

FRONTIER LITHIUM INC.

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2018 PAK PREFEASIBILITY STUDY – 2020 SPARK RESOURCE ESTIMATION NORTHWESTERN ONTARIO, CANADA

APRIL 07, 2020





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WSP
SUITE 300
93 CEDAR STREET
SUDBURY, ON, CANADA P3E 1A7

T: +1 705 674-0119
WSP.COM

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SIGNATURES

PREPARED BY

Original signed and stamped by

Todd McCracken, P.Geo.
Manager – Mining
WSP Canada Inc.

March 19, 2020

Date

Original signed and stamped by

Johnny Canosa, P.Eng.
Sr. Mining Engineer

March 19, 2020

Date

Original signed and stamped by

Roy Levesque, P.Eng.
Sr. Mining Engineer
JDS Energy and Mining

March 19, 2020

Date

Original signed and stamped by

Kurt Boyko, P.Eng.
Consulting Specialist, Mechanical
Nordmin Engineering Ltd.

March 19, 2020

Date

Original signed and stamped by

Steve Wilson, P.Eng.
Process Engineer
Wil-Solve Consulting Services

March 19, 2020

Date

APPROVED BY

Original signed and stamped by

Todd McCracken, P.Geo.
Manager – Mining
WSP Canada Inc.

March 19, 2020

Date

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ABBREVIATIONS

UNITS OF MEASURE

above mean sea level	amsl
acre	ac
ampere	A
annum (year)	a
billion	B
billion tonnes	Bt
billion years ago	Ga
British thermal unit	BTU
Centimetre	cm
cubic centimetre	cm ³
cubic feet per minute	cfm
cubic feet per second	ft ³ /s
cubic foot	ft ³
cubic inch	in
cubic metre	m ³
cubic yard	yd ³
Coefficients of Variation	Cvs
day	d
days per week	d/wk
days per year (annum)	d/a
dead weight tonnes	DWT
decibel adjusted	Ba
decibel	dB
degree	°
degrees Celsius	°C
diameter	Ø
dollar (American)	US\$
dollar (Canadian)	CAN\$
dry metric ton	mt
foot	ft
gallon	gal
gallons per minute	gpm
Gigajoule	GJ
Gigapascal	GPa
Gigawatt	GW
Gram	g
grams per litre	g/L
grams per tonne	g/t
greater than	>
hectare (10,000 m ²)	ha
hertz	Hz
horsepower	hp
hour	h
hours per day	h/d
hours per week	h/wk
hours per year	h/a
inch	in
kilo (thousand)	k

kilogram	kg
kilograms per cubic metre	kg/m ³
kilograms per hour	kg/h
kilograms per square metre	kg/m ²
kilometre	km
kilometre	km
kilometres per hour	km/h
kilopascal	kPa
kiloton	kt
kilovolt	kV
kilovolt-ampere	kVa
kilowatt	kW
kilowatt hour	kWh
kilowatt hours per tonne	kWh/t
kilowatt hours per year	kWh/a
less than	<
litre	L
litres per minute	L/m
megabytes per second	Mb/s
megapascal	Mpa
megavolt-ampere	Mva
megawatt	MW
metre	m
metres above sea level	masl
metres Baltic sea level	mbsl
metres per minute	m/min
metres per second	m/s
microns	µm
milligram	mg
milligrams per litre	mg/L
millilitre	mL
millimetre	mm
million	M
million bank cubic metres	Mbm ³
million bank cubic metres per annum	Mbm ³ /a
million tonnes	Mt
minute (plane angle)	'
minute (time)	min
month	mo
ounce	oz
pascal	Pa
centipoise	mPa·s
parts per million	ppm
parts per billion	ppb
percent	%
pound(s)	lb
pounds per square inch	psi
revolutions per minute	rpm

second (plane angle)....."

second (time) s

short ton (2,000 lb) st

short tons per day st/d

short tons per year st/y

specific gravity.....SG

square centimetre cm²

square foot ft²

square inch.....in²

square kilometre.....km²

square metre m²

three-dimensional 3D

tonne (1,000 kg) (metric ton).....t

tonnes per day t/d

tonnes per hour t/h

tonnes per year t/a

tonnes seconds per hour metre cubed ts/hm³

volt.....V

week.....wk

weight/weight w/w

wet metric ton.....wmt

ACRONYMS

Actlabs Activation Laboratories

ARD/ML Acid Rock Drainage / Metal Leaching

BFA Bench Face Angle

BGM Bituminous Geomembrane

Blue Heron Blue Heron Solutions for Environmental Management Inc.

CIZ Central Intermediate Zone

DMS Dense Media Separator

DTH Down the Hole

DTM Digital Terrain Model

EFR Emerald Fields Resources

Frontier Frontier Lithium

Golder Golder Associates Inc.

GSC Geological Survey of Canada

HDPE High-Density Polyethylene

HLM Houston Lake Mining

HMI Human Machine Interface

IBA Impact Benefit Agreement

IRR Internal Rate of Return

LIMS Low Intensity Magnetic Separator

LIZ Lower Intermediate Zone

LOM Life of Mine

MENDM Ministry of Energy, Northern Development and Mines

MLAS Mining Lands Administration System

MNDM Ministry of Northern Development and Mines

Nordmin Nordmin Resource & Industrial Engineering

NPV Net Present Value

ODM Ontario Department of Mines

OGS Ontario Geological Survey

PAF Paste Aggregate Fill

PAK Pakeagama

PLC Programmable Logic Controller

PFS Prefeasibility Study

PVC Polyvinyl Chloride

ROI	Radius of Influence
ROM	Run of Mill
SPT	Standard Penetration Test
TDC	Top-Dead-Centre
TMF	Tailings Management Facility
UIZ	Upper Intermediate Zone
WHIMS	Wet High Intensity Magnetic Separator
WRA	Waste Rock Area
WSP	WSP Canada Inc.



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1 SUMMARY

Frontier Lithium Inc. (Frontier) (TSX.V: FL) retained WSP Canada Inc. (WSP) in December 2019 to prepare an updated, independent mineral resource estimate in accordance with National Instrument 43-101 (NI 43-101) for the company's Spark deposit, located in northwestern Ontario, Canada. The Spark deposit is a separate deposit located on the PAK project which is subject to a prefeasibility study (PFS) completed on the PAK deposit. The Spark resource model does not impact the results of the PFS.

