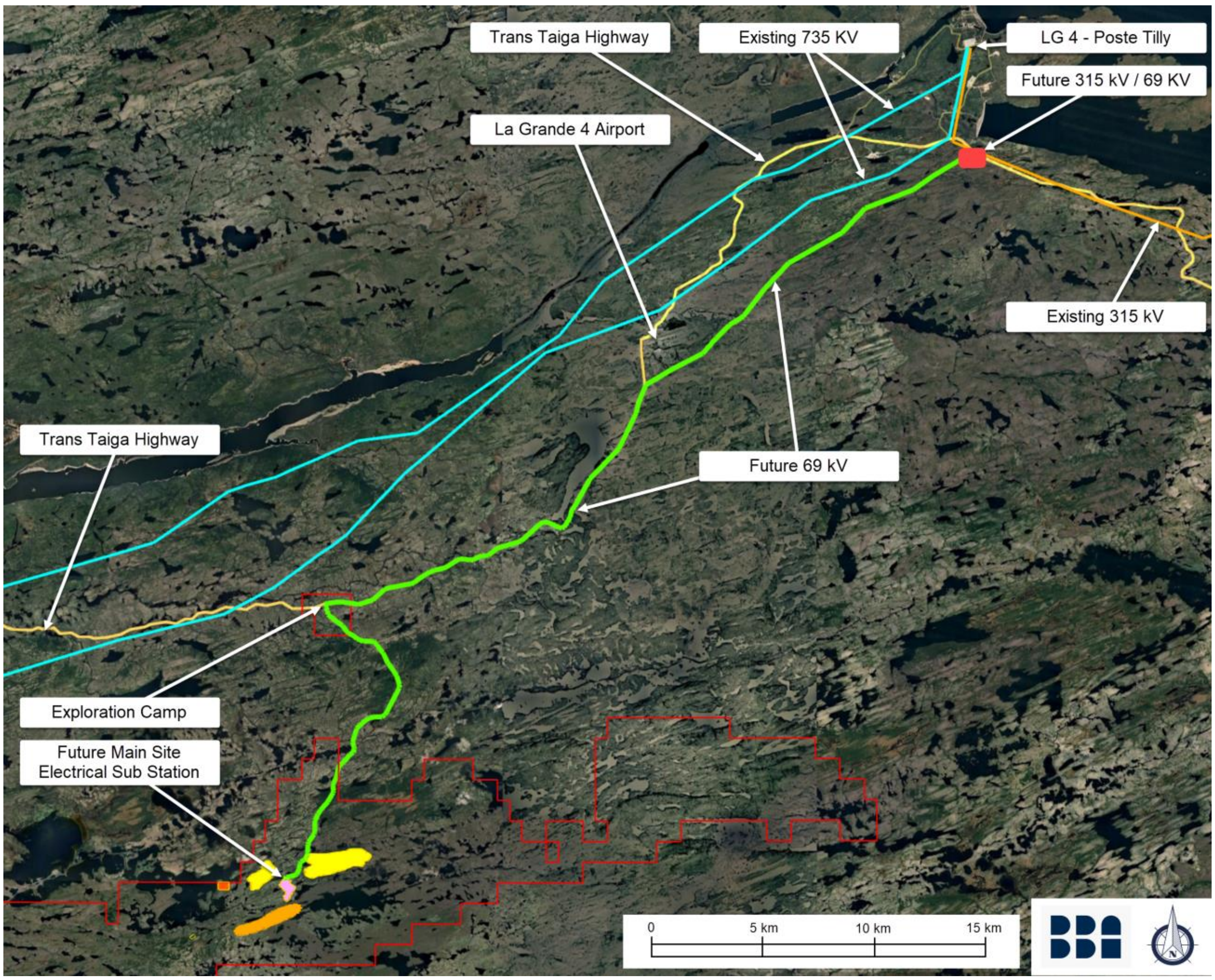



**Figure 18-23: Power line route option 1**

Single line diagrams illustrating the proposed interconnection substations are presented in Figure 18-24 and Figure 18-25.

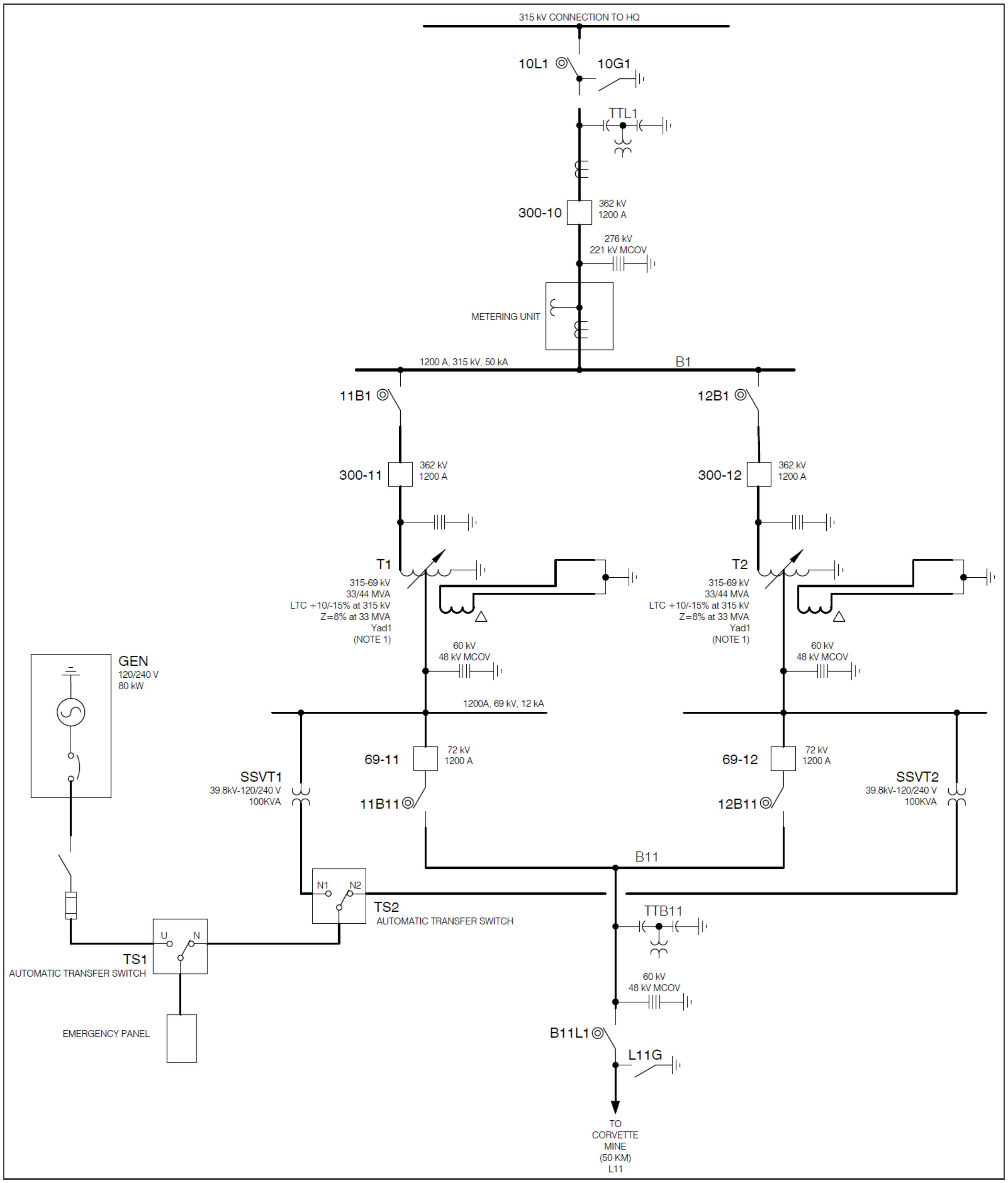



**Figure 18-24: Single line diagram – Interconnection substations**

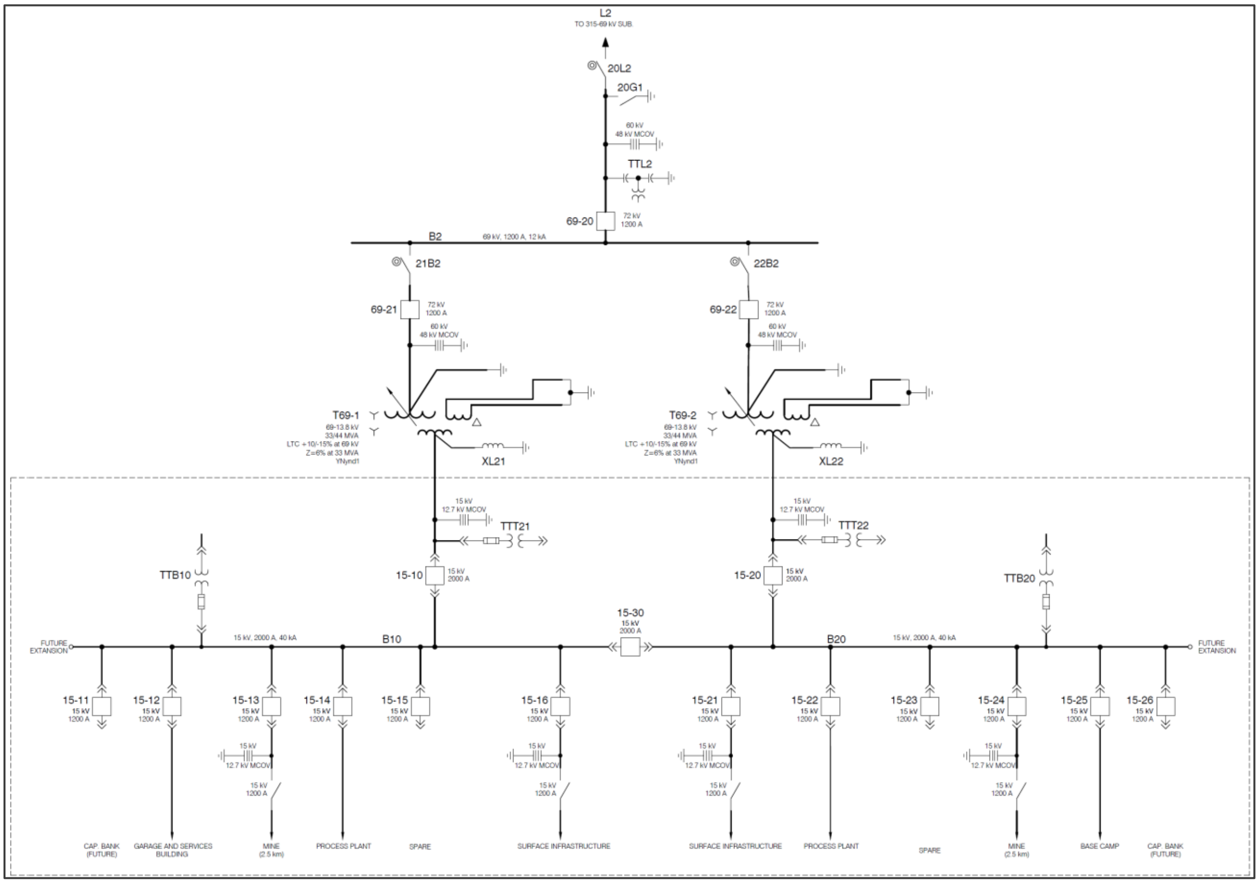



**Figure 18-25: Single line diagram – Interconnection substations**

## 18.3 Spodumene Concentrate Transportation

### 18.3.1 Highway Trucks and Trailers

Trucks and trailers will transport spodumene concentrate between the mine loadout area and the Matagami Transshipment Centre.

The MTC is approximately 834 km southwest of the mine loadout area.

Trucks will pull two-sided dumper trailers, providing a total payload capacity of 75 t (2 x 37.5 t). At full production, a fleet of 80 trucks will be required to transport approximately 2,300 tonnes of spodumene concentrate daily.

### 18.3.2 Railroad and Railcars

Trains with ~95-tonne capacity railcars will transport the spodumene concentrate railcars from the Matagami Transshipment Centre to Bécancour, QC, to be processed by a third party.

### 18.3.3 Matagami Transshipment Centre

Trucks will unload the spodumene concentrate on a concrete floor under a new prefabricated dome at the MTC.

Front-end loaders will manage the stockpile while loading railcars. The stockpile capacity is about 5 days of production (~11,500 t). The operation will be completed by a contractor under the supervision of the city of Matagami or its representative.

A new spur line will be built to accommodate the covered railcars, which will be delivered and picked up by the Canadian National Railway ("CN").

### 18.3.4 Train Discharge Station – Bécancour

Spodumene concentrate railcars will be emptied in Bécancour, QC, using a straddle excavator. Further storing and processing activities of the spodumene concentrate are not under Patriot's responsibility for this study.

# 19. Market Studies and Contracts

## 19.1 Lithium Market Overview

The lithium spodumene market continues to be complex, experiencing price volatility due to fluctuations in demand, evolving supply dynamics, and ongoing shifts in contract pricing mechanisms. However, a comprehensive analysis of recent market indicators, reference prices, and NI 43-101 technical reports and the June 2024 Banking Commodities Reports supports the justification of US$1,375/tonne as a representative benchmark price for spodumene concentrate [SC5.5%, Free on Board ("FOB") Bécancour basis] in Q3 2024.

## 19.2 Lithium Supply/Demand

**Supply:** Lithium raw material production (from varied sources and mineral species) is increasing as new projects come online and established producers expand, resulting in ample supply (Fastmarkets, 2024).

While there is sufficient chemical capacity supporting China's domestic consumption and export markets, refining capacity limitations in Western markets could impact the availability of battery-grade lithium products compliant with Western industry standards, like the *US Inflation Reduction Act* and *European Battery Passport* process.

There is growing concern about the geopolitical risk posed by the concentration of the lithium-ion battery supply chain in China.

**Demand:** Lithium demand remains strong, primarily driven by the EV sector, though growth has moderated since early 2023. Global EV sales growth reached 20% in H1 2024, with EV market share touching 17.8% in 2023, on track for 20% of all car sales in 2024 (combining BEV and PHEV passenger cars). Energy storage systems and consumer electronics continue to significantly contribute to overall demand. In fact, Energy Storage Systems ("ESS") will require more GWh installed capacity in 2025 than EV batteries did in 2020.

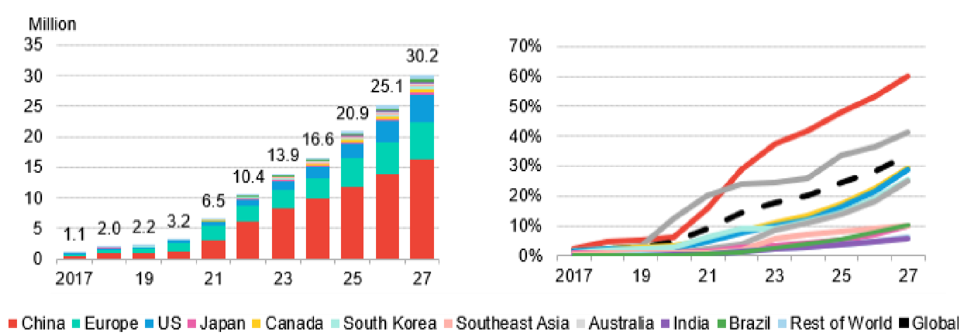



**Figure 19-1: Projected BEV and PHEV passenger car demand (Fastmarkets, 2024); (Rho Motion, 2024)Rho Motion, 2024; (Bloomberg, 2024)**

**Pricing Dynamics:** The market is shifting away from long-term contracts towards spot and short-term agreements, contributing to increased price volatility. Recent auction prices have fluctuated considerably, reflecting a changing market landscape, with some market sources suggesting a potential price floor is forming (S&P Global, 2024).

**Lithium Spodumene Concentrate Price Assumptions:**

- Spot Prices: Fastmarkets' assessment for spodumene concentrate (SC6%) CIF China was \$800–\$950/t on January 17, 2024, a significant decrease from the peak in early 2023. This decline is attributed to softening downstream chemical prices and ample lithium raw material supply (Fastmarkets, 2024).
- Contract Prices: Based on Benchmark Mineral Intelligence's latest assessment on July 10, 2024, the global weighted average price for lithium carbonate (min 99%) was \$12,210.62/t (Benchmark Mineral Intelligence, 2024). However, market sources anticipate spodumene prices to stabilize in the \$1,100–\$1,200/t range in Q3 (Benchmark Mineral Intelligence, 2024). Figure 19-2 shows the volatility of lithium prices over the last 3 years.

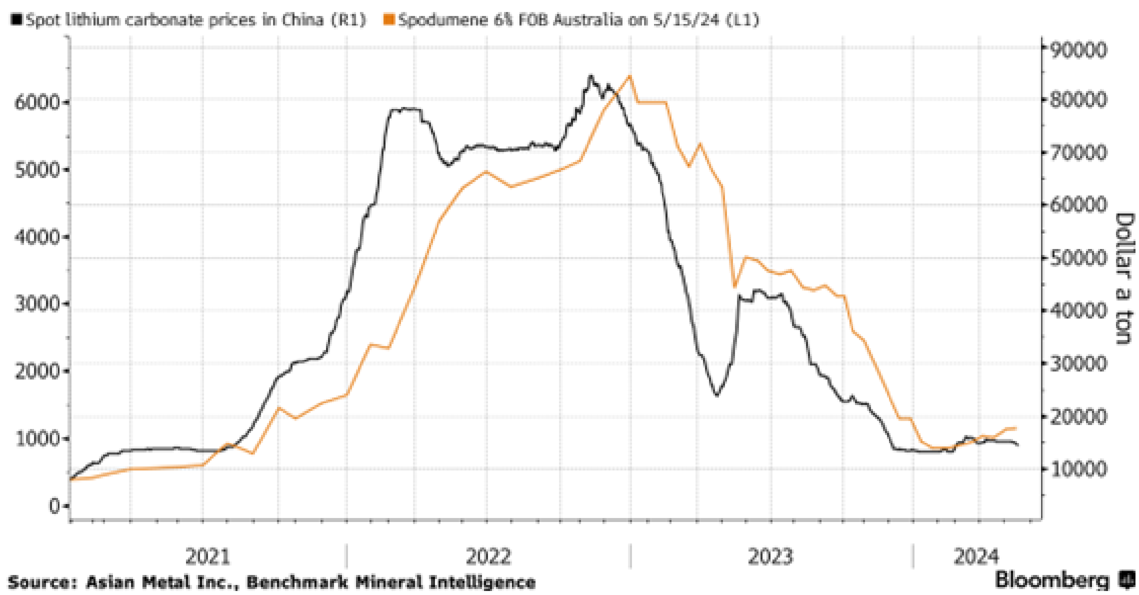



**Figure 19-2: Lithium carbonate and spodumene prices volatility (Bloomberg, 2024)**

- Recent NI 43-101 Reports & Press Releases: Several mining companies have recently published technical reports and press releases using a range of long-term spodumene price assumption. Table 19-1 presents spodumene price references (in US dollars per metric tonne), in the jurisdiction of Canada, obtained from recent NI 43-101 and JORC Code (2012) technical reports, company announcements, and banking commodity reports.

**Table 19-1: Spodumene price references in Canada**

| Project/Company Name | Report Type/ Source | Spodumene Concentrate % | Spodumene Price (US$/t) | Reference | Year | FOB vs. CIF China |
|---|---|---|---|---|---|---|
| James Bay Lithium Mine Project | Feasibility Study | 5.6% | 1,921 | Allkem Limited, James Bay Lithium Mine Project Feasibility Study, 2023 | 2023 | FOB (CA) |
| Georgia Lake Lithium Project | Pre-feasibility Study | 6% | 1,500 | Rock Tech Lithium, Georgia Lake Lithium Project Pre-feasibility Study, 2022 | 2022 | Not Mentioned |
| PAK Lithium Project | Feasibility Study | 6% | 1,350 | Frontier Lithium Inc., PAK Lithium Project Feasibility Study, 2023 | 2023 | FOB (Montreal) |
| Wabouchi Lithium Project | Feasibility Study | 5.5% | 2,381 | Nemaska Lithium Inc., Wabouchi Lithium Project Feasibility Study, 2023 | 2023 | FOB (Québec) |
| Rose Lithium-Tantalum Project | Feasibility Study | 5.56% (chemical grade) | 2,162 (chemical grade) | Critical Elements Lithium, Rose Lithium-Tantalum Project Feasibility Study, 2023 | 2023 | FOB (Québec) |
| Moblan Lithium Project | Definitive Feasibility Study | 6% | 1,190 | NI 43-101 Feasibility Study Report for the Moblan Lithium Project, Eeyou Istchee James Bay Territory, Québec, Canada | 2024 | FOB (Québec) |
| CIBC Commodities Consensus Forecast Summary (Monthly) | Analyst Report | 6% | 1,375 | CIBC Global Mining Group Analyst Consensus Commodity Price Forecasts May 31, 2024 | 2024 | CIF China |
| CIBC Commodities Consensus Forecast Summary (Long-term) | Analyst Report | 6% | 1,472 | CIBC Global Mining Group Analyst Consensus Commodity Price Forecasts May 31, 2024 | 2024 | CIF China |

Notes:

- Variability in Reporting: Not all companies explicitly disclose the exact spodumene price assumptions used in their studies. Some might use a range, a long-term average, or focus on different lithium products (e.g., lithium hydroxide).
- Spodumene concentrate prices vary depending on location reference. CIF China prices, which include shipping and insurance to China, are typically higher than FOB prices from other locations. Buyers should factor in these additional costs when comparing and making purchasing decisions
- Market Volatility: Spodumene prices are subject to significant volatility due to market forces, including supply and demand dynamics, geopolitical events, and technological advancements. The prices listed here are snapshots in time and may not reflect current market conditions.
- Concentrate Grade: The price of spodumene concentrate can vary depending on the lithium oxide ($Li_2O$) content. Table 19-1 above indicates the $Li_2O$ grade for each reference.

## 19.3 Benchmark Price Analysis

Based on the data presented, spodumene prices in recent technical reports, banking commodities analyst reports, and company disclosures cluster around $1,300–$1,500 per tonne for 5.5% spodumene concentrate. This suggests that a benchmark price within this range could be considered a fair representation of current market conditions. However, it is important to note that the price of spodumene can vary significantly based on the concentrate percentage and other factors.

## 19.4 Conclusion

The lithium spodumene market is characterized by dynamic pricing, shaped by a confluence of multifaceted factors. While price volatility is expected to persist, a benchmark price in the range of $1,300–$1,500 per tonne for 5.5% spodumene concentrate is justifiable based on the recent market.

Based on the spodumene price assessment, it is recommended that Patriot uses a long-term price outlook of US$1,375/tonne (SC5.5%, FOB Bécancour basis) (Table 19-2).

**Table 19-2: Spodumene concentrate price recommendation**

| Product | Price (US$/t) |
|---|---|
| Spodumene concentrate at 5.5% $Li_2O$ | 1,375 |

## 19.5 Contracts

No off-take agreement, memorandum of understanding, or future sales contract has been used on this Project.

# 20. Environmental Studies, Permitting, and Social or Community Impact

## 20.1 Environmental Setting

This chapter describes the main components of the current physical, biological, and human environments in the Project area. Data in this section is based on existing inventories and public databases. When necessary, further studies have been undertaken to provide the level of information required for the Environmental and Social Impact Assessment ("ESIA").

### 20.1.1 Physical Environment

#### 20.1.1.1 Physiography

Natural provinces are broad territories whose recognition is based on physiographic contrasts expressed by the nature and configuration of bedrock, relief, hydrography, and surface deposits. According to Québec's ecological reference framework, the Shaakichiuwaanaan Project area is in the natural province of the Grande Rivière Low Hills (Li, Ducruc, Côté, Bellavance, & Poisson, 2019). This natural province has low terrain with an undulating plain, which is succeeded inland by low hills. The geological bedrock consists mainly of tonalite and gneiss. Thin glacial deposits interspersed with rocky outcrops cover the hills (MELCCFP, 2023). The study area lies at an altitude between 260 m and 350 m above sea level (Séguin, Gagnon, Lepage, & Thomassin, 2022).

#### 20.1.1.2 Hydrology

The Project site is in the James and Hudson Bays drainage area (Region 09), the widest in Québec in terms of surface area.

Within this broad region that drains the inland waters of northwestern Québec to the west, the Project is in the heart of the Grande Rivière watershed (level 1). The Grande Rivière (or Rivière La Grande) runs for over 800 km, flowing from east to west, from its source on the Québec-Labrador border to its mouth in James Bay. Its watershed covers a vast area of over 200,000 km$^2$. In its natural state, this watershed was covering an area of 97,643 km$^2$, but the La Grande Complex Hydroelectric Project has resulted in a major detour of water into this watershed. Just south of the proposed Shaakichiuwaanaan Project area, the Pontois River watershed (level 2) drains an area of 19,142 km$^2$ westwards, and then joins the Grande Rivière watershed, some 50 km from the Project site. The boundary between these two watersheds is located approximately 1 km south of the proposed open pit.

Locally, the Shaakichiuwaanaan Project site is scattered with numerous bodies of water, some of which conflict with the infrastructure planned at this preliminary stage of the Project. This is particularly true in the case of Lake 001, which will be impacted by the establishment of the CV5 Open Pit. The subsequent design phases of the Project will aim, among other things, to minimize infrastructure encroachments into the water environment, in order to protect this resource as much as possible.

All inventories and studies required to document hydrology and water quality in the study area were initiated in 2022 and will continue until 2025 in order to provide the level of information required for the ESIA.

#### 20.1.1.3 Surficial Deposits and Hydrogeology

At the time of writing, only preliminary data from five boreholes in the area of the CV5 Deposit have been collected. The first hydrogeological study has been completed in the CV5 Deposit area and is described in further detail in Section 20.8. The information generated from the work to be carried out as part of the ESIA will be included in the ESIA report to be produced and submitted to the MELCCFP at a later date. All inventories and studies required to document surficial deposits and hydrogeology in the study area were initiated in 2023 and will continue until 2025 in order to provide the level of information required for the ESIA.

#### 20.1.1.4 Climate and Flora

The climate of the Grande Rivière Low Hills natural province, in which the study area is located, is characterized by cool summers and very cold winters (Environment Canada, 2023). The mean annual temperature is approximately -4 °C, with a summer mean of 8.5 °C and a winter mean of -16.5 °C. Average annual precipitation ranges from less than 600 mm to 800 mm.

The Project area is in the boreal vegetation zone, more specifically in the open boreal forest subzone, located between latitudes 52 N and 55 N (Gouvernment du Québec, 2023a). This subzone is characterized by low-density forests of black spruce with lichen beds. This area is also located in the Western subdomain of the spruce-lichen stands bioclimatic domain. Compared with the Eastern subdomain, the Western subdomain is characterized by a dry continental climate, where fire is more frequent, and relief is less pronounced.

The study area is in the Eastmain and Sakami rivers ecological region (No. 7d). The regional landscape unit is the *Lac de la Corvette* (No. 720) and the ecological district is Lac Nochet Low Hills (No. 720-008). According to the ecoforestry map available online (Gouvernment du Québec, 2023a), vegetation in the study area generally consists of lichen and moss spruce stands, with areas of lichen barrens. Since fires have been burning in the area for the past 20 years, several burned areas are present. Wetlands are mainly represented by minerotrophic and ombrotrophic bogs.

Surveys were completed in August 2023 by WSP to characterize the vegetation and wetlands and validate the presence of special-status species (see Section 20.1.2.8). The characterization results are only preliminary and will be included in the ESIA report to be produced and submitted to the MELCCFP at a later date. Also, all inventories and studies required to document and characterize vegetation in the study area will continue until 2025 in order to provide the level of information required for the ESIA.

### 20.1.2 Biological Environment

#### 20.1.2.1 Fish and Fish Habitat

The James Bay region is characterized by countless bodies of water and watercourses that are home to a variety of aquatic life (CRNTBJ, 2010). Fish habitat in the region is omnipresent and protected by federal and provincial legislation. Generally, fish habitat in Nord-du-Québec is of very high quality due to low levels of human disturbance. Fish populations in this region generally grow slower, live longer, and have lower density associated with lower ecosystem productivity compared to southern regions. According to the website of the Mirage Aventure outfitter (2023), located about 75 km from the study area, the fish generally caught are northern pike (*Esox lucius*), brook trout (*Salvelinus fontinalis*), lake trout (*Salvelinus namaycus*), and walleye (*Sander sp.*).

Fishing activities were carried out in 2022 and 2023 in the study area. Various fishing gear was used in addition to the environmental DNA collection method. A total of 10 species were captured or detected. These were northern pike, burbot (*Lota lota*), lake chub (*Couesius plumbus*), round whitefish (*Prosopium cylindraceum*), white sucker (*Catostomus commersonii*), longnose sucker (*Castostomus Catostomus*), pearl dace (*Margariscus margarita*), eastern blacknose dace (*Rhinichthys atrtalutus*), brook trout, and lake trout. None of these species has any special status (see Section 20.1.2.8).

During surveys, particular attention was paid to the delineation of fish habitat in all permanent and intermittent water bodies and streams. Under Canada's *Fisheries Act* and Québec's *Act Respecting the Conservation and Development of Wildlife*, any infrastructure encroaching on fish habitat and resulting in habitat loss must be compensated. As mentioned in Section 20.1.1.2, the current development plan encroaches on fish habitat in certain areas, especially at pit CV5, where diking of Lake 001 will result in direct fish habitat loss. Subsequent design phases of the Project will aim to minimize infrastructure encroachments into fish habitat.

Furthermore, all inventories and studies required to document and characterize aquatic fauna and fish habitat in the study area will continue until 2025 in order to provide the level of information required for the ESIA.

#### 20.1.2.2 Herpetofauna

According to the literature consulted, the study area is likely to be frequented by 10 species of herpetofauna (6 anurans, 3 urodeles, and 1 squamate), presented in Table 20-1. None of these species has any special status.

Surveys were carried out in the spring and summer of 2024 to provide a picture of the communities present in the study area and provide the level of information required for the ESIA.

**Table 20-1: List of herpetofauna species likely to frequent the study area**
**Source: (AARQ, 2023) & (CRNTBJ, 2010)**

| Order | English Name | Scientific Name |
|---|---|---|
| Anurans | American toad | *Anaxyrus americanus* |
| | Wood frog | *Lithobates sylvaticus* |
| | Mink frog | *Lithobates septentrionalis* |
| | Northern leopard frog | *Lithobates pipiens* |
| | Green frog | *Lithobates clamitans* |
| | Northern spring peeper | *Pseudacris crucifer* |
| Urodeles | Northern two-lined salamander | *Eurycea bislineata* |
| | Blue-spotted slamander | *Ambystoma laterale* |
| | Yellow-spotted salamander | *Ambystoma maculatum* |
| Squamates | Common garter snake | *Thamnophis sirtalis* |

### 20.1.2.3 Avian Fauna

According to CRNTBJ (2010), 238 bird species have been recorded in the Project region. Of these, many could be present in the study area. During the winter survey in March 2023, 12 species were inventoried, none of which had any special status (see Section 20.1.2.8). As for the nesting and migration periods, surveys have been scheduled to provide a picture of the communities that frequent the study area. Accordingly, all inventories and studies required to document and characterize avian fauna in the study area will continue until 2025 in order to provide the level of information required for the ESIA.

In terms of special status species, 12 species could potentially frequent the study area on an annual basis. These are the golden eagle (*Aquila chrysaetos*), the harlequin duck (*Histrionicus histrionicus*), the red crossbill percna subspecies (*Loxia curvirostra percna*), the common nighthawk (*Chordeiles minor*), the peregrine falcon anatum subspecies (*Falco peregrinus*), the Barrow's goldeneye (*Bucephala islandica*), the short-eared owl (*Asio flammeus*), the bank swallow (*Riparia riparia*), the olive-sided flycatcher (*Contopus cooperi*), the bald eagle (*Haliaeetus leucocephalus*), the rusty blackbird (*Euphagus carolinus*), and the yellow rail (*Coturnicops noveboracensis*) (see Section 20.1.2.8).

### 20.1.2.4 Bats

Based on known bat ranges and past surveys conducted in the Project region, the bat species potentially present in the study area are the big brown bat (*Eptesicus fuscus*), the little brown myotis (*Myotis lucifugus*), the northern myotis (*Myotis septentrionalis*), the hoary bat (*Lasiurus cinereus*), and the eastern red bat (*Lasiurus borealis*) (CRNTBJ, 2010). Of these species, only the big brown bat has no special status. The provincial and federal status of the various bat species is presented in Section 20.1.2.8. The wooded environments in the study area may be used by some species as maternity nests. Besides, wetlands and water bodies may be used for feeding and hydration.

Acoustic surveys (16 automated recording stations) were carried out in the study area from August 16 to October 7, 2023. These recordings have not been analyzed yet, therefore no results can be provided. In addition, the potential presence of maternity and hibernacula sites was field validated in 2023. Most of the surveyed maternity sites had low potential for use by bats. Hibernacula also showed low potential. All inventories required to document and characterize bats in the study area will continue until 2025 in order to provide the level of information required for the ESIA.

### 20.1.2.5 Small Mammals

Based on their ranges, the study area is likely to be frequented by 15 species of small mammals (Table 20-2). These include two special status species, which are the rock vole (*Microtus chrotorrhinus*) and the southern bog lemming (*Synaptomys cooperi*). Both of them are on the list of species likely to be designated as threatened or vulnerable (Gouvernement du Québec, 2023c).

Field surveys for small mammals were undertaken in 2023 and 747 specimens were captured. Identification will be done at a later date, and a complementary survey will be performed in 2024 to complete the data and provide the level of information required for the ESIA.

**Table 20-2: List of small mammals likely to frequent the study area**
**Source: (Desrosiers, Morin, & Jutras, 2002)**

| Order | English Name | Scientific Name |
|---|---|---|
| Rodents | Southern red-backed vole | *Myodes gapperi* |
| | Meadow vole | *Microtus pennsylvanicus* |
| | **Rock vole**[(1)] | *Microtus chrotorrhinus* |
| | Western heather vole | *Phenacomys intermedius* |
| | Deer mouse | *Peromyscus maniculatus* |
| | **Southern bog lemming**[(1)] | *Synaptomys cooperi* |
| | Northern bog lemming | *Synaptomys borealis* |
| | Woodland jumping mouse[(1)] | *Napaeozapus insignis* |
| | Meadow jumping mouse | *Zapus hudsonius* |
| | Ungava lemming | *Dicrostonyx hudsonius* |
| Insectivores | Cinereous shrew | *Sorex cinereus* |
| | American water shrew | *Sorex palustris* |
| | Arctic shrew | *Sorex arcticus* |
| | Hoy's pigmy shrew | *Sorex hoyi* |
| | Star-nosed mole | *Condylura cristata* |

[(1)] The study area is located north of the known distribution range of theses species.

Species in bold have a conservation status (see Section 20.1.2.8)

#### 20.1.2.6 Small Fauna and Fur-bearing Animals

According to CRNTBJ (2010), 25 species of small fauna and fur-bearing animals frequent the James Bay region. During surveys undertaken in March 2023, the presence of 10 species was confirmed. These are the red squirrel (*Tamiasciurus hudsonicus*), the northern flying squirrel (*Glaucomys sabrinus*), the snowshoe hare (*Lepus americanus*), the river otter (*Lontra canadensis*), the Canadian lynx (*Lynx canadensis*), the American marten (*Martes americana*), the black bear (*Ursus americanus*), the porcupine (*Erethizon dorsatum*), the red fox (*Vulpes vulpes*), and the American mink (*Neovison vison*). Tracks of weasel species and mustelid species were also observed. To date, no species of small fauna or furbearer with a special status, or evidence of the presence of such species, has been observed in the study area.

Moreover, all inventories required to document and characterize small fauna and fur-bearing animals in the study area will continue until 2025 in order to provide the level of information required for the ESIA.

#### 20.1.2.7 Large Fauna

The study area is likely to be frequented by moose (*Alces alces*), as well as two caribou ecotypes, naming the migratory caribou (*Rangifer tarandus caribou*), and the boreal caribou (*Rangifer tarandus caribou*). To validate the presence of these species, a literature review and field survey were conducted.

From January 24 to 26, 2023, an aerial survey of large wildlife was undertaken in the study area, covering a surface area of 1,470 km². The survey was carried out in the form of a series of manoeuvres at an average altitude of around 200 m and a speed of 100 km/h to 150 km/h. During the flights, the identification of trail networks and individuals was done by an experienced observer assisted by two observers at the rear of the aircraft. No caribou were observed during this survey.

On January 28, 2023, members of the local trapper's family participated in an aerial survey, focusing particularly on points where individuals had been found in the past. This information, combined with interviews with the local trapper's family, will inform the traditional knowledge section of the ESIA report.

As part of the work executed by the MELCCFP, 762 telemetric locations of migratory caribou have been recorded close to the Project. These were recorded between 2003 and 2015, and none were reported after this period. During an aerial survey conducted by the *Ministère des Forêts, de la Faune, et des Parcs* ("MFFP") in 2020 covering the study area, no migratory caribou observations were recorded. No boreal caribou were observed in the study area during the 2020 MFFP survey, and no telemetric locations were recorded.

For moose, a total of 27 individuals in 14 groups were counted during the January 2023 survey, corresponding to a very low abundance of 0.18 moose/10 km². Females accounted for 37% of the total, fawn for 22% and males for 41%. The presence of the species was also confirmed during a survey of trail networks undertaken in March 2023.

#### 20.1.2.8 Species at Risk

Several species with a special status are likely to frequent the study area. Local wildlife species with status in Canada, as defined by the *Species at Risk Act* ("SARA"), and in Québec, as defined by the *Act Respecting Threatened or Vulnerable Species*, are presented in Table 20-3. According to the database of the *Centre de données sur le patrimoine naturel du Québec* ("CDPNQ"), available via the interactive online map, no such plant or wildlife species are present within a 15 km radius of the Project (CDPNQ, 2023).

Regarding the special status for plant species, the "Potentiel" tool (Gouvernement du Québec, 2023d)was used to develop a preliminary list of threatened plant species potentially present in the Nord-du-Québec administrative region. This list contains 55 vascular plants potentially present in the study area and will be refined later according to the habitats. No special status plant species were observed during the surveys carried out by WSP in August 2023.

**Table 20-3: Special status wildlife species potentially present in the Project area**

| Class | English Name | Scientific Name | Status | | |
|---|---|---|---|---|---|
| | | | LEMVQ(1) | COSEWIC(2) | SARA(3) |
| Avian Fauna | Golden eagle | *Aquila chrysaetos* | V | – | – |
| | Harlequin duck | *Histrionicus* | V | SC | SC |
| | Red crossbill *percna* subspecies | *Loxia curvirostra percna* | – | T | T |
| | Common nighthawk | *Chordeiles minor* | LDTV | SC | SC |
| | Peregrine falcon anatum/tundrius | *Falco peregrinus* | V | – | – |
| | Barrow's goldeneye | *Bucephala islandica* | V | SC | SC |
| | Short-eared owl | *Asio flammeus* | LDTV | SC | T |
| | Bank swallow | *Riparia* | – | T | T |
| | Olive-sided flycatcher | *Contopus cooperi* | LDTV | SC | SC |
| | Bald eagle | *Haliaeetus leucocephalus* | V | – | – |
| | Rusty blackbird | *Euphagus carolinus* | LDTV | SC | SC |
| | Yellow rail | *Coturnicops noveboracensis* | T | SC | SC |

| Class | English Name | Scientific Name | Status | | |
|---|---|---|---|---|---|
| | | | LEMVQ[(1)] | COSEWIC[(2)] | SARA[(3)] |
| Bats | Little brown myotis | *Myotis lucifugus* | T | E | E |
| | Northern myotis | *Myotis septentrionalis* | T | E | E |
| | Hoary bat | *Lasiurus cinereus* | LDTV | E | – |
| | Eastern red bat | *Lasiurus borealis* | V | E | – |
| Small Mammals | Rock vale | *Microtus chrotorrhinus* | LDTV | – | – |
| | Southern bog lemming | *Synaptomys cooperi* | LDTV | – | – |
| Small Fauna and Fur Animals | Least weasel | *Mustela nivalis* | LDTV | – | – |
| | Wolverine | *Gulo* | T | SC | SC |
| Large Fauna | Boreal caribou | *Rangifer tarandus caribou* | T | T | T |

Status: **E:** Endangered; **LDTV:** Likely to be designated threatened or vulnerable specie; **SC:** Special concern; **T:** Threatened; **V:** Vulnerable.