Frontier owns the 100% rights to the Property claims. Frontier's land holdings in the area comprise 417 contiguous unsurveyed claim units for a total of 6,672 hectares. Two royalty agreements are in place for specific claim units and are subject to buyout clauses.

This report was prepared by independent consultants Todd McCracken, P.Geo. of WSP Canada, Johnny Canosa, P.Eng., Roy Levesque, P.Eng. of JDS Energy and Mining, Kurt Boyko, P.Eng. of Nordmin Engineering Ltd., Steve Wilson, P.Eng. of Wil-Solve Consulting Services.

The Issue Date of this report is April 7, 2020. The effective date of the Spark mineral resource estimation is January 20, 2020. The Effective Date of the PAK PFS is March 2, 2018.

1.1 PAK PREFEASIBILITY

1.1.1 GEOLOGY

The Property area is situated along the boundary between the Berens River and Sachigo Subprovinces (Card and Ciesielski, 1986 and Card, 1990) of the Archean Superior Province of the Canadian Shield.

The Property is underlain by the northwestern extension of the North Spirit Lake greenstone belt. The greenstone belt within the Property boundary is bounded to the north by biotitic tonalities and granites of the Whiteloon Lake Batholith (Sachigo Subprovince), and to the south by gneissic granodiorites and granites of the Bear Head Lake Batholith (Berens River Subprovince).

The three main lithological domains on the Property are: metasedimentary units composed of pelitic sediments, iron formation and conglomerate to the north; mafic metavolcanic and related metasedimentary rocks to the south; and the peraluminous two-mica Pakeagama Lake granite pluton emplaced along the unconformable contact between metasedimentary and metavolcanics metasedimentary rocks.

The Pakeagama Lake granitic pegmatite is a highly evolved, zoned, complex-type, petalite-subtype Lithium Cesium Tantalum (LCT) pegmatite with highly anomalous concentrations of lithium, cesium, tantalum, and rubidium.

The Pakeagama Lake pegmatite is the second largest complex-type petalite subtype pegmatite dyke in Ontario (*Breaks et al, 1999*).

Peter Vanstone, P. Geo., former chief geologist at the Tanco Mine, consolidated the pegmatite zones using commonly accepted pegmatite nomenclature and Tanco zone mineralogical criteria. The three main pegmatite zones identified in this work are (from northwest to southeast and perpendicular to the strike of the pegmatite) the Central Intermediate Zone (CIZ – tantalum, rubidium, and cesium enriched), Upper Intermediate Zone (UIZ - lithium enriched), and the Lower Intermediate Zone (LIZ – lithium and rubidium enriched). There is also a Wall Zone and Border Zone but their extent is limited.

The Property deposit model is a highly evolved, granitic, rare-element lithium cesium- tantalum bearing (LCT), complex Type – Petalite Subtype pegmatite similar to the Tanco pegmatite in the Bird River belt in southeastern Manitoba, which is the best known and a world-class example of this type of deposit model.

CHANNEL SAMPLING AND DIAMOND DRILLING

A total of 32 channels totaling 240 m were cut and samples collected between 2001 and 2017. A total of 32 NQ diamond drill holes totaling 6,307 m were completed between 2013 and in 2017. A series of 67 rotary percussion holes were drilled for a 280 tonne bulk sample of the UIZ in 2015. Sample collection, sample preparation, and sample analysis were completed to industry standards.

A Quality Assurance / Quality Control (QA/QC) program was in place for the diamond drilling programs and the channel programs after 2011. The 2001 channel program did not include standards and relied on the Analytical Laboratory's internal QA/QC program.

MINERAL RESOURCE ESTIMATION

The geological dataset generated by Frontier Lithium, consisting of data derived from diamond drilling and surface channel sampling, has been deemed suitable to support geological interpretation and resource estimate.

The estimation of the three domains was completed using capped and composited sample data on a 2.5 m x 2.5 m x 2.5 m block. The estimation was completed using Inverse Distance Squared (ID²) with Nearest Neighbour (NN) as a validation purposes.

The PAK mineral resource was developed on three domains at a Li₂O equivalent cut-off grade of 0.4% and contains a Measured and Indicated Resource of approximately 8.5 Mt with an average grade of 1.78% Li₂O, 101 ppm Ta₂O₅, 0.04% Cs₂O, and 0.33% Rb₂O. There is an additional Inferred Resource of approximately 1.9 Mt with an average grade of 2.01% Li₂O, 97 ppm Ta₂O₅, 0.02% Cs₂O, and 0.32% Rb₂O (Table 1.1). The effective date of the resource is March 2, 2018.

1.1.2 PRELIMINARY FEASIBILITY STUDY

The mining reserve considered for this study is estimated to be approximately 5.8 million tonnes at a grade of 2.00% Li₂O. The Preliminary Feasibility Study includes both Measured and Indicated Mineral Resource. Table 1.1 shows a breakdown of the mineable reserve.

Table 1.1 Mineral Reserve (Mine Diluted) Included in PFS Mine Plan – Effective March 2, 2018

Reserve Category	Million Tonnes	Li ₂ O%
Open Pit		
Proven	1.19	2.39
Probable	2.93	1.93
Sub total	4.12	2.06
Underground		
Probable	1.65	1.84
Total (OP+UG)	5.77	2.00

The PFS includes both open pit and underground mining operations. Underground mine access will be via portal, which is located three benches up from the bottom of the current pit design. A fresh air raise (also used as a second means of egress) would be excavated at one end of the underground workings, and the air would be exhausted to surface via another raise at the opposite end of the underground workings. Table 1.2 shows the key economic parameters used for the Preliminary Feasibility Study.

Table 1.2 Economic Assumptions and Parameters

Exchange Rate (US\$/CAN\$)	\$1.25
Discount Rate	8%
TG_SC7.2 Price (US\$)	\$1,250/tonne
CG_SC6.6 Price (US\$)	\$750/tonne

1.1.3 CAPITAL AND OPERATING COSTS

The PAK mine site project scope covered in this study is based on the construction of a green field facility having a nominal processing capacity of 1,118 tpd for open pit, and 1,100 tpd for underground. The Capital and Operating cost estimates related to the mine, processing plant, and site infrastructure have been developed by the QPs. Engineering quantities and costs related to the water and environmental management, including the associated costs, were provided by Golder Associates.

Capital and Operating costs for the Project are shown in Tables 1.3 and 1.4 respectively.