(1) *Liste des espèces désignées menacées ou vulnérables au Québec* (« LEMVQ »). *Gouvernement du Québec* (2023c).

(2) Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2023).

(3) *Species at Risk Act* (SARA). Government of Canada (2023).

## 20.2 Jurisdiction, Applicable Laws and Regulations

### 20.2.1 Provincial Laws and Regulations

Schedule 1 of Section 22 of the James Bay and Northern Québec Agreement contains a list of projects subject to the environmental and social impact assessment ("ESIA") and review process described in Division III of Chapter II of Title II of the *Environment Quality Act* ("EQA"; c. Q-2). Schedule A of the EQA repeats this list and refines it to make it operational. The Shaakichiuwaanaan Project, as a mining project on the territory of the JBNQA, is designated by paragraph a) of Schedule A of the EQA:

- *all mining developments, including the additions to, alterations or modifications of existing mining developments.*

The Preliminary Information Statement was submitted to the MELCCFP in November 2023. On April 5, 2024, the MELCCFP confirmed that the Project was subject to the environmental and social impact assessment procedure and issued a directive for the completion of the impact study.

### 20.2.2 Federal Laws and Regulations

The Schedule of the Physical Activities Regulations (SOR/2019-285) describing the Project in whole or in part is as follows:

- 18(c): The construction, operation, decommissioning and abandonment of a new metal mine, other than a rare earth element mine, placer mine or uranium mine, with an ore production capacity of 5,000 t/day or more.
- 18(d): The construction, operation, decommissioning and abandonment of a new metal mill, other than a uranium mill, with an ore input capacity of 5,000 t/day or more.

Preliminary analysis of the Project suggests that it is subject to the Impact Assessment examination procedure. However, the Impact Assessment Agency of Canada ("IAAC") will have to decide whether the designated project will be subject to an impact assessment if it is likely to have significant environmental effects on the components referred to in subsection 7(1), which are the following:

- Fish and fish habitat as defined in subsection 2(1) of the *Fisheries Act*;
- Aquatic species as defined in subsection 2(1) of the *Species at Risk Act*;
- Migratory bird as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*;
- Any other environmental component listed in Schedule 3 of the *Impact Assessment Act* (no components currently identified in this schedule as of October 14, 2023);
- Changes to the environment on federal and cross-border territory;
- The impacts in Canada of changes affecting Indigenous peoples on health and socioeconomic matters, on natural and cultural heritage, on the current use of lands and resources for traditional purposes, and on a construction, site or thing of historical, archeological, paleontological or architectural significance.

Is it noteworthy that in October 2023, the Supreme Court of Canada stated that the *Impact Assessment Act* is unconstitutional in some regards for examination of various types of projects, including mining projects. On June 20, 2024, the *Budget Implementation Act, 2024*, received Royal Assent and brought into force amendments to the *Impact Assessment Act* ("IAA"). These changes were made in response to the Supreme Court of Canada's decision on the constitutionality of the IAA. It is not yet known how these changes will affect the scope of the federal environmental assessment that may be required for this Project. Discussions with the IAAC are ongoing and the IAAC website is being monitored to identify any new procedures, policy and guidance documents that reflect these changes.

## 20.3 Environmental Permitting

Table 20-4 presents the most significant acts, regulations, directives and guidelines that apply to the Project. This list is non-exhaustive and is based on information known so far. Their applicability will have to be reviewed as the Project components are further defined.

**Table 20-4: Provincial and federal list of permits**

| 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. 17.1) |
| 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 the environmental and social impact assessment and review procedure applicable to the territory of James Bay and Northern Québec (Q-2, r. 25) |
| Regulation respecting the 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 landfilling and incineration of residual materials (Q-2, r. 19) |
| Regulation respecting used tire storage (Q-2, r. 20) |
| 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) |
| Regulation respecting compensation for adverse effects on wetlands and bodies of water (Q-2, r. 9.1) |
| 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 quality of the atmosphere (Q-2, r. 38) |
| 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) |

| Acts and Regulations |
|---|
| ***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) |
| ***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) |

| Acts and Regulations |
|---|
| ***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) |
| ***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) |

Table 20-5 presents a non-exhaustive list of required approvals, authorizations, permits or licenses based on the known components of the Project and typical activities related to mining projects.

**Table 20-5: Preliminary and non-exhaustive list of permitting requirements**

| Activities | Type of request | Authority |
|---|---|---|
| Closure plan | Approval | MRNF |
| Mining operations | Lease | MRNF |
| Mine waste management facilities and processing plant location | Approval | MRNF |
| Mine waste management facilities | Lease | MRNF |
| Infrastructure implantation on public land | Lease | MRNF |
| Construction and operation of an industrial establishment, the use of an industrial process and an increase in the production of property or services | Authorization | MELCCFP |
| Withdrawal of water, including related work and works | Authorization | MELCCFP |
| Establishment of potable, wastewater and mine water management and treatment facilities | Authorization | MELCCFP |
| Work, structures or other interventions carried out in wetlands and bodies of water | Authorization | MELCCFP |

| Activities | Type of request | Authority |
|---|---|---|
| Installation and operation of any other apparatus or equipment designed to treat water to prevent, abate or stop the release of contaminants into the environment | Authorization | MELCCFP |
| Installation and operation of an apparatus or equipment designed to prevent, abate or stop the release of contaminants into the atmosphere | Authorization | MELCCFP |
| Industrial depollution attestation | Attestation | MELCCFP |
| Carry out an activity likely to modify a wildlife habitat | Authorization | MELCCFP |
| Operation of a borrow pit | Authorization | MELCCFP |
| Harvest wood on public land where a mining right is exercised | Authorization | MRNF |
| Build or improve a multi-use road | Authorization | MRNF |
| Use of high-risk petroleum equipment | Permits | RBQ |
| Construction | Permits | RCM |
| Construct, place, alter, rebuild, remove or decommission a work in, on, over, under, through or across any navigable water | Approval | Transport Canada |
| Harmful alteration, disruption or destruction of fish habitat | Authorization | DFO |
| Explosives possession, magazine and transportation | Permit | SQ |
| Explosives transportation | Permit | NRCan |
| Use of nuclear substances and radiation devices | Licence | CNSC |
| Notice and Environmental Emergency Plan | - | ECCC |

## 20.4 Ore, Waste Rock and Tailings Management

A description of minerals, waste rock and tailings management is provided in Section 18.2. The geochemistry of the various materials is provided in Section 20.7.

## 20.5 Site-wide Water Management

Site-wide water management is provided in Section 18.2.

## 20.6 Baseline Hydrogeology

Hydrogeological information comes mainly from existing data and maps as well as field investigations carried out as part of the baseline hydrogeological study. Preliminary field work was carried out to determine the hydrogeological conditions of the rock aquifer in the sector of the CV5 Deposit. Exploratory drilling was carried out and observation wells were installed around the future CV5 Open Pit. Groundwater levels were measured and permeability tests were carried out in the observation wells and exploratory drilling.

Two groundwater sampling campaigns were carried out in six observation wells. The samples collected were analyzed in laboratory for the parameters recommended in Directive 019 (MDDEP, 2012). Sampling was carried out according to the MELCCFP sampling procedure.

Overburden over the study area is discontinuous and varies in thickness from 0 m to 20 m. It is composed of undifferentiated till and melt-out, or ablation till (glacial diamicton whose exact formation processes could not be determined). Lacustrine sediments are typically found at the bottom of waterbodies.

Bedrock is primarily composed of Amphibolite derived from basalt of Mesoarchean age and porphyritic granodiorites with potash feldspar phenocrysts of Neoarchean age. Bedrock unit is exposed at the surface at several locations over the study area.

Groundwater levels measured in the rock aquifer vary between 0.1 m and 4 m deep from the ground surface. Water levels depths ranging between 6 m and 8 m were also observed in observation wells installed on high elevations. The permeability values obtained following the slug test done in boreholes vary between $1x10^{-6}$ and $1x10^{-9}$ m/s. The single and double packer tests resulted in hydraulic conductivity values between $1x10^{-6}$ and $1x10^{-7}$ for the first 100 m of the bedrock and lower than $10^{-8}$ m/s for lower horizons.

The geological and hydrogeological data available for the study area were used to develop a three-dimensional groundwater numerical model. The calibrated model was used to predict the volume of groundwater captured during the dewatering activities and to estimate the extent of drawdown over the study area. Preliminary pit dewatering rates were evaluated for the three periods of mine operation (0–5, 5–10 and 10–15 years). Table 20-6 presents the estimated dewatering rates. Additional work, such as long-term pumping test in the pit footprint with monitoring the drawdown in existing boreholes and packer testing, is still required to better characterize the permeability profile within the bedrock unit. The data from the additional work will be used in the future studies to refine the hydrogeological model currently being produced.

**Table 20-6: Preliminary dewatering rates for open pit and underground mine CV5**

| Mine Operation Periods (year) | Open Pit ($m^3$/d) | Underground Mine ($m^3$/d) | Total Dewatering Rate ($m^3$/d) |
|---|---|---|---|
| 0–5 | 2,251 | 5,225 | 7,476 |
| 5–10 | 1,593 | 6,329 | 7,922 |
| 10–15 | 938 | 7,292 | 8,230 |

Results from the six groundwater samples taken in the observation wells located in the sector of the CV5 Open Pit showed concentrations respecting the MELCCFP criteria (drinking water and surface water resurgence) for the majority of the parameters analyzed. However, concentrations of arsenic and manganese exceeding the drinking water criteria were detected in some samples.

## 20.7 Geochemistry

### 20.7.1 Static Testing

Static testing has been carried out on 74 waste rock samples, eight mineralized material samples and two DMS tailings samples (84 samples total). For waste rock, numbers of samples reflect the relative importance of the various lithologies: amphibolite (30 samples), metasediment (25 samples), barren pegmatite (13 samples) and ultramafic (6 samples).

Regarding Acid Rock Drainage ("ARD"), 20 waste rock samples showed ARD potential as per the Guidelines on characterization of ore and mining residues (MELCCFP, 2023) (previously MELCC, 2020). ARD potential was especially important for metasediment (54.2% of the samples). Mineralized material and DMS tailings samples did not show ARD potential.

Leaching tests carried out with the SPLP and CTEU-9 procedures showed that waste rock samples were classified as leachable according to MELCCFP Guidelines. Twenty-eight waste rock samples were deemed leachable for arsenic according to the CTEU-9 leaching test. However, only four samples were classified as leachable according to the SPLP (Synthetic Precipitation Leaching Procedure) leaching test.

Nineteen waste rock samples (25.7%) were classified as leachable for copper according to the CTEU-9 procedure. However, only nine samples (12.2%) were classified as leaching following the SPLP test. Inversely, eight waste rock samples (10.8%) were classified as leachable for zinc according to the SPLP procedure and only two samples (2.7%) were classified as leaching following the CTEU-9 test.

Moreover, the majority of waste rock samples and mineralized material samples were deemed leachable for aluminum according to both CTEU-9 and SPLP leaching tests. Two ultramafic samples were also classified as high risk according to the TCLP leaching test (arsenic concentration).

Results from the static testing are presented in a report prepared by BBA and Vision Geochemistry Ltd. (Thomassin, Y.; Rey, N.; Sullivan, N., 2024a).

### 20.7.2 Kinetic Testing

Kinetic testing for waste rock was carried out on 13 humidity cells (six amphibolite, three ultramafic, two metasediment and two barren pegmatite). After 61 weeks, all humidity cell test results showed very low sulphate concentrations and therefore no ARD potential. Most metals showed low concentrations, with the exception of arsenic.

For all humidity cells, arsenic concentrations decreased from week 1 to week 61. At week 61, arsenic concentrations exceeded the MELCCFP resurgence in surface water criteria (0.34 mg/L) for two ultramafic samples and exceeded the Metal and Diamond Mines Effluent Regulation ("MDMER") limit (0.1 mg/L) for two ultramafic samples and one amphibolite sample. However, arsenic concentrations remained low for seven amphibolite samples, two metasediment samples, and two barren pegmatite samples.

Results from humidity cells' kinetic testing carried out on two mineralized material samples and two Dense Media Separation ("DMS") samples showed that those materials presented no ARD or Metal Leaching ("ML") potential.

Results from the first 40 weeks of kinetic testing have been presented in a geochemical report by BBA/Vision Geochemistry Ltd. (Thomassin, Y.; Rey, N.; Sullivan, N., 2024a).

Modelling of arsenic concentrations in runoff from the waste rock piles was carried out and a report prepared by BBA and Vision Geochemistry Ltd. was issued in July 2024 (Thomassin, Rey, & Sullivan, 2024b). Modelling was done using pile characteristics, hydrological and hydrogeological data, as well as  geochemical data. Average arsenic leaching rates measured in HCT for week 30 to week 40 were used, It should be noted that average arsenic leaching rates have decreased by a third between week 40 and week 61 and therefore the results from the modelling are conservative.

Modelling has shown that storage of all types of waste rock in the same stockpiles could result in arsenic concentrations in percolation water exceeding the MELCCFP resurgence in surface water criteria. Segregation of ultramafic waste rocks is therefore recommended.

## 20.8 Rehabilitation and Closure Planning

Closure and rehabilitation planning will take place in collaboration with our community partners. The main goals of closure and rehabilitation activities will be the following:

- Eliminate unacceptable health hazards and ensure public safety;
- Limit the production and spread of contaminants that could damage the receiving environment;

- Eliminate long term maintenance and monitor requirements;
- Return the site to a condition that is visually acceptable;
- Return infrastructure areas to a state that is compatible with future use.

### 20.8.1 Mine Site

The main measures for restoring the mine site will include:

- Carrying out a breach of the dam following the end of the pumping activities in the pit, at an elevation of around 373 m, which will transform the pit into a body of water;
- Hydroseeding or allowing natural revegetation of the pit perimeter;
- Building a raised trench or rock barrier to prevent access to the pit;
- Naturalization and revegetation of the Project footprint in accordance with regulations and community consultation;
- Levelling the overburden storage areas followed by naturalization and revegetation efforts;
- Demolishing and removing all buildings and other surface infrastructure;
- Levelling the process plant, paste backfill plant and camp areas, followed by naturalization efforts;
- Managing the materials generated during dismantling of the facilities, by applying the principles of reduction, reuse, recycling and reclamation and, if necessary, disposing of materials at authorized sites, according to the level of contamination;
- Conducting a land characterization study to identify the presence of contaminants with concentrations in excess of regulatory values and taking the necessary measures, in compliance with the provisions of the *Environment Quality Act,* and the Land Protection and Rehabilitation Regulation;
- Scarifying the roads built as part of the mining activities and restoring the natural drainage patterns;
- Dismantling the industrial wastewater treatment installations when they are deemed no longer necessary and dismantling all related installations (removal of pumps, pipelines, etc.);
- Creation of a breach in the water management basins, levelling the dams followed by naturalization and revegetation efforts;
- Restoring the hydrological drainage to passive flows when appropriate.

The tallyman's family has indicated a desire for the power line to remain intact, should the Project proceed. However, dismantling the power line and removing the posts, and revegetating the power line corridor have been included in the closure costs of the Project.

Progressive restoration works will be carried out during the mining operations in areas that are no longer active as a means of verifying the success of larger scale efforts that will take place during the mine closure phase.

The implementation of an environmental monitoring program will demonstrate that the restoration works have achieved their goals.

### 20.8.2 Transhipment Station

At the Matagami transhipment site, installations (rails, yards and storage buildings) dedicated to the Project will be owned and operated by the Town of Matagami and therefore, closure of these facilities will be their perogative and may remain in place for other users in the future. No cost has been included for closure.

### 20.8.3 Cost Estimation and Financial Guarantee

The total cost of reclamation (and the guarantee) is estimated at $71.3M. 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. A detailed cost estimate will be developed throughout the closure planning process in accordance with the Guidelines for Preparing Mine Closure Plans in Québec.

A financial bond corresponding to the total anticipated cost of completing all the work set forth in the rehabilitation and restoration plan will be provided to the Minister of Finance of Québec as required by the regulations.

## 20.9 GHG Emissions

Greenhouse gas emissions for the Project were estimated on the basis of available preliminary engineering data. At this stage of the Project, emissions were estimated for the construction and operations phases only. Total construction-related emissions are estimated at 95 kt $CO_2$ eq, mainly due to site clearing.

Annual emissions associated with operations are estimated at approximately 100 kt $CO_2$ eq (average of full production Years 4–19). The main contributors are the mining fleet, processing plant and concentrate transportation.

## 20.10 Community Relations

### 20.10.1 Consultation Activities

#### 20.10.1.1 Consultation Process

As part of the design of the Project, Patriot organized information sessions, beginning in 2022 and intensifying throughout 2023 and 2024. Recognizing the importance of involving Indigenous groups; local communities and authorities; interest groups; and land users in the design, planning and development of the Project, the main objective of these sessions was to contextualize the Project within its environment and gather preliminary concerns, recommendations, and interests from stakeholders.

It should be noted that in summer 2023, Patriot started the ECOLOGO UL 2723 certification program for mining exploration companies. The purpose of this certification is to audit exploration companies and their service providers to ensure the application of best social, environmental, and economic practices. Patriot expects to complete the audit process in 2024. The consultation and mobilization program aims to meet the following objectives:

- Encourage transparent, proactive, and effective communication between Patriot, host communities and all Project stakeholders.
- Increase the sharing of information about the Project and ensure adequate accountability for associated activities.
- Gather information related to the land use, culture, and traditions of local and Indigenous communities affected by the Project.
- Identify the concerns of stakeholders and the local realities, as well as potential challenges related to Project realization.
- Take a position on the concerns expressed, correct misperceptions when needed, and make the necessary commitments to answer the questions, comments, and issues about the Project.
- Develop a sustainable relationship of trust with the various Indigenous groups and other stakeholders.

Through its consultation and mobilization approach, Patriot wishes to offer local communities the opportunity to participate proactively in the planning and monitoring of the Project. The information gathered, especially the traditional knowledge of Indigenous groups, will thus be integrated into the design and impact analysis.

Various communication channels have been used to establish and maintain dialogue with authorities, stakeholders, and Indigenous groups since 2023. These include the following:

- Written communications (e-mails, letters, newsletters);
- Verbal communications (telephone interviews, videoconferencing);
- Video, website and social media posts;
- Face-to-face meetings;
- Public events;
- Radio broadcast.

The stakeholders targeted in this prior information process are presented in Table 20-7.

**Table 20-7: Stakeholders targeted as part of the prior information process**

| Category | Stakeholders |
|---|---|
| Indigenous Communities and Regional Organizations | ▪ Cree Nation Government<br>▪ Band Council of Chisasibi<br>▪ Cree Nation of Chisasibi<br>▪ Cree Nation of Wemindji<br>▪ Cree Nation of Mistissini<br>▪ Main land users (trapline owners/families)<br>▪ Cree Trappers' Association ("CTA")<br>▪ Chisasibi Business Development Group and business community<br>▪ Chisasibi Eeyou Resource and Research Institute |
| Political | ▪ Eeyou Istchee James Bay Regional Government<br>▪ *Ministère des Ressources naturelles et des Forêts*<br>▪ *Ministère de l'Environnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs*<br>▪ *Ministère de l'Économie, de l'Innovation et de l'Énergie*<br>▪ *Secrétariat aux relations avec les Premières Nations et les Inuits*<br>▪ Impact Assessment Agency of Canada |
| Municipal | ▪ Locality of Radisson<br>▪ Ville de Matagami |
| Economic | ▪ Hydro-Québec<br>▪ *Société du Plan Nord*<br>▪ *Société de développement de la Baie-James*<br>▪ Other companies from the mining industry |

With a particular focus on Indigenous groups, the Project was presented to initiate communication, explore points of interest, and begin the development of a clear understanding of the issues of concern of the land users. Questions were asked, concerns were expressed, and suggestions were made by land users. Detailed land-use documentation will be developed and integrated as part of the ESIA.

Land users are interested in partnering and collaborating with Patriot on the various activities and work to be carried out on the land during the study phase. In general, the Indigenous parties insisted on the importance of their upstream involvement in planning activities to be done on the trapline as well as during the preparation of the Project's environmental and social assessment.

### 20.10.1.2 Main Concerns

#### Main Concerns of Indigenous Groups

The meetings held so far have identified the preliminary concerns shared by Indigenous groups. The main concerns expressed at these meetings are outlined in Table 20-8.

**Table 20-8: Main comments and concerns expressed by Indigenous groups during mobilization and consultation activities**

| Theme | Comment/Concern |
|---|---|
| Water and Fish Habitat | ▪ Impact of mine effluent on the environment.<br>▪ Mine surface water/runoff management.<br>▪ Water requirements to supply the mine.<br>▪ Water protection and how water will be treated by the proponent.<br>▪ Cumulative impacts on fish habitat. |
| Traditional Use of Land and Resources | ▪ Disruption of traditional activities (hunting, fishing, trapping, berry picking, etc.) throughout the mine life cycle (construction, operation and closure).<br>▪ Impact on air, water, and soil quality, as well as on plants and animals. |
| Cumulative Impacts | ▪ So far, the cumulative impact of disturbances on traplines is believed to have depleted the resource.<br>▪ Increased activity on the Trans-Taiga Road is influencing the decline in moose and caribou numbers in the area.<br>▪ Hydroelectric development tops the list of contributors to cumulative impacts.<br>▪ Land users have mentioned that due to the creation of Hydro-Québec reservoirs, fish quality has declined considerably. |

| Theme | Comment/Concern |
|---|---|
| | ▪ The various projects in Eeyou Istchee James Bay are increasing pressure on the region's only road access, the Billy-Diamond Road.<br>▪ Pressure on health services from various development projects. |
| Local and Regional Economy | ▪ Indigenous communities want to benefit from the opportunities the Project offers and not only suffer the negative impacts.<br>▪ Land users would be interested in partnering with the proponent in the various activities and works to be carried out on the land as the Project's environmental and social assessment progresses.<br>▪ Comments were made on the importance of addressing future training and employment/contract opportunities within affected families and the community. It was also made clear that the current spirit of collaboration in these early stages of the Project does not translate into acceptance or approval of the Project.<br>▪ Community representatives have questions about the Project schedule.<br>▪ Stakeholders would like to know more about the economics of the lithium mining industry.<br>▪ Suggestion that Patriot hires an Indigenous liaison officer to facilitate participation of the Cree community members (information sharing, jobs, contracts, etc.).<br>▪ The importance of drawing up a list of training needs and the jobs that will be available was emphasized.<br>▪ Issues concerning certain hiring criteria deemed too high, particularly concerning the French language.<br>▪ Establishment of education agreements. |
| Communication and Consultation Processes | ▪ All the Eeyouch (James Bay Cree) we met felt it was important to establish a relationship of trust.<br>▪ For consultation events, the Crees favour the World Café method as the most productive.<br>▪ For the Crees, particularly the main users of the territory, the best communication tools for reaching communities would be local radio and television.<br>▪ Reach out to the younger generation by expanding communication channels, including the web, social media, site visits and direct invitations to students to participate in information and consultation events.<br>▪ It is important to translate documentation and include Cree words when possible. |
| Transport | ▪ Risk of accidents/collisions caused by increased traffic.<br>▪ Impact of increased traffic on large wildlife. |

| Theme | Comment/Concern |
|---|---|
| Health and Quality of Life | Several concerns related to social life and quality of life were raised:<br>▪ Equity in employment and career development;<br>▪ Systemic racism problems;<br>▪ Cultural safety (way of life, language, spirituality, cultural sites, traditional food, etc.);<br>▪ Greater openness of the territory comes with the risk of increased human trafficking (disappearance of Indigenous women);<br>▪ Risk to workers and land users' health and safety;<br>▪ Forest fire measures and evacuation plans;<br>▪ Difficulties in reconciling work and family life (rotating work schedules);<br>▪ Competition with local services for labour;<br>▪ Risks and failures related to site operations (exceptional events). |
| Regulation | ▪ Many questions raised to understand the authorization and consultation process, and environmental protection regime included in the JBNQA. |

The Company intends to respect the rights of Indigenous peoples and will continue to consider their interests, aspirations, and culture in the design, development, and operation of the Project. Patriot intends to expose the potential impacts, both positive and negative, whether related to the disturbance of traditional lands and resources, or to natural, cultural, and spiritual heritage. At all times, Patriot will ensure that the results of any engagement and agreement processes are mutually well understood by Indigenous groups.

In light of the issues raised during the meetings held so far, Patriot confirms its commitment to make social acceptability, citizen participation, and the interests of Indigenous and non-Indigenous groups a top priority of the planning and design of the Project and the assessment of its impacts. The Company's commitment is centered on four priorities:

13. Working upstream, with Indigenous and non-Indigenous groups, to reduce impacts at the source, prevent them and avoid them when possible. This includes impacts set out in Table 20-8 and Table 20-9.
14. Maximize positive spin-offs and benefits for parties affected by the Project.
15. Co-define, with the community, the conditions to be put in place for the Project to integrate harmoniously with the environment.
16. Execute an in-depth approach to address elements of concern or interest to stakeholders in a spirit of collaboration and take them into account in developing the Project.

### Main Concerns of Non-Indigenous Groups

The main comments and concerns of non-Indigenous stakeholders expressed so far during the various consultation activities presented in the previous section are summarized in Table 20-9.

**Table 20-9: Main comments and concerns expressed during consultation activities with non-indigenous stakeholders**

| Theme | Comment/Concern |
| --- | --- |
| Local and regional economy | ▪ Radisson and Matagami would like to take advantage of the opportunities offered by the Project to benefit from local and regional economic spin-offs;<br>▪ Risks associated with fluctuating lithium prices;<br>▪ Processing opportunities in Québec;<br>▪ Project energy requirements. |
| Communication and consultation processes | ▪ Initiate dialogue with the Radisson population with a Project presentation session;<br>▪ Promote an inclusive approach to achieve greater social acceptability. |
| Transport | ▪ The various projects in the Eeyou Istchee James Bay region are increasing pressure on the region's only road access, the Billy-Diamond Road;<br>▪ Increased traffic may translate into more collisions on the Billy-Diamond Road. |
| Health and quality of life | ▪ How to maximize the positive impact of the Project to attract new residents to Radisson;<br>▪ Measures to reduce commuting (Fly-In/Fly-Out);<br>▪ Forest fire measures and evacuation plan. |
| Regulations | ▪ Compliance with laws and authorizations processes at various levels of government, including municipal regulations. |

## 20.10.1.3 Future Mobilization Plan

### Indigenous Groups

With a view to maintaining a strong and ongoing relationship with the Indigenous groups affected by the Project, Patriot will continue to set up adapted, concerted information and consultation processes with Indigenous groups, and establish mutual collaboration and partnership agreements with them.

To this end, Patriot is working with the communities to execute a consultation, communication and mobilization plan that will include ongoing Project updates. This approach is flexible and can be adapted according to the feedback received. This plan aims to continue gathering the concerns and interests of Indigenous groups, particularly those relating to environmental issues, land use, employment, training opportunities, service provision, and other potential collaborations.

Through this approach, Patriot seeks to understand the opinions and concerns of Indigenous groups, and to openly discuss and record these communication activities. The Company encourages open dialogue, both formally and informally, to give the involved communities the opportunity to express their opinions and concerns about the Project. The outcome of these discussions with Indigenous groups will enable the Project to address their concerns and interests, and optimize its social acceptability.

It should be noted that the Preliminary Information Statement was presented to the members of the Chisasibi community, notably at meetings and a public event including the tallyman's family, band council members, and the community at large. A video summarizing the document is available in Cree, English, and French on the Patriot website. A formal presentation of the provincial Preliminary Information Statement was made to band representatives of the Cree Nation of Mistissini. Further meetings are planned in the coming months with members of the various Cree communities occupying the Eeyou Istchee James Bay territory to present the nature of the Project and its impacts, particularly those related to the transportation of spodumene concentrate, goods and services along the Billy-Diamond Highway and the Transtaiga road. Meetings with socio-economic and education/training stakeholders of those communities will also be held at the same time.

## Authorities and Other Parties

A first round of meetings has already taken place in 2023, targeting front-line regional players operating in the political, land use, geographic, social, financial, environmental, and technical spheres. The primary aim of this first round was to initiate a dialogue, which has since continued, presenting the main aspects of the Project to key Indigenous and non-Indigenous stakeholders as well as gathering general concerns about the Project before initiating the environmental and social assessment process. This approach established initial contact with stakeholders and opened up communication channels by sharing information on the Project (history, current activities, future development stages, preliminary schedule, industrial and technological processes, sources of supply, economic and social spin-offs).

Following the start of the environmental and social assessment process, more detailed formal consultations will be undertaken over time, as the Project progresses. For this second round of the consultation process, new stakeholders, who have yet to be met, will be added if necessary. Each of the targeted stakeholder groups will be consulted to gather and respond to their comments, questions, and concerns. In addition, information sessions for the public will be planned and advisory committees dealing with environmental, social, and economic issues will also be set up. At this stage, Patriot will focus on gathering stakeholders' comments, questions, and concerns about the Project, the aim being to optimize its overall performance and ensure that its integration into the local environment is well harmonized.

## 20.10.2 Social Components

### 20.10.2.1 Administrative Context

The Project is in Québec's Nord-du-Québec administrative region (number 10), which is divided into two territories: Eeyou Istchee James Bay and Nunavik. Located north of the 49th parallel, entirely on the Canadian Shield, the region covers just over half of Québec's total area and is the province's widest administrative region, covering 860,553 km$^2$ (*Ministère des Affaires municipales et de l'Habitation*), (MAMH, 2023).

More specifically, the Project lies within the territory of the EIJBRG, which, since 2014, has replaced the Municipality of James Bay. Nord-du-Québec is governed by the JBNQA and the Agreement Concerning a New Relationship Between le Gouvernement du Québec and the Crees of Québec, also known as the "*Paix des Braves*". The territorial regime introduced by the JBNQA is an important element of the land use. It divides the territory into category I, II, and III lands. The study area is located on category III lands, where the Crees have exclusive rights to trap fur-bearing animals, fish for certain species and enjoy various outfitting benefits, without having exclusive rights on these lands.

### 20.10.2.2 Population, Living Conditions, and Socio-economic Context

The Eeyou Istchee James Bay Regional Government's territory is made up of the traditional territory of Eeyou Istchee, with the Indigenous nation of the Eastern Cree, as well as Jamésie, a non-Indigenous territory equivalent to a regional county municipality ("RCM"). Divided into 16 communities, the Jamésiens and the Crees live side by side. This section presents a portrait of Radisson and the Cree communities of Chisasibi, Wemindji and Mistissini, which are closest to the Shaakichiuwaanaan Project (Table 20-10).

**Table 20-10: Cree communities and non-Indigenous towns near the Shaakichiuwaanaan Project**

| First Nation / Non-Indigenous Town | Land Status | Name of the Community | Affiliated Tribal Council | Approximate Distance from the Project | Population |
|---|---|---|---|---|---|
| **Cree Communities** | | | | | |
| Cree Nation of Chisasibi | JBNQA territory | Chisasibi | Grand Council of the Crees | 330 km west | 5,000 |
| Cree Nation of Wemindji | JBNQA territory | Wemindji | Grand Council of the Crees | 330 km southwest | 1,562 |
| Cree Nation of Mistissini | JBNQA territory | Mistissini | Grand Council of the Crees | 350 km south | 3,190 |
| **Jamésie** | | | | | |
| Radisson | JBNQA territory | N/A | N/A | 250 km west | 200 |

N/A: Not applicable

## Cree

As previously mentioned, the Property is on public lands, on the territory of the Eeyou Istchee James Bay Regional Government, specifically on the traditional lands of the Cree Nation of Chisasibi (trapline CH39). The Cree traditional territory (Eeyou Istchee) covers an area of over 400,000 km², including nine Cree communities with a total of 5,586 km² and over 300 traplines, or traditional family hunting and trapping grounds (CNG, 2022a). Its total population was 18,679 in 2021 (ISQ, 2022).

The Property is also located on the territory under the JBNQA, signed in 1975 between the Grand Council of the Crees, the *Association des Inuit du Nouveau-Québec* and the Governments of Canada and Québec. The JBNQA defines a land regime and divides the James Bay Territory into Category I, II, and III lands. Located on category III lands according to the JBNQA, the Shaakichiuwaanaan Project site does not contain any Indigenous land that has been set aside as a reserve but is divided into traplines occupied by Cree families. There are three Cree communities nearly equidistant from the Project site, they are the Cree Nation of Chisasibi (330 km to the west), the Cree Nation of Wemindji (330 km to the southwest), and the Cree Nation of Mistissini (350 km to the south). However, the drilling exploration activities to date and the planned infrastructure of the Project are all located on trapline CH39, managed by a tallyman from the Cree Nation of Chisasibi. For this reason, Patriot was given guidance from the Crees to focus the majority of the initial consultation with the Cree Nation of Chisasibi.

## Jamesian

The closest Jamesian community is Radisson, some 250 km west of the Project.

### 20.10.2.3 Main Human Receptors

The human receptors that may be affected by the Project are both temporary and permanent. They include hunting camps, waterways, burial grounds, and other sites used for traditional or cultural activities. No permanent residences are located within the footprint of the proposed mining infrastructure. However, some seasonal human receptors, mainly resort leases, are located nearby, the closest being approximately 18 km southwest of the Project, on the west shore of *Lac de la Corvette* (Figure 20-1). Cabins and other temporary facilities used for hunting may also be found near the Project site.

Furthermore, the *Mirage Aventure* is located about 75 km east of the Project, at KM-358 on the Trans-Taiga Road and the Sakami Lake Campground is located at KM-56 also on the Trans-Taiga Road, more than 175 km west of the Project (Figure 20-1).

All human receptors will be identified and located through field surveys and stakeholder interviews as part of the ESIA currently under way. The impacts of the Shaakichiuwaanaan Project on these temporary and seasonal human receptors will then be identified and management measures will be proposed as part of the impact assessment.

As for the location of permanent human receptors, they are all far from the Project components, since they are in the Cree Nations of Chisasibi, Wemindji, and Mistissini, as well as in the community of Radisson, all more than 250 km away from the Project.

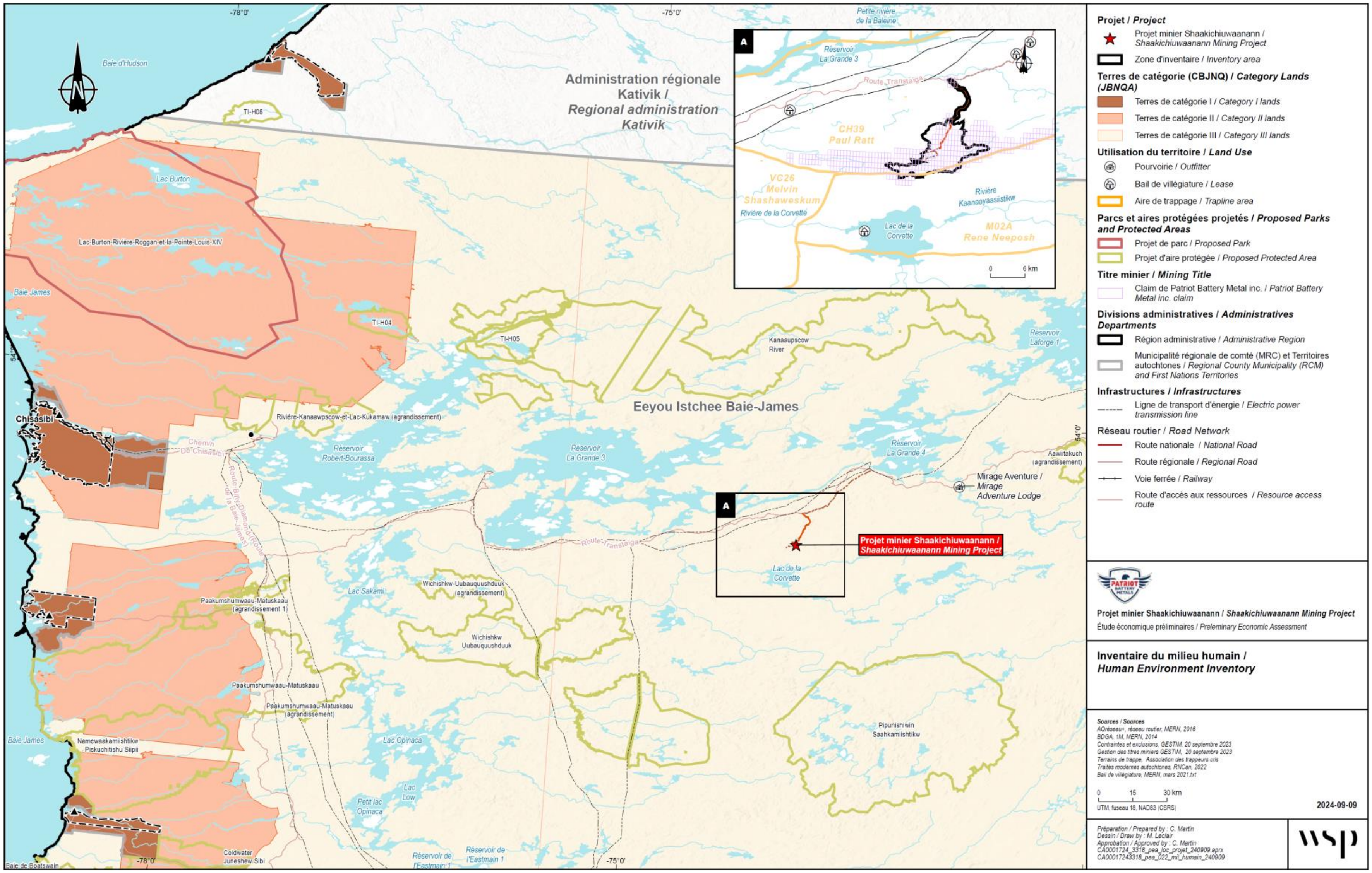



Figure 20-1: Human environment inventory

#### 20.10.2.4 Economic Activities

The Nord-du-Québec economy is mainly based on natural resource development. In 2022, the primary sector was nine times higher than in the rest of Québec (21.4% vs. 2.3%), while the tertiary sector was less present (57.3% vs. 79.6%) (Table 20-11).

**Table 20-11: Employment by sector in 2022**
**(Source: Statistics Canada, special compilation)**

| Territory | Primary Sector | Secondary Sector | Tertiary Sector | Total |
|---|---|---|---|---|
| Nord-du-Québec region | 21.4% | 21.3% | 57.3% | 100% |
| Province of Québec | 2.3% | 18.1% | 79.6% | 100% |

The Nord-du-Québec region's main economic sectors, based on gross domestic product ("GDP") in 2020, are mining, quarrying, along with oil and gas extraction representing 45.6%, followed by construction (10.3%), public services (9.7%), public administration (8.4%), and health care and social assistance (7.1%).

#### 20.10.2.5 Transport Infrastructure

Beginning at KM-544 on the Billy-Diamond Road, the Trans-Taiga Road is a gravel road that extends 666 km generally in an east-west orientation (Tourisme Eeyou Istchee Baie-James, 2016). The Project is located approximately 18 km south of the Trans-Taiga Road at KM 270 (Figure 20-1).

The region also has several airports, including the La Grande Airport located about 30 km northeast of the Project. This airport serves the La Grande 4 hydroelectric facilities and is owned by Hydro-Québec and managed by the *Société de développement de la Baie-James*. There is also the La Grande-Rivière Regional Airport, located in the community of Radisson. This airport is operated and owned by the *Société de développement de la Baie-James* (Société de développement de la Baie-James, 2009). Finally, in the Cree community of Chisasibi, the Robert Kanatewat Airport handles Air Creebec aircraft and provides medical transport services for the Cree Board of Health and Social Services of James Bay ("CBHSSJB") (Cree Nation of Chisasibi, 2023).

## La Grande Alliance

Launched in February 2020, the "*La Grande Alliance*" (meaning "The Great Alliance" in English; "LGA") Project concerns the sustainable development of infrastructure in the Eeyou Istchee James Bay region. The transport infrastructure examined as part of LGA's feasibility studies are designed to meet specific needs or seize opportunities, with the aim of fully integrating the economy of the Eeyou Istchee James Bay region, and Cree communities specifically, with a view to sustainable resource development.