Table 1.3 Capital Requirements for the PAK Lithium Project

Capital Requirements	\$ Million
Site prep/ infrastructure	45.6
Mill processing	59.3
Power distribution	6.4
Open pit equipment	12.9
Water treatment and waste management	9.5
Contingency	13.5
Total Pre-production Capital Cost	147.3
Total Sustaining Capital Cost	36.6

Table 1.4 Operating Costs for the PAK Lithium Project

Operating Costs	\$/tonne
Direct Open Pit Mining Cost	4.06
Direct Underground Mining Cost	84.07
Direct Processing Cost	18.01

1.1.4 PROCESSING

The ore zone characterisation and subsequent test work has lead to a robust mill design that adequately accommodates three distinct ore zones in the production of two spodumene (lithium) concentrates. Lithium deportment is predominantly in spodumene. Some lithium will be lost as solid solution in mica and tourmaline that are rejected from the concentrates to manage impurity levels.

The ore zones are relatively soft at coarse and intermediate sizes but become harder and abrasive at the ball mill size range. Spodumene liberation occurs at relatively coarse particle size distributions and the target primary grind for the mill is a P80 size of 200µm. Dense media separation was used ahead of the grinding circuit to reject barren material and reduce the equipment size and energy requirements of the grinding circuit design. A mica pre-float is used to manage fluorine content in the products. The pre-float tails are conditioned and spodumene is collected in two sequential flotation stages (Rougher and Scavenger). The rougher/scavenger segregation allows the collection of the phosphates and some of the other fast floating impurity elements to a smaller component of the rougher concentrate. Both Rougher and Scavenger concentrates are cleaned to reduce rock content. The Rougher-cleaner concentrate is then conditioned with a starch to depress a clean spodumene tailings and the resulting “phosphate concentrate” will meet the specifications for the chemical grade spodumene product. The tails from the phosphate float are combined with the scavenger cleaner tails into a product that meets the higher quality specifications for the technical grade product.

The flowsheet was demonstrated in a locked cycle test and produced a technical grade concentrate of 7.15% Li₂O, representing 73.7% of the lithium in mill feed in 39.5% of the mass. The concentrate had a P₂O₅ assay of 0.16%, well below the 0.25% limit, and (K₂O+Na₂O) was 0.43%. A chemical grade concentrate was also produced at 7.14% Li₂O, representing 7.6% of the lithium in mill feed in 4.1% of the mass. The concentrate had a P₂O₅ assay of 1.42% and Potassium and sodium (K₂O+Na₂O) of 0.39%. These concentrates were produced without gravity separation or WHIMS iron removal and so it is very reasonable to expect the quality of a commercially produced concentrates to show lower grades for both Ta and Fe₂O₃.

Combined lithium recovery to saleable products was (73.7% + 7.6%) = 81.3% of the mill feed. The feed to flotation (FRON-12) was DMS-upgraded, representing 92.8% of the lithium in ore. Thus, the adjusted recoveries (basis = ore) become:

Technical grade (73.7* 0.928)	= 68.4%
Chemical grade (7.6* 0.928)	= 7.0%
Combined Products (81.3* 0.928)	= 75.4%

1.1.5 PFS FINANCIALS

The PAK Lithium Project provides positive economic returns. Table 1.5 summarizes the estimated returns for the PAK Lithium Project.

Table 1.5 Estimated Returns for the PAK Lithium Project

Project Economics	
Pre-Tax	
NPV (8% Discount Rate)	\$448 M
Internal Rate of Return	46.5%
Cumulative Cash Flow	\$1,013 M
Post-Tax	
NPV (8% Discount Rate)	\$301 M
Internal Rate of Return	38.3%
Cumulative Cash Flow	\$700 M

1.2 SPARK

1.2.1 GEOLOGY

The Spark pegmatite has two predominant lithologies. These are an early aplite that occurs ubiquitously throughout the pegmatite with what appears to be a later phase of coarser-grained feldspar-quartz-spodumene-muscovite overprinting the aplite. Coarse to megacrystic K-feldspar is scattered within the aplite, and spodumene abundance ranges from common to absent.

The later phase that appears to overprint the aplite at Spark has similar lithology and texture to the Lower Intermediate Zone (LIZ) at PAK and has been geologically classified as such. The LIZ at Spark consists of coarse to megacrystic grey to tan K-feldspar up to 20 cm in size (typically 2-5 cm), common to abundant fine to coarse-grained white to light grey spodumene with varying textures, muscovite, and quartz. K-feldspar and quartz show graphic texture in some intersections. Intervals of aplite up to a couple meters thick also occur in the LIZ at Spark. Accessory minerals include beryl, black tourmaline, fluoro-apatite and locally arsenopyrite and rare lollingite. Contacts between host metavolcanic rocks and both the aplite and LIZ commonly display a deformed biotite-tourmaline-holmquistite-arsenopyrite contact zone. Greyish white to light grey spodumene occurs throughout the pegmatite varying from fine grained laths (1-3 mm) to coarse grained “Jackstraw” texture with crystal laths up to 3 cm in length. Locally megacrystic grey feldspar crystals up to 20 cm occur but typically are 2 to 5 cm in size. This later phase has been geologically logged as LIZ (Lower Intermediate Zone) because of similarity in texture and composition to the LIZ at the PAK deposit.

There is a narrow interval (around 3 m thick) present at surface and in the subsurface in the western portion of the Spark pegmatite consisting of dark-coloured muscovite, dark grey quartz, megacrystic grey K-feldspar, and common blue apatite. The mineralogy and texture of this interval is similar to the Central Intermediate Zone (CIZ) at PAK.

1.2.2 EXPLORATION

Two years of channel sampling and mapping, totaling 236.4m, was completed on the Deposit. The channels were cut using a gas-powered rock saw. All channels and sampling programs were completed to industry standards.

1.2.3 DIAMOND DRILLING

Two years of diamond drilling, totaling 2,499 m in 9 holes, was completed on the Deposit. Drilling programs. All drill programs were completed to industry standards.

1.2.4 MINERAL RESOURCE ESTIMATE

The geological dataset generated for the Spark deposit by Frontier consisting of data derived from diamond drilling and surface channel sampling, has been deemed suitable to support geological interpretation and resource estimate.

The estimation of the single domain was completed using capped and composited sample data on a 2 m x 2 m x 2 m block. The estimation was completed using Ordinary Krig (OK) with Inverse Distance Squared (ID²) and Nearest Neighbour (NN) as a validation purpose.

The Spark pit constrained mineral resource was developed on a single domain at a Li₂O cut-off grade of 0.65% Li₂O cut off, is 3.2 Mt at 1.59% Li₂O, 123 ppm Ta₂O₅, 0.015% Cs₂O, and 0.256% Rb₂O in an Indicated Resource. An additional 12.2 Mt at 1.36 % Li₂O, 107 ppm Ta₂O₅, 0.02% Cs₂O, and 0.228% Rb₂O in an Inferred Resource.

The effective date of the Spark mineral resource is January 20, 2020.

1.3 RECOMMENDATIONS

The PFS supports that the PAK Lithium Project could be economically viable. The results of the PFS justifies additional exploration to further advance the project. A two-phased approach is recommended.

1.3.1 PHASE 1 PROGRAM

Phase 1 is designed to enhance the project leading towards a feasibility study. The budget of \$1.4 million is estimated to be required to complete the Phase 1 program. The recommended work for Phase 1 is summarized below:

- Consider Advanced Exploration by processing a bulk sample centred on the high-grade Upper Intermediate Zone of the PAK deposit with a test pilot plant on site.
- Continue drilling mineralized zone at Spark to increase confidence of the mineral resource.
- Characterize the mineral zonation's at Spark to determine mineralogical and geochemical similarities and potential contrasts to the PAK deposit
- Define optimum size and area required to complete a test mining scenario to evaluate the economics for mining in an area without hydro power and all-season roads.
- Complete a Project Description for the project for permitting purposes.
- Continue the baseline study program and enlarge to encompass the Spark pegmatite area.
- Continue to engage local First Nations communities.
- Develop detailed closure plan and associated costs.
- Explore options to minimize initial capital costs by using a phased approach to the mill construction.
- Explore options to further reduce impurities in the technical grade Lithium concentrates.
- Commence a study of the Spark pegmatite including Fe₂O₃ content in spodumene and developing a flowsheet for processing based on the PAK processing flowsheet.
- Explore options to minimize initial capital costs by using a phased approach to the mill construction.
- Explore options to further reduce impurities in the technical grade Lithium concentrates.
- Commence a study of the Spark pegmatite including Fe₂O₃ content in spodumene and developing a flowsheet for processing based on the PAK processing flowsheet.

1.3.2 PHASE 2 PROGRAM

Phase 2 is designed to collect the data required to complete a feasibility study. The budget for Phase 2 is estimated to be \$3 million. The recommended work for Phase 2 is summarized below:

- Continue with the current surface drilling programs at PAK targeting areas where additional mineralization is expected within, below and adjacent to the Lithium mineralization considered in this study.
- Update the geological and mineral resource model to incorporate new understanding from exploration drilling.
- Enlarge pit design to get as close as geotechnically possible to Pakeagama Lake.
- Study the viability of using battery operated equipment underground.
- Refine and optimize the production stope designs.
- Complete detailed surface and underground geological mapping to refine stratigraphy, structural setting and characterize mineralization.
- Address the gaps in the geotechnical coverage caused by the expansion of the proposed open pit shell with the interpretation and new geotechnical drilling. This includes the eastern and western extents of the pit walls as well as the pit bottom.
- Develop a water management plan by simply collecting surface water/overburden/shallow top of the bedrock runoff and seepage in sumps on the pit floor may be sub-optimal.
- Update the geologic model with the emphasis on identifying potential major structures.
- Conduct geotechnical studies on the waste rock and stripped surface organics pile designs to determine overall dump height and slope angle maximum bench lifts and safe face slope angles.
- Explore options to source hydro power from local or neighbouring sources.
- Consider the timing and explore option to source grid power from the Wataynikaneyap Power Project.
- Investigate the possibility of blending Spark with the PAK deposit for processing.
- Perform cost-benefit analysis of reducing output of technical grade and subsequent increase of chemical grade output.
- Complete proof of concept development work to produce Lithium compounds (carbonate and hydroxide) for thorough evaluation of chemical grade concentrate alternatives.
- Update the project engineering to a feasibility level design, using the project pre-feasibility study as a base and the information gathered during Phase 1 and Phase 2 programs.

2 INTRODUCTION

The Property is a lithium-tantalum-bearing pegmatite system located approximately 175 km north of Red Lake, in northwestern Ontario. The claims are currently owned 100% by Frontier Lithium Inc (Frontier). Frontier is based in Val Caron, Ontario and is listed on the TSXV with the symbol FL.

No exploration work had been conducted on the Property prior to Frontier's acquisition of the Property in 1999. All previous work in the region was government-funded mapping projects.

To date, Frontier has delineated three mineralized zones on the Property through the compilation of mapping, channel sampling, and diamond drill data.

The objectives of this report are to:

- Prepare a technical report on the PAK Property in accordance with NI 43-101 summarizing land tenures, exploration history, and drilling;
- Update the mineral resource for PAK;
- Generate a mine design and declare Proven and Probable Mineral Reserves including understanding the geotechnical conditions of the operation for PAK.
- All supporting infrastructure including ventilation, power, buildings, tailings management facility, etc. for PAK
- Summarize the environment permitting requirements for PAK.
- Compile capital expenditure and operating expenditure estimates for PAK.
- Build a financial model and perform an economic analysis of PAK.
- Generate a maiden mineral resource on Spark
- Provide recommendations and budget for additional work.

This report has been prepared in accordance with NI 43-101, Form 43-101F1 and Companion Policy 43-101CP.

All work is completed using the metric system, and all values are in Canadian dollars unless otherwise stated.

All data reviewed for the report was provided by Frontier in digital format, with access to paper reports and logs when requested. The work completed by Frontier encompasses surface exploration, including mapping, sampling, trenching, and geological/structural modeling. Frontier has completed two rounds of diamond drilling on the Property.

Historical work conducted in the region has been compiled by Frontier and was available for review.

2.1 SUMMARY OF QUALIFIED PERSONS

The Consultants preparing this technical report are specialists in the fields of geology, exploration, Mineral Resource and Mineral Reserve estimation and classification, mining, geotechnical, environmental, permitting, metallurgical testing, mineral processing, processing design, civil, mechanical, electrical, capital and operating cost estimation, and mineral economics.

None of the Consultants or any associates employed in the preparation of this report has any beneficial interest in Frontier. The Consultants are not insiders, associates, or affiliates of Frontier Lithium. The results of this Technical Report are not dependent upon any prior agreements concerning the conclusions to be reached, nor are there any undisclosed understandings concerning any future business dealings between Frontier and the Consultants. The Consultants are being paid a fee for their work in accordance with normal professional consulting practice.