The main infrastructure studied by *La Grande Alliance* ( (LGA, 2023a)) involves the following:

- Rehabilitation and paving of access roads to the communities of Waskaganish, Eastmain, Wemindji, Nemaska and Mistissini;
- Rehabilitation and paving of the North Road;
- The rail link between Matagami and Rupert River;
- Reactivation of the Grevet-Chapais rail line;
- The rail link between Rupert River and La Grande River;
- The extension of the road to Whapmagoostui;
- The rehabilitation and extension of Road 167;
- The rail link between La Grande River and Whapmagoostui;
- Development of a seasonal port at Whapmagoostui.

For the Shaakichiuwaanaan Project, Patriot plans to transport the spodumene concentrate to Matagami by truck, via the existing Billy-Diamond Road. In the context of LGA's development, Patriot wishes to study all possibilities and remains on the lookout for any current or future transportation infrastructure project that would offer an alternative to moving the concentrate. Thus, LGA's proposal for the possible extension of Road 167 to the Trans-Taiga Road, creating a second north-south transportation corridor to serve the eastern part of the territory, seems promising. In addition to significantly reducing travel time between Mistissini/Chibougamau and Chisasibi, the extension would link the two most populous regions in the area, facilitate interregional connectivity and provide access to currently isolated areas (LGA, 2023b). Although Patriot remains very interested in the LGA projects, the PEA does not assume any of them will go forward.

### 20.10.2.6 Hunting, Fishing, and Trapping

The Project site is in Hunting Zone number 22 north and overlaps with the Fur-Bearing Animal Management Units ("UGAF" or *unités de gestion des animaux à fourrure*) numbers 91 and 94 (Québec, Gouvernement du, 2022b); (Québec, Gouvernement du, 2022c). Furthermore, lake trout and walleye fishing are of great interest activities.

As mentioned, the Shaakichiuwaanaan Project is on category III lands. These lands are accessible to all communities, but the Cree population retains exclusive rights to hunt and trap fur-bearing animals, as well as fish for certain aquatic species (including lake whitefish, lake sturgeon, burbot, and suckers).

In parallel with modern life, Cree communities continue to hunt, trap and fish as part of their traditional activities. The territory of Eeyou Istchee James Bay is divided into family traplines. These traplines are used year-round by Cree families for traditional activities (Cree-Québec Forestry Board, 2018). Species trapped in the area mainly include beaver, marten, muskrat, otter, red fox, lynx, and mink (Cree Trappers' Association, 2021).

The Project is located within the trapline CH39 (Figure 20-1) of the Cree Nation of Chisasibi, covering an area of approximately 2,070 $km^2$ (Cree Geoportal, 2023). The southern portion of the claims are located at the border of the trapline M02A of the Cree Nation of Mistissini, which covers an area of approximately 2,202 $km^2$, as well as the trapline VC26, which covers an area of approximately 1,772 $km^2$ of the Cree Nation of Wemindji.

Goose and moose hunting are also important traditional activities for members of the Cree communities. The Goose Break is an age-old tradition practised by the Cree in the Nord-du-Québec region which takes place during the spring. Businesses and schools are shut down for a few weeks to allow community members to take part in this traditional goose hunt (Air Tunilik, 2023). Besides geese, other species such as caribou, bear, lynx, red fox, ruffed grouse, and ptarmigan are also hunted by Cree throughout the year (Cree Trappers Association, 2022).

### 20.10.2.7 Heritage and Archeology

According to the information available on the *Inventaire des Sites Archéologiques du Québec* ("ISAQ") of the *Ministère de la Culture et des Communications du Québec* ("MCC"), no areas of high archeological potential have been identified near the Shaakichiuwaanaan Project.

A more detailed analysis will be carried out through field surveys with the Cree communities and a desktop analysis as part of the ESIA . The effects of the Project on this aspect will also be studied, and management measures will be proposed accordingly.

## 20.10.3 Engagement Activities Requirements

The provincial government recommends that promotors engage, in good faith and as early as possible, in a process of information and consultation with First Nation and local communities. The approach must be based on respect, transparency, and collaboration. The *Ministère de l'Énergie et des Ressources naturelles* ("MERN") (now the "MRNF" or *Ministère des Ressources naturelles et des Forêts*) published an Aboriginal Community Consultation Policy Specific to the Mining Sector (MERN, 2019).

### 20.10.4 Stakeholder Engagement Approach

The Company's stakeholder engagement approach aims to build meaningful relationships with the Indigenous and non-Indigenous groups and individuals that are likely to be impacted by the Project activities. The Company has taken a proactive approach holding more than 200 communication activities since January 2022, mainly with the Cree Nation of Chisasibi. The objectives of this approach are to:

- Inform stakeholders likely to be affected on the purpose of the Project as well as its potential socio-economic and environmental effects;
- Consider and address issues raised by stakeholders;
- Document traditional knowledge and land use in the vicinity of the Project;
- Share results of field studies or other relevant studies;
- Gather feedback, information, concerns, questions, suggestion and comments to guide or adapt the design of certain project components/activities;
- Improve the Project and its social acceptability by involving community members.

The Company is encouraging open discussion, formally and informally, through various ways:

- Regular meetings and calls with key stakeholders (tallyman and family, local leadership and organizations);
- Community information sessions and presentations;
- Using the services of a Cree translator;
- Participation of community members in field inventories;
- Distribution of written documentation on the Project;
- Sending information by letters, e-mails and texts;
- Posting information, videos and press releases on its website.

### 20.10.5 Agreements

To date, there have been no agreements signed with any stakeholders.

# 21. Capital and Operating Costs

The capital and operating cost estimates for the Project cover construction, operation, and closure of the Shaakichiuwaanaan mine site. Costs were estimated using estimations from first principals, quotes from vendors and contractors and BBA's experience, and work completed on similar sized operations and projects in Northern Québec. All capital and operating cost estimates cited in this Report are expressed in Canadian dollars as of Q2 2024, unless otherwise indicated.

## 21.1 Capital Cost

### 21.1.1 Summary

Capital costs were divided into three categories: Stage 1 capital cost, expansion capital, and sustaining capital. Cumulative LOM capital expenditure is estimated to be $2,024.9M. Table 21-1 provides an overview of the capital costs by category on a cumulative basis for the life of the Project.

**Table 21-1: Project LOM capital cost summary**

| Capital Expenditure | Stage 1 Capital Cost ($M) | Expansion Capital ($M) | Combined Phases ($M) | Sustaining Capital ($M) | Total Cost ($M) |
|---|---|---|---|---|---|
| General | 142.1 | 9.0 | 151.1 | - | 151.1 |
| Mine and Stockpiles | 148.4 | 29.8 | 178.2 | 256.4 | 434.6 |
| Process | 124.6 | 124.6 | 249.2 | 26.0 | 275.2 |
| Terminals (truck and train) | 8.5 | - | 8.5 | - | 8.5 |
| Other Services and Facilities | 14.3 | - | 14.3 | - | 14.3 |
| Underground Mine Lateral Development | - | 110.9 | 110.9 | 203.4 | 314.3 |
| Underground Mine Infrastructure & Paste Plant | - | 71.3 | 71.3 | 144.1 | 215.4 |
| Fish Habitat Compensation | 20.1 | - | 20.1 | - | 20.1 |
| Indirect Cost | 140.5 | 78.2 | 218.7 | - | 218.7 |
| **Subtotal** | **598.5** | **423.8** | **1,022.3** | **629.9** | **1,652.2** |
| Contingency | 162.9 | 80.0 | 242.9 | 21.5 | 264.4 |
| **Total Including Contingency** | **761.4** | **503.9** | **1,265.2** | **651.4** | **1,916.6** |
| Pre-production Cost | 108.3 | - | 108.3 | - | 108.3 |
| **Total** | **869.7** | **503.9** | **1,373.5** | **651.4** | **2,024.9** |

### 21.1.2 Scope and Structure of Capital Cost Estimate

The overall capital cost estimate developed in this PEA Study generally meets the AACE Class 5 requirements and has an accuracy range of between -25% and +55%. The capital cost estimate for this study forms the basis for the approval of further development of the Project by means of further technical studies. Generally, engineering performed to date is around 1% of the full Project definition.

The estimate has been organized according to the agreed upon work breakdown structure ("WBS") by discipline, and by BBA's work element coding ("WEC"). The estimate line item has been identified with a package number for installation and equipment and/or material supply.

BBA and Primero have developed core-engineering deliverables to a level of detail consistent with the requirements of the estimate. Additionally, deliverables have been structured to reflect the adopted estimate WBS.

The capital cost estimate abides by the following criteria:

- Reflects general accepted practices in the cost engineering standards;
- Assumes contracts will be awarded to reputable contractors on a cost-reimbursable basis;
- Labour costs are based on Western Canadian Industrial construction rates;
- Winter conditions are expected between the months of October and April. This is incorporated within the productivity factors of the Project;
- Stage 1capital costs and sustaining capital costs are expressed in constant Q2 2024 Canadian dollars ("CA$" / "$"), with an exchange rate of US$0.76 per CA$1.00.

### 21.1.3 Work Breakdown Structure

The capital cost estimate was developed in accordance with Patriot's WBS, with the estimate responsibilities summarized in Table 21-2.

**Table 21-2: Capex estimate responsibilities by WBS Area**

| WBS Area | WBS Description | Responsible Entity |
|---|---|---|
| 10 | General | BBA/Desfor/WSP |
| 12 | Mine and Stockpiles | BBA |
| 13 | Process | Primero/BBA |
| 17 | Terminals (truck and train) | BBA |
| 18 | Other Services and Facilities | BBA |

| WBS Area | WBS Description | Responsible Entity |
|---|---|---|
| 12 | Underground Mine Lateral Development | BBA |
| 19 | Pre-production Cost | BBA |
| 10 | Fish Habitat Compensation | BBA |
| 19 | Indirect Cost | BBA |
| 199 | Contingency | BBA |

### 21.1.4 Exclusions

The following items were excluded from the capital cost estimate:

- Risk-related costs;
- Certain land acquisitions;
- Licensing and financing costs;
- Project development costs incurred to date, including studies and early works;
- Taxes (included in the financial model);
- Geotechnical anomalies (must be considered as a risk);
- Operating costs (except capitalized overburden and waste stripping);
- Changes to design criteria;
- Work stoppages;
- Scope changes or an accelerated schedule;
- Hazardous waste issues.

### 21.1.5 Stage 1 Capital Costs

Stage 1 capital costs are defined as all costs incurred before the start of production (Years -2 and -1). This includes all costs associated with building the camp and infrastructure, stockpiles, mining pre-production costs, the first phase of the processing plant and their related indirect costs and contingencies. The total Stage 1 capital cost for the Shaakichiuwaanaan Project is estimated to be $869.7M (including contingencies, indirect costs and pre-production costs). Stage 1 capital cost summary of the Project is outlined in Table 21-3. The capital cost breakdown descriptions are outlined in Sections 21.1.5.1 to 21.1.5.5.

Table 21-3: Project Stage 1 capital cost summary

| Stage 1 Capital Cost | $M | % |
|---|---|---|
| General | 142.1 | 16.3% |
| Open Pit Mine and Stockpiles | 148.4 | 17.1% |
| Process | 124.6 | 14.3% |
| Terminals (truck and train) | 8.5 | 1.0% |
| Other Services and Facilities | 14.3 | 1.6% |
| Fish Habitat Compensation | 20.1 | 2.3% |
| Indirect Cost | 140.5 | 16.2% |
| **Subtotal** | **598.5** | **68.8%** |
| Contingency | 162.9 | 18.7% |
| **Total Including Contingency** | **761.4** | **87.5%** |
| Pre-production Cost | 108.3 | 12.5% |
| **Total** | **869.7** | **100%** |

### 21.1.5.1 General

The general capital costs for the Shaakichiuwaanaan Project were estimated by BBA based on project requirements and various engineering deliverables. As such, the total general capital cost of the main site is estimated at $142.1M, which is detailed in Table 21-4.

Table 21-4: General capital cost by WBS

| WBS | Description | Total ($M) |
|---|---|---|
| **General** | **- Main Site** | |
| 10000 | General - Main Site - General | 1.0 |
| 10110 | General - Main Site - Main Access Roads | 15.0 |
| 10120 | General - Main Site - On-Site Roads and Bridges | 14.0 |
| 10200 | General - Main Site - Gate/Security Post | 0.1 |
| 10260 | General - Main Site - Workers Camp - Permanent | 42.1 |
| 10330 | General - Main Site - Light Vehicle Fleet | 2.2 |
| 10340 | General - Main Site - Fuel Depot and Station - Heating Oil & Fuel - Mill Area | 4.3 |
| 10350 | General - Main Site - Truck Scale | 0.6 |
| 10370 | General - Main Site - Highway garage & Fueling Station | 3.8 |
| 10400 | General - Main Site - Electrical - Site Distribution | 34.8 |
| 10450 | General - Main Site - Electrical - Powerlines | 24.2 |
| | **Total** | **142.1** |

### Quantity Basis

Major areas such as 10120, 10340, 10400, and 10450 were evaluated and quantified by the responsible engineering department while the other areas were quantified based on assumptions to meet the Project criteria.

Assumptions used include the following:

- Workers permanent camp is 400 rooms for Stage 1 (initial capital cost) and 100 additional rooms will be added for Stage 2;
- An allowance was included to cover the cost of the site's general telecom needs.
- Site infrastructure including bridges, access road, gates and security checkpoints, fuel depot, etc.
- A permanent fleet of light vehicles is to be acquired before Year 1 to cover needs during operations.
- Electrical site distribution throughout the mine site.
- Electrical 54 km, 69 kV powerline from LG-4 to the site.

### Pricing Basis

- Pricing has been built using unit rates from BBA's in-house benchmark and historical data.

## 21.1.5.2 Open Pit Mine and Stockpiles

Capital costs for the open pit mine and stockpiles were estimated at $148.4M, as detailed in Table 21-5. These costs were determined by performing preliminary engineering designs to quantify the necessary workload. An equipment and material list was developed to apply to BBA's in-house pricing based on recent project benchmarks and historical data. Budgetary pricing was obtained for the mining equipment and machinery.

The mining equipment necessary for the first 2 years of operation will be leased in order to reduce the initial capital requirements. The leasing terms include a 20% down payment the year before taking delivery of the equipment and a 5-year leasing term at an interest rate of 8%. The remaining equipment will be paid in full one year before it is required.

**Table 21-5: Mine and stockpiles costs by WBS**

| WBS | Description | Total ($M) |
|---|---|---|
| **Mine and Stockpiles** | | |
| 12000 | General – Mining Equipment | 39.1 |
| 12050 | Mine Roads | 22.1 |
| 12300 | Mine Garage | 23.5 |
| 12600 | Mining Truck Fuel Station | 5.6 |
| 12650 | Explosive Management | 0.3 |
| 12700 | Electrical Distribution | 1.5 |
| 12715 | Paste Plant - Distribution | 0.4 |
| 12800 | Stockpile - 001 | 10.5 |
| 12810 | Stockpile - 002 | 35.9 |
| 12840 | Stockpile - OB-01 - Overburden Stockpile | 2.7 |
| 14000 | Water Diversion Channel | 6.8 |
| | **Total** | **148.4** |

The costs for the stockpile's construction include site preparation, excavation and backfill, ditch construction and installation of liners for 25% of Stockpile's 002 footprint.

### 21.1.5.3 Process

The capital costs for the processing plant includes only the costs of Stage 1, capable of processing 2.5 Mtpa. Costs for Stage 2 of the processing plant are under the expansion capital costs. The cost estimation basis for the process concentrator was largely based on Primero's work. Primero developed an equipment list including the necessary mechanical equipment and the prices for their supply, to which BBA included the cost of labour for this equipment.

To complete the rest of the process area, BBA applied factors on the remaining disciplines based on similar projects, whose details can be found in Table 21-6. These factors were applied on the total mechanical price, estimated at $86.74M:

- Earthwork and site works were estimated at 12.4% of installed mechanical equipment to cover the cost services in rock.
- Concrete activities were estimated at 36.1% of installed mechanical equipment.
- Structural works were estimated at 35.4% of installed mechanical equipment.
- Architectural was estimated at 12.4% of installed mechanical equipment.
- Piping was estimated at 20% of installed mechanical equipment.

- Electrical was estimated at 33% of installed mechanical equipment.
- Automation/telecom was estimated at 15% of installed mechanical equipment.
- An HVAC allowance was included and estimated at 8% of installed mechanical equipment.
- An allowance for required chutes and plate work was included and estimated at $14.0M based on BBA's benchmark, and represents 20% of installed mechanical equipment.

The total capital cost of the first phase of the processing plant facility was estimated at $124.6M (Table 21-6).

**Table 21-6: Stage 1 Process cost by WBS**

| WBS | Description | Stage 1 Total ($M) |
|---|---|---|
| **Process** | | |
| 13000 | General | 0.3 |
| 13100 | Concentrator | 83.6 |
| 13111-13121 | Services | 2.7 |
| 13200 | Offices and Administration Building | 2.9 |
| 13400 | Crushing Plant | 0.8 |
| 13411-13421 | Crushing and Screening | 8.7 |
| 13511-13521 | Mineralized Material Storage and Reclaim | 0.5 |
| 13611-13621 | Feed Preparation Circuit | 2.2 |
| 13612-13622 | Primary DMS | 2.0 |
| 13711-13721 | Secondary DMS | 1.2 |
| 13712-13722 | Recrush DMS | 1.8 |
| 13713-13723 | DMS Product and Tailings Handling | 2.0 |
| 13714-13724 | Magnetic Separation | 0.9 |
| 13812-13822 | Reagent Mixing | 0.3 |
| 13900 | Tails Dewatering and Services | 0.5 |
| 13911-13921 | Fine By-pass and Middlings Dewatering | 14.2 |
| | **Total** | **124.6** |

### 21.1.5.4 Terminals (Truck and Train)

Capital costs for the terminals were estimated based on quantities from BBA's engineering. These costs mainly concern the Matagami terminals. These include costs of a warehouse to store the material, as well as a crane and transfer mechanism to load the material on the trains, called the Matagami Terminal. Table 21-7 shows the detailed costs by WBS for the Terminals area.

**Table 21-7: Terminals (truck and train) costs by WBS**

| WBS | Description | Total ($M) |
|---|---|---|
| **Terminals, Truck and Train** | | |
| 17200 | Matagami Terminal | 8.5 |
| | **Total** | **8.5** |

### 21.1.5.5 Other Services and Facilities

The Project's Other Services costs cover the mine water treatment. The process involves removing arsenic contained in the water and will be divided into two trains (reaction, decantation, filtration). These two trains will be built prior to Year 1. It should be noted that only one train is required for the first 5 years, while the provision of one additional train is made for the other years. Table 21-8 shows the pre-construction cost by WBS for the Other Services and Facilities area.

**Table 21-8: Other services and facilities costs by WBS**

| WBS | Description | Total ($M) |
|---|---|---|
| **Other Services and Facilities** | | |
| 18700 | Water Treatment Plant and Diffuser | 14.3 |
| | **Total** | **14.3** |

### 21.1.5.6 Fish Habitat Compensation

Given that some fish habitat will be lost due to the drainage of Lake 001 for the open pit mining, fish habitat will need to be compensated. Approximately 67 hectares of fish habitat will need to be replaced during the pre-production phase. The total cost of the fish habitat compensation is estimated to be $20.1M.

### 21.1.5.7 Indirect Costs

Indirect costs for the Shaakichiuwaanaan Project include all costs needed to carry out engineering, procurement, and construction management services, and were calculated by BBA using factors and metrics from similar projects. The main costs in this category are EPCM services, temporary facilities, third-party services, spare parts, freight, and customs. The indirect costs listed in Table 21-9 concern the pre-production portion of the indirect costs. Some indirect costs will be assigned to the expansion capital costs.

**Table 21-9: Stage 1 indirect costs by WBS**

| WBS | Description | Total ($M) |
|---|---|---|
| 19010 | Owner's Costs | 21.4 |
| 19030 | EPCM Services for Concentrator | 67.4 |
| 19040 | EPCM Services for Mining | 1.9 |
| 19050 | EPCM Services for TMF | 5.4 |
| 19060 | Temporary Facilities & Utilities | 20.2 |
| 19100 | Catering | 6.7 |
| 19320 | POV & Mechanical Acceptance | 2.8 |
| 19330 | Insurance, Duties, Taxes | 1.9 |
| 19340 | Commissioning Spare Parts | 1.9 |
| 19380 | Initial Fill | 0.9 |
| 19390 | Freight | 8.5 |
| 19900 | Vendor Representatives | 1.4 |
| | **Total** | **140.5** |

## Owner's Costs

Owner's costs are to be provided by Patriot.

The following is a list of items considered to be part of the Owner's costs:

- Owner's team salaries and expenses;
- Technology fees;
- Environmental permitting, monitoring, water and soil analysis, etc.;
- Allowance for upgrade of any off-site facilities;
- Removal and disposal of unknown hazardous materials;
- Capital and operating spares;
- Owner's Project office (other than space provided by the EPCM Contractor's site construction office) including rent, communications, furniture and equipment, and office supplies;
- Taxes and duties;
- Public relations, labour relations (unions), or local authorities;
- Owner's travel, legal and other corporate office charges to the Project;
- Environmental and construction permits and government approvals;

- Project insurance including comprehensive general liability and insurance for construction equipment and tools, and builder's all-risk insurance;
- Commissioning and start-up salaries and expenses;
- Training of plant operating personnel and Training Centre;
- Owner's contingency and Project Risk Reserve;
- Owner's costs were estimated at 5% of the direct costs.

### EPCM Services

Engineering, procurement, and construction management ("EPCM") services costs are based on the project execution plan and schedule, in conjunction with a detailed assessment of required resources. EPCM costs have been dived into three sections (Concentrator, Mining, and Tailings) to obtain a more precise and accurate estimate for each workload.

17. EPCM costs for the concentrator section were estimated at 19% of the direct costs.
18. EPCM costs for the mining section were estimated at 5% of the direct costs.
19. EPCM costs for the DMS tailings section were estimated at 10% of the direct costs.

### Temporary Construction Facilities and Services

These costs cover site services and temporary facilities for the following broad items:

- Temporary roads, fencing and facilities, lay down areas, signage, and parking;
- Temporary buildings such as trailers, offices, sheds, portable toilets;
- Material handling and warehousing;
- Construction site services (surveying, security, medical, scaffolding, janitorial, concrete testing, craft training, etc.);
- Temporary utilities such as potable water supply pipe and sewage drainage pipe;
- Site safety inductions for contractor personnel;
- Temporary power during construction.

The cost to cover the temporary construction facilities and services was estimated at 4% of the direct costs.

An allowance has also been added to cover the costs for an on-site concrete batch plant, which was estimated at $4.5M.

### Catering Costs

Catering service costs are calculated based on the peak requirements at the site, which are derived from the estimated site hours. The daily catering cost is estimated at $80 per worker during construction activities.

### POV and Mechanical Acceptance

An allowance equivalent to 3% of the direct equipment cost is included to cover costs for pre-operational verification and mechanical acceptance.

### Commissioning Spare Parts

Spare parts for pre-operational testing, commissioning and start-up, and for 1-year operating have been established as a percentage of equipment costs. Costs for capital spares have been established based on recent similar project.

Spare parts were estimated at 2% of the direct equipment cost.

### Initial Fills

First fills include the following:

- Oils, lubricants, and fluids;
- Specific chemicals for process purposes (if required);
- First fills were estimated at 1% of the direct equipment cost.

### Freight

Freight costs are included in the indirect cost accounts, meaning that all non-mechanical bulk material pricing is inclusive of freight to the site.

Freight costs were estimated at 9% of the direct equipment cost.

### Vendor Site Representatives

Costs for vendor representative support are based on a preliminary evaluation based on the estimated duration and daily rate. Assistance during construction and pre-commissioning is included while assistance for commissioning and start-up is covered by the Owner's costs.

The Vendor's representative was estimated at 1.5% of the value of equipment.

#### 21.1.5.8 Project Contingency

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 project risks, currency fluctuations, escalation beyond predicted rates, or costs due to potential scope changes or labour disruptions.

No formal contingency calculations were done in the scope of Shaakichiuwaanaan's PEA. Typically, for a class 5 estimate (conceptual or PEA), the contingency amount is not based on a range analysis or even detailed deterministic analysis, but mainly on previous project experience and industry standards. The main reason for this is that these types of estimates are conceptual and have little engineering definitions and are often based on factoring or parametric estimating techniques. This lack of definition in scope and pricing due to factorization makes the contingency amount in a class 5 less critical to the overall Capex due to the broad accuracy range associated with this type of estimate. For this reason, contingency amounts for a class 5 are often kept at under 30% of direct and indirect costs. The concentrator and its infrastructure were determined at 30% based on the explanation above. As DMS tailings stockpile and mining contingency, these were set at 20% due to their better engineering definition and known historical cost of mobile equipment and unit rates, which are less volatile compared to the factorized and parametric estimate of the concentrator. The costs listed in Table 21-10 are the contingency costs for the pre-production portion of the Capex. More contingency costs for the processing plant will be placed under the expansion capital.

**Table 21-10: Stage 1 contingency costs**

| WBS | Description | Total ($M) |
|---|---|---|
| 19010 | Contingency for Concentrator, Other Infrastructure and Indirect Costs | 140.3 |
| 19030 | Contingency for Mining | 9.7 |
| 19040 | Contingency for TMF | 12.9 |
| | **Total** | **162.9** |

#### 21.1.5.9 Pre-production Costs

The pre-production costs refer to operational costs that can be categorized as Capex, as they occur prior to the start of commercial production. The pre-production costs include the costs for mining the early phase of the open pit and some operational costs for the processing plant. Table 21-11 shows the pre-production costs for the processing plant and mining.

**Table 21-11: Pre-production costs**

| WBS | Description | Total ($M) |
|---|---|---|
| Other Services and Facilities | | |
| - | Mine Stripping, Pre-production and Preparation | 82.3 |
| - | Processing Plant Pre-production Cost | 26.0 |
| | **Total** | **108.3** |

## 21.2 Expansion Capital Costs

The expansion capital includes the costs related to the construction and development of the underground mine, the camp expansion, the expansion of the stockpiles, the second train of the processing plant and their related indirect costs and contingencies. The expansion capital will occur during the first 2 years of production (Years 1 and 2). All other capital expenses will be under the sustaining capital. The expansion capital cost was estimated to be $503.9M as described in Table 21-12.

**Table 21-12: Expansion capital costs summary**

| Capital Expenditure | Expansion Capital ($M) | Expansion Capital (%) |
|---|---|---|
| General (Camp Expansion) | 9.0 | 1.8% |
| Mine and Stockpiles | 29.8 | 5.9% |
| Process | 124.6 | 24.7% |
| Underground Mine Lateral Development | 110.9 | 22.0% |
| Underground Mine Infrastructure & Paste Plant | 71.3 | 14.2% |
| Indirect Cost | 78.2 | 15.5% |
| **Subtotal** | **423.9** | **84.1%** |
| Contingency | 80.0 | 15.9% |
| **Total including contingency** | **503.9** | **100%** |

The construction of the stockpiles was spread over the first 3 years of operation (Year -1 to Year 2) to reduce initial capital requirements. The mining camp will also need to be extended from 400 to 500 rooms to accommodate the new personnel working in the underground mine. A 5% contingency rate was used for the underground mine since most of the costs are related to the development of the mine. A 10% growth allowance was also added to the Capex development metres to account for unplanned additional development that would need to be performed. The contingency rate used for the paste plant was 25%.

#### 21.2.1.1 Stockpile Expansion

Given that not all the space planned for Stockpiles 001 and 002 is required from Year 1, only 50% of the total cost was classified as initial capital, and the remaining 50% as expansion capital. Construction costs were spread over 3 years; 50% during pre-production and 25% for Years 1 and 2. Liner costs for Stockpile 002, however, were not spread over 3 years, in order to have the space required to store arsenic-generating materials as soon as possible.

#### 21.2.1.2 Process

All the expansion capital costs allocated to the processing plant is to build the second phase (Stage 2) of the plant identical to the first phase. Like Stage 1, it will be able to process 2.5 Mtpa of mineralized material. The total cost of the second phase of the processing plant was estimated at $124.6M split spread over 2 years.

#### 21.2.1.3 Underground Mine Lateral Development

The development of the UG mine will start at Year 1, a year after the open pit. The costs include all expenses related to the mining equipment operation, labour, consumables, maintenance, and technical services support. BBA estimated the costs using actual data from other comparable UG mining operations in Québec. During the first 2 years, approximately 15.6 km of tunnels will be developed in the underground mine by the underground contractor at a cost of approximately $110.9M. A summary of the costs is outlined in Table 21-13.

**Table 21-13: Development Expansion Capex Summary**

| UG Development Capex | Expansion Capex ($M) | Expansion Capex (%) |
|---|---|---|
| **Development Cost** | | |
| Development Labour | 17.0 | 15% |
| Development Equipment | 10.3 | 9% |
| Development Explosives | 4.2 | 4% |
| Drilling Consumables | 1.2 | 1% |
| Piping | 2.2 | 2% |
| Ventilation Tubing | 3.1 | 3% |
| Other Costs | 3.0 | 3% |
| Ground Support Consumables | 10.2 | 9% |
| Support Labour | 32.5 | 29% |
| Support Equipment | 3.5 | 3% |
| Contractor's Profit | 17.4 | 16% |
| Technical Service | 6.5 | 6% |
| **Total** | **110.9** | **100%** |

### 21.2.1.4 Underground Mine Infrastructure and Paste Plant

BBA used cost estimates from other similar underground mining projects in Québec to estimate infrastructure costs. Unit costs were then applied to the quantities included in the mine design. In addition to the lateral development, underground infrastructure will need to be put in place including:

- Electrical stations;
- Pumping stations;
- Ore passes and ore chutes;
- Fans and ventilation system infrastructure;
- Truck trolley system;
- Electrical and communication wiring;
- Garage, fuels and gear bays;
- Explosives and detonators depot;
- Paste backfill infrastructure.

A paste plant will also need to be constructed next to the processing plant at an estimated cost of $25.5M. The total cost of the underground infrastructure, including the paste plant, was estimated to be $71.3M.

## 21.3 Sustaining Capital Costs

Sustaining capital costs include all expenditures necessary to sustain operations throughout the LOM. These include costs for purchasing open pit mining equipment, development of the UG mine, stockpile expansions, and renewal of the site's infrastructure and processing plant. It also includes indirect costs and contingencies related to those expenses. Sustaining costs start at Year 1 until the end of the mining operations. The LOM sustaining capital costs were estimated to be $651.4M. The main items that are part of each category are presented in Table 21-14.

**Table 21-14: LOM sustaining capital costs**

| Capital Expenditure | Sustaining Capital ($M) | Sustaining Capital (%) |
|---|---|---|
| Open Pit Mine and Stockpiles | 256.4 | 39% |
| Process | 26.0 | 4% |
| Underground Mine Lateral Development | 203.4 | 31% |
| Underground Mine Infrastructure & Paste Plant | 144.1 | 22% |
| **Subtotal** | **629.9** | **97%** |
| Contingency | 21.5 | 3% |
| **Total Including Contingency** | **651.4** | **100%** |

## 21.4 Estimated Operating Cost

### 21.4.1 Summary

Operating costs are all the costs related to the daily operation of the mining complex. These include the costs associated to the operation, maintenance, and administration of the site. The total LOM operating cost for the Shaakichiuwaanaan mine site was estimated at $7,581M, as detailed in Table 21-15.

**Table 21-15: Total LOM operating cost at site**

| Parameters | Unit Cost ($/t conc) | Operating Cost ($M) |
|---|---|---|
| Open Pit Mining | 109.40 | 1,627.1 |
| DMS Tailings Handling | 11.59 | 172.4 |
| Underground Mining | 183.64 | 2,731.4 |
| Processing | 90.46 | 1,345.5 |
| G&A | 106.02 | 1,576.9 |
| Electrical Power & Propane(1) | 8.56 | 127.3 |
| **Total** | **509.67** | **7,580.7** |

(1) Excludes electrical and propane costs for the processing plant, OP/UG mining equipment and UG mine ventilation.

## 21.4.2 Open Pit Mining and Tailings

### 21.4.2.1 Summary

Over the LOM, mining operations will move an estimated 297.0 Mt of material, including 239.0 Mt of in situ material in the open pit, 48.1 Mt of DMS tailings staked, and 57.9 Mt of rehandling. The rehandled material includes all the mineralized material tonnes coming from the UG mine (39.8 Mt) and 25% of the mineralized material from the open pit (18.1 Mt). The total operating cost over the 19 years of mining operations (25 if including the rehandling) will be approximately $1,799M. The LOM average unit costs per tonne mined are summarized in Table 21-16. The mine will be operated by the Owner.

**Table 21-16: Mining unit cost summary**

| Mining Cost | Unit | Cost |
|---|---|---|
| Cost per Tonne Mined | $/t | 7.10 |
| Cost per Mineralized Material Mined | $/t | 32.24 |
| Cost per Tonne of Concentrate | $/t | 109.39 |

#### 21.4.2.2 Cost Parameters & Assumptions

To estimate the mine's operating costs, assumptions were established. Table 21-17 shows the assumptions for the consumable prices.

**Table 21-17: Consumables cost assumptions**

| Consumables | Unit | Value |
|---|---|---|
| Diesel Fuel | $/L | 1.73 |
| Electrical Cost | $/kWh | 0.05 |
| Emulsion Cost (Titan XL 1000) | $/kg | 1.36 |

#### 21.4.2.3 Open Pit Operating Cost

Table 21-18 summarizes the operating costs for the open pit. The LOM costs were estimated by applying equipment, labour, and consumable quantities and unit costs to the mining schedule. The main mining operations for the open pit spreads over 19 years, including the pre-production year (Year -1 to Year 18). Some rehandling and mine maintenance activities will remain until the UG mine is depleted at Year 24. A total of 239 Mt of material will be mined over the LOM, including 172.5 Mt of waste rock, 16.0 Mt of overburden and 50.5 Mt of mineralized material.

**Table 21-18: Open pit mine operating costs summary**

| Parameters | LOM Total ($M) | Average LOM ($/t mined) | Opex |
|---|---|---|---|
| Mine Supervision | 35.8 | 0.16 | 2% |
| Technical Services | 92.2 | 0.40 | 6% |
| Loading | 208.3 | 0.91 | 13% |
| Hauling | 385.7 | 1.68 | 24% |
| Drill & Blast | 305.3 | 1.33 | 19% |
| Mine Support | 226.9 | 0.99 | 14% |
| Mine Services | 302.5 | 1.32 | 19% |
| Explosive Contractor | 70.2 | 0.31 | 4% |
| **Total** | **1,627.1** | **7.10** | **100%** |

## Mine Supervision and Technical Services

The mine supervision and technical services costs include all the costs related to the personnel supervising the mining operations and the technical services staff.

## Loading & Hauling

Costs for the loading and hauling equipment include the following elements:

- Fuel cost;
- Equipment operators;
- Lubricants, tires, and other consumables;
- Maintenance and repair parts (excludes labour).

Mobile equipment costs were estimated based on the estimated number of operating hours each equipment would run per year, as described in Section 16.4.4.8. The estimated operating cost per hour for the equipment was provided by the equipment manufacturers.

Labour for maintenance is included the mine services.

## Drill & Blast

Drill and blast costs include the costs related to the operation of the drills, including labour, explosives and detonators, and costs related to the transportation of explosives.

## Mine Support

The mine support costs include all the costs for the support equipment, including labour, fuel, consumables, and maintenance and repairs.

## Mine Services

The mine services costs include the following:

- Mine service equipment operation (including labour and maintenance);
- All the labour costs (including supervision and planner);
- Mineralized material control;
- Road maintenance (aggregate);
- Miscellaneous dewatering costs.

### Explosives Contractor

The mine will hire a contractor to produce, store, and deliver all explosives on site. The cost for the contactor was calculated based on a quotation received by an explosive's contractor in 2023.

### Workforce

The workforce costs were estimated based on the number of personnel and compensation packages described in Section 16.5.7. A 35% fringe was assumed for all personnel to account for all of their benefits. Some overtime and yearly bonuses were also considered in the compensation packages.

## 21.4.3 Tailings Management Costs

Tailings management involves loading, hauling and dozing of tailings from the mill to Stockpile 001. These two types of material will be filtered at the plant and are relatively coarse compared to other mining operations as this is a DMS (dense media separation) plant. It will also be relatively dry. The cost associated with this activity includes equipment and labour costs.

**Table 21-19: Tailings management operating costs summary**

| Parameters | LOM Total ($M) | Average LOM ($/t DMS Tailings Stacked) | Average LOM ($/t conc) |
|---|---|---|---|
| Tailings Operating Cost | 172.4 | 3.58 | 11.59 |

## 21.4.4 Underground Mine Operating Cost

### 21.4.4.1 Summary

Underground mine operations, for both production and development, will be performed by a mining contractor. The underground mining Opex was estimated with a mix of actual operating costs from similar UG mines in Québec and a quotation from a reputable mining contractor obtained in 2024. The UG mining costs were divided into two categories, contractor costs and Owner's costs. Table 21-20 shows a summary of the Opex.

Table 21-20: Underground Opex summary

| UG Operating Costs | LOM Total Cost ($M) | Unit Cost ($/t milled) (1)(2) | LOM Total Cost (%) |
|---|---|---|---|
| **Contractor Costs** | | | |
| Labour | 908.9 | 22.85 | 33% |
| Equipment Operation | 430.3 | 10.82 | 16% |
| Consumables | 399.3 | 10.04 | 15% |
| **Sub Total Direct Contractor Cost** | **1,738.5** | **43.70** | **64%** |
| Profit & Equipment Purchase | 347.7 | 8.74 | 13% |
| **Total Contractor Costs** | **2,086.2** | **52.44** | **76%** |
| **Owner's Costs** | | | |
| Labour | 139.7 | 3.51 | 5% |
| Backfill | 406.0 | 10.21 | 15% |
| Power & Ventilation | 99.4 | 2.50 | 4% |
| **Total Owner's Costs** | **645.2** | **16.22** | **24%** |
| **Total UG Operating Costs** | **2,731.4** | **68.66** | **100%** |

(1) Unit costs from mineralized material from the UG mine only (39.8 Mt).

(2) Costs exclude Capex development costs.

### 21.4.4.2 Contractor Costs

The contractor costs are divided into two categories, development costs and production costs. The development costs include all the costs related to the development of the mine tunnels and excavations. The development costs are subsequently divided into Capex and Opex costs. All the development, except for the draw points, were considered as Capex. All the stope's draw points are therefore considered as Opex. Table 21-21 summarizes all the contractor costs.

After estimating the operating costs for the contractor, BBA applied a 20% increase to account for the contractor's profits and the mining equipment that will need to be purchased by the contractor.

**Table 21-21: Contractor cost summary**

| UG Operation Cost | LOM Total Cost ($M) | Unit Cost ($/t milled)[1] | LOM Total Cost (%) |
|---|---|---|---|
| **Development Cost** | | | |
| Development Labour | 176.6 | 4.44 | 8% |
| Development Equipment | 107.3 | 2.70 | 5% |
| Development Explosives | 30.5 | 0.77 | 1% |
| Drilling Consumables | 8.7 | 0.22 | 0% |
| Piping | 15.7 | 0.39 | 1% |
| Ventilation Tubing | 7.8 | 0.20 | 0% |
| Other Costs | 21.8 | 0.55 | 1% |
| Ground Support Consumables | 74.0 | 1.86 | 4% |
| Support Labour | 89.3 | 2.25 | 4% |
| Support Equipment | 11.8 | 0.30 | 1% |
| **Production Cost** | | | |
| Production Labour | 221.0 | 5.56 | 11% |
| Production Equipment | 191.6 | 4.81 | 9% |
| Stope Blasting | 55.1 | 1.39 | 3% |
| Drilling Consumables | 59.1 | 1.49 | 3% |
| Ground Support Consumables | 8.2 | 0.21 | 0% |
| Support Labour | 421.9 | 10.61 | 20% |
| Support Equipment | 60.0 | 1.51 | 3% |
| Diamond Drilling | 59.7 | 1.50 | 3% |
| Fixed Equipment Maintenance | 118.5 | 2.98 | 6% |
| **Total Direct Contractor Costs** | **1,738.5** | **43.70** | **83%** |
| Profit & Equipment Purchase | 347.7 | 8.74 | 17% |
| **Total Contractor Costs** | **2,086.2** | **52.44** | **100%** |

[1] Unit costs from mineralized material from the UG mine only (39.8 Mt).

The support labour and equipment will complete tasks related to the development and production; therefore, the costs were divided between the two categories based on the number of tonnes mined.

#### 21.4.4.3 Owner's Costs

The Owner's costs include all the costs that will be the responsibility of the mine's operator. These include technical services, paste backfill, and electricity consumption. A summary of the Owner's costs is presented in Table 21-22.

**Table 21-22: Owner's costs summary**

| UG Operation Cost | LOM Total Cost ($M) | Unit Cost ($/t milled)(1) | LOM Total Cost (%) |
|---|---|---|---|
| Technical Services | 139.7 | 3.51 | 22% |
| Backfill | 406.0 | 10.21 | 63% |
| Power and Ventilation | 99.4 | 2.50 | 15% |
| **Total Owner's Costs** | **645.2** | **16.22** | **100%** |

(1) Unit costs from mineralized material from the UG mine only (39.8 Mt).

### 21.4.5 Processing Facility Operating Costs

The annual operating costs for the mineral processing facility were estimated for a nominal year of processing 5,000,000 dry tonnes per year of mineralized material with an average grade of 1.31% $Li_2O$ and producing 827,530 tpa of spodumene concentrate with a grade of 5.50% $Li_2O$ achieving 69.5% $Li_2O$ recovery. These operating costs could be scaled up or down as a function of the mass of mineralized material processed using fixed and variable cost attribution.

#### 21.4.5.1 Basis

The following cost centres were used for the operating cost estimation:

- Plant labour;
- Consumables;
- Reagents;
- Energy and utilities;
- Maintenance;
- Laboratory;
- Mobile equipment.

Select cost centres (transportation, water treatment, camp, and G&A spend) were out of Primero's scope for the cost estimation, as they are included in BBA's project spend estimate.

### 21.4.5.2 Summary

A summary of the mineral processing facility operating cost estimate is provided in Table 21-23 and Table 21-24. All fixed costs were applied for each year the plant was in operation, and variable costs were adjusted based on the tonnages fed to the processing plant each year. The variable costs shown in Table 21-24 are based on a 5 Mtpa throughput.

**Table 21-23: Processing plant cost summary**

| Processing Plant Opex | LOM Total Cost ($M) | Unit Cost ($/t milled) | Unit Cost ($/t conc) |
|---|---|---|---|
| Processing Cost | 1,345.5 | 14.91 | 90.46 |

**Table 21-24: Mineral processing facility operating cost estimate by activity (based on 5 Mtpa milled)**

| Processing Plant Activity | Annual Cost ($M) | | | LOM Total Cost ($M) | Unit Cost ($/t conc) |
|---|---|---|---|---|---|
| | Total ($M) | Variable ($M) | Fixed ($M) | | |
| Plant Labour | 28.7 | 2.9 | 25.8 | 672.0 | 45.18 |
| Consumables | 18.8 | 16.0 | 2.8 | 356.6 | 23.98 |
| Reagents | 7.4 | 7.4 | 0.0 | 134.1 | 9.02 |
| Energy and Utilities | 4.5 | 4.1 | 0.5 | 84.3 | 5.67 |
| Maintenance | 3.2 | 2.4 | 0.8 | 62.4 | 4.19 |
| Laboratory | 1.4 | 1.1 | 0.4 | 27.8 | 1.87 |
| Mobile Equipment | 0.4 | 0.3 | 0.1 | 8.3 | 0.56 |
| **Total** | **64.5** | **34.2** | **30.4** | **1,345.5** | **90.46** |

#### 21.4.5.3 Methodology

The methodology used to estimate the mineral processing facility operating costs is described in the following subsections. Primero's lithium processing experience and data were used along with, when possible, vendor quotes.

**Plant Labour**

The plant labour cost was estimated to be $28.7M per year with 179 plant personnel (88 people per processing train). Labour was on a two-weeks-on, two-weeks-off rotations with 12-hour shifts. Labour costs were estimated as the sum of industry-average salaries and an additional labour cost burden (40% of salaries), which includes overtime pay, performance pay, and fringe benefits, but excludes travel spend and accommodation spend.

**Consumables**

The cost of consumables was estimated to be $18.8M per year. Consumables consist of items such as screen panels, crusher liners, slurry pump parts, conveyor belts and chute liners.

**Reagents**

Reagents cost was estimated to be $7.4M per year. Reagents includes FeSi and flocculent.

**Energy and Utilities**

Energy and utilities cost was estimated to be $4.5M per year. The processing plant energy cost was estimated to be $3.4M per year with 67.6 MWh/y of energy consumption (assumed a load factor of 0.80 and a diversity factor of 0.95) at a price of $0.05/kWh. Additionally, utilities cost including raw water requirements were estimated to total $1.1M per year. The processing plant power requirements were estimated on a unit-by-unit basis using vendor data and/or the Primero database.

**Maintenance**

Maintenance costs were estimated to be $3.2M per year. Maintenance spend included spend on operator tools, maintenance contractors for a shutdown, historian license, and additional third-party inspection and contractors for conveyor belts, overhead cranes, and fire detection and suppression.

**Laboratory**

Laboratory cost was estimated to be $1.4M per year. This cost includes slurry samples, solid samples, filter cake samples, solution samples, independent metallurgical testing, and other spend.

#### Mobile Equipment

Mobile equipment cost was estimated to be $0.4M per year for 26 pieces of equipment.

### 21.4.6 General and Administration Costs

General and administration costs ("G&A") include all costs that are not directly linked to the daily operation of the mine. The costs were mainly estimated from calculations from first principals, quotes from vendors and BBA's experience with similar projects. The G&A costs include the following items:

- Management and administration personnel;
- Human resources, finance, IT and health & safety personnel;
- Office and warehouse supplies;
- Truck freight transportation costs to site;
- IT Equipment, subscriptions & software licenses;
- Permits, insurance, and banking fees;
- Air transportation to site;
- Camp costs (food, cleaning);
- Water treatment;
- Consultant fees;
- Access road maintenance;
- Waste disposal;
- Security.

The total LOM costs for the G&A were estimated to be $1,576,9M or approximately $106.02/t of concentrate produced. The average annual cost at peak production is approximately $74.2M. Table 21-25 summarizes the G&A costs by sector.

**Table 21-25: G&A costs summary**

| G&A Opex Estimation | LOM Total ($M) | Unit Cost ($/t conc) | Opex (%) |
|---|---|---|---|
| G&A Labour | 462 | 31.09 | 29% |
| G&A Expenses | 626 | 42.08 | 40% |
| Site Services | 14 | 0.95 | 1% |
| Crew Rotation Expenses | 230 | 15.51 | 15% |
| Camp Costs | 244 | 16.39 | 15% |
| **Total** | **1,577** | **106.02** | **100%** |

From Year 19, given that the open pit mining operations will cease and only the UG and processing plant will be operating, the G&A costs will be reduced by 50% compared to the costs at peak production. The same assumption was made for the first year of pre-production.

First Nations agreements are excluded from the G&A at this stage.

### 21.4.6.1 G&A Labour

An estimated 174 G&A employees will be employed at peak production. The majority of employees will be on site, with only 28 employees not required to be on site. Table 21-26 describes the number of employees by sector and specifies that are likely to work on site or at the corporate offices. The average annual cost for G&A employees will be approximately $21.8M.

**Table 21-26: G&A personnel summary**

| Department | Working Off Site | Day Shift | Night Shift | Off Rotation | Total |
|---|---|---|---|---|---|
| **Administration** | | | | | |
| General Manager | | 1 | | | **1** |
| Assistant General Manager | | 1 | | | **1** |
| Administrative Assistant | | 1 | | 1 | **2** |
| **Human Resources** | | | | | |
| HR Manager | | 1 | | 0 | **1** |
| HR Coordinator | | 1 | | 1 | **2** |
| HR Staff | 2 | 1 | | 1 | **4** |
| Community Liaison | 1 | 1 | | 0 | **2** |

| Department | Working Off Site | Day Shift | Night Shift | Off Rotation | Total |
|---|---|---|---|---|---|
| **Accounting** | | | | | |
| Controller/Accountant | 4 | | | | **4** |
| Payroll Coordinator | 2 | | | | **2** |
| Payroll Staff | 4 | | | | **4** |
| **Warehouse** | | | | | |
| Purchasing Manager | 1 | | | | **1** |
| Purchasing (Buyer) | 4 | | | | **4** |
| Forklift Operator/Material Coordinator | | 2 | 1 | 3 | **6** |
| Warehouse Staff | | 2 | 1 | 3 | **6** |
| **Health & Safety** | | | | | |
| Health & Safety Coordinator | | 1 | | 1 | **2** |
| Security Staff | | 3 | | 3 | **6** |
| First Aid Attendants | | 2 | | 2 | **4** |
| Training Staff | | 2 | | 2 | **4** |
| **IT Technology** | | | | | |
| IT Manager | | 1 | | 1 | **2** |
| IT Coordinator | 4 | 2 | | 2 | **8** |
| IT Specialist | 6 | 1 | | 1 | **8** |
| Instrumentation Technician | | 1 | 1 | 2 | **4** |
| **Environmental** | | | | | |
| Environmental Manager | | 1 | | 1 | **2** |
| Environmental Coordinator | | 2 | | 2 | **4** |
| Environmental Technician | | 4 | | 4 | **8** |
| Water treatment Operator | | 2 | 2 | 4 | **8** |
| **Building Maintenance** | | | | | |
| Site Services Manager/Supervisor | | 1 | | 1 | **2** |
| General Services/Carpenter | | 4 | | 4 | **8** |
| Electricians | | 4 | | 4 | **8** |
| Mine Dry Attendant | | 1 | | 1 | **2** |
| **Camp/Accommodations** | | | | | |
| Camp Coordinator | | 1 | | 1 | **2** |
| General Maintenance Staff | | 4 | | 4 | **8** |
| Kitchen Staff | | 8 | | 8 | **16** |
| Cleaning Staff | | 12 | | 12 | **24** |
| Nurse | | 2 | | 2 | **4** |
| **Total** | **28** | **70** | **5** | **71** | **174** |

#### 21.4.6.2 G&A Expenses

The G&A general expenses are described in Table 21-27. Most of the costs were estimated based on BBA's experience and with Patriot's input. The LOM costs exclude the costs incurred during the pre-production year, which are accounted as Capex.

**Table 21-27: G&A expenses summary**

| G&A Opex Estimation | LOM Total ($M) | Average Annual Cost(1) ($M/year) | Full Production Annual Avg Cost(2) ($M) |
|---|---|---|---|
| Communications/IT/Computer Supplies and Software Licenses | 42.0 | 1.7 | 2.0 |
| Admin and Technical Office Supplies | 10.5 | 0.4 | 0.5 |
| Warehouse Supplies | 10.5 | 0.4 | 0.5 |
| Truck Freight | 25.6 | 1.1 | 1.2 |
| Postage, Courier & Light Freight | 2.1 | 0.1 | 0.1 |
| Personal Protective Equipment | 21.0 | 0.9 | 1.0 |
| Medical Services Cost | 2.8 | 0.1 | 0.1 |
| First-Aid On-site | 0.4 | 0.0 | 0.0 |
| Computers | 2.8 | 0.1 | 0.1 |
| Waste Disposal | 5.3 | 0.2 | 0.3 |
| Personnel Recruitment/Relocation Costs | 3.2 | 0.1 | 0.2 |
| Permits & License Compliance | 2.7 | 0.1 | 0.1 |
| Insurance | 73.5 | 3.0 | 3.5 |
| Bank Charges | 0.5 | 0.0 | 0.0 |
| Professional Fees - Accounting | 3.2 | 0.1 | 0.2 |
| Professional Fees - Legal | 5.3 | 0.2 | 0.3 |
| Access roads Maintenance | 189.0 | 7.7 | 9.0 |
| Community Relations | 10.5 | 0.4 | 0.5 |
| Allowance for Additional Flights, Travel, Accommodations | 3.2 | 0.1 | 0.2 |
| Equipment Rental | 6.3 | 0.3 | 0.3 |

| G&A Opex Estimation | LOM Total ($M) | Average Annual Cost(1) ($M/year) | Full Production Annual Avg Cost(2) ($M) |
|---|---|---|---|
| Consultants - Various Areas | 10.5 | 0.4 | 0.5 |
| ICS Cybersecurity - Software | 5.3 | 0.2 | 0.3 |
| Training Costs | 11.0 | 0.5 | 0.5 |
| Security Gate Operations (Contractor) | 16.4 | 0.7 | 0.8 |
| Accommodation for Concentrate Transportation Truckers in Matagami | 60.0 | 2.4 | 3.3 |
| Municipality Tax and School | 102.5 | 4.4 | 5.0 |
| **Total** | **626.0** | **25.9(1)** | **30.4(2)** |

(1) Average on full LOM (Years -1 to 24).
(2) Average during full production years (Years 4 to 18).

#### 21.4.6.3 Site Services

Costs for site services mainly comprise water treatment and domestic water treatment on site. The average annual cost of the water treatment was estimated at approximately $0.6M.

#### 21.4.6.4 Crew Rotation Expenses

As the site will be a FIFO, regular air transportation to the site will need to be organized for the employees. A quote from a reputable charter airline was used to estimate the transportation costs. The estimated annual cost for air transportation is $10.1M for an estimated three flights a week with a 100-passenger plane.

#### 21.4.6.5 Camp Costs

As the mine is located in a remote area of northern Québec, all personnel working will live on site. Approximately 500 employees will live on site at all times during operation. The camp costs include all costs for cleaning and maintaining the camp and feeding the employees. The estimated annual cost for the camp during the full production period (Years 4 to 18), without the employees' wages, is approximately $11.1M.

### 21.4.7 Electrical and Propane Costs

The electrical consumption required for the overall operation is presented in Chapter 18. Based on the estimated consumption, the electrical costs were calculated at a rate of $0.05/kWh. Electrical costs related to mining equipment and process equipment are included in their respective unit cost. As such, the electrical cost of these two areas is excluded from Table 21-28.

**Table 21-28: Electrical costs**

| WBS Code | WBS Description | Energy Consumption (kWh/d) | Cost ($/y) |
|---|---|---|---|
| 10200 | General - Main Site - Gate/Security Post | 634 | 11,563 |
| 10260 | General - Main Site - Workers Camp - Permanent | 61,440 | 1,121,280 |
| 10300 | General - Main Site - Warehouse | 432 | 7,884 |
| 10310 | General - Main Site - Aggregate Plant | 648 | 11,826 |
| 10320 | General - Main Site - Concrete Batch Plant | 648 | 11,826 |
| 10370 | General – Main Site – Highway Garage and Fueling Station | 3,600 | 65,700 |
| 10450 | General - Main Site - Electrical - Powerlines | 12,000 | 219,000 |
| 10500 | General - Main Site - Fire Protection and Detection Loop | 144 | 2,628 |
| 10550 | General - Main Site - Telecommunication | 120 | 2,190 |
| 12300 | Mine and Stockpiles - Underground Mine | 0(1) | 0(1) |
| 12300 | Mine and Stockpiles - Mine Garage | 3,240 | 59,130 |
| 12350 | Mine and Stockpiles - Wash Bay | 216 | 3,942 |
| 12400 | Mine and Stockpiles - Warehouse | 216 | 3,942 |
| 12450 | Mine and Stockpiles - Mine Offices and Dry | 7,440 | 135,780 |
| 12500 | Mine and Stockpiles - Mobile Equipment Fleet | 0(1) | 0(1) |
| 12650 | Mine and Stockpiles - Explosives Management | 6,480 | 118,260 |
| 12700 | Mine and Stockpiles - Electrical Distribution | 1,080 | 19,710 |
| 12715 | Mine and Stockpiles – Paste Plant - Distribution | 23,592 | 430,559 |
| 12800 | Mine and Stockpiles - Stockpile - RTW-01 - Recoverable + Tailing + Waste Rock from Starter Pit | 11,931 | 217,750 |
| 13100 | Process - Concentrator - General | 0(2) | 0(2) |
| 18000 | Other Services and Facilities - General | 12,000 | 219,000 |
| 18700 | Other Services and Facilities - Water Treatment Plant and Diffuser | 7,800 | 142,350 |

(1) Included in mining Opex.
(2) Included in process Opex.

Excluding mining and processing electrical consumption, the electrical cost is estimated at $2.8M per year. If we include mining and processing, for indication purposes, the overall electrical cost is estimated at $10.5M per year.

The cost of heating of the processing plant and auxiliary buildings by propane is approximately $2.2M. The garage and the paste plant will also be heating with propane at a cost of $300,000/year. Therefore, the total yearly cost of propane for heating is estimated at $2.5M annually.

### 21.4.8 Concentrate Transportation Costs

All the spodumene concentrate will be transported by a reputable contractor with extensive experience on the Trans-Taiga and the Billy-Diamond roads. The estimated concentrate transportation cost from the mine site to Bécancour is \$226.22/t dry of concentrate (\$213.41/t wet). This includes the material transfer from the trucks into railcars at the Matagami Transshipment Centre. The transportation price excludes the costs for the driver's accommodation and transportation to the mine site. Those costs are captured under the G&A costs. The shipping price will be slightly higher for the first 5 years, as the payment of the railcar cover will be done and will become the property of Patriot, as shown in Table 21-29. The cost per tonne is considering a moisture content of 6%. Transshipment in Matagami will be serviced by another contractor and railway transportation will be serviced by CN. The estimated concentrate transportation costs are presented in Table 21-29.

**Table 21-29: Concentrate transportation costs**

| Activities | Cost $/t dry |
|---|---|
| Truck Transportation from Mine Site to Matagami | 148.40 |
| Transshipment in Matagami from Truck to Railcars | 15.90 |
| Rail Transportation from Matagami to Bécancour | 50.21 |
| Railcar Leasing and Railcar Cover Leasing | 8.53 |
| Leasing Cover for 5 Years | 2.77[1] |
| Unloading in Bécancour | 3.18 |
| **Total First 5 Years** | **228.98** |
| **Total remaining LOM** | **226.22** |

[1] Cost for the first 5 years only.

## 21.5 Mine Closure Costs

The total cost of reclamation (and the guarantee) was estimated at $107.8M. A summary of all the closure costs are presented in Table 21-30.

**Table 21-30 Mine closure cost summary**

| Reclamation and Closure Costs | Cost ($M) |
|---|---|
| Reclamation and Closure Downpayment | 7.1 |
| Bond Interest Payment | 36.9 |
| Reclamation and Closure Spend | 64.2 |
| Mine and Equipment Salvage | (13.4) |
| Demolition | 13.0 |
| **Total Reclamation and Closure Costs** | **107.8** |

The total cost of the Reclamation and Closure was estimated at $71.3M. 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.

As per Québec regulation, the full reclamation amount must be paid within the first 3 years of the Project, including a 50% down payment due the first year. To reduce the pre-production capital and improve the Project's economics, a bond would instead be purchased where a down payment of 10% would be due the first year and only the interest on the bond would be paid over the LOM. The final remaining amount would be paid the last year when reclamation activities will start. The assumed interest rate on the bond is 2.5%, which is within industry's standards for junior companies.

In addition to the reclamation costs, demolition costs of the mine site were also considered based on the value of the building in place. A salvage value of 10% was assumed for the remaining mining equipment used in the last 10 years of the mining operations. The salvage value is $13.4M for the equipment assets after the life of the operation. The salvage value factor was determined from experiences of peers and common industry practice.

The demolition costs are factored at 10% of the mine and concentrator building infrastructure. The demolition costs are $13.0M for infrastructure removal and clean up. The demolition value factor was determined from experiences of peers and common industry practice.

# 22. Economic Analysis

## 22.1 Overview

The economic/financial assessment of the Shaakichiuwaanaan Project was carried out using a discounted cash flow approach on a pre-tax basis and after-tax basis, with spodumene concentrate at 5.5% Li Oxide as the only sales product. The product sales prices and the cost estimates are in Canadian dollars (CA$ or $) unless otherwise stated. An exchange rate of US$0.76 per CA$1.00 was assumed to convert US$ market price projections. No provision was made for the effects of inflation. A tax expert established the tax impact based on current Canadian tax regulations.

The internal rate of return ("IRR") on total investment was calculated based on 100% equity financing. The net present value ("NPV") was calculated from the cash flow generated by the Project, based on a discount rate of 8%. The payback period, based on the undiscounted annual cash flow of the Project, is also indicated as a financial measure. The payback period starts after the initial capital is spent for the start of the concentrator plant production. Furthermore, a sensitivity analysis has been performed for the pre-tax base case and after-tax base case to assess the impact of variations in commodity prices, recovery, initial capital costs, sustaining costs and operating costs on NPV and IRR.

After-tax analysis was completed by a third-party accounting firm contracted through Patriot. BBA is not a tax expert and is relying on other experts for the completion of the tax analysis model as disclosed in Chapter 3.

## 22.2 Cautionary Statement

Certain information and statements contained in this section and in the Report are "forward-looking" in nature. Forward-looking statements include, but are not limited to, statements with respect to the economic and study parameters of the Project; Mineral Resource Estimates, Mineral Reserve Estimates; the cost and timing of any development of the Project; the proposed mine plan and mining methods; dilution and extraction recoveries; processing method and rates and production rates; projected metallurgical recovery rates; infrastructure requirements; capital, operating and sustaining cost estimates; the projected life of mine and other expected attributes of the Project; the NPV and IRR and payback period of capital; working capital; future metal prices; the timing of the environmental assessment process; changes to the Project configuration that may be requested as a result of stakeholder or government input to the environmental assessment process; government regulations and permitting timelines; estimates of reclamation obligations; requirements for additional capital; environmental risks; and general business and economic conditions.

All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted.

The financial analysis included in this PEA is preliminary in nature and it includes a percentage of Inferred Mineral Resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There is no certainty that the Preliminary Economic Assessment will be realized.

## 22.3 General Assumptions

General assumptions regarding the economic analysis are disclosed in this Report, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Report, the economic analysis is subject to the following assumptions:

- There being no significant disruptions affecting the development and operation of the Project.
- The availability of certain consumables and services and the prices for power and other key supplies being approximately consistent with assumptions in the Report.
- Labour and material costs being approximately consistent with assumptions in the Report.
- The timelines for prior consultation and baseline data collection being generally consistent with PEA assumptions and permitting and arrangements with stakeholders being consistent with current expectations as outlined in the Report.
- All environmental approvals, required permits, licenses and authorizations will be obtained from the relevant governments and other relevant stakeholders.
- Additional carbon taxes, beyond those included in the fully taxed fuel costs, have been included.
- The Project has been evaluated on an after-tax basis. It must be noted that there are many potential complex factors that affect the taxation of a mining project. The taxes, depletion, and depreciation calculations in the PEA economic analysis are simplified and are intended only to give a general indication of the potential tax implications; like the rest of the PEA economics, they are only preliminary. Additionally, the Clean Technology Manufacturing ("CTM") Investment Tax Credit ("ITC") was anticipated to become applicable for eligible capital cost for the benefits perceived from the government incentives.
- The timelines for exploration and development activities on the Project.
- Assumptions made in mineralized material estimate and the financial analysis based on that estimate, including, but not limited to, geological interpretation, grades, commodity price assumptions, extraction and mining recovery rates, geotechnical, hydrological, and

hydrogeological assumptions, capital and operating cost estimates, and general marketing, political, business, and economic conditions.

- The production schedules and financial analysis annualized cash flow tables are presented with conceptual years shown. Years shown in these tables are for illustrative purposes only. If additional mining, technical, and engineering studies are conducted, these may alter the Project assumptions as discussed in this Report and may result in changes to the calendar timelines.
- Discounting begins at the start of initial capital spend at Year -2.
- Tonnes of concentrate are in dry tonnes.
- Open pit mining pre-production begins in the first quarter ("Q1") in Year -1; the pre-production mining on the Project consists of stripping, preparation and associate fuel electric and propane costs, 196 kt of mineralized material is mined, but not processed until Year 1. Production that feeds the plant starts Year 1.
- UG mine development starts Year 1. Mineralized material production begins in Year 3 and will ramp-up over 3 years.
- Process plant commissioning and associated cost is allocated in Year -1
- Stage 1 of commercial concentrator plant production start-up is scheduled to begin in the first quarter ("Q1") of Year 1 at the Shaakichiuwaanaan mine site, pre-production. No concentrate product is produced in Year -1. Phase 2, expansion of concentrator is completed in ("Q4") Year 2. There is a production ramp-up in Year 3 and the first full year of production operating at full nameplate capacity is Year 4.
- The base case prices used for the Project are shown in Table 22-1.

**Table 22-1: Commodity prices**

| Commodity Prices | Unit | Price |
|---|---|---|
| 5.5% Li Concentrate | US$/t | 1,375 |

- BBA is using reasonable prices for the current market and long-term forecast.
- The United States to Canadian dollar exchange rate has been assumed to be US$0.76 : CA$1.00 over the life of mine (CA$:US$ exchange rate of 1.32).
- All cost estimates are in constant Q3 2024 Canadian dollars with no inflation or escalation factors taken into account.
- Class-specific Capital Cost Allowance rates used for the purpose of determining the allowable taxable income was performed by a third-party accounting firm.
- Final rehabilitation and closure costs are started in Year 23, at the end of the mine life.
- Project revenue is derived from the sale of 5.5% spodumene concentrate.

- Exploration costs for growth are excluded from the economic assessment.
- Royalties are calculated as provided by Patriot, i.e., 2% * (Revenue - Concentrate Transport – Transport Losses).
- All projects related payments and reimbursements incurred prior to Q1 – Year -2 are considered sunk costs.

This financial analysis was performed on a pre-tax basis. The after-tax basis was performed by an external tax consultant and the results were provided to BBA. Table 22-2 shows the key parameters and assumptions basis used in the Project.

**Table 22-2: Summary of parameters and assumptions basis**

| Parameters | Unit | Value |
|---|---|---|
| **Physicals** | | |
| Stage 1 Construction and Ramp Up Phase | y | 2 |
| Stage 2 Expansion Construction and Ramp Up Phase | y | 2 |
| Years of Operation | y | 24 |
| Operating Days | d | 365 |
| **Open Pit** | | |
| Resource Mined | Mt | 50.5 |
| Waste Mined (including pre-strip) | Mt | 188.6 |
| Total Tonnes Mined | Mt | 239.0 |
| Strip Ratio | W/O | 3.7 |
| **Underground** | | |
| Resource Mined | Mt | 39.8 |
| **Total** | | |
| Total Resource Mined and Processed | Mt | 90.3 |
| Average DMS Process Plant Feed Rate LOM | Mt | 3.8 |
| Average DMS Process Plant Feed Rate(1) | Mt | 4.5 |
| Grade $Li_2O$ | % | 1.31 |
| Average $Li_2O$ Recovery | % | 69.5 |
| Concentrate Moisture Content | % | 6 |
| Spodumene Concentrate | Mt | 14.9 |
| Average Annual Production Rate LOM | ktpa | 620 |
| Average Annual Production Rate(2) | ktpa | 800 |
| **Exchange Rate** | | |
| Exchange | US$/CA$ | 0.76 |

| Parameters | Unit | Value |
|---|---|---|
| **Concentrate Grade** | | |
| $Li_2O$ Grade | % | 5.50 |
| **Commodity Prices** | | |
| $Li_2O$ Grade 5.5% | US$/t | 1,375 |
| **Recovery** | | |
| Plant Recovery | % | $75 \times \left(1 - e^{(-2 \times \mathrm{Li_{grade}})}\right)$ |
| **Operating Costs** | | |
| Mining Cost | $/t conc | 304.63 |
| Processing Cost | $/t conc | 106.02 |
| Site Administration | $/t conc | 99.02 |
| **Cash Operating Cost at Site(3)** | **$/t conc** | **509.67** |
| Concentrate Transport | $/t conc | 226.74 |
| **Total Cash Operating Cost (FOB Bécancour)(4)** | **$/t conc** | **736.41** |
| Sustaining Capital | $/t conc | 43.79 |
| **All-in Sustaining Cost(5)** | **$/t conc** | **780.20** |
| **Utilities/Energy Cost** | | |
| Power (Site and Mills) | $/kWh | 0.05 |
| Diesel Fuel | $/L | 1.73 |
| **Salvage Value** | | |
| Salvage Value Factor | % | 10.00 |
| **Demolition Value** | | |
| Demolition Value Factor | % | 10.00 |
| **Royalty on Concentrate** | | |
| Royalty | % | 2.00 |
| **Transport Losses** | | |
| Transport Losses (mat. movement) | % | 0.20 |
| **Fish Habitat Compensation** | | |
| Fish Habitat Compensation | $/hectare | 300,000 |
| Number of Hectares | hectare | 67 |
| **Reclamation and Closure Bond** | | |
| Downpayment | % | 10 |
| Interest on Downpayment | % | 1 |
| Interest on Bond | % | 2.5 |

| Parameters | Unit | Value |
|---|---|---|
| **Working capital** | | |
| # of Days per Year | day | 365 |
| #of Days in Account Receivable | day | 30 |
| # of Days in Account Payables | day | 30 |

(1) The average DMS process plant feed rate of ~4.5 ktpa is calculated considering the period of full production, i.e., Years 4 to 18.

(2) The annual production rate of ~800 ktpa is calculated considering the period of full production, i.e., Years 4 to 18.

(3) Cash operating cost at site includes mining, processing, and site administration expenses calculated on an SC5.5 basis. This is a non-GAAP financial measure, and when expressed per tonne, non-GAAP ratios. Refer to the "*Important Notice* " for further information on these measures.

(4) Total cash operating cost (FOB Bécancour) includes mining, processing, site administration, and product transportation to Bécancour calculated on an SC5.5 basis. This is a non-GAAP financial measure, and when expressed per tonne, non-GAAP ratios. Refer to the "*Important Notice*" for further information on these measures.

(5) All-in sustaining costs ("AISC") includes mining, processing, site administration, and product transportation costs to Bécancour and sustaining capital over the LOM per unit of concentrate produced during the LOM, and excludes Royalties. This is a non-GAAP measure, and when expressed per tonne, a non-GAAP ratio. Refer to the "*Important Notice*" for further information on these measures.

## 22.4 Mill Feed and Concentrate Production

The mine will produce a mill feed of 90.3 Mt at an average grade of 1.31% $Li_2O$. The averaged mined mill feed tonnes are 3.8 Mt per year for the 24-year mine life and the average process plant feed rate for the period of full production, i.e., Years 4 to 18 is ~4.5 ktpa.

Figure 22-1 shows the annual production of the mill feed and grade for the LOM.

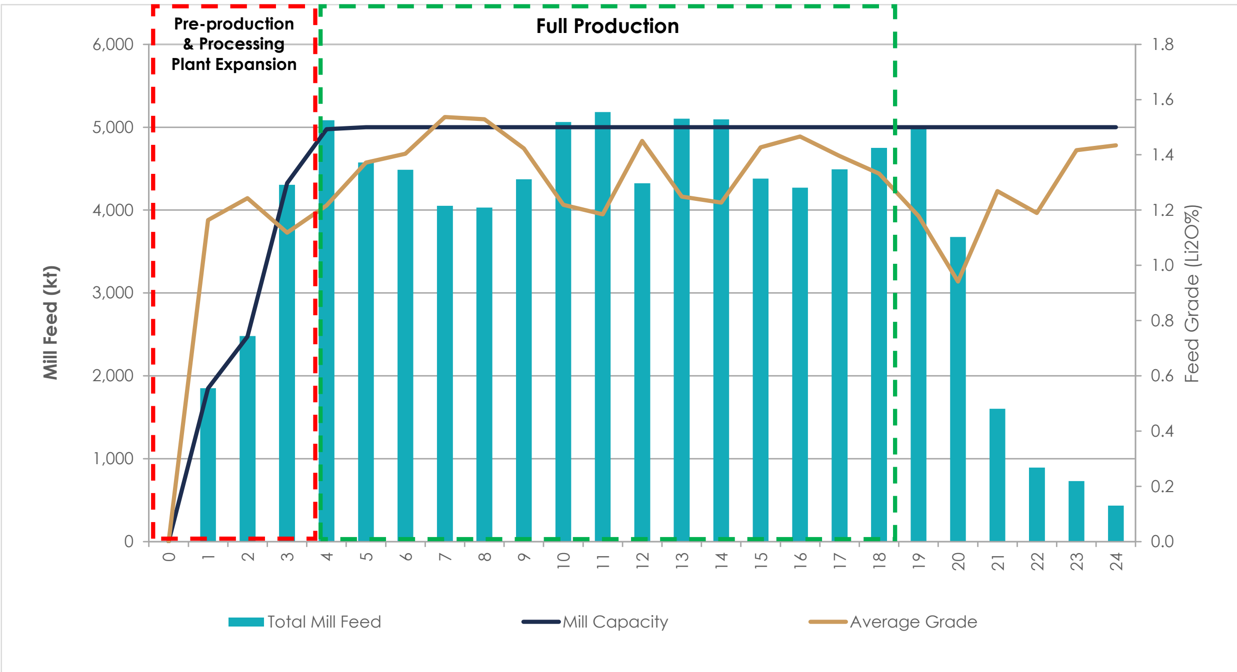



**Figure 22-1: Milled feed and $Li_2O$ annual production and grade**

The Project will produce 14.9 Mt of economic of 5.5% Li concentrate at the Shaakichiuwaanaan mine site.

The concentrate will be produced on site for 24 years at an average annual production of 620,000 tpa (Table 22-3).

**Table 22-3: Average annual production and concentrate produced in the Project**

| Product | Average Production (tpa) | Total Production (t) |
|---|---|---|
| 5.5 Li% Concentrate | 620,000 | 14,874,000 |

For the period of full production, i.e., Years 4 to 18, the concentrate will be produced on site for at an average annual production of 794,000 tpa. Table 22-4 shows the average annual production from Year 4 to Year 18 and the total concentrate produced in the full production capacity.

Table 22-4: Average annual production and concentrate produced for Year 4 to Year 18

| Product | Average Production Y4-18 (tpa) | Total Production Y4-18 (t) |
|---|---|---|
| 5.5 Li% Concentrate | 794,000 | 11,910,000 |

## 22.5 Stage 1 Capital Cost, Expansion and Sustaining Costs

The capital costs are allocated as Stage 1 capital cost, expansion capital, sustaining capital, and closure and reclamation costs. The Stage 1 period is 2 years prior to production (Years -2 and -1) and expansion capital is 2 years after Stage 1 (Years 1 and 2).

Stage 1 capital cost includes general infrastructure including the main access road, bridge, electrical powerline, fish habitat compensation and accommodation camp, all designed to serve both the Stage 1 and Expansion Phases. Additionally, the Mine and Stockpiles category includes the garage, fuel station, and stockpile area, while the Process category covers capital expenditures for the first production train with a capacity of 2.5 Mtpa. An overall contingency has been applied to all direct and indirect costs. Commissioning is also included in the initial capital in Years -1 and -2.

The Expansion Phase includes costs related to the construction and development of the underground mine, the camp expansion, the expansion of the stockpiles, and the second train of the processing plant and their related indirect costs and contingencies.

The sustaining capital includes the mine mobile equipment purchases, replacement and overhauls, site and process plant upgrades, stockpile preparation, foundations, dams, ditches.

The recovery and reclamation consist of an initial downpayment of 10% of the total estimated costs for the closure and reclamation plan. The remaining 90% is bonded and interest is paid until the Project starts the required closure and reclamation work.

Table 22-5 shows the capital expenditures summary.

Table 22-5: Capital expenditures summary

| Capital Expenditure | Stage 1 Capital Cost ($M) | Expansion Capital ($M) | Combined Phases ($M) | Sustaining Capital ($M) | Total Cost ($M) |
|---|---|---|---|---|---|
| General | 142.1 | 9.0 | 151.1 | - | 151.1 |
| Mine and Stockpiles | 148.4 | 29.8 | 178.2 | 256.4 | 434.6 |
| Process | 124.6 | 124.6 | 249.2 | 26.0 | 275.2 |
| Terminals (truck and train) | 8.5 | - | 8.5 | - | 8.5 |
| Other Services and Facilities | 14.3 | - | 14.3 | - | 14.3 |
| Underground Mine Lateral Development | - | 110.9 | 110.9 | 203.4 | 314.3 |
| Underground Mine Infrastructure & Paste Plant | - | 71.3 | 71.3 | 144.1 | 215.4 |
| Fish Habitat Compensation | 20.1 | - | 20.1 | - | 20.1 |
| Indirect Cost | 140.5 | 78.2 | 218.7 | - | 218.7 |
| **Subtotal** | **598.5** | **423.8** | **1,022.3** | **629.9** | **1,652.2** |
| Contingency | 162.9 | 80.0 | 242.9 | 21.5 | 264.4 |
| **Total Including Contingency** | **761.4** | **503.9** | **1,265.2** | **651.4** | **1,916.6** |
| Pre-production Cost | 108.3 | - | 108.3 | - | 108.3 |
| **Total** | **869.7** | **503.9** | **1,373.5** | **651.4** | **2,024.9** |

Figure 22-2 shows the capital costs allocation used in the Project Financial Model.

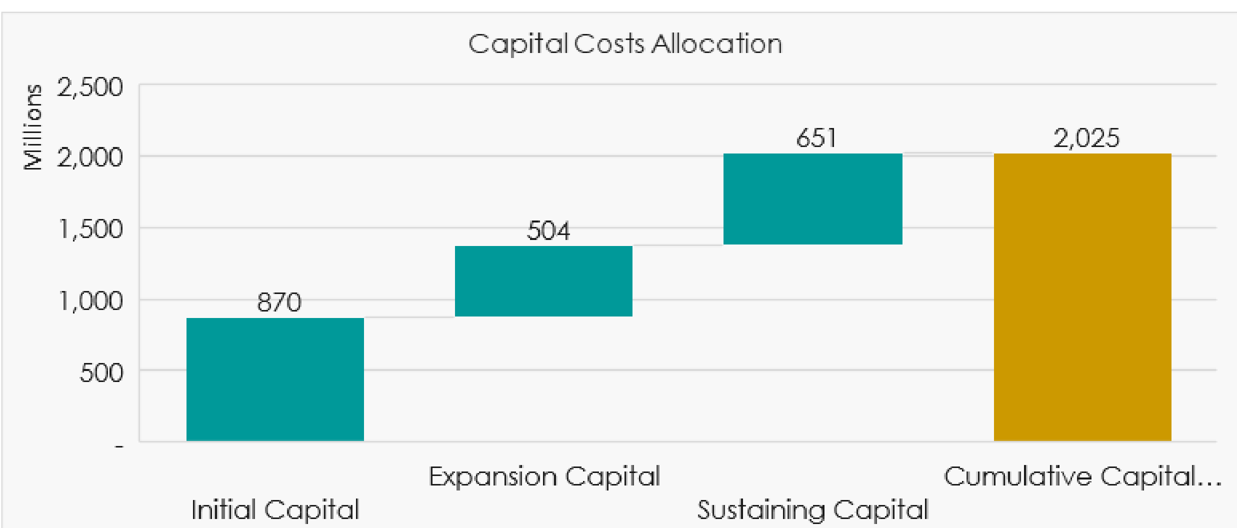



Figure 22-2: Capital costs allocation

The indirect costs are 20% of the direct initial capital costs. The contingency used for the capital expenditures is 21% of direct and indirect costs. The initial capital spend is in Year -1 and Year -2. Details of the capital costs are provided in Chapter 21. All capital costs (initial capital, pre-production, expansion, sustaining, reclamation and closure) for the Project are distributed against the development schedule to support the economic cash flow model. Figure 22-3 presents the planned annual and cumulative LOM capital cost profile.