The following individuals, by virtue of their education, experience, and professional association, are considered Qualified Persons (QP) as defined in the NI 43-101 standard, for this report, and are members in good standing of appropriate professional institutions:

- Todd McCracken, P.Geo., Manager – Mining, WSP Canada
- Johnny Canosa, P.Eng., Sr. Mining Engineer.
- Roy Levesque, P.Eng., Sr. Mining Engineer, JDS Energy and Mining.
- Kurt Boyko, P.Eng., Consulting Specialist - Mechanical, Nordmin Engineering Ltd.
- Steve Wilson, P.Eng., Process Engineer – Wil-Solve Consulting Services

The authors wish to make clear that they are qualified persons only in areas of this report where they are identified by a “Certificate of Qualified Person”. Table 2.1 outlines the Qualified Person(s) responsible for the corresponding section of this report.

Table 2.1 Report Responsibility Matrix

Section	Title	Qualified Person	Company
1	Summary	Todd McCracken, P.Geo.	WSP Canada
2	Introduction	Todd McCracken, P.Geo.	WSP Canada
3	Reliance on Other Experts	Todd McCracken, P.Geo.	WSP Canada
4	Property Description and Location	Todd McCracken, P.Geo.	WSP Canada
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography	Todd McCracken, P.Geo.	WSP Canada
6	History	Todd McCracken, P.Geo.	WSP Canada
7	Geological Settings and Mineralization	Todd McCracken, P.Geo.	WSP Canada
8	Deposit Types	Todd McCracken, P.Geo.	WSP Canada
9	Exploration	Todd McCracken, P.Geo.	WSP Canada
10	Drilling	Todd McCracken, P.Geo.	WSP Canada
11	Sample Preparation, Analyses and Security	Todd McCracken, P.Geo.	WSP Canada
12	Data Verification	Todd McCracken, P.Geo.	WSP Canada
13	Mineral Processing and Metallurgical Testing	Steve Wilson, P.Eng., Ph.D.	Wil-Solve Consulting
14	Mineral Resource Estimate	Todd McCracken, P.Geo.	WSP Canada
15	Mineral Reserve Estimate	Johnny Canosa, P.Eng. Roy Levesque, P.Eng.	JDS Energy and Mining
16	Mining Methods	Johnny Canosa, P.Eng. Roy Levesque, P.Eng.	JDS Energy and Mining
17	Recovery Methods	Kurt Boyko, P.Eng.	Nordmin Engineering
18	Project Infrastructure	Johnny Canosa, P.Eng.	
19	Market Studies and Contracts	Roy Levesque, P.Eng.	JDS Energy and Mining

(table continues on next page)

Section	Title	Qualified Person	Company
20	Environmental Studies, Permitting and Social or Community Impact	Johnny Canosa, P.Eng.	
21	Capital and Operating Costs	Johnny Canosa, P.Eng.	
22	Economic Analysis	Johnny Canosa, P.Eng.	
23	Adjacent Properties	Todd McCracken, P.Geo.	WSP Canada
24	Other Relevant Data and Information	Todd McCracken, P.Geo.	WSP Canada
25	Interpretation and Conclusion	Todd McCracken, P.Geo.	WSP Canada
26	Recommendation	Todd McCracken, P.Geo.	WSP Canada
27	References	Todd McCracken, P.Geo.	WSP Canada

2.2 SITE VISITS

Mr. Todd McCracken, P.Geo., of WSP Canada visited the site October 1 and 2, 2013, and again July 14 and 15, 2015. In addition, Mr. McCracken has visited the core farm located at 2736 Belisle Drive in Val Caron, Ontario several times.

Mr. Roy Levesque, P. Eng. of JDS Energy and Mining and Mr. Johnny Canosa, P.Eng. visited the site on September 21, 2016.

WSP considers the site visit current, per NI 43-101CP, Section 6.2, on the basis that no material work has been completed on the Property since the date of the site visit, and all practices and procedures documented were reviewed.

2.3 CURRENCY

All dollar values are in Canadian dollars (\$CAD) unless otherwise stated. An exchange rate of \$1US = \$1.25CAN was used for the financial analysis.

2.4 EFFECTIVE DATE

The issue date of this report is April 7, 2020. The effective date of the PAK Prefeasibility Study is April 16, 2018. The effective date of the Spark resource statement is January 22, 2020.

3 RELIANCE ON OTHER EXPERTS

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

This report includes technical information, which 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 QP does not consider them to be material.

The QP who prepared this report relied on information provided by experts who are not QPs. The QP believes 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 upon Garth Drever of Frontier Lithium for matters pertaining to mineral claims and mining leases as disclosed in Section 4 and confirmed on the Ontario Ministry of Northern Development and Mines website.
- Johnny Canosa P. Eng. has relied upon Jon Hykawy, PhD who completed an independent analysis on selling prices for technical grade and chemical grade lithium concentrates, as summarized in Section 19.
- Johnny Canosa P. Eng. has relied upon Rick Rienguette, who summarized completed environmental testing used to complete Section 20.