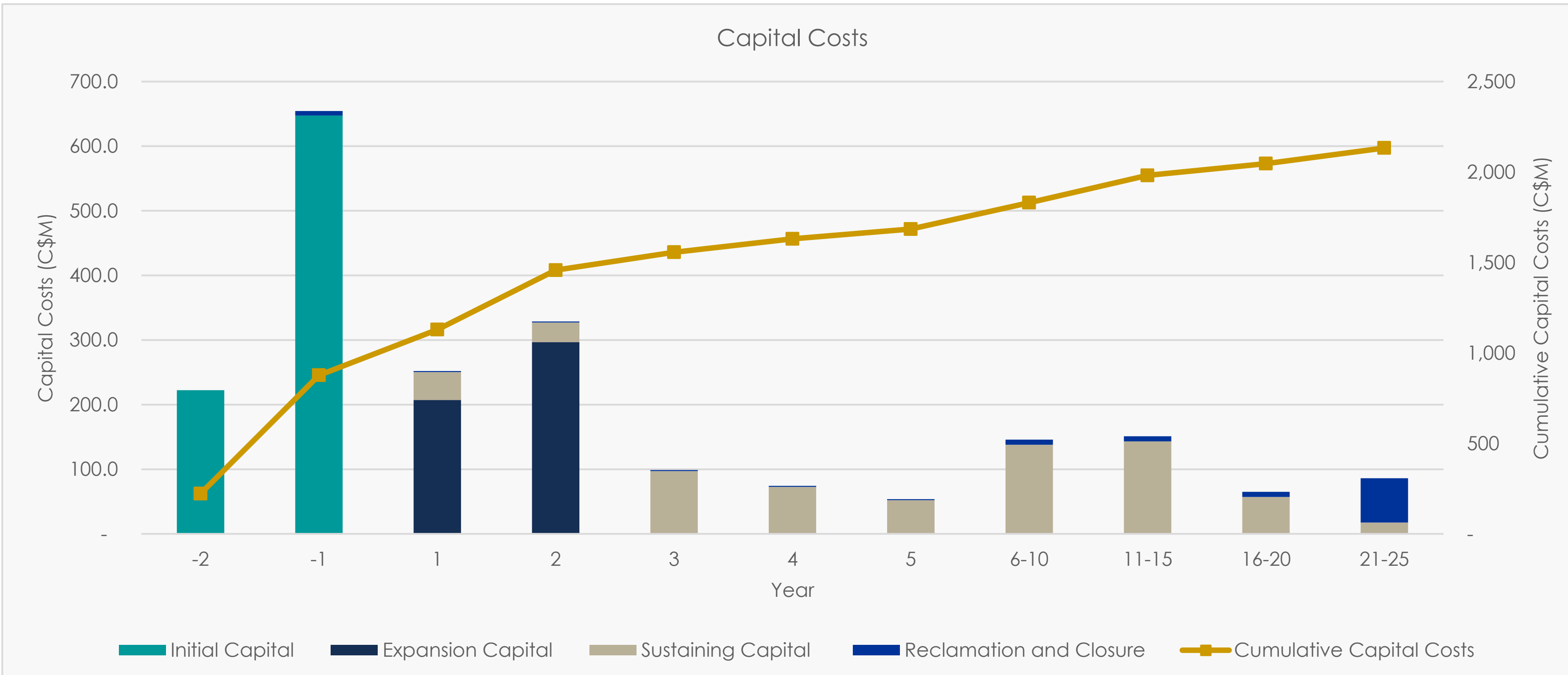



**Figure 22-3: Overall capital costs profile**

## 22.6 Working Capital

The working capital term is used to assess the investment short-term liquidity and operational efficiency. It reflects the ability to manage day-to-day operations effectively. Table 22-6 shows the commercial terms used for the working capital parameters for accounts receivable, inventory and accounts payable and the working capital commercial assumptions used for the financial assessment.

**Table 22-6: Working capital commercial terms**

| Parameters | Description | Unit | Value |
|---|---|---|---|
| **Working Capital** | | | |
| # of Days per Year | | day | 365 |
| #of Days in Accounts Receivable | The money owed to a Company | day | 30 |
| # of Days in Accounts Payable | Short-term liabilities, payment to others | day | 30 |

## 22.7 Transportation Loss

A 0.2% transportation loss of lithium concentrate was assumed to accounts for all the concentrate that will be loss during loading and unloading activities at the different transport points (mine site, Matagami, and Bécancour). It also accounts for potential larger spillage due to accidents or contamination. The loss in revenue for the transportation loss over the LOM is $53.8M, or approximately $2.2M a year.

## 22.8 Royalties

A 2% royalty on the revenues generated by the CV5 Deposit for both underground and open pit mines must be paid to DG Resource Management Ltd. and Osisko Gold Royalties Inc. The Project's royalty is calculated using the parameters defined in Table 22-7.

**Table 22-7: Royalties applied to the Project**

| Parameter | Description |
|---|---|
| A | Gross Sales |
| B | Processing, Concentrator Transport and Transport Losses |
| C | Processing penalties, discounts or costs |
| **Royalty** | $\mathbf{2\%} \times [\boldsymbol{A} - (\boldsymbol{B} + \boldsymbol{C})]$ |

An estimated $469.7M in royalties will be paid over the LOM, or $19.6M annually on average.

## 22.9 Taxation

The Project is subject to three levels of taxation: federal corporate income tax, provincial corporate income tax, and provincial mining taxes. The taxation calculations for the Project were compiled by third-party taxation experts; however, this information was not verified by BBA.

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.

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 Northern Québec, and the after-tax analysis does not attempt to reflect any future changes in corporate structure or property ownership;
- Financing is with 100% equity and, therefore, does not consider interest, loans, debt structures 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;
- The CTM ITC (enacted on June 20, 2024) provides an anticipated  up to 30% of the cost of the investment ineligible property used for eligible activities through a refundable investment credit mechanism.
  - The CTM ITC is applied in the tax calculations; however, there is no guarantee that the credit will be eligible within the timeframe of the Project execution.
- Carbon emissions are applied in the model and deducted in the tax calculations.
- Actual taxes payable will be affected by corporate activities, including tax loss carry-forwards from prior investment losses.

The combined effect on the Project of the three levels of taxation and credits, including the elements described above, is an effective tax rate of 37.5%, i.e., federal and provincial corporate tax of 22% and 18% provincial income tax. It is also anticipated, based on the Project assumptions, that the Project will pay approximately $4,991M of taxes over the life of the Project, as shown in Table 22-8.

**Table 22-8: Total taxes for Shaakichiuwaanaan**

| Taxes | Value ($M) |
|---|---|
| Federal and Provincial Taxes | 2,840 |
| Clean Technology Manufacturing Investment Tax Credit | (230) |
| Québec Mining Tax | 2,293 |
| GHG $CO_2$ Emission Costs[1] | 88 |
| **Total Corporate Income and Mining Taxes** | **4,991** |

[1] In Québec, mining operations are subject to a carbon pricing mechanism where they are charged $45.00 per metric tonne of carbon dioxide equivalent ("$CO_2e$") emissions. This means that for every tonne of greenhouse gases ("GHG"s) emitted, expressed in terms of their equivalent impact to carbon dioxide, mining companies in Québec have to pay a fee of $45.00.

## 22.10 Financial Analysis Summary

An 8% discount rate was applied to the cash flow to derive the NPV for the Project on a pre-tax and after-tax basis. Cash flows have been discounted to Q1, Year -2 for start of the development of the Project. The summary of the financial evaluation for the base case of the Project is presented in Table 22-9.

The pre-tax base case financial model results in an internal rate of return of 37.9% and an NPV of $4,699M with a discount rate of 8%. The simple pre-tax payback period is 3.6 years. On an after-tax basis, the base case financial model results in an internal rate of return of 33.8% and an NPV of $2,937M with a discount rate of 8%. The simple after-tax payback period is 3.6 years.

**Table 22-9 Financial analysis summary**

| Description | | CA$ M | US$ M |
|---|---|---|---|
| Pre-Tax | **Discount Rate** | | |
| | 0% | 13,299 | 10,107 |
| | 5% | 6,819 | 5,182 |
| | **8%** | **4,699** | **3,571** |
| | 10% | 3,698 | 2,811 |
| | 15% | 2,073 | 1,575 |
| | Pre-Tax IRR | 37.9% | |
| | Payback Period | 3.6 years | |
| After-Tax | **Discount Rate** | | |
| | 0% | 8,308 | 6,314 |
| | 5% | 4,270 | 3,245 |
| | **8%** | **2,937** | **2,232** |
| | 10% | 2,305 | 1,752 |
| | 15% | 1,269 | 964 |
| | After-Tax IRR | 33.8% | |
| | Payback Period | 3.6 years | |
| | Cumulative Effective Tax Rate | 37.5% | |

The summary of the Project discounted cash flow financial model (pre-tax and after-tax) is presented in Table 22-10.

**Table 22-10: Financial model summary**

| Item | Unit | Total | Y-2 | Y-1 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11-15 | Y16-20 | Y21-25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Physicals** | | | | | | | | | | | | | | | | | |
| Total Mineralized Materia Feed | kt | 90,248 | - | - | 1,850 | 2,481 | 4,305 | 5,085 | 4,573 | 4,485 | 4,052 | 4,030 | 4,373 | 5,064 | 24,083 | 22,205 | 3,661 |
| $Li_2O$ Grade (%) | % $Li_2O$ | 1.31% | - | - | 1.16% | 1.24% | 1.12% | 1.22% | 1.37% | 1.40% | 1.54% | 1.53% | 1.42% | 1.22% | 1.30% | 1.27% | 1.30% |
| Mineralized Material Mined - Open Pit | kt | 50,464 | - | 196 | 2,151 | 3,057 | 2,783 | 3,858 | 2,840 | 2,008 | 3,023 | 2,110 | 2,295 | 1,951 | 14,181 | 10,011 | - |
| Mineralized Material Mined - Underground | kt | 39,784 | - | - | - | 6 | 655 | 1,090 | 2,023 | 2,235 | 2,282 | 2,230 | 2,223 | 2,164 | 10,655 | 10,558 | 3,227 |
| Waste Mined OP | kt | 188,561 | - | 9,804 | 9,849 | 11,943 | 13,217 | 12,142 | 13,160 | 13,992 | 12,977 | 13,890 | 13,705 | 14,049 | 41,687 | 8,146 | - |
| Overall Stripping Ratio (w:o) | | 3.74 | - | - | 4.58 | 3.91 | 4.75 | 3.15 | 4.63 | 6.97 | 4.29 | 6.58 | 5.97 | 7.20 | 1.73 | 0.87 | - |
| **Recovery** | | | | | | | | | | | | | | | | | |
| Contained $Li_2O$ - Feed for Lithium Concentrate | kt | 1,178.6 | - | - | 21.5 | 30.9 | 48.2 | 61.9 | 62.8 | 63.0 | 62.3 | 61.6 | 62.2 | 61.7 | 313 | 282 | 48 |
| **Products** | | | | | | | | | | | | | | | | | |
| $Li_2O$ Grade @ 5.5% Concentrate | kt | 14,873.8 | - | - | 264.9 | 385.5 | 586.1 | 769.4 | 800.4 | 806.5 | 809.3 | 800.2 | 799.2 | 767.7 | 3,944.8 | 3,540.4 | 599 |
| Tailings | kt | 75,374.0 | - | - | 1,585.1 | 2,095.9 | 3,718.9 | 4,315.3 | 3,772.9 | 3,678.9 | 3,242.5 | 3,229.9 | 3,573.9 | 4,295.9 | 20,138.1 | 18,664.9 | 3,061.7 |
| **Gross Revenue** | | | | | | | | | | | | | | | | | |
| 5.5% $Li_2O$ Conc. Sales | $M | 26,909.8 | - | - | 479.2 | 697.5 | 1,060.4 | 1,392.0 | 1,448.1 | 1,459.1 | 1,464.3 | 1,447.8 | 1,445.9 | 1,388.9 | 7,136.9 | 6,405.2 | 1,084.6 |
| **Total Sales** | **$M** | **26,909.8** | **-** | **-** | **479.2** | **697.5** | **1,060.4** | **1,392.0** | **1,448.1** | **1,459.1** | **1,464.3** | **1,447.8** | **1,445.9** | **1,388.9** | **7,136.9** | **6,405.2** | **1,084.6** |
| **Deductions** | | | | | | | | | | | | | | | | | |
| Transport Losses | $M | 53.8 | - | - | 1.0 | 1.4 | 2.1 | 2.8 | 2.9 | 2.9 | 2.9 | 2.9 | 2.9 | 2.8 | 14.3 | 12.8 | 2.2 |
| Royalty | $M | 469.7 | - | - | 8.4 | 12.2 | 18.5 | 24.3 | 25.2 | 25.5 | 25.6 | 25.3 | 25.2 | 24.2 | 124.6 | 111.8 | 18.9 |
| **Total Deductions** | **$M** | **523.5** | **-** | **-** | **9.3** | **13.6** | **20.6** | **27.0** | **28.1** | **28.4** | **28.5** | **28.2** | **28.1** | **27.0** | **138.9** | **124.6** | **21.1** |
| **Revenue** | **$M** | **26,386.4** | **-** | **-** | **469.9** | **683.9** | **1,039.8** | **1,365.0** | **1,420.0** | **1,430.7** | **1,435.8** | **1,419.6** | **1,417.7** | **1,361.9** | **6,998.0** | **6,280.6** | **1,063.4** |
| **Capital Expenditures** | | | **Initial Capital** | | **Expansion Capital** | | | | | | | | | | | | |
| General | $M | 151.1 | 42.6 | 99.5 | - | 9.0 | - | - | - | - | - | - | - | - | - | - | - |
| Mine and stockpiles | $M | 178.3 | 45.0 | 103.9 | 14.9 | 14.9 | - | - | - | - | - | - | - | - | - | - | - |
| Process | $M | 249.2 | 37.4 | 87.2 | 62.3 | 62.3 | - | - | - | - | - | - | - | - | - | - | - |
| Terminals (Truck and Train) | $M | 8.5 | 2.5 | 5.9 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Other Services and Facilities | $M | 14.3 | 4.3 | 10.0 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Underground Mine Lateral Development | $M | 110.9 | - | - | 44.2 | 66.7 | - | - | - | - | - | - | - | - | - | - | - |
| Underground Mine Infrastructure & Paste Plant | $M | 71.3 | - | - | 11.0 | 60.4 | - | - | - | - | - | - | - | - | - | - | - |
| Fish Habitat Compensation | $M | 20.1 | - | 20.1 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Subtotal Direct Costs** | **$M** | **803.6** | **131.3** | **326.7** | **132.3** | **213.3** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Indirect Costs | $M | 218.7 | 42.1 | 98.3 | 39.1 | 39.1 | - | - | - | - | - | - | - | - | - | - | - |
| Contingency | $M | 242.8 | 48.9 | 114.0 | 35.6 | 44.3 | - | - | - | - | - | - | - | - | - | - | - |
| **Total Capital Costs – before pre-production Opex** | **$M** | **1,265.1** | **222.3** | **539.0** | **207.1** | **296.8** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |
| Pre-production Cost for Process Plant | $M | 26.0 | - | 26.0 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Stripping, Mine Pre-production/Preparation | $M | 82.3 | - | 82.3 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| **Total Capital Costs** | **$M** | **1,373.5** | **222.3** | **647.3** | **207.1** | **296.8** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** | **-** |

| Item | Unit | Total | Y-2 | Y-1 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11-15 | Y16-20 | Y21-25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Operating** | | | | | | | | | | | | | | | | | |
| OP Mining & Tailings | $M | 1,799.6 | - | - | 80.4 | 97.6 | 102.7 | 103.3 | 95.2 | 99.7 | 102.9 | 103.9 | 105.6 | 108.0 | 473.3 | 276.7 | 50.1 |
| UG Mining | $M | 2,731.4 | - | - | 5.1 | 30.1 | 82.2 | 109.2 | 146.0 | 149.1 | 153.9 | 149.6 | 150.5 | 144.0 | 662.3 | 667.1 | 282.3 |
| G&A | $M | 1,576.9 | - | - | 69.8 | 72.1 | 74.2 | 74.3 | 74.4 | 74.4 | 74.4 | 74.4 | 74.3 | 74.3 | 369.7 | 310.2 | 160.5 |
| Processing Opex | $M | 1,345.5 | - | - | 43.0 | 47.3 | 59.8 | 65.1 | 61.6 | 61.0 | 58.1 | 57.9 | 60.3 | 65.0 | 316.4 | 303.6 | 146.5 |
| Electrical Power & Propane (exclusive of mining equipment and process plant) | $M | 127.3 | - | - | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 5.3 | 26.5 | 26.5 | 21.2 |
| Concentrate Transport | $M | 3,372.5 | - | - | 60.6 | 88.3 | 134.2 | 176.2 | 183.3 | 182.4 | 183.1 | 181.0 | 180.8 | 173.7 | 892.4 | 800.9 | 135.6 |
| **Total Operating Costs** | **$M** | **10,953.1** | **-** | **-** | **264.3** | **340.8** | **458.4** | **533.4** | **565.9** | **571.9** | **577.7** | **572.1** | **576.6** | **570.2** | **2,740.5** | **2,385.0** | **796.3** |
| **Sustaining Capital Costs** | | | | | | | | | | | | | | | | | |
| Mine and Stockpiles | $M | 256.4 | - | - | 42.9 | 29.4 | 18.8 | 20.7 | 29.4 | 4.2 | 7.9 | 2.0 | 10.6 | 48.8 | 39.5 | 2.2 | - |
| UG Mine Lateral | $M | 203.4 | - | - | - | - | 44.8 | 25.6 | 9.4 | 8.1 | 3.9 | 8.2 | 7.0 | 13.3 | 54.1 | 22.3 | 6.6 |
| UG Mine Infrastructure | $M | 144.1 | - | - | - | - | 29.9 | 23.9 | 5.0 | 3.0 | 2.5 | 3.0 | 2.7 | 4.8 | 29.4 | 29.9 | 10.1 |
| Process | $M | 26.0 | - | - | - | - | - | - | 5.1 | - | - | - | - | 5.1 | 15.8 | - | - |
| Subtotal Direct Costs | $M | 629.9 | - | - | 42.9 | 29.4 | 93.4 | 70.2 | 48.8 | 15.3 | 14.4 | 13.2 | 20.3 | 71.9 | 138.9 | 54.4 | 16.7 |
| Contingency | $M | 21.5 | - | - | 0.5 | 0.9 | 3.7 | 2.5 | 3.4 | 0.6 | 0.3 | 0.6 | 0.5 | 0.9 | 4.2 | 2.6 | 0.8 |
| **Total Sustaining Costs** | **$M** | **651.4** | **-** | **-** | **43.4** | **30.4** | **97.2** | **72.7** | **52.2** | **15.8** | **14.7** | **13.7** | **20.8** | **72.9** | **143.1** | **57.0** | **17.6** |
| **Closure and Reclamation** | | | | | | | | | | | | | | | | | |
| Closure and Reclamation Costs | $M | 107.8 | - | 7.1 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 8.0 | 8.0 | 68.6 |
| **Changes in Working Capital** | **$M** | **-** | **18.28** | **34.93** | **(48.83)** | **(4.69)** | **(37.96)** | **(22.10)** | **(3.46)** | **(3.36)** | **(0.03)** | **0.77** | **1.11** | **8.26** | **(11.76)** | **40.95** | **27.90** |
| **EBITDA[1]** | **$M** | **15,433.2** | **-** | **-** | **205.6** | **343.1** | **581.4** | **831.6** | **854.1** | **858.8** | **858.1** | **847.5** | **841.1** | **791.7** | **4,257.5** | **3,895.6** | **267.2** |
| **Pre-Tax Cash Flow** | **$M** | **13,299.2** | **(204.1)** | **(619.5)** | **(95.3)** | **9.7** | **444.7** | **735.2** | **796.9** | **838.0** | **841.8** | **833.0** | **819.8** | **725.5** | **4,094.6** | **3,871.4** | **207.7** |
| **Cumulative Pre-Tax Cash Flow** | **$M** | **-** | **(204.1)** | **(823.6)** | **(919.0)** | **(909.3)** | **(464.6)** | **270.5** | **1,067.4** | **1,905.4** | **2,747.2** | **3,580.1** | **4,399.9** | **5,125.5** | **9,220.1** | **13,091.5** | **13,299.2** |
| **Taxes** | | | | | | | | | | | | | | | | | |
| Federal and Provincial Taxes | $M | 2,839.7 | - | - | - | - | 37.1 | 89.6 | 111.7 | 166.2 | 171.2 | 171.2 | 172.6 | 162.3 | 879.0 | 823.7 | 55.0 |
| Clean Technology Manufacturing Investment Tax Credit | $M | (230.2) | - | - | (170.4) | (46.3) | (6.5) | (4.6) | (2.2) | - | (0.2) | - | - | - | - | - | - |
| Québec Mining Tax | $M | 2,293.1 | - | - | 5.8 | 12.4 | 25.2 | 66.3 | 121.4 | 132.4 | 137.8 | 137.8 | 138.3 | 122.3 | 704.0 | 669.6 | 20.0 |
| GHG $CO_2$ Emission Costs | $M | 88.1 | - | - | 2.5 | 3.3 | 4.1 | 4.7 | 4.6 | 4.8 | 4.8 | 4.9 | 4.9 | 4.9 | 23.0 | 18.2 | 3.5 |
| **Total Taxes** | **$M** | **4,990.7** | **-** | **-** | **(162.1)** | **(30.7)** | **59.9** | **155.9** | **235.5** | **303.5** | **313.6** | **313.9** | **315.8** | **289.5** | **1,606.1** | **1,511.5** | **78.5** |

| Item | Unit | Total | Y-2 | Y-1 | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 | Y7 | Y8 | Y9 | Y10 | Y11-15 | Y16-20 | Y21-25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Post-Tax Cash Flow** | $M | 8,308.5 | (204.1) | (619.5) | 66.8 | 40.4 | 384.8 | 579.2 | 561.3 | 534.6 | 528.2 | 519.1 | 504.0 | 436.1 | 2,488.6 | 2,360.0 | 129.1 |
| **Cumulative Post-Tax Cash Flow** | | - | (204.1) | (823.6) | (756.9) | (716.5) | (331.7) | 247.5 | 808.9 | 1,343.4 | 1,871.6 | 2,390.7 | 2,894.7 | 3,330.8 | 5,819.4 | 8,179.3 | 8,308.5 |
| **Discount Rate** | 8% | | | | | | | | | | | | | | | | |
| **Pre-Tax NPV** | | | | | | | | | | | | | | | | | |
| **Payback Period (years)** | | **3.63** | | | | | | | | | | | | | | | |
| 0% | | 13,299.2 | | | | | | | | | | | | | | | |
| 5% | | 6,818.8 | | | | | | | | | | | | | | | |
| **8%** | | **4,698.7** | | | | | | | | | | | | | | | |
| 10% | | 3,698.4 | | | | | | | | | | | | | | | |
| 15% | | 2,072.7 | | | | | | | | | | | | | | | |
| **Pre-Tax IRR** | | **37.9%** | | | | | | | | | | | | | | | |
| **Post-Tax NPV** | | | | | | | | | | | | | | | | | |
| **Payback Period (years)** | | **3.57** | | | | | | | | | | | | | | | |
| 0% | | 8,308.5 | | | | | | | | | | | | | | | |
| 5% | | 4,269.9 | | | | | | | | | | | | | | | |
| **8%** | | **2,937.4** | | | | | | | | | | | | | | | |
| 10% | | 2,305.0 | | | | | | | | | | | | | | | |
| 15% | | 1,268.8 | | | | | | | | | | | | | | | |
| **Post-Tax IRR** | | **33.8%** | | | | | | | | | | | | | | | |

(1) EBITDA is a non-GAAP financial measure and ratio which is comprised of net income or loss from operations before income taxes, finance expense – net, depreciation and amortization. Refer to the "Important Notice" for further information on these measures.

The cumulative cash flow projections for pre-tax and after-tax basis are shown in Figure 22-4.

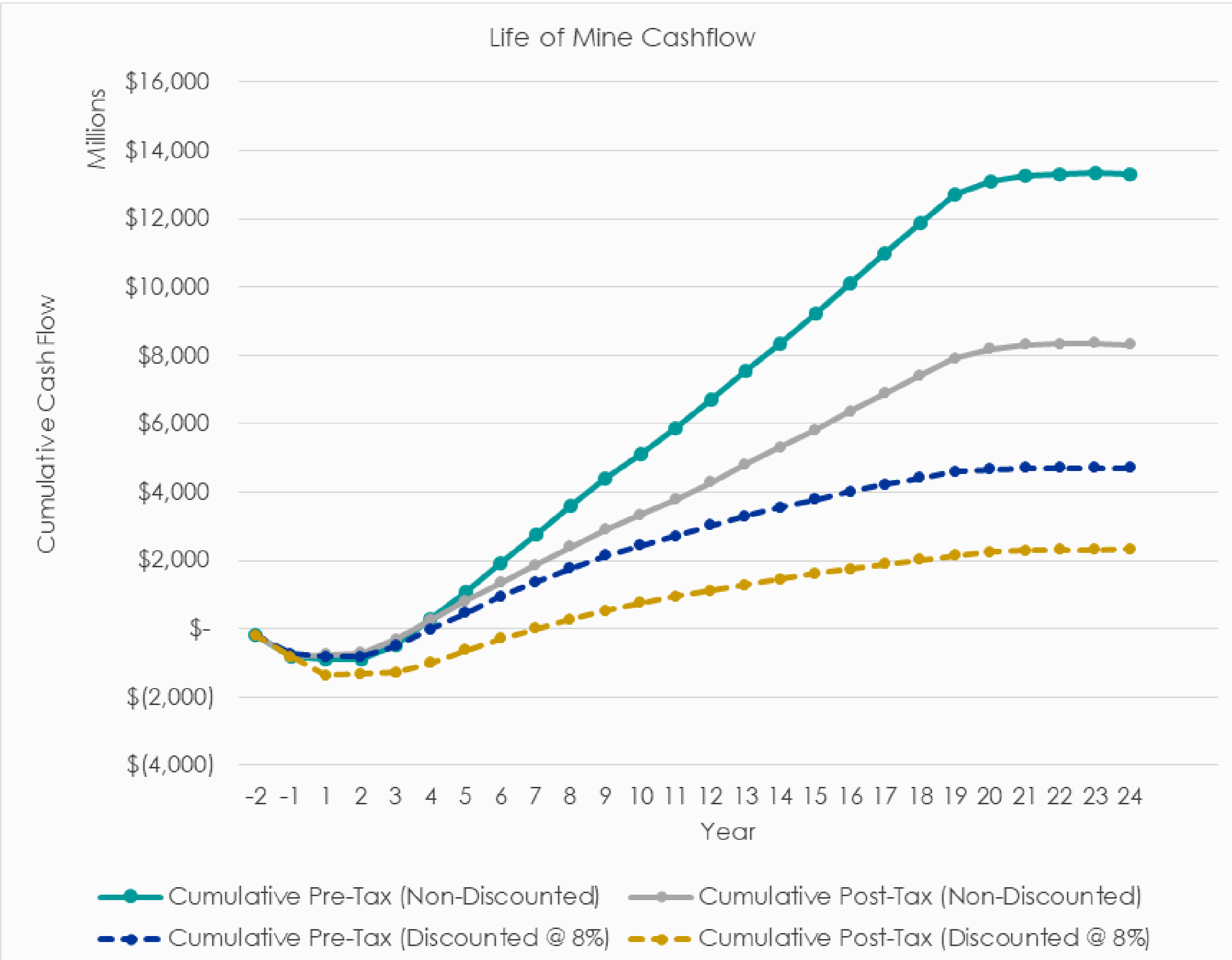



**Figure 22-4: Life of mine pre-tax and after-tax cumulative cash flow projection**

## 22.11 Project Cash Flows

Figure 22-5 presents the Project cash flows.

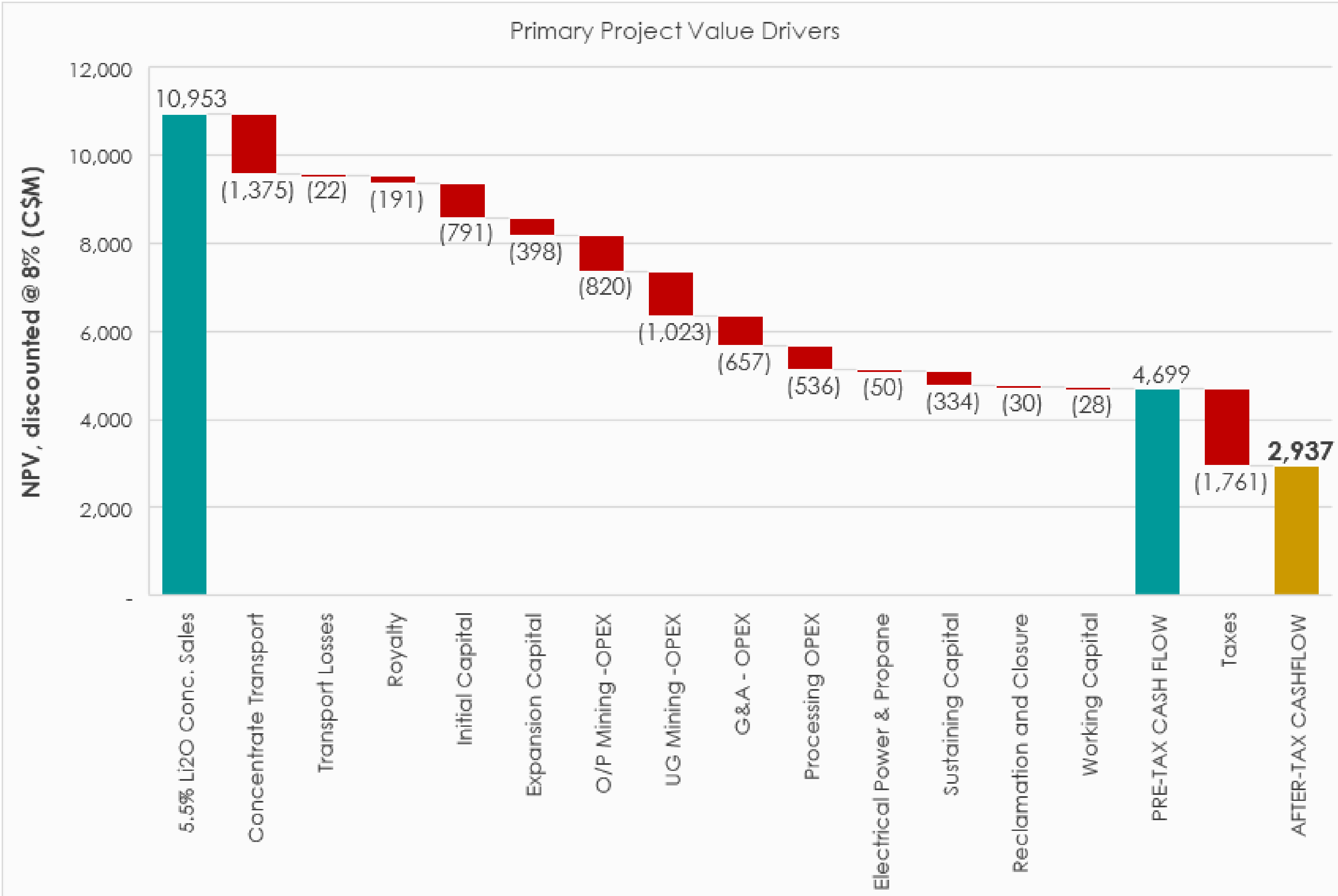



**Figure 22-5: Project cash flows**

## 22.12 Sensitivity Analysis

A financial sensitivity analysis was performed on the base case after-tax cash flow NPV (8%) and IRR of the Project, considering variations in spodumene concentrate prices, exchange rate, capital costs, sustaining capital costs and operating costs. For the base case assumptions refer to Table 22-2. The after-tax results for the Project IRR and NPV based on the sensitivity analysis are presented in Table 22-11 through Table 22-17. The summary of the after-tax NPV (8%) and IRR are shown in Table 22-18 and Table 22-19 and shown graphically in Figure 22-6 and Figure 22-7. Table 22-11 through Table 22-17 presents the Project NPV at a range of discount rates from 0% to 15% and sensitivities from -30% to +30%. The NPV (8%), which is the base case, is bolded in the tables below.

**Table 22-11: NPV sensitivity results - Grade**

| Grade | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **$Li_2O$ Grade** | 0.91% | 1.04% | 1.18% | 1.31% | 1.44% | 1.57% | 1.70% |
| **Discount Rate** | | | | | | | |
| 0% | $3,252 | $4,986 | $6,683 | $8,308 | $9,900 | $11,470 | $13,013 |
| 5% | $1,448 | $2,421 | $3,366 | $4,270 | $5,152 | $6,019 | $6,870 |
| **8%** | **$845** | **$1,570** | **$2,269** | **$2,937** | **$3,588** | **$4,226** | **$4,851** |
| 10% | $559 | $1,166 | $1,749 | $2,305 | $2,845 | $3,375 | $3,893 |
| 15% | $3,252 | $4,986 | $6,683 | $8,308 | $9,900 | $11,470 | $13,013 |
| **Payback Period** | 6.1 | 4.8 | 4.1 | 3.6 | 3.2 | 2.9 | 2.7 |
| **IRR** | 16.6% | 23.0% | 28.7% | 33.8% | 38.6% | 43.1% | 47.2% |

**Table 22-12: NPV sensitivity results - Spodumene price**

| 5.5% Spodumene Concentrate Price | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **$Li_2O$ Price** | $963 | $1,100 | $1,238 | $1,375 | $1,513 | $1,650 | $1,788 |
| **Discount Rate** | | | | | | | |
| 0% | $3,560 | $5,186 | $6,778 | $8,308 | $9,818 | $11,325 | $12,823 |
| 5% | $1,621 | $2,532 | $3,418 | $4,270 | $5,107 | $5,940 | $6,767 |
| **8%** | **$975** | **$1,653** | **$2,308** | **$2,937** | **$3,555** | **$4,168** | **$4,775** |
| 10% | $669 | $1,235 | $1,782 | $2,305 | $2,818 | $3,326 | $3,829 |
| 15% | $172 | $554 | $920 | $1,269 | $1,609 | $1,946 | $2,277 |
| **Payback Period** | 5.8 | 4.7 | 4.0 | 3.6 | 3.2 | 3.0 | 2.7 |
| **IRR** | 17.8% | 23.7% | 29.0% | 33.8% | 38.3% | 42.6% | 46.6% |

**Table 22-13: NPV sensitivity results - Exchange rate**

| Exchange Rate | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **Exchange Rate (CA$:US$)** | 0.92 | 1.05 | 1.18 | 1.32 | 1.45 | 1.58 | 1.71 |
| **Discount Rate** | | | | | | | |
| 0% | $3,590 | $5,212 | $6,801 | $8,308 | $9,836 | $11,339 | $12,834 |
| 5% | $1,645 | $2,554 | $3,439 | $4,270 | $5,124 | $5,956 | $6,781 |
| **8%** | **$997** | **$1,673** | **$2,327** | **$2,937** | **$3,571** | **$4,183** | **$4,789** |
| 10% | $689 | $1,255 | $1,800 | $2,305 | $2,834 | $3,342 | $3,844 |
| 15% | $191 | $572 | $937 | $1,269 | $1,625 | $1,961 | $2,291 |
| **Payback Period** | 5.7 | 4.6 | 4.0 | 3.6 | 3.2 | 2.9 | 2.7 |
| **IRR** | 18.2% | 24.1% | 29.5% | 33.8% | 38.9% | 43.2% | 47.2% |

**Table 22-14: NPV sensitivity results - Recovery**

| Recovery (%) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **Recovery (%)** | 48.62 | 55.57 | 62.51 | 69.46 | 76.41 | 83.35 | 90.30 |
| **Discount Rate** | | | | | | | |
| 0% | $4,846 | $6,029 | $7,190 | $8,308 | $9,423 | $10,537 | $11,648 |
| 5% | $2,446 | $3,069 | $3,681 | $4,270 | $4,856 | $5,441 | $6,024 |
| **8%** | **$1,627** | **$2,075** | **$2,516** | **$2,937** | **$3,357** | **$3,776** | **$4,193** |
| 10% | $1,233 | $1,600 | $1,960 | $2,305 | $2,648 | $2,990 | $3,330 |
| 15% | $576 | $814 | $1,047 | $1,269 | $1,490 | $1,709 | $1,926 |
| **Payback Period** | 4.5 | 4.1 | 3.8 | 3.6 | 3.3 | 3.1 | 2.8 |
| **IRR** | 24.3% | 27.7% | 30.8% | 33.8% | 36.7% | 39.6% | 42.3% |

Table 22-15: NPV sensitivity results - Capital costs

| Capital Costs | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **Capital Costs (M)** | 962 | 1,099 | 1,236 | 1,374 | 1,511 | 1,648 | 1,786 |
| **Discount Rate** | | | | | | | |
| 0% | $8,721 | $8,583 | $8,446 | $8,308 | $8,171 | $8,034 | $7,896 |
| 5% | $4,644 | $4,519 | $4,395 | $4,270 | $4,145 | $4,020 | $3,896 |
| **8%** | **$3,292** | **$3,174** | **$3,056** | **$2,937** | **$2,819** | **$2,701** | **$2,583** |
| 10% | $2,647 | $2,533 | $2,419 | $2,305 | $2,191 | $2,077 | $1,963 |
| 15% | $1,583 | $1,479 | $1,374 | $1,269 | $1,164 | $1,059 | $954 |
| **Payback Period** | 2.8 | 3.1 | 3.3 | 3.6 | 3.8 | 4.0 | 4.3 |
| **IRR** | 46.8% | 41.5% | 37.3% | 33.8% | 30.9% | 28.4% | 26.3% |

Table 22-16: NPV sensitivity results - Sustaining capital costs

| Sustaining Capital | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **Sustaining Capital (M)** | 456 | 521 | 586 | 651 | 716 | 782 | 847 |
| **Discount Rate** | | | | | | | |
| 0% | $8,504 | $8,439 | $8,374 | $8,308 | $8,243 | $8,178 | $8,113 |
| 5% | $4,395 | $4,353 | $4,312 | $4,270 | $4,228 | $4,186 | $4,145 |
| **8%** | **$3,037** | **$3,004** | **$2,971** | **$2,937** | **$2,904** | **$2,871** | **$2,838** |
| 10% | $2,392 | $2,363 | $2,334 | $2,305 | $2,276 | $2,247 | $2,218 |
| 15% | $1,332 | $1,311 | $1,290 | $1,269 | $1,248 | $1,226 | $1,205 |
| **Payback Period** | 3.5 | 3.5 | 3.5 | 3.6 | 3.6 | 3.6 | 3.7 |
| **IRR** | 34.9% | 34.5% | 34.2% | 33.8% | 33.4% | 33.1% | 32.7% |

**Table 22-17: NPV sensitivity results - Operating costs**

| Operating Cost | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Variation** | -30% | -20% | -10% | **0%** | 10% | 20% | 30% |
| **Operating Cost (M)** | 5,306 | 6,065 | 6,823 | 7,581 | 8,339 | 9,097 | 9,855 |
| **Discount Rate** | | | | | | | |
| 0% | $9,563 | $9,146 | $8,730 | $8,308 | $7,883 | $7,440 | $6,980 |
| 5% | $4,964 | $4,734 | $4,503 | $4,270 | $4,034 | $3,790 | $3,537 |
| **8%** | **$3,452** | **$3,282** | **$3,110** | **$2,937** | **$2,762** | **$2,581** | **$2,394** |
| 10% | $2,735 | $2,593 | $2,450 | $2,305 | $2,159 | $2,007 | $1,851 |
| 15% | $1,561 | $1,464 | $1,367 | $1,269 | $1,170 | $1,067 | $961 |
| **Payback Period** | 3.2 | 3.3 | 3.5 | 3.6 | 3.7 | 3.8 | 4.0 |
| **IRR** | 38.1% | 36.7% | 35.3% | 33.8% | 32.3% | 30.8% | 29.3% |

The sensitivity analysis reveals that the US$:CA$ exchange rate, grade and spodumene concentrate price have the most significant influence on both NPV and IRR compared to the other parameters, based on the ranges evaluated. Other notable sensitivities are operating. The capital costs show significant influence on the IRR. The Project is less sensitive to changes in sustaining capital costs.

Overall, the NPV and IRR of the Project is positive over the range of values used for the sensitivity analysis when the sensitivities are analyzed individually.