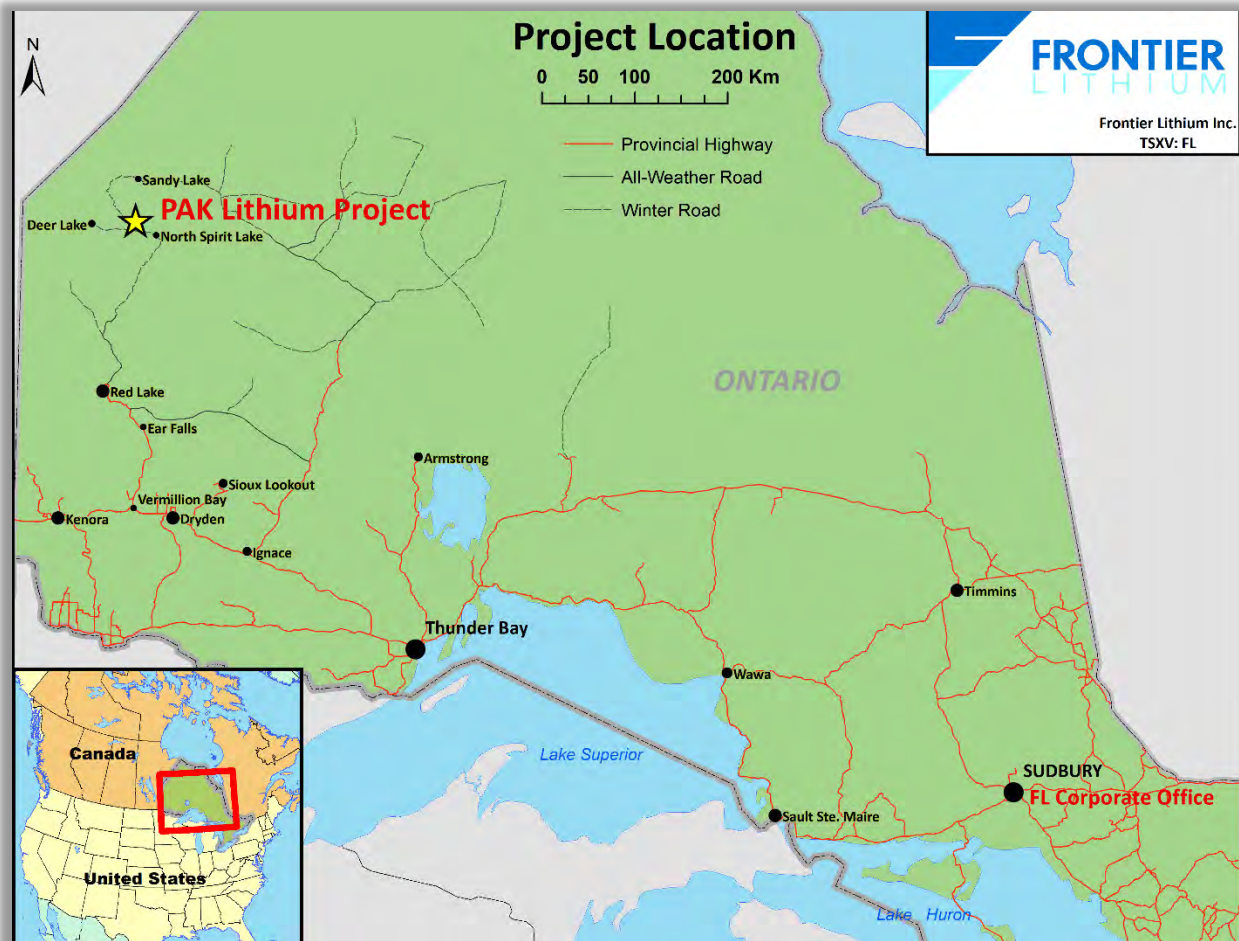
The QPs have assumed, and relied on the fact, that all the information and existing technical documents listed in the References Section 27 of this report are accurate and complete in all material aspects. While the QPs reviewed all the available information presented, we cannot guarantee its accuracy 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 Property is located 175 km north of Red Lake, Ontario in the Red Lake Mining Division and is on Crown Land (Figure 4.1). The centre of the Project is located on National Topographic System map sheet reference is 53C/11 at approximately 52°36'N latitude and 93°23'W longitude near Pakeagama Lake.

Figure 4.1 Location Map



4.2 MINERAL DISPOSITION

The Property is composed of one Mining Lease and 1,379 Mining Claims (all contiguous un-surveyed claim units) for a total of 27,068.5 hectares as illustrated in Table 4.1 and displayed on Figure 4.2. All mining claims are currently in good standing. A complete detailed list of the Land Tenure and location map can be found in in Appendix A.

The Property is presently owned 100% by Frontier Lithium. In late March of 1999, Frontier Lithium entered into an option agreement to earn a 100% interest in Mining Claim KRL 1232441 from John Gregory Brady. Upon complying with the terms of the agreement, Frontier Lithium exercised their option and acquired a 100% interest in the claim. In February 2017, the claim was converted to Mining Lease 109669.

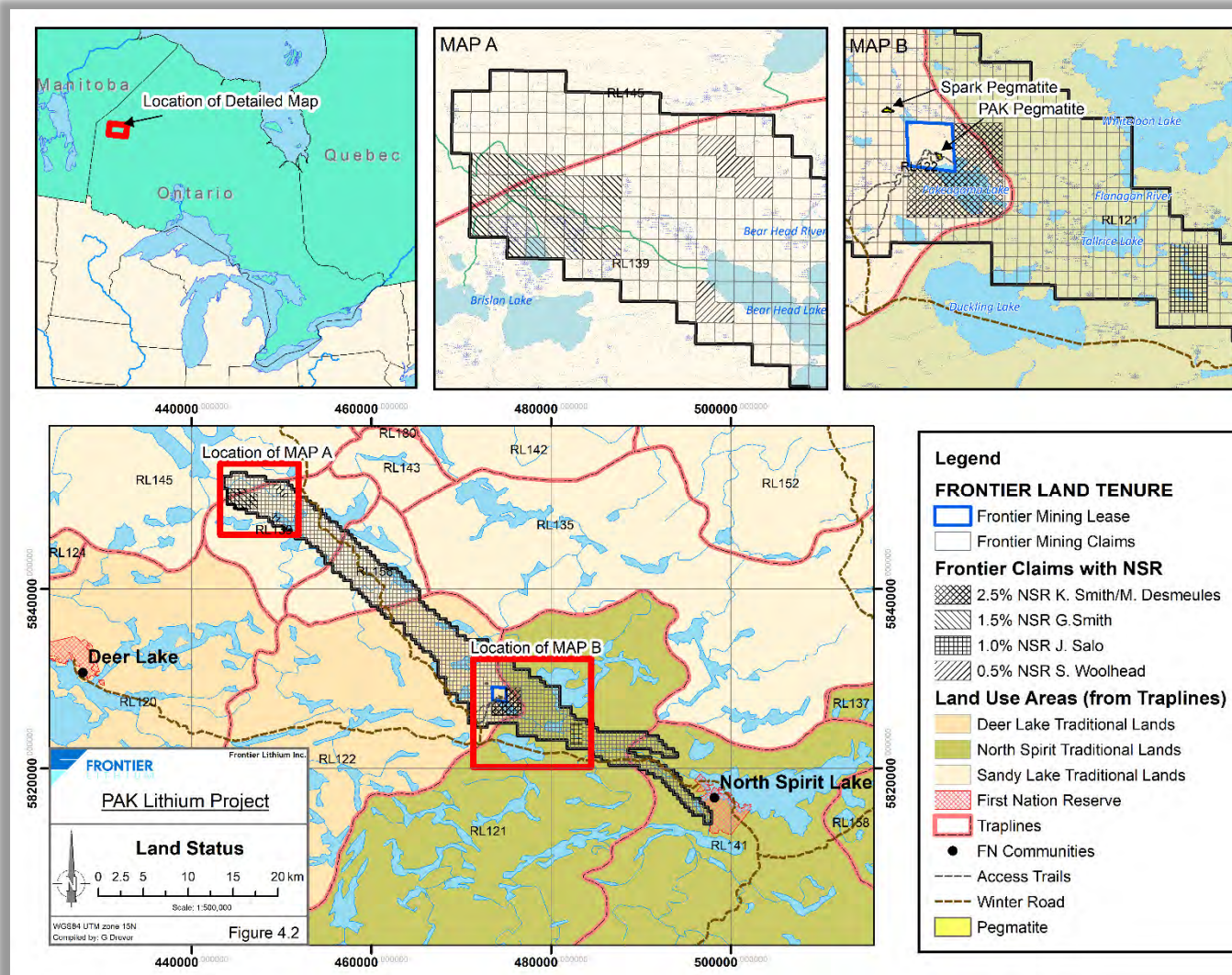
On December 8, 2010, Frontier Lithium entered into a 6-year agreement with two private individuals, Michael Desmeules (50%) and Karin Smith (50%) to acquire 100% of three mining claims (each 16 unit claims) collectively called the Pakeagama South-East. In 2015, Frontier Lithium completed the earn-in by issuing a total of 500,000 common shares and payment of \$110,000.

Fourteen additional claims were staked in 2014 to the northwest and southeast, and in 2015 two more claims were staked to the west to make up the land tenure prior to the Ministry of Energy, Northern Development and Mines (MENDM) transitioned to their on-line Mining Lands Administration System (MLAS). The new system uses cells based on the provincial grid system instead of claim units. Frontier's former legacy claims were subsequently converted into 432 Mining Claim cells and by March 2020, Frontier had acquired an additional 947 claims for a grand total of 1,379 claims totalling 26,826 ha.

Table 4.1 Summary of Land Tenure

Tenure Type	Land Use Region	NSR Royalty	Number	Area (ha)
Mining Lease	Deer Lake (NSR with J. Brady)	2.5%	1	242.2
Mining Claim	Deer Lake		378	7,257.7
Mining Claim	Deer Lake (NSR with Smith/Desmeules)	2.5%	43	597.9
Mining Claim	Deer Lake-North Spirit Lake		26	432.5
Mining Claim	Deer Lake-North Spirit Lake (NSR with Smith/Desmeules)	2.5%	9	132.1
Mining Claim	North Spirit Lake		424	8,260.2
Mining Claim	North Spirit Lake (NSR with Smith/Desmeules)	2.5%	3	37.6
Mining Claim	North Spirit Lake (NSR with J. Salo)	1.0%	1	294.5
Mining Claim	Sandy Lake		445	8,700.0
Mining Claim	Sandy Lake (NSR with G.Smith)	1.0%	35	683.6
Mining Claim	Sandy Lake (NSR with S.Woolhead)	0.5%	2	175.8
Mining Claim	Sandy Lake-Deer Lake		13	254.5
	Total		1,380	27,068.5

Figure 4.2 Location Map showing Land Tenure of PAK Lithium Project



4.3 TENURE RIGHTS

Surface rights to Property currently remain with the Crown. The Ontario Mining Act (2010) grants access to a mineral claim without having the surface rights. The Mining Lease holder has the right to extract minerals subject to additional approvals. The Mining Lease provides both surface rights and the mineral rights.

4.4 ROYALTIES AND RELATED INFORMATION

The terms of the royalty require payment of a 2.5% NSR for the original claim 1232441, now Mining Lease 109669. Frontier Lithium has a provision to reduce the royalty to 1.5% at a cost of \$1,000,000. A similar royalty agreement is in place for 55 claim cells immediately to the east and south of the lease (see Figure 4.2) with a 2.5% NSR and the ability to reduce the royalty to 1.0% for \$1,500,000. Two additional areas acquired in late 2018 have a 1.5% and 0.5% NSR with the ability to buy-out the royalty for \$1,000,000 and \$500,000 respectively. A single claim group (294.53 ha) along the Flanagan River was acquired in March 2020 has a 1.0% NSR which can be purchased for \$1,000,000.

4.5 ENVIRONMENTAL LIABILITIES

No industrial activities such as mining or mineral processing have been conducted on the Property.

Disturbance on the Property has been limited to drill trails, and drill pad set ups.

WSP did not observe or is not aware of any environmental liabilities on the Property.

4.6 PERMITS

All permits required to conduct exploration on the Property are current.

4.7 OTHER RELEVANT FACTORS

The PAK Lithium Project is not currently subject to any formal First Nation agreements. Exploration Agreements are in place with four of the surrounding communities, whereby the development of the Project will incorporate hiring practices for the employment of the residents of North Spirit Lake, Deer Lake, Sandy Lake, and Keewaywin First Nations and the use of services from the communities.

The PAK and Spark pegmatites are currently delineated on the PAK Lithium Property which lies directly within the trapline area designated as RL 122. The trapping area is currently held by a resident of Deer Lake. The area to the southeast is within the trapline designated as RL 121, which is currently held by a resident of North Spirit Lake.

In 2013, Phase II of the Ontario Mining Act modernization was implemented whereby Aboriginal notification and consultation is mandated prior to exploration plans and permits for mineral exploration is granted by the government.

Frontier Lithium submitted for an exploration permit for the Project by which the Ministry of Northern Development and Mines (MNDM) has identified the Aboriginal communities of Deer Lake First Nation and North Spirit Lake First Nation to be notified about Frontier Lithium's planned activities.

During the 2014 drilling program, representatives from the North Spirit Lake band council visited the Property, were updated on the progress to date, and were provided with a tour of the pegmatite area and the operating diamond drill.

On July 14, 2015, representatives from North Spirit Lake visited the Property and were provided a tour of the drill camp and outcrop area including the site where the bulk sample was extracted.

In December 2015, both Deer Lake and North Spirit Lake councils were provided with a draft proposal for an exploration agreement with Frontier Lithium.

On October 21, 2016, Frontier Lithium signed exploration agreements with Deer Lake First Nation and Sandy Lake First Nation. The agreements promote unity and a mutually beneficial and respectful relationship between Frontier Lithium and the Communities. It allows for the exploration of its current and additional (if any) mining claims or properties that the Company may acquire. The Parties are committed to making best efforts to develop an Impact Benefit Agreement (IBA).