Table 22-18: Summary of NPV sensitivity results

| Item | Results | | | | | | |
|---|---|---|---|---|---|---|---|
| **Discount Rate:** | **8%** | | | | | | |
| **After-Tax Net Present Value (NPV) @ 8% (CA$ M)** | **-30%** | **-20%** | **-10%** | **0%** | **10%** | **20%** | **30%** |
| Li Oxide Grade (±30%) | 845 | 1,570 | 2,269 | 2,937 | 3,588 | 4,226 | 4,851 |
| Price (US$) Li Oxide Grade 5.5% (±30%) | 975 | 1,653 | 2,308 | 2,937 | 3,555 | 4,168 | 4,775 |
| Exchange Rate (US$:CA$) (±30%) | 997 | 1,673 | 2,327 | 2,937 | 3,571 | 4,183 | 4,789 |
| Recovery (±30%) | 1,627 | 2,075 | 2,516 | 2,937 | 3,357 | 3,776 | 4,193 |
| Capital Costs (±30%) | 3,292 | 3,174 | 3,056 | 2,937 | 2,819 | 2,701 | 2,583 |
| Sustaining Capital (±30%) | 3,037 | 3,004 | 2,971 | 2,937 | 2,904 | 2,871 | 2,838 |
| Operating Cost (±30%) | 3,452 | 3,282 | 3,110 | 2,937 | 2,762 | 2,581 | 2,394 |

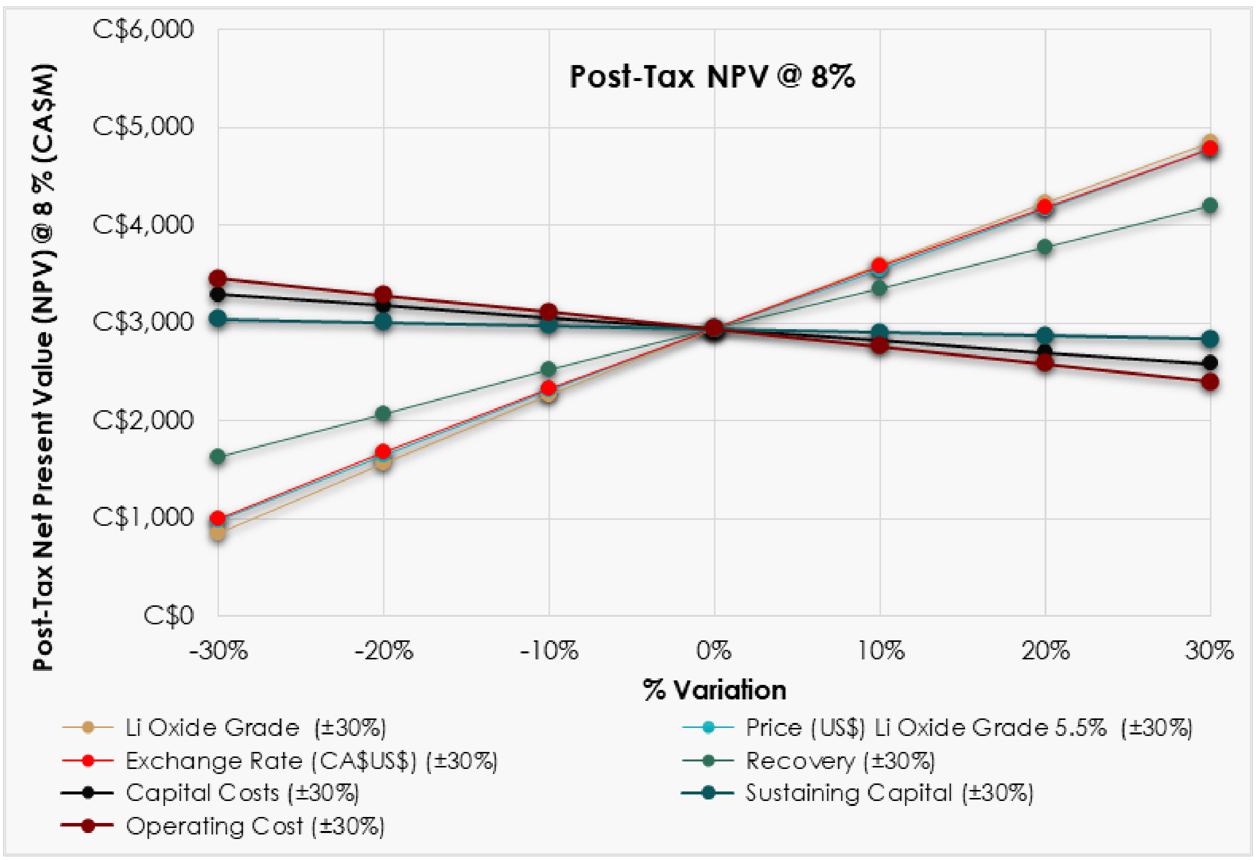



Figure 22-6: Sensitivity analysis of net present value (after-tax) to financial variables

Table 22-19: Summary of IRR sensitivity results

| Item | Results | | | | | | |
|---|---|---|---|---|---|---|---|
| **Discount Rate:** | **8%** | | | | | | |
| **After-Tax Net Present NPV) @ 8% (CA$ M)** | **-30%** | **-20%** | **-10%** | **0%** | **10%** | **20%** | **30%** |
| Li Oxide Grade (±30%) | 16.6% | 23.0% | 28.7% | 33.8% | 38.6% | 43.1% | 47.2% |
| Price (US$) Li Oxide Grade 5.5% (±30%) | 17.8% | 23.7% | 29.0% | 33.8% | 38.3% | 42.6% | 46.6% |
| Exchange Rate (US$:CA$) (±30%) | 51.5% | 44.6% | 38.8% | 33.8% | 29.5% | 25.5% | 22.0% |
| Recovery (±30%) | 24.3% | 27.7% | 30.8% | 33.8% | 36.7% | 39.6% | 42.3% |
| Capital Costs (±30%) | 46.8% | 41.5% | 37.3% | 33.8% | 30.9% | 28.4% | 26.3% |
| Sustaining Capital (±30%) | 34.9% | 34.5% | 34.2% | 33.8% | 33.4% | 33.1% | 32.7% |
| Operating Cost (±30%) | 38.1% | 36.7% | 35.3% | 33.8% | 32.3% | 30.8% | 29.3% |

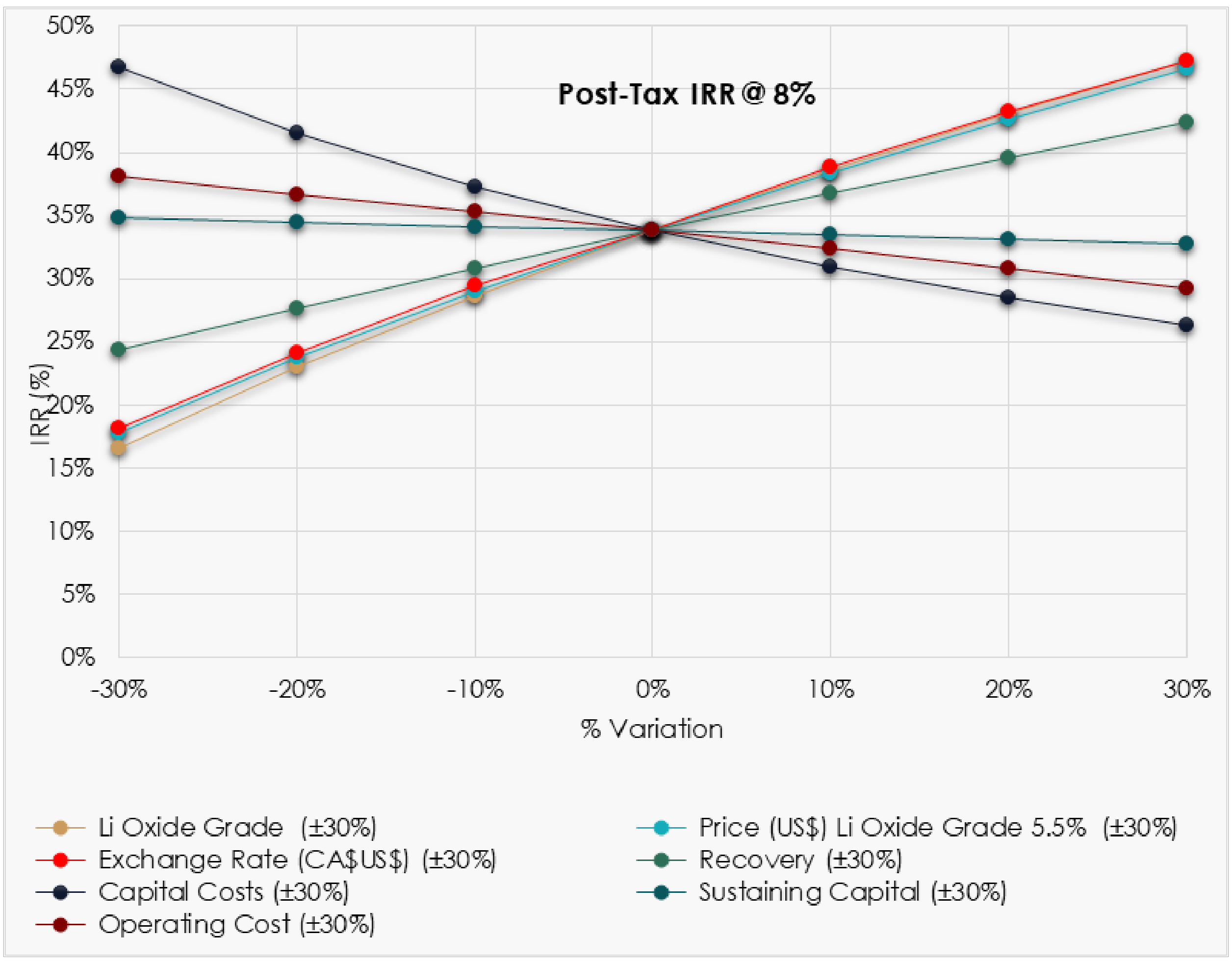



Figure 22-7: Sensitivity analysis of internal rate of return (after-tax) to financial variables

# 23. Adjacent Properties

The Shaakichiuwaanaan Property is located in a region of active mineral exploration within the La Grande Greenstone Belt of the James Bay. The geological setting is prospective for gold, silver, base metals, platinum group elements, and lithium over several different deposit styles including orogenic gold (Au), volcanogenic massive sulfide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and lithium pegmatite (Li, Ta). In addition, a magmatic-hydrothermal Cu-Au-Ag-Mo deposit style (potential Archean porphyry) has been recognized in the immediate region. As a result of recent market conditions and exploration success in the region, the exploration focus on adjacent properties is predominantly LCT pegmatite.

The Company holds the dominant land position with respect to greenstone belt in the region; however, the Property is fully surrounded by other properties held over multiple mineral exploration companies. As of the Effective Date of this Report, mineral exploration companies with properties immediately adjacent to the Company's Shaakichiuwaanaan Property are noted below in Table 23-1 and Figure 23-1.

**Table 23-1: Other properties situated immediately adjacent to the Shaakichiuwaanaan Property**

| Company | Property |
|---|---|
| Rio Tinto Exploration Canada Inc.<br>(under Option from Midland Exploration Inc. for up to 70% interest) | Mythril East |
| SOQUEM Inc. (50%) & Azimut Exploration Inc. (50%) JV | Pikwa |
| Brunswick Exploration Inc.<br>(under Option from Midland Exploration Inc. for up to 85% interest) | Mythril |
| Champion Electric Metals Inc. | Lithium |
| Quebec Lithium Ltd. (Metals Australia Ltd.) | Corvette River |
| Lithium One Metals Inc. | Taycan |
| Mosaic Minerals Corp. | Pluton SM |
| ALX Resources Corp. / Forrestania Resources Ltd. | Volta |
| Spod Lithium Corp. | Grande 4 & Megali |
| Arbor Metals Corp. | Jarnet |
| Tearlack Resources Ltd. | Shelby (Patriot North) |
| Victory Battery Metals Corp. | Stingray |

The QP notes that he has not directly verified information related to mineralization on adjacent properties, and that it is not necessarily indicative of the mineralization present on the Shaakichiuwaanaan Property.

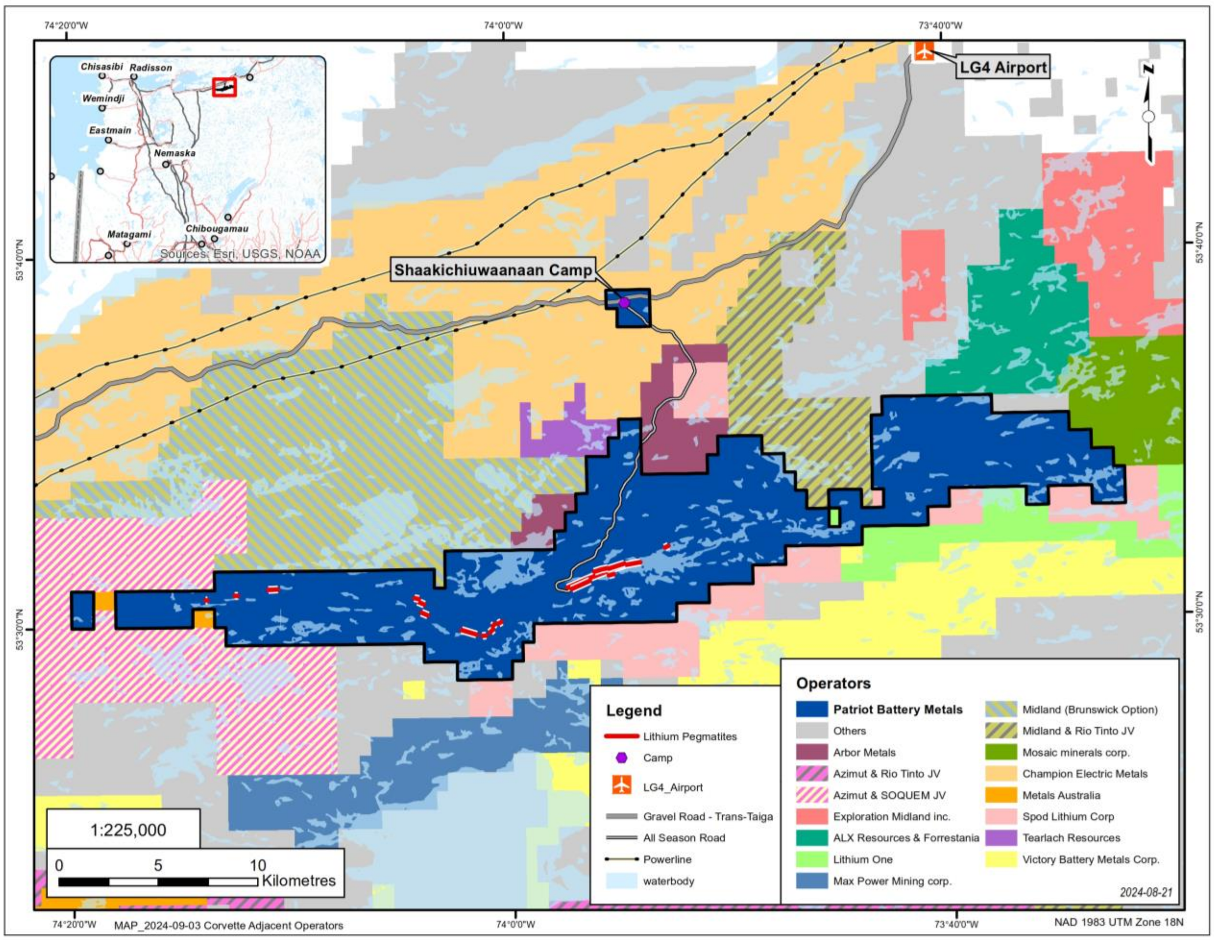



**Figure 23-1: Adjacent properties to the Shaakichiuwaanaan Property (as of August 3, 2024)**

# 24. Other Relevant Data and Information

## 24.1 Project Implementation and Execution Plan

This chapter provides a summary and general description of the Project Execution Plan upon which the Project Schedule and the Capital Cost Estimate were developed.

The Project is expected to proceed to the Feasibility Study phase following the completion of the current Preliminary Economic Assessment Study. Once these front-end studies have been completed and a positive decision has been received from Patriot's Board of Directors, the Project will kick off the site's early works and engineering, procurement, construction and management ("EPCM") activities.

The Project execution milestones are as follows:

- Pre-feasibility Study;
- Feasibility Study;
- Obtention of all permits and approvals;
- Front-end engineering and design;
- Engineering and procurement for long lead items;
- Main site early works and temporary infrastructure;
- Awarding of EPCM contracts;
- Mine development;
- Infrastructure construction;
- Construction of the Matagami Transshipment Centre.

### 24.1.1 Management

EPCM service providers will be directly managed by Patriot's engineering team.

Project financing will be led by Patriot's financial team.

### 24.1.2 Engineering and Procurement

The Feasibility Study will identify equipment and packages that will benefit from early engineering design. Typical early engineering works are listed below:

- Site surveys to establish the location of the crushing system and other important infrastructure to make the best use of the main site's natural topography;

- Progressing engineering and procurement activities for the crushing building and other major equipment and infrastructure;
- Ordering of critical and long lead items;
- Onboarding of the construction contractors to start the following infrastructure:
  - Additional access roads and bridges;
  - Water and sewage treatment plants;
  - Powerline and electrical substation;
  - Workers permanent camp.

### 24.1.3 Construction Management

Construction works will be scheduled as each trade's involvement in the Project commences.

Early works construction from the EPCM contractor include the following major tasks:

- Construction of the mine site camp;
- Civil and earthworks contractor for bulk site clearing and grading;
- Electrical contractor for installation of primary power and substation;
- Mechanical (mechanics, pipe fitters, riggers) contractor for infrastructure equipment installation (sewage and water treatment plants, facilities such as trailers, fuel farm, etc.).

## 24.2 Project Execution Schedule

The critical path for this schedule involves the environmental technical studies, the provincial impact assessment process, as well as the process facility construction. A duration of approximately 4 years was estimated for the provincial impact assessment process. The duration is calculated from the Preliminary Information Statement submission to the MRNF until the issuing of the General Certificate of Authorization.

The Project Execution Schedule was developed, and its main milestones are presented in Table 24-1.

**Table 24-1: Project Execution Milestones**

| Activities / Milestones | Period |
|---|---|
| PEA – Technical Report Completed | Q3 2024 |
| Feasibility Study – Technical Report Completed | Q4 2025 |
| Environmental Impact Assessment Completed | Q3 2025 |
| Construction Start | Q1 2028 |
| Commissioning Start | Q4 2028 |

## 24.3 High Grade Nova Zone

The first underground pyramid to be mined is targeting the Nova Zone area, which contains the highest grade of the CV5 Pegmatite. below show example of tonnes and $Li_2O$ grades within some stopes in the Nova Zone. The Nova Zone is located near surface, between 200 m and 500 m below the surface. The zone contains several high-grade stopes that may enable Patriot to be very competitive in the world's hard rock mining marketplace. This zone is preferentially targeted in the underground mining sequence to access high-grade mineralized material early into the mine life. This high-grade is characterized by large crystal structure which makes the material easily recovered by DMS techniques at relatively large crush size. By developing the open pit mine and the underground Nova Zone concurrently, a blended high feed grade can be realized. It is these characteristics, unique to the Nova Zone and to the CV5 Deposit that result in a competitive advantage for improved project benefit.

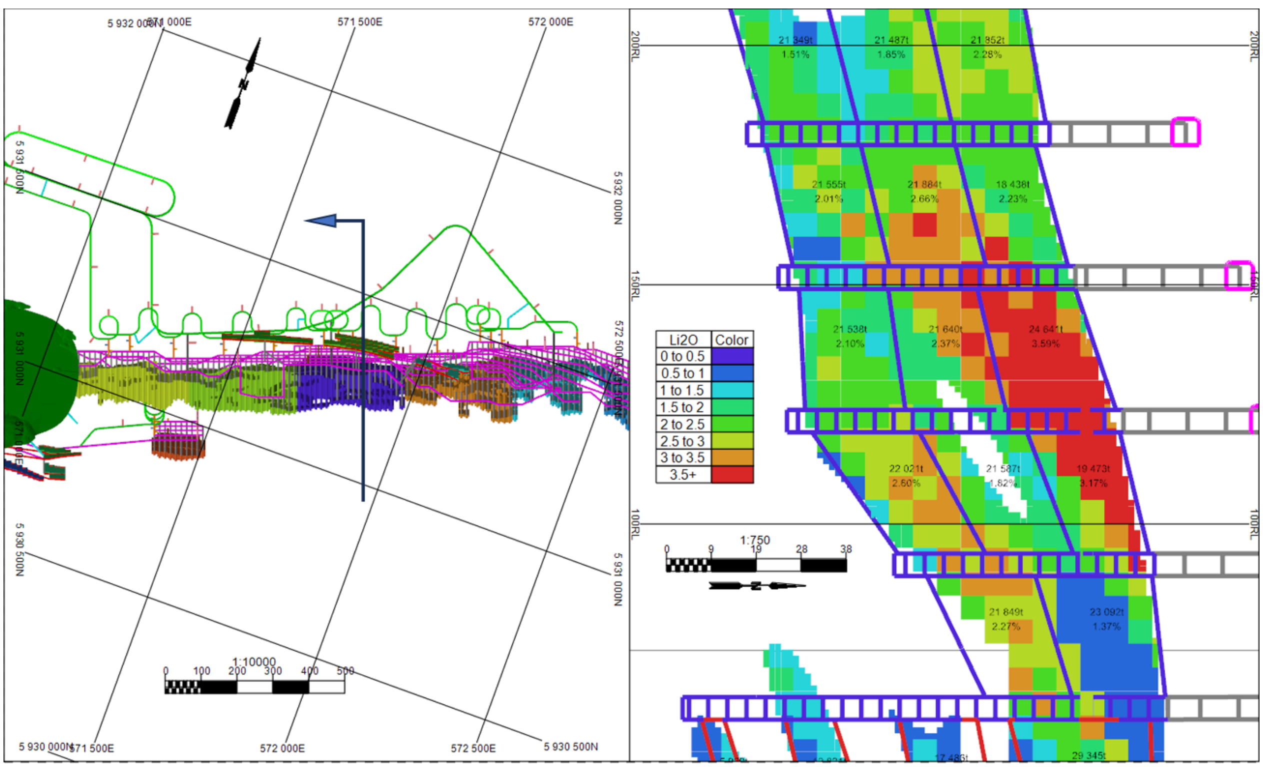



**Figure 24-1: Example 1 of Nova Zone stopes tonnes and $Li_2O$% grade (plan view and cross-section)**

## 24.4 Shaakichiuwaanaan Exploration Target

On August 5, 2024, the Company released an Exploration Target for the Shaakichiuwaanaan Project (Patriot, 2024b). The Exploration Target has been presented as an approach to assess the potential endowment of the Project or the potential to host additional Mineral Resources of lithium pegmatite, subject to the success of future mineral exploration at the Property, and outside of that already defined.

The Exploration Target (also known as a "Target for Further Exploration") for the Shaakichiuwaanaan Project is approximately:

- 146 Mt to 231 Mt at 1.0% to 1.5% $Li_2O$.

The potential quantity and grade of the Exploration Target are conceptual in nature. There has been insufficient exploration to define a Mineral Resource and it is uncertain if further exploration will result in the target being delineated as a Mineral Resource. The Exploration Target has been determined based on the interpretation of a consolidated dataset of surface rock sample descriptions and assays, outcrop mapping and descriptions, drill hole logs and core sample assays, geophysical surveys, and remote sensing data (refer to "Methodology of Determination for the Exploration Target" below for more information about the base on which the disclosed potential quantity and grade has been determined).

The Exploration Target for the Project is exclusive of (i.e., does not include) the Shaakichiuwaanaan MRE, announced concurrently by the Company (and described in this Report), and only considers the CV Lithium Trend and immediately proximal areas (Figure 7-5).

The Company intends to test the validity of the Exploration Target in future exploration programs at the Project, beginning in 2025 and extending over several years. Systematic diamond drilling (NQ core size) of the known spodumene pegmatite clusters and corridors between and proximal to these clusters which collectively form the basis of the Exploration Target, will be the primary method of exploration.

### 24.4.1 Methodology for the Determination of the Exploration Target

The Exploration Target has been completed in accordance with NI 43-101 – Standards of Disclosure for Mineral Projects and the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition ("JORC").

The basis on which the quantity and grade of the Exploration Target has been determined includes a review and interpretation of an extensive Property-scale dataset of surface rock sample descriptions and assays (>1,500 grab, chip, and channel samples), pegmatite outcrop mapping and descriptions (>1,000 outcrops/observations), drill hole logs and core sample assays, geophysical surveys (magnetics, IP-resistivity), and remote sensing data (LiDAR and orthophoto).

The method of determination included a detailed review of the consolidated dataset followed by 3D modelling to create a conceptual volume for all implied LCT pegmatite bodies within, and proximal to, the CV Lithium Trend. To estimate a tonnage the pegmatite specific gravity ("SG") used was approximately 2.626 based on the same linear regression formula as the MRE (SG = 0.0688x $Li_2O$% + 2.625). An associated grade was then applied. The implied tonnage of each volume was then reduced by a factor to account for the likelihood of being mineralized at a reasonable grade, which was then further discounted to arrive at a final range of tonnage and lithium grade. The estimated tonnage was then rounded to the nearest million tonnes and the grade rounded to the nearest 0.1% $Li_2O$.

The 3D modelling of the implied pegmatite volumes was also constrained by the known spodumene pegmatite clusters at the Property, including their interpreted corridors of potential along strike. The volumes were further capped at a vertical depth from surface of 200 m. The areas of the CV Lithium Trend with defined Mineral Resources (i.e., the CV5 and CV13 pegmatites, a collective 6.9 km of trend) were not included in the determination of the Exploration Target. Therefore, the Exploration Target for the Shaakichiuwaanaan Project is exclusive of (i.e., does not include) the Mineral Resources presently defined at the Project.

# 25. Interpretation and Conclusions

## 25.1 Geology and Mineral Resources

The Shaakichiuwaanaan Property is an advanced-stage exploration property located within the La Grande Greenstone Belt region of James Bay. The geological setting is prospective for gold, silver, base metals, platinum group elements, and lithium over several different deposit styles including orogenic gold (Au), volcanogenic massive sulfide (Cu, Au, Ag), komatiite-ultramafic (Au, Ag, PGE, Ni, Cu, Co), and lithium pegmatite (Li, Ta).

The updated consolidated MRE for the Shaakichiuwaanaan Project includes both the CV5 and CV13 spodumene pegmatites for a total of 80.1 Mt at 1.44% $Li_2O$ Indicated and 62.5 Mt at 1.31% $Li_2O$ Inferred, for 4.88 Mt contained lithium carbonate equivalent ("LCE"). Presented by resource location/name, this MRE includes 78.6 Mt at 1.43% $Li_2O$ Indicated and 43.3 Mt at 1.25% $Li_2O$ Inferred at CV5, and 1.5 Mt at 1.62% $Li_2O$ Indicated and 19.1 Mt at 1.46% $Li_2O$ Inferred at CV13. The cut-off grade is variable depending on the mining method and pegmatite.

The consolidated MRE for the Shaakichiuwaanaan Project, including that of the CV5 Pegmatite on its own, reaffirms it – by a wide margin – as the largest lithium pegmatite Mineral Resource in the Americas and 8th largest globally as of its effective date of August 21, 2024. These metrics and context firmly reaffirm and entrench the Project as a Tier 1, world class lithium pegmatite asset.

Both the CV5 and CV13 spodumene pegmatites remain open along strike at both ends, and to depth. Coupled with the Exploration Target (see Section 24.4) for the Shaakichiuwaanaan Property, significant potential is present for additional Mineral Resources to be defined.

The Preliminary Economic Assessment considers only the Mineral Resources of the CV5 Spodumene Pegmatite.

## 25.2 Mining Method

The Project employs a hybrid approach, integrating both open pit and underground mining operations. The material within the open pit will be extracted using the conventional truck and shovel method. For the underground mine, the long hole mining method, including both transverse and longitudinal techniques, will be utilized.

The open pit was designed using the RF0.65 shell. It measures 2.8 km in length, 425 m at its widest point, and approximately 200 m at its deepest. The development is planned in four phases. The starter pit, which avoids all fish habitats, has a 1.15% $Li_2O$ grade near the surface. The second phase features a low strip ratio but a lower grade (1.05% $Li_2O$) than the overall deposit and requires building a small dam, about 100 m long and 4 m high, on the lake during the pre-production year. The third phase involves pushing back Phase 2, while Phase 4 is the final push-back to reach the ultimate pit. Table 25-1 summarizes the material mined in each phase of the open pit development.

**Table 25-1: Pit phases tonnage summary**

| OP Designs | Mineralized Material Tonnes (Mt) | Waste Tonnes (Mt) | OVB Tonnes (Mt) | Avg $Li_2O$ Grade (%) | Total Material (Mt) | Strip Ratio (t/t) |
|---|---|---|---|---|---|---|
| Phase 1 | 2.7 | 11.2 | 7.1 | 1.15% | 21.1 | 6.69 |
| Phase 2 | 8.9 | 19.8 | 0.3 | 1.05% | 29.0 | 2.25 |
| Phase 3 | 8.4 | 27.7 | 2.3 | 1.08% | 38.4 | 3.58 |
| Phase 4 | 30.5 | 113.8 | 6.4 | 1.14% | 150.9 | 3.94 |
| **Total** | **50.5** | **172.5** | **16.0** | **1.11%** | **239.3** | **3.74** |

Open pit mining will include drilling and blasting techniques in combination with large hydraulic shovels and front-end loader-type excavators for loading blasted material into haul trucks. The trucks then haul the material from the mine to the crusher, ROM stockpile, or mine waste rock stockpiles, depending on the material type. Support equipment includes dozers, graders, utility loaders, water trucks, and service vehicles. The pre-production period will be minimal since mineralized material is available at the surface. The removal of the overburden will be the main pre-production activity. The open pit life of mine will start with a pre-production year followed by 18 years of production and 2 years of stockpile rehandling. The open pit mineralized material will vary generally between 1.5 Mtpa and 2.5 Mtpa to complete the underground stable production. The yearly total material movement from the open pit reach a maximum 16 Mt.

Underground mine will use long hole mining method with level every 30 m. There will be nine pyramids mined bottom up. The mineralized material will be excavated with underground LHD scoop of 18t capacity that will dump into ore pass or into haulage truck that has a capacity of 65 t. There will be two access ramps connecting the surface portals with the underground mine. One ramp is for the services and the other one for the production haulage. Mineralized material from the underground will be 100% rehandle on surface to feed the crusher. The ventilation networks will use the ramp and five ventilation raises that will be developed during the life of mine of 24 years. Development will occur from Year 1 to Year 3 and production will start on Year 3 and end on Year 24. The production from underground is stable at 2 Mtpa except for the last few years.

The overall life of mine mineralized material is 90.2 Mt at a diluted grade of 1.31% considering a mining recovery of 97%. Mineralized material from the open pit is 50.5 Mt at a grade of 1.11% $Li_2O$ while the underground mineralized material is 39.8 Mt at 1.54% $Li_2O$. See Table 25-2 for the summary.

Table 25-2: Mineralized material mined over the life of mine

| Design | Mineralized Material Tonnes (Mt) | Waste Tonnes (Mt) | OVB Tonnes (Mt) | Avg $Li_2O$ Grade (%) | Total Material (Mt) |
|---|---|---|---|---|---|
| Open Pit | 50.5 | 172.5 | 16.0 | 1.11% | 239.3 |
| Underground | 39.8 | 6.6 | 0 | 1.54% | 46.4 |
| **Total** | **90.2** | **179.1** | **16** | **1.31%** | **285.7** |

## 25.3 Processing

The PEA uses a DMS-only process for resource beneficiation, selected for its processing simplicity and efficiency in commissioning and ramp-up. By adopting the DMS-only approach, the Project benefits from lower operating expenses due to the reduced complexity and energy requirements. This streamlined process is expected to enhance economic efficiency and aligns with the commitment to sustainable and responsible mining practices.

This design incorporates two parallel production lines at a feed design capacity of 2.5 Mtpa each, a plant size that has been repeatedly and successfully built and operated in the spodumene industry. Additionally, the DMS process generates a minimal quantity of dry-stacked tailings, further enhancing the Project's efficiency and reducing waste management requirements.

The DMS-only flowsheet has been validated by extensive metallurgical test work conducted by SGS Canada and supervised by Primero, both with extensive experience in lithium processing operations.

The test work to date (summarized in Figure 25-1) has confirmed that the coarse spodumene is the dominant lithium mineral, achieving concentrate grades of over 5.5% $Li_2O$ with global lithium recoveries in HLS testing ranging from 70% to 85% (for feed grades in the range 1.0% to 1.5% $Li_2O$ respectfully).

The Shaakichiuwaanaan pegmatites have repeatedly shown excellent processing performance, generating high recoveries at the target concentrate grade. This ease of processing is attributed to the consistently large spodumene crystals found in the CV5 Pegmatite. The robust recoveries exhibited across a range of feed lithium grades is a key differentiator for the Project.

The test work results from both HLS and DMS of the CV5 material, the expected recovery curve from a 3-size range DMS plant (processing Shaakichiuwaanaan pegmatites) and, for reference, recoveries from other operating DMS-only plants (as compiled by external consultants, Primero) are shown comparatively in Figure 25-1. The Project's higher expected recovery (from other DMS-only operations) is due to the wide size range being treated (9.5 mm to 0.65 mm), the quality of the material (large spodumene grains with a narrow grain size distribution), and the 3-size range DMS plant (which lessens the impact of particle size effect in the DMS process).

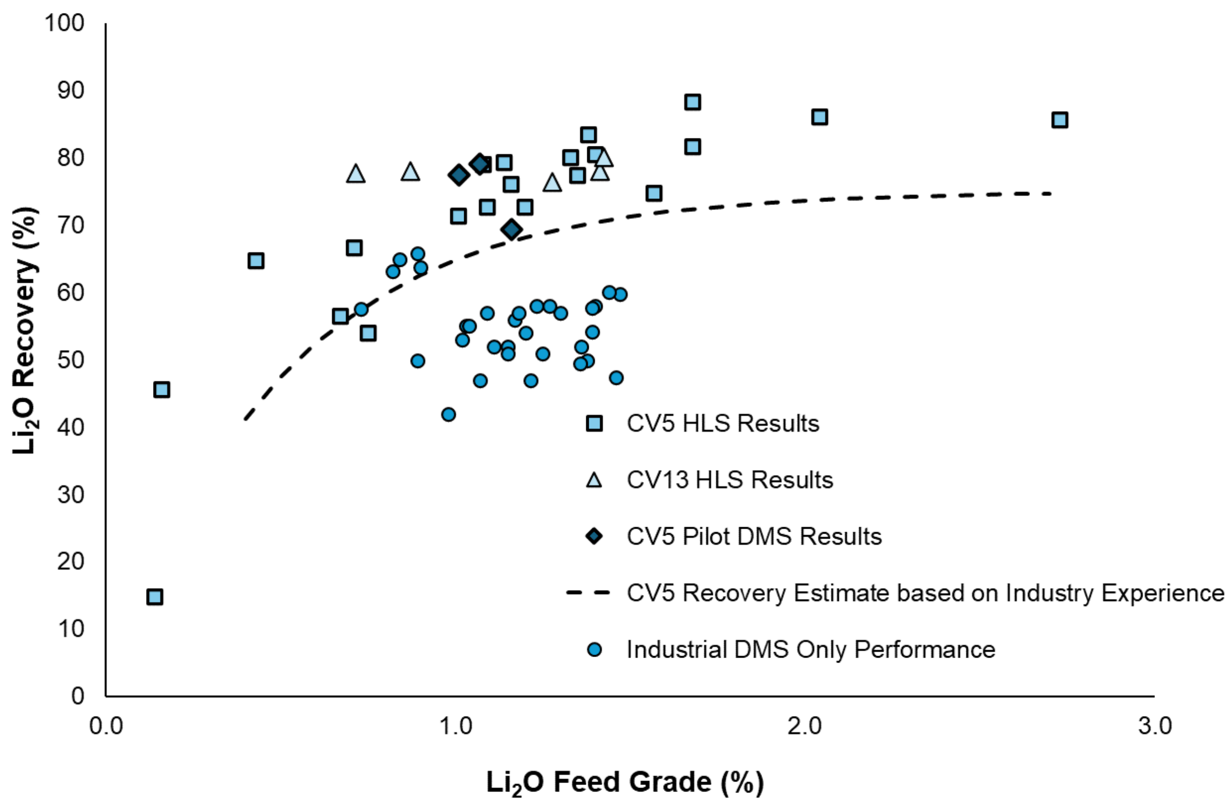



**Figure 25-1: Metallurgical test work recovery (global) results & industry based recovery estimates for 3x size range DMS process plant**

By achieving high recoveries with a simpler DMS process design, the Shaakichiuwaanaan Project positions itself with a competitive advantage in the lithium market. Table 25-1 shows the majority of other operating DMS-only plants ('Industrial DMS Only Performance'), achieving recovery rates well below the estimated Shaakichiuwaanaan Project DMS lithia recovery performance from test work to date.

## 25.4 Hydrogeology

The review of available data as well as the execution of field investigation work made it possible to define the following geological and hydrogeological context:

- The study site is surrounded by several unmarked waterbodies and marshy areas;
- The overburden is composed mainly of undifferentiated glacial deposits, made up of boulders and cobbles with a matrix of sand, silt and gravel in variable proportions. The loose deposits over the study area are discontinuous and their thickness varies between 0 m and 20 m;
- The bedrock encountered under the overburden was cored up to a depth of 300 m;
- The bedrock is generally composed of alternating gray-to-green amphibolite, wacke (Guyer) and intrusion of white and black pegmatite. The rock is generally of good quality and presents low intensity fracturing, observed in areas of lithology change;
- Bedrock constitutes the primary aquifer on site. Groundwater levels measured in the rock aquifer vary between 0.1 m and 4 m deep from the ground surface;
- The permeability values obtained following the slug test done in boreholes vary between $1x10^{-6}$ and $1x10^{-9}$ m/s. The single and double packer tests resulted in hydraulic conductivity values between $1x10^{-6}$ and $1x10^{-7}$ for the first 100 m of the bedrock and lower than $10^{-8}$ m/s for lower horizons;
- Groundwater flow in the bedrock generally goes towards the Lake 001 located in the center of the site. In the western sector, the flow is oriented towards the northwest, towards the outlet of Lake 001;
- The groundwater samples collected during the two sampling campaigns, and analyzed in the laboratories, showed concentrations lower than the EDC and RES criteria of the MELCCFP for the majority of the parameters analyzed. However, certain concentrations exceeded the MELCCFP drinking water criteria, namely arsenic in the majority of samples, and manganese for two samples;
- Comparison between the chemical analysis results of surface water and those of groundwater indicates that the water is classified in the same chemical facies, which confirms direct exchanges between groundwater and surface water on the site;
- Given that the groundwater level in the bedrock on the site is located close to the ground surface, dewatering work will be required to keep the CV5 Open Pit and UG mine dry. Preliminary pit dewatering flow rates, as assessed using the groundwater flow numerical model, are estimated at 7,500 $m^3$/d, 8,000 $m^3$/d and 8,300 $m^3$/d for the three periods of mine operation 0–5, 5–10 and 10–15 years, respectively. However, additional field work (long-term pumping test with water level monitoring) will be required to refine the calculation of dewatering flow rates;
- As part of the operation of the mine, diversion of the lake located upstream of the future open pit should be considered before the start of the dewatering activities.

## 25.5 Tailings, Water, Waste Rock and Overburden Management

This section summarizes conceptual design executed in relation to water diversion infrastructure and the management of project waste materials (tailings, middlings, waste rock and overburden). The design includes:

- LOM waste storage area lay-outs;
- Related water management infrastructure;
- Water diversion infrastructure.

### Mine Waste Management

Note that, at this stage of the Project and based on baseline geochemical testing results, it is assumed that middlings and waste rock (except ultramafic waste rock that represents 12% of all the material from the pit) are not acid-generating and non-metal leaching material. The DMS tailings are considered non-acid generating, but the metal leaching aspect is still on testing; no official results are available. To BBA's knowledge, no geochemical testing has been undertaken in overburden materials.

Tailings produced during process operations exit the concentrator via two different streams, middlings (49 Mt) and tailings (26 Mt). The two streams are made of various sub-streams within the process and are combined before leaving the process plant. The tailings design approach is based on two combined principal streams exiting the plant:

- Consolidated fines + middlings;
- DMS tailings.

Both reject streams will exit the plant in a relatively dry state; as such they can be ideally managed using a Dry-Stack method. Middlings and tailings streams will need to be managed in separate stockpiles to provide operational flexibility and reuse of a portion of the reject material (middlings) for underground backfill. A dedicated stockpile for middlings is located northwest of the plant (Stockpile 001). Stockpile 002 comprises a segregated but combined pile of tailings and waste rock. In short, the sizes of the two piles are:

- Stockpile 001: with a footprint of 91 ha and 24 $Mm^3$ of storage capacity;
- Stockpile 002: with a total footprint of 255 ha and 107 $Mm^3$ of total storage capacity.

Waste rock produced during operations totalizes 179 Mt. Overburden adds up to 16 Mt. Two overburden stockpiles (Stockpile 004 and 005) are located south of the pit and the sizes of the piles are:

- Stockpile 004 and 005: for each pile, with a total footprint of 25 ha and 4 Mm³ of storage capacity each.

A layout of all stockpiles is presented in Chapter 18.

## Water Management

The specific design criteria for water infrastructure have been previously described in Chapter 18. All runoff water from projected infrastructure including roads, stockpiles, ROM pads, and the CV5 mine pit will be collected through ditches and basins.

The water collected from Stockpile 001 (middlings) and uncontaminated portion of Stockpile 002 (DMS tailings and uncontaminated waste rock) will be released into the environment. The water collected from arsenic leaching waste rock, stored on the eastern side of Stockpile 002, will be pumped through pipelines up to the water treatment basin and then to the water treatment plant. The treated water will be finally discharged into Lake 027. The overland flow generated by Stockpiles 004 and 005 (overburden piles) will be collected through ditches and diverted by gravity into the open pit.

A pumping station will be required to transfer water requiring treatment to meet discharge criteria to the water treatment basin. All other contact water will be managed by gravity drainage. Table 25-3 summarizes the length of ditches and length of basins for each of the stockpiles.

**Table 25-3: Stockpiles water management infrastructure**

| Stockpile | Area Managed | Ditch Network (km) | Basins (m³ +/-) | No. of basins |
|---|---|---|---|---|
| Stockpile 001 | Middlings | 3.8 | 113,000 | 1 |
| Stockpile 002 | DMS tailings<br>Arsenic leaching and uncontaminated waste rock | 7.5 | 311,000 | 3 |
| Stockpile 004 | Overburden | 2.1 | Not required | 0 |
| Stockpile 005 | Overburden | 1.9 | Not required | 0 |

### Water Diversion Infrastructure

The CV5 pit will be developed over 20 years (Years 2033, 2038 and 2043), which will be framed in the same area changing only their depth. The open pit development requires lake diversion infrastructure including dams and an outlet channel from Year 1. This proposed Lake 001 diversion solution will maintain the water levels of Lake 001 at the current height and will divert the water by gravity to one of the lakes located in the northern area of the open pit.

Lake diversion dam construction requires building sections on the land and lake to close the topography and ensure lake flows only exit at the north outlet channel. Bathymetry survey showed depths as high as 7 m along the section of dam built on the lake. The key features included in the design of the dam are described in detail in Chapter 18 and are listed below:

- Coffer dam;
- Transition granular fill;
- Common fill;
- Sheet piles.

## 25.6 Environmental Permitting

To date, none of the inventories carried out have identified any environmental issues posing a risk to the Project. Most inventories need to be continued and/or completed in 2024 and 2025 to confirm this conclusion. Potential impacts on species at risk confirmed on the territory can be mitigated by specific mitigation measures. Any encroachment of the Project into fish habitat will have to be compensated under applicable regulations. Similarly, any encroachment of the Project into wetlands or the water environment may be subject to a compensation program.

Environmental characterization field studies must continue to obtain all the environmental baseline data required for the environmental and social impact assessment processes initiated at the federal and provincial levels. In parallel, the process of stakeholder engagement and consultation (both Indigenous and non- Indigenous) initiated must continue, based on the principles of respect, transparency, and collaboration.

## 25.7 Capital Cost

Capital costs were divided into three categories: Stage 1 capital cost, expansion capital, and sustaining capital. The total Stage 1 capital cost for the Shaakichiuwaanaan Project is estimated to be $869.7M (including contingencies and indirect costs).

The expansion capital includes the costs related to the construction and development of the underground mine, the camp expansion, the expansion of the stockpiles, the second train of the processing plant and their related indirect costs and contingencies. The expansion capital will occur during the first 2 years of production (Years 1 and 2). All other capital expenses after Year 2 are included in the sustaining capital. The expansion capital cost was estimated to be $503.9M.

Sustaining capital costs include all expenditures necessary to sustain operations throughout the LOM. Sustaining costs start at Year 1 until the end of the mining operations and were estimated to amount to $651.4M over the LOM.

Cumulative LOM capital expenditure, including Stage 1 capital cost, expansion capital, and sustaining capital and sustaining costs, is estimated to be $2,024.9M. Table 25-4 provides an overview of the capital costs (pre-production, expansion and sustaining) on a cumulative basis for the life of the Project.

**Table 25-4 Project LOM capital cost summary**

| Capital Expenditure | Stage 1 Capital Cost ($M) | Expansion Capital ($M) | Combined Phases ($M) | Sustaining Capital ($M) | Total Cost ($M) |
|---|---|---|---|---|---|
| General | 142.1 | 9.0 | 151.1 | - | 151.1 |
| Mine and Stockpiles | 148.4 | 29.8 | 178.2 | 256.4 | 434.6 |
| Process | 124.6 | 124.6 | 249.2 | 26.0 | 275.2 |
| Terminals (truck and train) | 8.5 | - | 8.5 | - | 8.5 |
| Other Services and Facilities | 14.3 | - | 14.3 | - | 14.3 |
| Underground Mine Lateral Development | - | 110.9 | 110.9 | 203.4 | 314.3 |
| Underground Mine Infrastructure & Paste Plant | - | 71.3 | 71.3 | 144.1 | 215.4 |
| Fish Habitat Compensation | 20.1 | - | 20.1 | - | 20.1 |
| Indirect Cost | 140.5 | 78.2 | 218.7 | - | 218.7 |
| **Subtotal** | **598.5** | **423.8** | **1,022.3** | **629.9** | **1,652.2** |
| Contingency | 162.9 | 80.0 | 242.9 | 21.5 | 264.4 |
| **Total Including Contingency** | **761.4** | **503.9** | **1,265.2** | **651.4** | **1,916.6** |
| Pre-production Cost | 108.3 | - | 108.3 | - | 108.3 |
| **Total** | **869.7** | **503.9** | **1,373.5** | **651.4** | **2,024.9** |

## 25.8 Operating Cost

The operating cost estimate is based on a combination of experience, reference projects, budgetary quotes, and factors as appropriate for a preliminary study. No cost escalation or contingency has been included within the Opex.

The Opex in this study was prepared by BBA based on inputs from Primero and Patriot. The operating costs include the costs to mine and process the mineralized material to produce spodumene concentrate, general and administration expenses (G&A) and transportation. Operation will be implemented by Patriot.

The operating cost over the 25-year mine life is estimated to be at $7,581M, which represents a unit operating cost of $509.67/t (mine site operating cost). The estimated cost for the concentrate transportation from the mine site to Bécancour is $226.74/t dry. This however excludes the costs for the driver's accommodation and transportation to the mine site. Those costs are captured under the G&A costs under the mine operating cost.

## 25.9 Economic Analysis

The pre-tax base case financial model results in an internal rate of return of 37.9% and an NPV of $4,699M with a discount rate of 8%. The simple pre-tax payback period is 3.6 years. On an after-tax basis, the base case financial model results in an internal rate of return of 33.8% and an NPV of $2,937M with a discount rate of 8%. The simple after-tax payback period is 3.6 years. Table 25-5 shows the financial analysis summary.

**Table 25-5: Financial analysis summary**

| Description | | CA$ M | US$ M |
|---|---|---|---|
| Pre-Tax | **Discount Rate** | | |
| | 0% | 13,299 | 10,107 |
| | 5% | 6,819 | 5,182 |
| | **8%** | **4,699** | **3,571** |
| | 10% | 3,698 | 2,811 |
| | 15% | 2,073 | 1,575 |
| | Pre-Tax IRR | 37.9% | |
| | Payback Period | 3.6 years | |
| After-Tax | **Discount Rate** | | |
| | 0% | 8,308 | 6,314 |
| | 5% | 4,270 | 3,245 |
| | **8%** | **2,937** | **2,232** |
| | 10% | 2,305 | 1,752 |
| | 15% | 1,269 | 964 |
| | After-Tax IRR | 33.8% | |
| | Payback Period | 3.6 years | |
| | Cumulative Effective Tax Rate | 37.5% | |

The Project is most sensitive to the exchange rate, grade, and spodumene concentrate price. Therefore, improving the geological model for definition and accuracy is recommended. The spodumene concentrate price and the exchange rate are based on market risks (supply and demand) and political risks, respectively.

The Shaakichiuwaanaan Project warrants further study to increase the level of engineering to decrease the technical risks.

## 25.10 Market

The supply and demand for each form of lithium product can vary depending on a variety of factors, such as market demand, geopolitical events, and mining operations. There is a disconnect between the supply and demand for lithium cathodes in North America due to the current lack of secondary transformation plants and Li-based cathode production outside of China, Korea and Japan.

There are several different forms of lithium products traded on the market, including spodumene concentrate. The prices of these products can vary depending on factors such as the quality and purity of the product, the source of the material, and the level of market demand.

In recent years, the price of lithium products has been volatile because of fluctuations in supply and demand. At times, the price of lithium products has soared due to a shortage of supply caused by increased demand from the electric vehicle industry, while at other times, the price has dropped due to oversupply or weaker demand.

Overall, the lithium market is expected to continue to grow in the coming years as demand for electric vehicles and energy storage systems increases. However, the market will likely remain volatile due to supply and demand imbalances and fluctuations in the global economy.

The Company does not have any offtake agreements, Memorandums of Understanding ("MOUs"), Letters of Intent ("LOIs"), or future selling contracts used in this Project.

## 25.11 Project Risks and Opportunities

As with most mining projects, there are risks that could affect the economic viability of the Project. Many of these risks are based on incomplete knowledge and can be managed as more sampling, testing, design, engineering and planning are conducted. Table 25-6 identifies what are currently deemed to be the most significant project-specific risks, potential consequences and possible mitigation measures that could affect the feasibility and economic results of the Project.

The most significant of these risks linked with the Shaakichiuwaanaan Project are delays in permit approval, labour availability, dam breach, and availability of electrical power from Hydro-Québec.

Many of the above-noted risks can be attenuated with adequate exploration, engineering, planning, and proactive management.

Risks which are beyond the control of the Project proponents are much more difficult to anticipate and mitigate. In some circumstances, it remains possible to reduce exposure. Such risks include possible instabilities related to the political situation in the Project region, metal prices, exchange rates and government legislation. These external risks are generally intrinsic to all mining projects. Negative variance to these items from the assumptions made in the economic model would reduce the profitability of the mine.

Opportunities remain to improve the economics, timing and/or permitting potential of the Project. These main opportunities, excluding those typical to all mining projects (e.g., improvements in metal prices, exchange rates, etc.), are identified in Table 25-7. Further testing, engineering and planning are required before these can be incorporated in the Project economics.

**Table 25-6: Project risks**

| Area | Risk description and potential impact | Mitigation Strategies |
|---|---|---|
| **Geology** | ▪ Less mineralized material tonnage than expected | ▪ Continue definition drilling campaigns |
| **Geotechnical and Hydrogeology** | ▪ Dam breach flooding the mine<br>▪ More water coming into the pit than accounted for | ▪ Complete dam breach study<br>▪ Additional water pumping and treatment capacity |
| **Permitting** | ▪ Delays in permitting due to fish habitat encroachment, arsenic presence, in situ rock<br>▪ Water diversion authorization to the south | ▪ Investigate alternative mine development and surface layout solutions |
| **Logistics** | ▪ Forest fires interrupting equipment deliveries or forcing the evacuation of construction crews causing Project delays | ▪ Build fire breaks, sprinkler systems |
| **Energy Supply** | ▪ Hydro-Québec not allowing the energy block to the Company | ▪ Investigate alternative power generation sources |
| **Electrical Power Requirements** | ▪ The main site electricity consumption is estimated at 25.7 MW, just above the latest power demand to HQ of 25.0 MW | ▪ Optimization shall be made in the future phase |
| **Processing** | ▪ Not hitting iron content specification in concentrate because of higher than planned dilution | ▪ Modification of the flow sheet with addition of ore sorting and/or magnetic separation |
| **Project Execution** | ▪ General workers shortage, especially at site | ▪ Incorporate schedule float. Early selection of Engineering and construction management providers |
| **Operations** | ▪ Forest fires preventing access to the mine site | ▪ Build fire breaks, sprinkler systems |

| Area | Risk description and potential impact | Mitigation Strategies |
|---|---|---|
| **Financial** | ▪ Commodity volatility<br>▪ Foreign exchange<br>▪ Grade and recoveries<br>▪ Use of the CMT-ITC | ▪ MOU, LOIs or other midstream and downstream product purchase agreements<br>▪ Political, and the country's trade, economic drivers<br>▪ Improve grade certainty by diamond drilling and validate metallurgical recovery by testing, pilot plant and sampling throughout the mineralized material mined areas<br>▪ Understand and apply for government incentives, both provincial and federal, early on the Project |
| **Closure** | ▪ Requirement for a liner to cover the waste rock piles | ▪ Additional geochemistry modelling |

**Table 25-7: Project opportunities**

| Area | Opportunities | Strategies |
|---|---|---|
| **Geology** | ▪ Conversion to material identified in the Exploration Target to a mineral resource | ▪ Continued exploration including surface mapping and diamond drilling |
| **Mine** | ▪ Evaluate underground mining impacts on the Project viability | ▪ Reevaluate the limits between the open pit and underground mine |
| **Logistics** | ▪ Improve spodumene concentrate truck transportation costs | ▪ Complete a trade-off study comparing trucking to Matagami vs building Renard Road and trucking to Chibougamau |

## 25.12 Conclusions

BBA, Primero and WSP have been mandated by the Patriot to carry out a Preliminary Economic Assessment to assess the economic viability of the Shaakichiuwaanaan Project.

This Technical Report provides a summary of the results and findings from the main aspects evaluated, including Mineral Resources, mine design, metallurgy, process design, infrastructure, environmental management, capital and operating costs, and economic analysis.

This PEA was prepared by experienced and competent independent consultants using recognized engineering standards and methods. The mutual conclusion is that the Shaakichiuwaanaan Project PEA contains adequate details and information to support the positive economic outcome presented. In Chapter 26, recommendations are made to mitigate the risks and benefit from potential opportunities identified during the study. In conclusion, the QPs recommend that the Company proceed to the next phase of project development for the Shaakichiuwaanaan Project, which is the initiation of a Pre-feasibility Study.

# 26. Recommendations

The results of this Shaakichiuwaanaan Mineral Resource Estimate, including both the CV5 and CV13 pegmatites demonstrate that the Property has the potential to host deposits amenable to the production of spodumene concentrate. Additionally, the robust results of the Preliminary Economic Assessment on the CV5 Pegmatite component of the Shaakichiuwaanaan MRE support continued development of this deposit though the next stages of engineering studies.

## 26.1 Geology / Exploration

Although the Property remains strongly prospective for copper-gold-silver at the Maven Trend, and gold at the Golden Trend, the results of the 2021 through April 2024 drilling have firmly focused exploration on lithium pegmatite at the CV Trend, and the prospectivity of the Property to host additional sizable occurrences. Significant and continued lithium pegmatite exploration, including a combination of surface work and drilling, is warranted, and recommended.

These recommended activities would support advancing the Project to the completion of a PFS. A exploration program focused on lithium pegmatite is proposed (single phase), which includes:

- Additional step-out and delineation drilling at the CV5, CV9, and CV13 pegmatites, which remain open along strike and at depth.
- At CV5, CV9, and CV13, there remains a strong potential for resource expansion through further testing along strike and to depth, as well as testing for sub-parallel trending veins.
- Drill testing of the other spodumene pegmatite clusters – namely CV4, CV8, CV12 – and corridors between.
- Continued surface mapping and channel sampling over the known spodumene pegmatite clusters.
- Continued prospecting and rock sampling over potential extensions of the CV Lithium Trend and other unexplored areas of the Property.
- Evaluation and potential application of relevant geophysical surveys.

The estimated budget is $10M and is summarized in Table 26-1 and includes all supporting costs to operate the program.

**Table 26-1: Phase 1 estimated budget**

| Task | Estimated Cost ($) |
|---|---|
| Drill Exploration (CV5) | 3,500,000 |
| Drill Exploration (CV13 & CV9) | 3,000,000 |
| Drill Exploration (CV4, CV8, CV12, etc.) | 2,750,000 |
| Surface Exploration, Geophysics, | 750,000 |
| **Total** | **10,000,000** |

## 26.2 Mining

The recommendations for the open pit and underground mining aspects of the Project are described in the following sections.

### 26.2.1 Dilution and Mineral Loss

Dilution and mineral loss trade-off studies should be performed to reduce contamination from iron-rich host rock. The current dilution maximizes the mining recovery, but a more conservative approach should be considered to reduce dilution.

### 26.2.2 Open Pit Haulage Fleet

#### 26.2.2.1 Haul Truck Fleet Standardization

The haul trucks used for open pit mining could be standardized to only one size with a fleet of 150 t class. The current fleet is composed two different sizes, 100 t and 200 t class trucks for mineralized material and waste mining. A trade-off study should be done to validate the pros and cons of having a fleet of only one size trucks. Having only one size trucks has several advantages including better operational flexibility, simpler maintenance, logistic and having to store fewer spare parts. A few 100 t class trucks may still be needed for middlings, tailings, and overburden.

#### 26.2.2.2 Haulage Simulation

A haulage simulation should be conducted in the next study to confirm that the right number of haul trucks required to achieve the targeted mining production. In this current study, fixed queue and traffic time were applied to each haulage cycle to simulate traffic, queues at the shovel and interactions between the haul trucks. A software simulation can also more accurately estimate the cycle times and therefore better estimate the truck's real productivity.

### 26.2.3 Underground Infrastructure

#### 26.2.3.1 Portals and Ventilation Raise Location

Portals and ventilation raises locations are based on preliminary infrastructure layout, but should be reviewed in detail with site visit and field investigation to optimize the portals location mainly and adjust it for operational efficiency with the crusher location. Ventilation raises location should be optimized to avoid the lake and ensure there are no water connections on surface.

#### 26.2.3.2 Material Handling

The material handling system from the stopes considered is the trolley assist truck. A trade-off study to review alternative should be perform and should consider the conveyor, railveyor, vertical conveyor to ensure this is the most favorable approach.

#### 26.2.3.3 Ore Passes Trade-off

For the current mine design, the ore passes were strategically located so that most draw points would be located within a reasonable haulage distance. However, some draw points are located relatively far from three ore passes (+500 m), which could affect the mine's productivity. A more detailed trade-off study could be conducted to determine the optimal location and the optimal number of ore passes to be build. Ore passes are expensive and complex infrastructure to build so removing one ore pass could reduce the capital expenditure of the Project.

#### 26.2.3.4 Auxiliary Infrastructure

A more thorough analysis on the number of auxiliary underground infrastructure, including gear bays, fuel bays, pumping stations, etc., could be conducted to reduce the capital expenditure for the construction of the mine.

#### 26.2.3.5 Paste Backfill

Testing with the paste backfill need to be conducted to prove that the DMS middling and tailings can be used for the paste backfill for the underground mine. The paste recipe also needs to be tested to see if it will be of sufficient strength for backfilling the stopes.

The paste backfill infrastructure also need to be designed to ensure that the required amount of paste can be transported to every stope throughout the mine.

### 26.2.4 UG Mining Dilution

For the purpose of this study, flat operational dilution rates were used for dilution of the mineralized material coming from the underground stopes. A more accurate method called equivalent linear overbreak slough ("ELOS") could be used instead to estimate mining dilution in the stopes. It consists of applying a fixed or variable overbreak rule on the hanging and footwall of the stopes. This method would more accurately estimate the dilution over each stope based on geotechnical parameters.

### 26.2.5 Mine of the Future

The mine of the future is one that leverages technology to improve the transversal effectiveness of the collaboration of the different actors of the process. These measures can enhance the overall equipment effectiveness ("OEE") of the value chain and increase productivity, safety and sustainability. Therefore, it is recommended to study the impact of these technologies on operations and planning, as well as the feasibility and benefits of setting up an integrated remote operation center ("IROC") that can monitor and control all aspects of the mine from a single location. The estimated investments for implementing these technologies range from 1 to multiple million dollars depending on the level of automation and optimization.

Here are some examples of relevant use cases that leverage technology and their impact on process in the mining industry:

- **Autonomous vehicles**: Mining companies can use self-driving loaders, drills, and other equipment to increase efficiency and reduce human errors and injuries.
- **Autonomous trucks**: Purchasing autonomous trucks could be a great option for Patriot. Being a FIFO site, labour is often more expensive and harder to recruit and retain at the mine site. At peak production, over 40 haul truck drivers will be required, which would cost the mine over $6.0M a year only in labour cost. Autonomous trucks can also increase the annual operating hours by up to 1,000 hours, from 5,500 effective hours per year to 6,500 hours allowing the mine to mine the same number of tonnes with less trucks.
- **Geolocation**, tracking and fencing: Mining companies can use GPS, RFID, and other wireless technologies to track the location and status of people, equipment, and materials in real time.
- **Augmented reality**: Mining companies can use augmented reality ("AR") to overlay digital information onto the physical environment, such as instructions, diagrams, or data.
- **Predictive asset maintenance**: Mining companies can use sensors, data analytics, and artificial intelligence ("AI") to monitor the condition and performance of equipment and machinery.

- **Automation of topography** and block model update using drones and cloud computing: Mining companies can use drones to capture high-resolution aerial images of the mine site and upload them to the cloud for processing and analysis.
- **AI and continuous systems planning** using data centralization: Mining companies can use AI to optimize their systems planning by integrating and analyzing data from various sources, such as sensors, cameras, drones, geolocation, and tracking devices.
- **Digital power systems** are essential for optimizing the energy consumption and generation in mining operations, especially with the goal of decarbonization. Digital power systems can supervise and control the power usage of various equipment and machinery, such as electric vehicles, hoists, crushers, conveyors, and ventilation systems.
- **Cybersecurity** and security operation center ("SOC") are important aspects of the mining industry, as they can help to protect the critical infrastructure and data from cyber threats and incidents.

## 26.3 Processing

### 26.3.1 Metallurgical Testing

As the Project advances, further test work will be required to develop a DMS only flowsheet. These tests are:

- Comminution test work for crushing (e.g., Bond Crushing Work Index "CWi"). This work serves to confirm the crusher sizing and provides an indication of the size distribution feeding the plant.
- Dewatering test work including vacuum filter test work and thickening test work. The feed stream of particular interest is the material that bypasses the DMS circuit.
- Further magnetic separation test work, particularly in the coarse concentrates. Testing the effectiveness of coarser particles in wet belts separators is required for estimating final iron specification.
- Testing alternative magnetic separation technologies for the coarse DMS concentrate (i.e., 9.5 mm to 3.3 mm size range) is recommended.
- Up flow (Teeter bed type) classification test work, in conjunction with DMS test work, on higher mica feed samples to determine the impact to the circuit if a mica removal step is implemented to the circuit.
- Due to the width and orientation of the CV5 Pegmatite lenses, the expected dilution of the plant feed is expected to be relatively low. However, there may be opportunities to maximize the extraction of spodumene concentrate from the deposit if parts of the deposit with higher dilution are directed to an ore sorting processing solution. Ore sorting test work is planned for the next phase of test work.

### 26.3.2 Processing Plant

The following opportunities exist for the processing plant, further study of the following items are recommended in the next stage of the study:

- The iron specification of <1.2% $Fe_2O_3$ based on typical value as of the time of the study. Investigating the future implications of a +/-0.1% $Fe_2O_3$ on sales price of the concentrate will determining the feasibility of certain project options. For example, depending on the sensitivity of iron contamination on spodumene, sales price will determine whether the Project should install ore sorting or not.
- With the current understanding of the geological body (i.e., its substantial width and its vertical orientation), an integrated ore sorting plant within the crushing circuit is not required. However, there is an opportunity to target blocks that contact the host rock to be directed to a distinct storage pile. Spodumene can recovered from this pile via a modular ore sorting plant. This would allow for more recovery of spodumene from the deposit without feeding high amounts of external dilution (the main source of final iron contamination) to the plant.
- The concentrator design at project start-up is recommended to be a DMS only plant (as currently described in this study). The start up of DMS only plants for both feed tonnages and recovery has consistently been shown to be very quick. Installing a processing plant for the lithium contained in the bypass fraction (i.e., the -0.65 mm fraction) as a phase 2 later in the Project's life cycle is an opportunity for the Project. Test work will ultimately dictate the nature of this processing plant.
- Currently, the tailings (i.e., the DMS bypass fraction and the DMS tailings) are being stored in separate piles. This is to offer maximum flexibility to the generation of a correct mixture of material for the paste backfill plant. As the correct recipe of paste backfill feed material is ascertained, there will be an opportunity to optimize the tailings handling area.

## 26.4 Infrastructure

### 26.4.1 Main Site Layout – General

- Optimize the locations of the main infrastructure such as stockpiles, dikes, roads, process plant, portals, water treatment plant, garages, warehouses, workers camp and offices. This work will require condemnation, geotechnical, and geomechanical drilling, as well as various other studies and field surveys.

### 26.4.2 Hydrogeology

The preliminary hydrogeological investigations carried out by BBA in 2023 (PEA Level) was mainly focused on characterising the open pit area. A feasibility level hydrogeological program was therefore prepared to improve the understanding and recognition of groundwater flow regime throughout the entire mine site (Open pit, underground mine and stockpiles). This program is currently under execution. Hydrogeological field work was combined with the proposed geotechnical boreholes program in order to optimize interventions and minimize costs. Geotechnical boreholes will be converted to observation wells to carry out hydrogeological tests and groundwater sampling. The results will be used to:

- Define the hydrogeological conditions at both regional and local scales. This includes defining shallow and deep piezometric maps, hydraulic properties of unsaturated/saturated overburden materials and hydraulic properties of different shallow and deep bedrock units.
- Improve and update the 3D hydrogeological model developed for the mine site in the PEA study. The updated model will be recalibrated and then used to: 1) predict the volume of groundwater that will be captured during the open pit and underground mine dewatering activities; 2) estimate the extent of short- and long-term drawdown caused by dewatering activities over the study area; 3) evaluate the potential impact of dewatering activities on the neighboring surface water bodies and wetlands; and 4) evaluate the potential seepage of tailings storage facility toward the groundwater.

### 26.4.3 Water Management

#### 26.4.3.1 Site Wide Water Balance and Quality

- Water deviation infrastructure are designed to transfer Lake 001 water to one of the lakes located in the northern area of the open pit.
- Seasonal water level fluctuations in Lake 001 should be monitored and used to confirm or update the proposed elevation for diversion dam crest. A detailed risk analysis must also be conducted to evaluate the likelihood of flooding along and down gradient of the diversion channel. This assessment should address whether the water level fluctuations at lake 001 could lead to overflow and impact the surrounding areas, including the pit and plant site. Additionally, channel alignment near the open pit's crest necessitates special design and blasting procedures to prevent connectivity with these sensitive receptors. It is also important to reassess the MTOs due to their reliance on a high-level interpretation of natural stratigraphy; increased rock excavation will significantly affect capital expenditure (Capex) estimates. Furthermore, the design proposed in this study does not account for environmental features needed for effective fish passage, implying that additional costs should be anticipated to integrate these requirements. Special attention should also be given to the stability of the crown pillar in light of these considerations.

- Given the heights and locations of the water diversion dam, a dam breach analysis will be required at the next stage of design.

### 26.4.4 Water Treatment

- Optimize site wide water management. This might introduce more effluent points.
- Optimization of water treatment plant process and sizing when more results from geochemical characterization and water quality model are available.

#### 26.4.4.1 Potable Water

A groundwater exploration program is currently under execution to investigate the quantity and quality of the groundwater near the worker's permanent camp and the concentrator building. The results of these investigations, which includes drilling and testing of deep groundwater wells, will be used to define, at each of these areas:

- The water-prone zones for drilling and installation of the water supply wells;
- The characteristics of the wells (diameter and depth);
- The efficiency of water wells (specific capacity);
- The number of well required to satisfy water needs at each area.

#### 26.4.4.2 Sewage System

- Conduct soil characterization near the worker's permanent camp and the concentrator building to confirm the drainage field location and efficiency.
- Optimize domestic wastewater plant locations and technologies when additional information on the general site layout is confirmed.

### 26.4.5 Geochemical Testing and Modelling

- Complementary geochemical testing and modelling are required including the tailings and middlings streams, waste rock and overburden.

### 26.4.6 Geotechnical

- A comprehensive geotechnical program covering all major infrastructure locations is currently under execution.

### 26.4.7 Main Site Access Road

- Identify non-PAG and nonmetal leaching waste rock to be used for road rehabilitation and construction.
- Evaluate bearing capacity of foundation materials along the length of the new on-site roads to optimize construction.

### 26.4.8 Power

- Continue the negotiation with Hydro-Québec to secure the 25 MW power block and secure the permits and authorizations to build the 69 kV powerline.

### 26.4.9 Telecommunication

- Validate ultimate Internet needs and execute a trade off study on possible options (optical fiber vs satellite).

### 26.4.10 Concentrate Transloading Site

- Conclude an agreement with the owner of the land for the Matagami Transshipment Centre site.

### 26.4.11 Concentrate Transportation Study

- Carry out a bulk material test program to establish flowability and freezing behaviour of the concentrate to optimize the bulk material handling technology selection.

### 26.4.12 Concentrate Transportation Optimization

- In addition to the established strategy for transporting spodumene concentrate, there are substantial opportunities to enhance logistics and decrease transport costs for the Project. A key initiative involves capitalizing on infrastructure advancements facilitated by the *La Grande Alliance*, a collaboration between the Cree Nation and the Government of Québec. Specifically:
  - Infrastructure Synergy: The forthcoming link from the Renard Mine via Highway 167 to the Trans-Taiga Road promises to significantly shorten transportation routes, thereby lowering logistics expenses.
- Strategic Engagement for Transport Efficiency.

- Stakeholder Engagement: During the initial phases of the Feasibility Study ("FS"), it is recommended to collaborate with stakeholders from *La Grande Alliance*, encompassing First Nations and government entities. Goals include:
  - Synchronizing the Project timeline with the planned expansion of Highway 167, as detailed in the Alliance's Feasibility Study.
  - Evaluating the potential cost savings of transporting spodumene concentrate from the Shaakichiuwaanaan Project site to Chibougamau's CN rail infrastructure, for onward transport to Bécancour, QC.

#### 26.4.12.1 Decarbonation

Usage of propane could be re-evaluated in a trade-off study to identify alternative methods of heating such as heat recovery, electrification, heat pumps and/or bi-energy and others. Such a trade-off study could benefit from government financial incentives offering up to 75% coverage of the cost of the study.

## 26.5 Environmental Fieldwork and Studies

- Continued environmental work is recommended to support the Project as it advances through economic and development studies.
- Project development should avoid, as much as possible, the deposition of mine waste in fish habitat to avoid a listing on Schedule 2 of the *Metal and Diamond Mining Effluent Regulations* (SOR/2002-222).
- Amendments to the federal *Impact Assessment Act* (S.C. 2019, c. 28, s. 1) are expected in 2024, which could change the scope of the Impact Assessment examination procedure applicable to this project. While data acquisition will continue to meet federal expectations, monitoring of changes in the law will be required to ensure that the project is consistent with these amendments.

## 26.6 Economic Studies

The financial model speculated the use of the CMT-ITC, which would provide a significant impact on the capital spend. Therefore, early application for funding through provincial and federal governments is recommended.

In addition, there are lithium battery facilities that are in development and MOUs and LOIs is a path to be negotiation to more determinant prices, if applicable for the next stage of the Project.

## 26.7 Proposed Work Program and Budget

The costs for the recommended work program are estimated to be approximately $19.6M based on past project experience and current site costs. Table 26-2 provides a cost estimate summary for the required field work and studies to support the next phase of project development.

**Table 26-2: Proposed work program budget**

| Activities | Estimated Cost (M$) |
|---|---|
| Geology / Exploration | 10.0 |
| Mining | 0.3 |
| Processing – Metallurgical Testing | 0.5 |
| Infrastructure – Site Optimization and Selection (Main and Transloading Sites) | 0.2 |
| Infrastructure - Hydrogeology (Hydrogeological Analyses and Numerical Modelling) | 0.4 |
| Infrastructure - Geochemical Testing and Modelling | 0.2 |
| Infrastructure - Decarbonation – Power Systems | 0.1 |
| Infrastructure - Concentrate Transportation Study and Transloading Sites Selection | 0.3 |
| Environmental Fieldwork, Studies and Permitting | 2.5 |
| Market Studies | 0.1 |
| Pre-feasibility Study | 5.0 |
| **Total** | **19.6** |

# 27. References

AARQ. (2023, November 1). AARQ. Récupéré sur Atlas des amphibiens et reptiles du Québec: https://www.atlasamphibiensreptiles.qc.ca/wp/especes/

Air Tunilik. (2023, October 18). Qu'est-ce que les vacances du Goose Break au Canada (2023). . Récupéré sur https://airtunilik.com/quest-ce-que-les-vacances-du-goose-break-au-canada/

Archer, P., & Oswald, R. (2008a - GM63675). Rapport géologique et recommandations Travaux de Forage et de Cartographie 2007, Projet FCI, Québec, Félicie – Corvette Ouest – Island Lake. Mines Virginia Inc.

Archer, P., & Oswald, R. (2008b - GM63695). Rapport géologique et recommandations, Travaux de Terrain 2006, Projet FCI, Québec, Félicie - Corvette Ouest - Island Lake. Mines Virginia Inc.

Azimut Exploration. (2024 - Pending).

Bambic, P. (1997). Corvet Quest Property Work Summary. Minex Consulting Enr. Report, for Virginia Gold Mines Inc.

Bandyayera, D., Burniaux, P., & Chapon, B. (2013). Géologie de la région du lac Magin (33G09), de la colline Captel (33G15) et du lac Fontay (33G16), Baie-James, Québec. Ministère des Ressources naturelles, Québec, RP 2013-01, 32.

Bandyayera, D., Burniaux, P., & Morfin, S. (2011). Géologie de la région du lac Brune (33G07) et de la Baie Gavaudan (33G10). Ministère des Ressources naturelles et de la Faune, Québec, RP 2011-01, 25.

Benchmark Mineral Intelligence. (2024, July 10). Lithium Price Assessment. Récupéré sur Benchmark Mineral Intelligence: https://www.benchmarkminerals.com/price-assessments/lithium/?tab=table

Bird, D. (2023). Lithium - Deficits Still on the Horizon But the Pace of New Supply is Picking Up, Lithium Commodity Market Report. RFC Ambrian.

Birkett, T., & Clark, T. (1991). A Lower Proterozoic Carbonatite at Lac LeMoyne, Northern Quebec: Geology and Mineral Potential. Geological Survey of Canada, Current Activities Forum, Program and Abstracts, page 18.

Bloomberg. (2024, May 20). Lithium Miners Shake Up Trading to Tackle Wild Price Swings. Récupéré sur Bloomberg: https://www.energyconnects.com/news/utilities/2024/may/lithium-miners-shake-up-trading-to-tackle-wild-price-swings/

Bouazza, Z., Mahdi, A., & Fournier, A. (2024). Technical Report for Patriot Battery Metals. Water Management Plan and Water Diversion. BBA Doc. No. 7535006-014000-41-ERA-0002-R00, dated September 11, 2024.

Bradley, D., McCauley, A., & Stillings, L. (2017). Mineral-deposit model for lithium-cesium-tantalum pegmatites. US Geological Survey Scientific Investigations Report 2010-5070-O.

Card, K. (1986). Geology and Tectonics of the Archean Superior Province, Canadian Shield. Dans Workshop on Early Crustal Genesis: The World's Oldest Rocks (pp. 27-29). LPI Technical Report 86-04.

CDPNQ. (2023, November 1). Centre de données sur le patrimoine naturel du Québec. Récupéré sur Data on Species at risk. Interactive map.: https://services-mddelcc.maps.arcgis.com

Cerny, P., & Ercit, T. (2005). The Classification of Pegmatites revisited. Canadian Mineralogist, 2005-2026.

Champion Electric Metals. (2024, July 16). Champion Electric Confirms Spodumene-Bearing Pegmatite Dikes in Multiple Trenches at Quebec Lithium Project, James Bay Territory. Récupéré sur News: https://www.champem.com/news/champion-electric-confirms-spodumene-bearing-pegmatite-dikes-in-multiple-trenches-at-quebec-lithium-project-james-bay-territory

Chavingny, P. (1999 - GM56091). Reconnaissances Geologique, Lac Corvet Quest, PEM 1284, 33G/08-09, Baie James, Quebec, Canada. Ressources Naturelles - Secteur Mines.

Clark, T., & Wares, T. (2006). Lithotectonic and Metallogenic Synthesis of the New Quebec Orogen (Labrador Trough), MM 2005-01. Publication du M.E.R.

CNG. (2022a, October 9). Récupéré sur Cree Nation Government. The Eeyou of Eeyou Istchee.: https://www.cngov.ca/community-culture/communities/

COSEWIC. (2023).

Cree Geoportal. (2023). CTA Trapline Maps. Retrieved from: https://www.creegeoportal.ca/. Consulted on October 18, 2023.

Cree Nation of Chisasibi. (2023). Aéroport de Chisasibi – YKU. https://chisasibi.ca/departments-services/airport/ Consulted October 18, 2023.

Cree Trappers Association. (2022). Annual Report 2021-2022. 85 p.

Cree Trappers' Association. (2021). Ishtchiikun. https://creetrappers.ca/about/ishthchiikun. Consulted on October 18, 2023.

Cree-Québec Forestry Board. (2018). Lands, MUS and traplines. Retrieved from: http://www.ccqfcqfb.ca/fr/le-regime-forestier-adapte/le-territoire-dapplication/sites-et-territoires-dinteret-pour-les-cris/. Consulted on October 18, 2023.

CRNTBJ. (2010). Commission sur les ressources naturelles et le territoire de la Baie-James. Portrait faunique de la Baie-James, C09-07.

D'Amours, I. (2011 - DP 2011-08). Synthèse des levés magnétiques de la Baie-James. Gouvernement du Québec.

de Chavigny, P. (1999 - GM 56161). Reconnaissance Geologique, Permis JVT/Boreale (PEM 1308-1309-1310-1294), SNRC 33G, Baie James, Quebec, Canada. Mines D'OR Virginia Inc/Exploration Boreale Inc.

Demers, M., & Blanchet, C. (2001). Propriete Lac Erlandson-Ta Reconnaissance Geologique Aout 2001. Mines d'Or Virginia.

Desrosiers, N., Morin, R., & Jutras, J. (2002). Atlas des micromammifères du Québec. Société de la faune et des parcs du Québec, Direction du développement de la faune.

Ekstrom, R. (1960 - GM10515). Report of Exploration in the Corvette Lake - La Grande River Area, New Quebec, June-October, 1959. Tyrone Mines Ltd (GM10515).

Environment Canada. (2023, November 1). Récupéré sur Cadre écologique du Canada. Écorégions du Canada. Collines La Grande.: http://www.ecozones.ca/francais/regionhttp://www.ecozones.ca/francais/region/72.html#:~:text=Cette%20%C3%A9cor%C3%A9gion%20s%27%C3%A9tend%20sur,%27environ%20%2D4%20%C2%B0C

Fastmarkets. (2024, July). Fastmarkets. Récupéré sur Participants speculate price floor for spodumene: https://www.fastmarkets.com/insights/participants-speculate-price-floor-for-spodumene/

Gagnon et al. (2012). Preliminary Economic Assessment, Ashram Rare Eart Deposit for Commerce Resources Corp. Montreal (Blainville): SGS Canada Inc.

Gaia Metals Corp. (2020, April 16). Gaia Metals Corp. Identifies New Targets and Unlocks Potential at Golden Gap, Corvette-FCI Property, James Bay Region, Quebec. Récupéré sur Baystreet.ca: https://www.baystreet.ca/viewarticle.aspx?id=585238&msclkid=4b2b1ee4ae1b11eca84362ff6bf8e17f

Goldak Airborne Surveys. (2009 - DP 2009-01). Levé spectrométrique et magnétique aéroporté sur le territoire de la Baie-James – blocs NW and SW du secteur LG-4. Gouvernement du Québec.

Goutier, J., & Dion, C. (2004). Géologie et minéralisation de la Sous-province de La Grande, Baie-James, in Québec Exploration 2004. Ministère des Ressources naturelles, de la Faune et des Parcs, Québec, DV 2004-06.

Goutier, J., Dion, C., Quellet, M.-C., David, D., David, J., & Parent, M. (2002). Géologie de la région du lac Guyer (33G/05, 33G/06 et 33G/11). . Ministère des Ressources naturelles, Québec, RG 2001-15, 53.

Goutier, J., Gigeon, J., Burniaux, P., Dion, C., Takam, F. T., Chartier-Montreuil, W., & Bandyayera, D. (2021 - RP 2020-01). Géologue de la région du lac de la Corvette, Eeyou Istchee Baie-James. Gouvernment du Québec.

Gouvernement du Québec. (2023d, November 1). Récupéré sur Espèces floristiques menacées ou vulnérables. Outil Potentiel. Base de données MIcrosoft Access.: https://www.environnement.gouv.qc.ca/biodiversite/especes-designees-susceptibles/

Gouvernement du Québec. (2023c, November 1). Gouvernement du Québec. Récupéré sur Liste des espèces désignées menacées ou vulnérables au Québec (LEMVQ).: https://www.quebec.ca/agriculture-environnement-et-ressources-naturelles/faune/gestion-faunehabitats-fauniques/especes-fauniques-menacees-vulnerables/liste

Gouvernment du Québec. (2023a, November 1). Gouvernment du Québec. Récupéré sur Zone de végétation et domaines bioclimatiques du Québec: https://mffp.gouv.qc.ca/documents/forets/FE_zones_vegetation_bioclimatiques_MRNF.pdf

Government of Canada. (2022, 04 12). La Grande Rivière Airport, Quebec. Récupéré sur https://weather.gc.ca/: https://weather.gc.ca/past_conditions/index_e.html?station=ygl&msclkid=111e1565ba8e11ec8720853f5e5ba60f

Government of Québec. (2022, April 6). Société du Plan Nord. Récupéré sur https://www.quebec.ca/gouvernement/ministeres-et-organismes/societe-plan-nord

Henning, J., Gonzalaz, C., & Hamediazad, F. (2024). Geotechnical Investigations prepared for Innova Lithium. Factual Report of 2024 Geotechnical Diamond Drill Investigation, Corvette CV5 Site. BBA Doc. No. 7535017-000000-4M-ERA-0001-001, July 22, 2024, 67 pages with appendices.

Houle, P. (2004). James Bay Region Central Superior Province (Opatica, Opinaca, Nemiscau, and La Grande Subprovinces). Dans Report on Mineral Exploration Activities in Quebec 2004 (pp. 9-16). MERN.

Hydro-Québec. (2022, 03 24). Hydro-Québec Production. Récupéré sur Hydro-Québec: https://www.hydroquebec.com/generation/generating-stations.html?msclkid=355698ccabbf11ecb0bd2805430e7368

Investissement Québec. (2023, August 16). Why Quebec?, Power Generating Capacity. Récupéré sur https://www.investquebec.com/international/en/why-quebec/hydroelectricity.html

ISQ. (2022). Institut de la Statistique du Québec (ISQ). Panorama des régions du Québec. Édition 2022.

Jagodits, F. (1996 - GM54133). Report on multi-sensor helicopter-borne geophysical survey, Sakami project. Sial Géosciences inc., submitted to Phelps Dodge Corporation of Canada Ltd.

James et al. (2003). The Southeastern Churchill Province Revisited: U-Pb Geochronology, Regional Correlations, and Enigmatic Orma Domain, Current Research, Report 03-1. Newfoundland Department of Mines and Energy Geological Survey.

Johnson, M. (1996 - GM56869). Summary report, Sakami Project, Lac Guyer and Lac de la Corvette areas, Baie-James region. Phelps Dodge Corporation of Canada.

Knox, A. (2022). NI 43-101 Technical Report on the Corvette Property, Quebec, Canada. Patriot Battery Metals Inc.

LGA. (2022a, 03 24). Récupéré sur La Grande Alliance: https://www.lagrandealliance.quebec/en/

LGA. (2022b). Infrastructure Program Feasibility Studies, Interim Report. Cree Development Corporation.

LGA. (2023a, October). Récupéré sur Études de faisabilité du Programme d'Infrastructures. Octobre 2023.: https://www.lagrandealliance.quebec/wp-content/uploads/2023/10/LGA-Executive-Summary-2023-FINAL-FR_compressed.pdf

LGA. (2023b). La Grande Alliance. Études de faisabilité du programme d'infrastructures. Executive summary. 38 p.

Li, T., Ducruc, J.-P., Côté, M.-J., Bellavance, D., & Poisson, F. (2019). Les provinces naturelles : première fenêtre sur l'écologie du Québec. Québec, ministère de l'Environnement et de la Lutte contre les changements climatiques, Direction de la connaissance écologique.

Lucas, S., & St-Onge, M. (1998). Geology of the Precambiran Superior and Grenville Provinces and Precambrian Fossils in North AMerica. Dans Geology of Canada, No. 7, Volume C-1 (Vol. C-1, p. 394). Geological Survey of Canada.

MAMH. (2023, October 9). MAMH. Récupéré sur Ministère des Affaires municipales et de l'Habitation. Région administrative 10 : Nord-du-Québec.: https://www.mamh.gouv.qc.ca/fileadmin/publications/organisation_municipale/cartotheque/Region_10.pdf

McCracken, T. and Cunningham, R. (2023). NI 43-101 Technical Report for Patriot Battery Metals. Mineral Resource Estimate for the CV5 Pegmatite, Corvette Property. September 8, 2023. 284 pages.

MDDEP. (2012). Directive 019 on the mining industry.

MELCCFP. (2023, November 1). Ministère de lEnvironnement, de la Lutte contre les changements climatiques, de la Faune et des Parcs. Récupéré sur Aires protégées au Québec. Les provinces naturelles. Niveau I du cadre écologique de référence du Québec: https://www.mamh.gouv.qc.ca/fileadmin/publications/organisation_municipale/cartotheque/Region_10.pdf

MERN. (2019). Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec. 51 p. and appendices. Ministère de l'Énergie et des Ressources Naturelles.

MERN. (2022). Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec.

MRNF. (2023, August 14). Québec Ministère des Ressources naturelles et des Forêts. Récupéré sur GESTIM des titres miniers: https://gestim.mines.gouv.qc.ca

NIIGAAN. (2022). Technical Note. Environmental, social, and hydrological surveys.

Patriot. (2023a, July 30). Patriot Battery Metals Inc. Announces the Largest Lithium Pegmatite Resource in the Americas at CV5, Corvette Property, Quebec, Canada. Récupéré sur News: https://patriotbatterymetals.com/patriot-announces-the-largest-lithium-pegmatite-resource-in-the-americas-at-cv5-corvette-property-quebec-canada/

Patriot. (2023b, October 18). Patriot Battery Metals Inc. Discovers New High-Grade Zone at CV13 Spodumene Pegmatite, Corvette Property, Quebec, Canada. Récupéré sur News: https://patriotbatterymetals.com/patriot-discovers-new-high-grade-zone-at-the-cv13-spodumene-pegmatite-corvette-property-quebec-canada/

Patriot. (2024a, August 5). Patriot Battery Metals Inc. Significant Mineral Resource Upgrade at Shaakichiuwaanaan Lithium Project to Underpin Impending PEA. Récupéré sur Patriot Battery Metals / News: https://patriotbatterymetals.com/significant-mineral-resource-upgrade-at-shaakichiuwaanaan-lithium-project-to-underpin-impending-pea/

Patriot. (2024b, August 5). Patriot Battery Metals Inc. Exploration Target for the Shaakichiuwaanaan Lithium Project Outlines District Scale Opportunity, Quebec, Canada. Récupéré sur News: https://patriotbatterymetals.com/exploration-target-for-the-shaakichiuwaanaan-lithium-project-outlines-district-scale-opportunity-quebec-canada/

Percival, J. (2007). Geology and Metallogeny of the Superior Province, Canada. Dans W. Goodfellow, Mineral Deposits of Canada. A synthesis of major deposit types, district metallogeny, the evolution of geological provinces and exploration methods (pp. 903-928). Special Publication 5.

Percival, J., Skulski, T., Sanborn-Barrie, M., Stott, G. L., Corkery, M., & Boily, M. (2012). Chapter 6 - Geology and Tectonic Evolution of the Superior Province, Canada. Dans Tectonic Styles in Canada: The Lithoprobe Perspective (pp. 312-378). Geological Association of Canada, Special Paper 49.

Pride, C. (1978 - GM34044). Lake Sediment Geochemistry, 1974. MRN.

Primero. (2024). Corvette PEA – Process Design Criteria (45705-DCR-PR-001-REVE). February 2024.

Québec Ministère des Ressources naturelles et des Forêts. (2024, June 10). Récupéré sur GESTIM des titres miniers: https://gestim.mines.gouv.qc.ca

Québec, Gouvernement du. (2022b). Maps of fur-bearing animal management units ("UGAF" or unités de gestion des animaux à fourrure) numbers 91 and 94. Retrieved from: https://www.quebec.ca/en/tourism-and-recreation/sporting-and-outdoor-activities/trapping/maps-ugaf. Consulted on October 18.

Québec, Gouvernement du. (2022c). Hunting zone maps. Retrieved from: https://www.quebec.ca/en/tourism-and-recreation/sporting-and-outdoor-activities/sport-hunting/hunting-zone-maps. Consulted on October 18, 2023.

Quellette, J.-F., & Vachon, D. (2014 - GM68359). Technical Report and Recommendations, 2013 Exploration Program, FCI Project, Quebec. Komet Resources Inc, Virginia Mines Inc.

Rho Motion. (2024). EV Sales H1 2024: Europe Slowest Growing Region. Consulté le 2024, sur Rho Motion: https://rhomotion.com/news/ev-sales-h1-2024-europe-slowest-growing-region/

Romain, D., & Larivière, J.-F. (2021 - GM 72626). Report on the 2021 Exploration Campaigns on the Mythril Regional Project: Prospecting. Midland Exploration, MRN.

Roscoe, S., & Donaldson, J. (1988). Uraniferous pyrite quartz pebble conglomerate and layered ultramafic intrusion in a sequence of quartzite, carbonate, iron formation and basalt of probable Archean age at Lac Sakami, Quebec. Dans Recent Research, Part C, Paper 88-1C (pp. 117-121). Geological Survey of Canada.

Roy, I., & Archer, P. (2010 - GM65536). Technical Report and Recommendations, Fall 2009 Exploration Program, FCI Property, Quebec. Virginia Mines Inc., Odyssey Resources Ltd.

S&P Global. (2024, July). Récupéré sur Asian lithium prices to be steady in Q2 on measured demand, ample supply: https://www.spglobal.com/commodityinsights/en/market-insights/latest-news/metals/041524-trade-review-asian-lithium-prices-to-be-steady-in-q2-on-measured-demand-ample

S&P Global Market Intelligence. (2024). Commodity Market Outlook. New York: S&P Global Market Intelligence.

Schmidt, P. T. (2013). High-field-strength element distribution of the Eldor carbonatite complex, Canada. Karls-Eberhart Universität, Tübingen. Diploma thesis.

Schmidt, P. T., Samson, I. M., William-Jones, A. E., & Smith, D. L. (2017). HFSE evolution of the Eldor Carbonatite. SGA 2017 conference abstract.

Séguin, A., Gagnon, E., Lepage, C., & Thomassin, Y. (2022). Initial Environmental and Social Scoping Report - Preliminary Economic Assessment – Socio-environmental Requirements. James-Bay Region, Northern Quebec: BBA.

SGS. (2023a). The Mineralogical Characterization of Twenty-Two Pegmatite Samples from the Corvette-FCI Property, James Bay, Québec. By SGS Canada Inc. Project 19005-01.

SGS. (2023b). An Investigation into Scoping Level Study Metallurgical Testwork on Samples from the Corvette-FCI Property, James Bay, Québec. By SGS Canada Inc. Project 19005-02.

SGS. (2023c). An Investigation into Variability HLS Testwork on Samples from the Corvette Property, James Bay Québec. By SGS Canada Inc. Project 19005-04.

SGS. (2023d). An Investigation into the HLS Testwork on Five Variability Samples from the Corvette-FCI Property, James Bay, Québec. By SGS Canada Inc. Project 19005-06.

SGS. (2024). Title and Report Pending.

SGS Canada. (2022, 04 01). Mining Geochemistry. Récupéré sur https://www.sgs.ca/en/mining/analytical-services/geochemistry

Sherer, R. (1984). Evaluation of Selected Samples from Eldor Resources Ltd., Permit 669 Carbonatite, Quebec. Union Molycorp.

Smith, D. L. (2018). Simplified Exploration Work Report - Corvette Property, GM70744. 92 Resources Corp.

Smith, D. L. (2019 - GM71513). Simpilified exploration work report, FCI West Property. O3 Mining Inc., MERN.

Smith, D. L. (2019). 2018 Exploration of the Corvette Property, Quebec. 92 Resources Corp., MERN.

Smith, D. L. (2020 - GM71564). 2019 Exploration of the FCI property, Quebec. Gaia Metals Corp., MERN.

Smith, D. L., & Brown, J. (2016). 2012, 2013, and 2014 Exploration of the Eldor Property, Quebec. Commerce Resources Corp.

Smith, D. L., & Mickelson, P. (2023 (GM pending)). 2020 Exploration of the Corvette Property. Patriot Battery Metals Inc., MRNF (pending).

Smith, D. L., Mickelson, P., & Blu, F. (2023 - GM73402). 2021 Exploration of the Corvette Property. Patriot Battery Metals Inc., MRNF (pending).

Smith, D., Schmidt, N., & Carter, M. (2014). 2010 and 2011 Exploration of the Eldor Property, Northern Quebec. Commerce Resources Corp.

Smith, Darren L. (2021 - GM72176). 2019 Exploration of the Corvette Property, Quebec. Gaia Metals Corp, MERN.

Société de développement de la Baie-James. (2009). Retrieved from: https://www.sdbj.gouv.qc.ca/fr/aeroport/a-propos/. Consulted on October 18, 2023.

St-Seymour, K., & Francis, D. (1988). Magmatic interaction between mantle and crust during the evolution of the Archean Lac Guyer greenstone belt. Canadian Journal of Earth Sciences, 25, 691-700.

Thomassin, Y.; Rey, N.; Sullivan, N. (2024a). Analysis and Interpretation of the CV5 Static and Kinetic Geochemistry Program. Prepared by BBA Inc. and Vision Geochemistry Ltd. May 23, 2024.

Thomassin, Y., Rey, N., & Sullivan, N. (2024b). Geochemical Modelling of Arsenic Leaching Risk for CV5 Waste Rock Stockpiles. Prepared by BBA Inc. and Vision Geochemistry Ltd. on July 3, 2024.

Tourisme Eeyou Istchee Baie-James. (2016). Maps and itineraries. Retrieved from: https://www.escapelikeneverbefore.com/en/discover-the-region/maps-and-routes/. Consulted on October 18, 2023.

Weather Spark. (2020, November 26). Récupéré sur Weather Spark: https://weatherspark.com/y/147066/Average-Weather-at-La-Grande-Rivi%C3%A8re-Airport-Canada-Year-Round

Wright et al. (1998). Pyrochlore, mineralization, and glimmerite formation in the Eldor (Lake LeMoyne) carbonatite complex, Labrador Trough, Quebec, Canada. Proceedings of the 33rd Forum on the Geology of Industrial Minerals. Canadian Institute of Mining, Metallurgy, and Petroleum, Special Vol. 50, 205-213.

# Appendix A:
# List of Claims – Shaakichiuwaanaan Property

**Shaakichiuwaanaan Property**
**Claim Listing as of August 19, 2024**
**Status of all titles: Active**

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 58090 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (2514,42 $) |
| 58091 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (1993,81 $) |
| 58092 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (1993,81 $) |
| 58093 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (603,63 $) |
| 58094 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (603,63 $) |
| 58098 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (1298,72 $) |
| 58099 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (476,21 $); 2037/02/24 (3209,45 $) |
| 58100 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (122,24 $); 2037/02/24 (7551,45 $) |
| 58101 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (603,63 $) |
| 58102 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (458,09 $); 2037/02/24 (2514,36 $) |
| 58103 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (4846,95 $) |
| 58108 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (603,63 $) |
| 58109 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (1819,27 $) |
| 58110 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (0 $); 2037/02/24 (6335,82 $) |
| 58111 | 2005-02-25 0:00 | 2025-02-24 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/24 (180,52 $); 2037/02/24 (1298,72 $) |
| 58166 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (603,63 $) |
| 58171 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/02/29 (76,72 $); 2037/02/28 (603,63 $) |
| 58175 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/02/29 (223,78 $); 2037/02/28 (603,63 $) |
| 58176 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (603,63 $) |
| 58177 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (603,63 $) |
| 58178 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (603,63 $) |
| 58179 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (108399,87 $) |
| 58181 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/02/29 (606,54 $); 2037/02/28 (603,63 $) |
| 58182 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/02/29 (118,98 $); 2037/02/28 (603,63 $) |
| 58231 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (11912,44 $) |
| 58232 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (17037,04 $) |
| 58233 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (98788,31 $) |
| 58234 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (24000,04 $) |
| 58235 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (24369,93 $) |
| 58236 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (21225,08 $) |
| 58237 | 2005-03-01 0:00 | 2025-02-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/02/29 (0 $); 2037/02/28 (115592,19 $) |
| 2021045 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021046 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021047 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021048 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021049 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021050 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (4376,59 $) |
| 2021051 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (980,26 $) |
| 2021052 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2021053 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021054 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2028/07/17 (0 $); 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021055 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2028/07/17 (0 $); 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021056 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021057 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021058 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (74,67 $); 2038/07/17 (603,63 $) |
| 2021059 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021060 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (603,63 $) |
| 2021061 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/07/17 (0 $); 2038/07/17 (3034,9 $) |
| 2021062 | 2006-07-18 0:00 | 2026-07-17 23:59 | 51,23 | Lithium Innova inc. 100 % | 2028/07/17 (0 $); 2033/07/17 (0 $); 2038/07/17 (7030,91 $) |
| 2024264 | 2006-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/09/06 (0 $); 2036/09/06 (2356,11 $) |
| 2024265 | 2006-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2033/09/06 (0 $); 2036/09/06 (6414,19 $) |
| 2099380 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099382 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099384 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (1819,27 $) |
| 2099386 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099388 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099390 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099392 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099393 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099395 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099398 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099399 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2099401 | 2007-07-04 0:00 | 2025-07-03 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/03 (0 $); 2037/07/03 (603,63 $) |
| 2120677 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (15438,91 $) |
| 2120678 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (252102,45 $) |
| 2120679 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (27330,19 $) |
| 2120680 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (1378,16 $) |
| 2120681 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (182,35 $); 2037/09/10 (21957,07 $) |
| 2120682 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (1106,71 $); 2037/09/10 (106276,14 $) |
| 2120683 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (437,6 $); 2037/09/10 (114739,51 $) |
| 2120684 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (6185,2 $) |
| 2120685 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (8290,38 $) |
| 2120686 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (7956,37 $) |
| 2120687 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (14,36 $) |
| 2120688 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (0 $) |
| 2120689 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/09/10 (1989,7 $); 2037/09/10 (31706,94 $) |
| 2120690 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (105893,53 $); 2032/09/10 (4166,14 $); 2037/09/10 (16834,5 $) |
| 2120691 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (224676,12 $); 2032/09/10 (5941,37 $); 2037/09/10 (135969,96 $) |
| 2120692 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (477985,38 $); 2032/09/10 (3066,91 $); 2037/09/10 (10390,02 $) |
| 2120694 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (95758,51 $); 2032/09/10 (2948,54 $); 2037/09/10 (3460,96 $) |
| 2120696 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (15528,05 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2120697 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (12530,11 $) |
| 2120698 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (15607,42 $) |
| 2120699 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (603,63 $) |
| 2120700 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (603,63 $) |
| 2120701 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (603,63 $) |
| 2120702 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (13804,17 $) |
| 2120703 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (91549,75 $) |
| 2120704 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (2620,18 $) |
| 2120705 | 2007-09-11 0:00 | 2026-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2031/09/10 (0 $); 2033/09/10 (0 $); 2036/09/10 (1420,48 $) |
| 2120711 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/09/10 (0 $); 2037/09/10 (603,63 $) |
| 2120712 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (603,63 $) |
| 2120713 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (1266,49 $) |
| 2120714 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,26 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (0 $); 2037/09/10 (4781,66 $) |
| 2120717 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,25 | Lithium Innova inc. 100 % | 2027/09/10 (0 $); 2032/09/10 (561,6 $); 2037/09/10 (122102,43 $) |
| 2120719 | 2007-09-11 0:00 | 2025-09-10 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/09/10 (729,42 $); 2037/09/10 (24133,32 $) |
| 2125067 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125068 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125069 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (3034,89 $) |
| 2125070 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (5076,03 $); 2037/09/26 (603,63 $) |
| 2125073 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,2 | Lithium Innova inc. 100 % | 2027/09/26 (94044,39 $); 2032/09/26 (1153,98 $); 2037/09/26 (603,63 $) |
| 2125075 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,23 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (409815,89 $) |
| 2125076 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,23 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (811,79 $); 2037/09/26 (1993,81 $) |
| 2125079 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125080 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125081 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,22 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125091 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125092 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (78,71 $); 2037/09/26 (603,63 $) |
| 2125093 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (0 $); 2037/09/26 (603,63 $) |
| 2125094 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (53058,2 $); 2032/09/26 (5657,03 $); 2037/09/26 (603,63 $) |
| 2125095 | 2007-09-27 0:00 | 2025-09-26 23:59 | 51,21 | Lithium Innova inc. 100 % | 2027/09/26 (0 $); 2032/09/26 (10119,2 $); 2037/09/26 (603,63 $) |
| 2461438 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (3817,38 $); 2032/09/06 (10570,19 $); 2033/09/06 (928,56 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461439 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (1869,07 $); 2033/09/06 (359,77 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461440 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (1527,1 $); 2033/09/06 (359,77 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461441 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (144,62 $); 2033/09/06 (359,77 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461442 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461443 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (735,07 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461444 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (179,15 $); 2033/09/06 (359,77 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461445 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461446 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461447 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461448 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461449 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2461450 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (739,85 $); 2033/09/06 (4552,86 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461451 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (39,24 $); 2032/09/06 (6429,89 $); 2033/09/06 (4084,2 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461452 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (915,23 $); 2033/09/06 (477,13 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461453 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (619,47 $); 2033/09/06 (417,54 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461454 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461455 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461456 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461457 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461458 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461459 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2461460 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461461 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461462 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (70,45 $) |
| 2461463 | 2016-09-07 0:00 | 2026-09-06 23:59 | 51,23 | Lithium Innova inc. 100 % | 2030/09/06 (0 $); 2032/09/06 (0 $); 2033/09/06 (0 $); 2036/09/06 (192,03 $); 2038/09/06 (603,63 $) |
| 2468204 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,22 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (724,53 $); 2033/11/06 (526,88 $); 2036/11/06 (795,66 $) |
| 2468205 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (873,58 $); 2033/11/06 (1262,01 $); 2036/11/06 (795,66 $) |
| 2468206 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (454,17 $); 2036/11/06 (795,66 $) |
| 2468207 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,21 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |
| 2468208 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468209 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |
| 2468210 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (2217,23 $); 2033/11/06 (359,77 $); 2036/11/06 (795,66 $) |
| 2468211 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (232,27 $); 2033/11/06 (359,77 $); 2036/11/06 (795,66 $) |
| 2468212 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |
| 2468213 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (1715,61 $); 2036/11/06 (795,66 $) |
| 2468214 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (3146,39 $); 2036/11/06 (795,66 $) |
| 2468215 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (1969,03 $); 2033/11/06 (6972,5 $); 2036/11/06 (795,66 $) |
| 2468216 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (3222,6 $); 2033/11/06 (8292,99 $); 2036/11/06 (795,66 $) |
| 2468217 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (138,23 $); 2033/11/06 (7837,65 $); 2036/11/06 (795,66 $) |
| 2468218 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (4005,35 $); 2036/11/06 (795,66 $) |
| 2468219 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,2 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (822,44 $); 2033/11/06 (751,62 $); 2036/11/06 (795,66 $) |
| 2468220 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (947,31 $); 2033/11/06 (359,77 $); 2036/11/06 (262,48 $) |
| 2468221 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (564,3 $); 2033/11/06 (359,77 $); 2036/11/06 (262,48 $) |
| 2468222 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (440,47 $); 2033/11/06 (359,77 $); 2036/11/06 (262,48 $) |
| 2468223 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (2185,11 $); 2033/11/06 (359,77 $); 2036/11/06 (262,48 $) |
| 2468224 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (756,13 $); 2033/11/06 (510,62 $); 2036/11/06 (262,48 $) |
| 2468225 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468226 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (2733,57 $); 2033/11/06 (632,62 $); 2036/11/06 (262,48 $) |
| 2468227 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468228 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (99,53 $); 2036/11/06 (795,66 $) |
| 2468229 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |
| 2468230 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (153,96 $); 2036/11/06 (795,66 $) |
| 2468231 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2468232 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,19 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (795,66 $) |
| 2468233 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468234 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (298,64 $); 2033/11/06 (384,43 $); 2036/11/06 (262,48 $) |
| 2468235 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (10,05 $); 2033/11/06 (510,66 $); 2036/11/06 (262,48 $) |
| 2468236 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (2434,01 $); 2033/11/06 (597,06 $); 2036/11/06 (262,48 $) |
| 2468237 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (407,54 $); 2036/11/06 (262,48 $) |
| 2468238 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (906,39 $); 2033/11/06 (1224,43 $); 2036/11/06 (262,48 $) |
| 2468239 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468240 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468241 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468242 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468243 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,18 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468244 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,17 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468245 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,17 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468246 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,17 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468247 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,17 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2468248 | 2016-11-07 0:00 | 2026-11-06 23:59 | 51,17 | Lithium Innova inc. 100 % | 2030/11/06 (0 $); 2032/11/06 (0 $); 2033/11/06 (0 $); 2036/11/06 (262,48 $) |
| 2497825 | 2017-07-18 0:00 | 2025-07-17 23:59 | 51,16 | Lithium Innova inc. 100 % | 2031/07/17 (24,6 $); 2034/07/17 (359,77 $); 2037/07/17 (262,48 $) |
| 2497826 | 2017-07-18 0:00 | 2025-07-17 23:59 | 51,16 | Lithium Innova inc. 100 % | 2031/07/17 (689,73 $); 2034/07/17 (359,77 $); 2037/07/17 (262,48 $) |
| 2497827 | 2017-07-18 0:00 | 2025-07-17 23:59 | 51,16 | Lithium Innova inc. 100 % | 2031/07/17 (1222,5 $); 2034/07/17 (608,32 $); 2037/07/17 (262,48 $) |
| 2497828 | 2017-07-18 0:00 | 2025-07-17 23:59 | 51,15 | Lithium Innova inc. 100 % | 2031/07/17 (1494,47 $); 2034/07/17 (516,78 $); 2037/07/17 (262,48 $) |
| 2497829 | 2017-07-18 0:00 | 2025-07-17 23:59 | 51,15 | Lithium Innova inc. 100 % | 2031/07/17 (1980,24 $); 2034/07/17 (582,99 $); 2037/07/17 (262,48 $) |
| 2510220 | 2018-01-23 0:00 | 2026-01-22 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/01/22 (70,45 $) |
| 2520593 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520594 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520595 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520596 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (143,07 $); 2038/07/11 (603,63 $) |
| 2520597 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520598 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520599 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520600 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520601 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520602 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520603 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520604 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520605 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520606 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,25 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520607 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (745,89 $); 2033/07/11 (597,01 $); 2038/07/11 (603,63 $) |
| 2520608 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520609 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (453,74 $); 2033/07/11 (650,97 $); 2038/07/11 (603,63 $) |
| 2520610 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (833,07 $); 2033/07/11 (359,77 $); 2038/07/11 (603,63 $) |
| 2520611 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (739,7 $); 2033/07/11 (359,77 $); 2038/07/11 (603,63 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2520612 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (432,25 $); 2033/07/11 (1127,45 $); 2038/07/11 (603,63 $) |
| 2520613 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (1005,26 $); 2038/07/11 (603,63 $) |
| 2520614 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,51 $); 2038/07/11 (603,63 $) |
| 2520615 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (347,07 $); 2038/07/11 (603,63 $) |
| 2520616 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (896,34 $); 2038/07/11 (70,45 $) |
| 2520617 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (601,68 $); 2038/07/11 (70,45 $) |
| 2520618 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,24 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (427,16 $); 2038/07/11 (70,45 $) |
| 2520619 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (195,98 $); 2038/07/11 (603,63 $) |
| 2520620 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (172,48 $); 2038/07/11 (603,63 $) |
| 2520621 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (792,9 $); 2038/07/11 (70,45 $) |
| 2520622 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (193,83 $); 2038/07/11 (70,45 $) |
| 2520623 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (212,07 $); 2038/07/11 (70,45 $) |
| 2520624 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (191,66 $); 2038/07/11 (70,45 $) |
| 2520625 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (374,86 $); 2038/07/11 (70,45 $) |
| 2520626 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,23 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (190,33 $); 2038/07/11 (70,45 $) |
| 2520627 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (182,85 $); 2038/07/11 (70,45 $) |
| 2520628 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (191,08 $); 2038/07/11 (70,45 $) |
| 2520629 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (191,37 $); 2038/07/11 (70,45 $) |
| 2520630 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,22 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (244,61 $); 2038/07/11 (70,45 $) |
| 2520631 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (433,2 $); 2038/07/11 (70,45 $) |
| 2520632 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (432,77 $); 2038/07/11 (70,45 $) |
| 2520633 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (465,38 $); 2038/07/11 (70,45 $) |
| 2520634 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (351,81 $); 2038/07/11 (70,45 $) |
| 2520635 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520636 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,21 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520637 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,2 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520638 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,2 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520639 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,2 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520640 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,2 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (242,28 $); 2038/07/11 (70,45 $) |
| 2520641 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,2 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (139,05 $); 2038/07/11 (3196,8 $) |
| 2520642 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (417,04 $); 2038/07/11 (70,45 $) |
| 2520643 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (449,27 $); 2038/07/11 (70,45 $) |
| 2520644 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (793 $); 2038/07/11 (70,45 $) |
| 2520645 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (131,61 $); 2038/07/11 (70,45 $) |
| 2520646 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520647 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520648 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,19 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520649 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (515,82 $); 2038/07/11 (70,45 $) |
| 2520650 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (571,22 $); 2038/07/11 (70,45 $) |
| 2520651 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (200,04 $); 2038/07/11 (70,45 $) |
| 2520652 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (286,59 $); 2038/07/11 (70,45 $) |
| 2520653 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (1434,1 $); 2038/07/11 (70,45 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2520654 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (414,29 $); 2038/07/11 (70,45 $) |
| 2520655 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520656 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,18 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520657 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520658 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (427,44 $); 2038/07/11 (70,45 $) |
| 2520659 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (908,75 $); 2038/07/11 (70,45 $) |
| 2520660 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (382,74 $); 2038/07/11 (70,45 $) |
| 2520661 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520662 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520663 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,17 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520664 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,16 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520665 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,16 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (276,03 $); 2038/07/11 (70,45 $) |
| 2520666 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,16 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520667 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,16 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (70,45 $) |
| 2520668 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,28 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520669 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,28 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520670 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,28 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520671 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,28 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520672 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,28 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520673 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (941,16 $); 2038/07/11 (689 $) |
| 2520674 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (911,49 $); 2038/07/11 (6192,75 $) |
| 2520675 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (1743,31 $); 2038/07/11 (603,63 $) |
| 2520676 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (949,28 $); 2038/07/11 (603,63 $) |
| 2520677 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520678 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520679 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520680 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520681 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520682 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520683 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520684 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520685 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520686 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,27 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520687 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2520688 | 2018-07-12 0:00 | 2026-07-11 23:59 | 51,26 | Lithium Innova inc. 100 % | 2032/07/11 (0 $); 2033/07/11 (119,52 $); 2038/07/11 (603,63 $) |
| 2531732 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | |
| 2531733 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | |
| 2531734 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (999,4 $) |
| 2531735 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (1573,8 $) |
| 2531736 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (1554,6 $) |
| 2531737 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (1567,4 $) |
| 2531738 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (1565,8 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2531739 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,25 | Lithium Innova inc. 100 % | 2035/02/13 (167,4 $) |
| 2531740 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,25 | Lithium Innova inc. 100 % | |
| 2531741 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | |
| 2531742 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | |
| 2531743 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | 2035/02/13 (897 $) |
| 2531744 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | 2035/02/13 (952,2 $) |
| 2531745 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | 2035/02/13 (1473 $) |
| 2531746 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,23 | Lithium Innova inc. 100 % | 2035/02/13 (926,6 $) |
| 2531747 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (1458,6 $) |
| 2531748 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2035/02/13 (164,2 $) |
| 2531749 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | |
| 2531750 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/02/13 (70,45 $) |
| 2531751 | 2019-02-14 0:00 | 2026-02-13 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/02/13 (70,45 $) |
| 2536272 | 2019-04-16 0:00 | 2026-04-15 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/04/15 (603,63 $) |
| 2536273 | 2019-04-16 0:00 | 2026-04-15 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/04/15 (70,45 $) |
| 2536274 | 2019-04-16 0:00 | 2026-04-15 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/04/15 (70,45 $) |
| 2536275 | 2019-04-16 0:00 | 2026-04-15 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/04/15 (70,45 $) |
| 2536296 | 2019-04-17 0:00 | 2026-04-16 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/04/16 (603,63 $) |
| 2536297 | 2019-04-17 0:00 | 2026-04-16 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/04/16 (603,63 $) |
| 2536298 | 2019-04-17 0:00 | 2026-04-16 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/04/16 (603,63 $) |
| 2536477 | 2019-04-23 0:00 | 2026-04-22 23:59 | 51,26 | Lithium Innova inc. 100 % | 2038/04/22 (1818,88 $) |
| 2574882 | 2020-07-29 0:00 | 2026-07-28 23:59 | 51,25 | Lithium Innova inc. 100 % | 2038/07/28 (407,21 $) |
| 2574883 | 2020-07-29 0:00 | 2026-07-28 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/07/28 (407,21 $) |
| 2574884 | 2020-07-29 0:00 | 2026-07-28 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/07/28 (407,21 $) |
| 2574885 | 2020-07-29 0:00 | 2026-07-28 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/07/28 (336,76 $) |
| 2574886 | 2020-07-29 0:00 | 2026-07-28 23:59 | 51,24 | Lithium Innova inc. 100 % | 2038/07/28 (336,76 $) |
| 2621215 | 2021-10-13 0:00 | 2025-10-12 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2621216 | 2021-10-13 0:00 | 2025-10-12 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2621217 | 2021-10-13 0:00 | 2025-10-12 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2621218 | 2021-10-13 0:00 | 2025-10-12 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2621219 | 2021-10-13 0:00 | 2025-10-12 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2623807 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,21 | Lithium Innova inc. 100 % | 2037/10/31 (70,45 $) |
| 2623808 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,21 | Lithium Innova inc. 100 % | 2037/10/31 (3196,8 $) |
| 2623809 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,21 | Lithium Innova inc. 100 % | |
| 2623810 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,21 | Lithium Innova inc. 100 % | |
| 2623811 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,2 | Lithium Innova inc. 100 % | 2037/10/31 (1982,21 $) |
| 2623812 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,2 | Lithium Innova inc. 100 % | 2037/10/31 (2676,26 $) |
| 2623813 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,2 | Lithium Innova inc. 100 % | 2037/10/31 (5732,18 $) |
| 2623814 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,19 | Lithium Innova inc. 100 % | 2037/10/31 (3717,35 $) |
| 2623815 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,19 | Lithium Innova inc. 100 % | 2037/10/31 (70,45 $) |
| 2623816 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,19 | Lithium Innova inc. 100 % | 2037/10/31 (2431,26 $) |
| 2623817 | 2021-11-01 0:00 | 2025-10-31 23:59 | 51,19 | Lithium Innova inc. 100 % | 2037/10/31 (4341,99 $) |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2626748 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2626749 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2626750 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626751 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626752 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (336,76 $) |
| 2626753 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (407,21 $) |
| 2626754 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2626755 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626756 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626757 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626758 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626759 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (192,03 $) |
| 2626760 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (407,21 $) |
| 2626761 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,23 | Lithium Innova inc. 100 % | 2037/11/20 (407,21 $) |
| 2626762 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2626763 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2626764 | 2021-11-21 0:00 | 2025-11-20 23:59 | 51,22 | Lithium Innova inc. 100 % | 2037/11/20 (262,48 $) |
| 2627351 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2627352 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2627353 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2627354 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2627355 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2627356 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2627357 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2627358 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627359 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627360 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627361 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627362 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627363 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627364 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627365 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627366 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627367 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627368 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2627369 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627370 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627371 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627372 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627373 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627374 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627375 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2627376 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627377 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627378 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627379 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2627380 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627381 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627382 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627383 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627384 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627385 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627386 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2627387 | 2021-11-28 0:00 | 2025-11-27 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2628013 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628014 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628015 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628016 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628017 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628018 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628019 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,2 | Lithium Innova inc. 100 % | |
| 2628020 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628021 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628022 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628023 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628024 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628025 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628026 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628027 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628028 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,19 | Lithium Innova inc. 100 % | |
| 2628029 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628030 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628031 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628032 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628033 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628034 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628035 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628036 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628037 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628038 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628039 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628040 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628041 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628042 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2628043 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628044 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628045 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628046 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628047 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,18 | Lithium Innova inc. 100 % | |
| 2628048 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628049 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628050 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628051 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628052 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628053 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628054 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628055 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628056 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628057 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628058 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628059 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628060 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628061 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628062 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628063 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,17 | Lithium Innova inc. 100 % | |
| 2628064 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628065 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628066 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628067 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628068 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628069 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628070 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628071 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628072 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,16 | Lithium Innova inc. 100 % | |
| 2628073 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628074 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628075 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628076 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628077 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628078 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2628079 | 2021-12-01 0:00 | 2025-11-30 23:59 | 51,15 | Lithium Innova inc. 100 % | |
| 2636839 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,09 | Lithium Innova inc. 100 % | |
| 2636840 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,09 | Lithium Innova inc. 100 % | |
| 2636841 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,09 | Lithium Innova inc. 100 % | |
| 2636843 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,08 | Lithium Innova inc. 100 % | |
| 2636844 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,08 | Lithium Innova inc. 100 % | |

| Title No | Date of Registration | Expiry Date | Area (Ha) | Titleholder(s) (Name, Number and Percentage) | Peremptive Date and Amount |
|---|---|---|---|---|---|
| 2636845 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,08 | Lithium Innova inc. 100 % | |
| 2636846 | 2022-02-21 0:00 | 2025-02-20 23:59 | 51,08 | Lithium Innova inc. 100 % | |
| 2655998 | 2022-07-06 0:00 | 2025-07-05 23:59 | 51,14 | Lithium Innova inc. 100 % | |
| 2655999 | 2022-07-06 0:00 | 2025-07-05 23:59 | 51,14 | Lithium Innova inc. 100 % | |

BBA.CA