On June 6, 2017, Frontier Lithium signed an exploration agreement with North Spirit Lake First Nation. The agreement promotes unity and a mutually beneficial and respectful relationship between Frontier Lithium and the Community. It allows for the exploration of its current and additional (if any) mining claims or properties that the Company may acquire. The Parties commit to make best efforts to develop an Impact Benefit Agreement (IBA).

On July 31, 2019, Frontier Lithium was notified by the Ministry of Energy, Northern Development and Mines (MENDM) had identified the Aboriginal communities of Deer Lake First Nation, North Spirit Lake First Nation, Sandy Lake First Nation and Keewaywin First Nation were to be notified about Frontier Lithium's planned activities.

On August 7, 2019, representatives from North Spirit Lake, Deer Lake and Sandy Lake First Nations visited the Property and were provided with a tour of the PAK deposit area and the exploration camp. During a lunch meeting, a detailed presentation was provided describing Frontier's proposal for Advanced Exploration on the Project.

On December 18, 2019, Frontier Lithium signed an exploration agreement with Keewaywin First Nation. The agreement promotes unity and a mutually beneficial and respectful relationship between Frontier Lithium and the Community. It allows for the exploration of its current and additional (if any) mining claims or properties that the Company may acquire. The Parties commit to make best efforts to develop an Impact Benefit Agreement (IBA).

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

5.1 ACCESS

Access to the Property is available year-round by chartered ski or float equipped aircraft from Red Lake, Ontario (175 km) to the south of Pakeagama Lake.

The Project is located in a relatively isolated area of northwestern Ontario where infrastructure is absent except for a winter road, which services the communities of Deer Lake, Sandy Lake, and North Spirit Lake. The winter road is located adjacent to the west side of the claim group (Figure 5.1), and vehicle access can be gained to the Property from this winter road in February and March.

Bearskin Airlines and Wasaya Air service the nearby communities of Deer Lake, North Spirit Lake, and Sandy Lake with daily flights year-round.

Access to the Property is available year-round if required.

5.2 CLIMATE

Four climate data stations operated by Environment Canada are located at Island Lake in Manitoba, and Red Lake, Pickle Lake and Big Trout Lake in Ontario. The average mean annual temperature is -0.9°C . The average daily temperature in summer is from 8.9°C to 19.2°C , while in winter the average range is from -20.3°C to -11.6°C . Average yearly precipitation for the area is 655 mm (www.climate.weather.gc.ca).

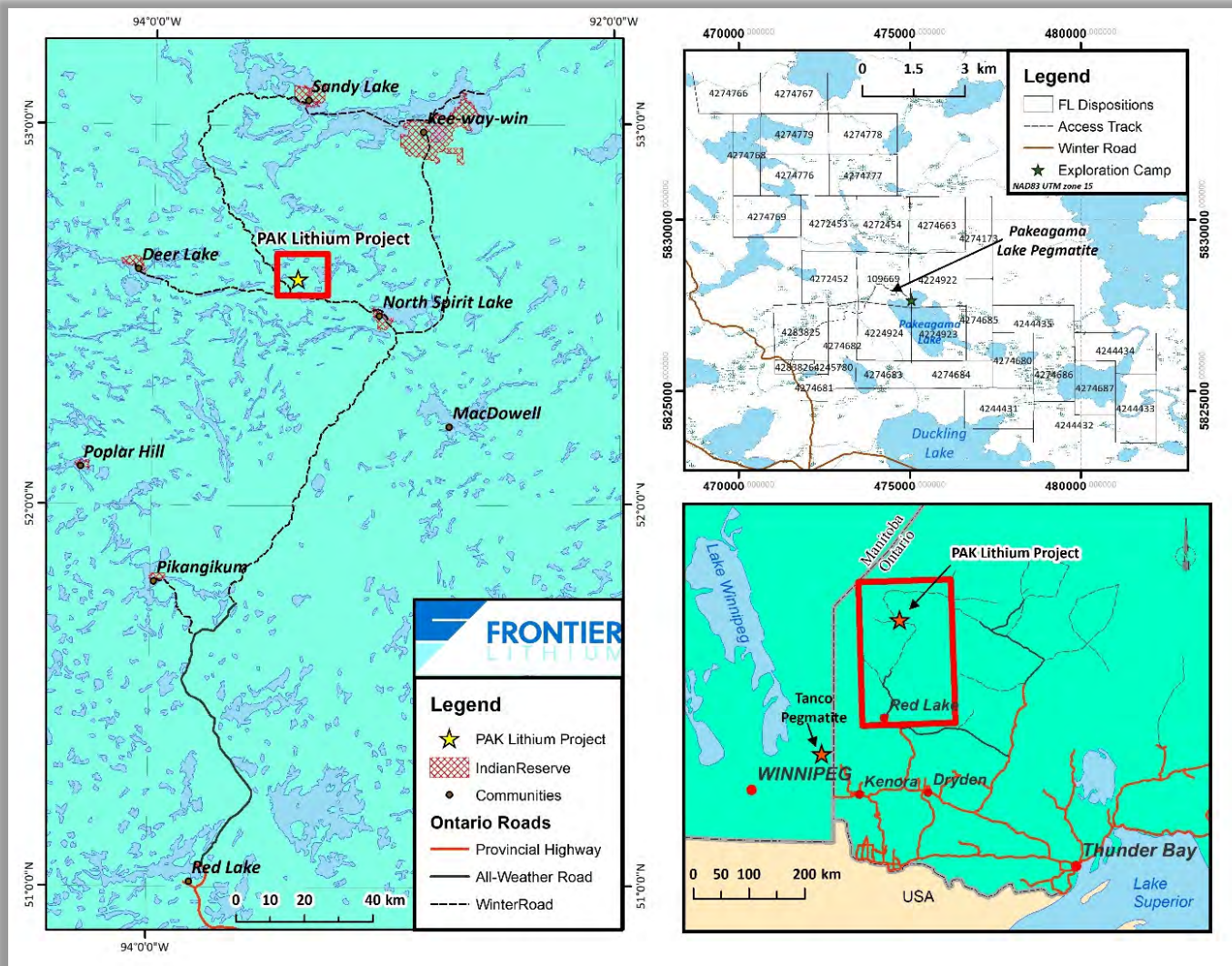
5.3 INFRASTRUCTURE

Water sufficient for mining operations is present within the Property. Surface rights sufficient for a mining operation can be readily obtained, and the necessary area for mining and processing infrastructure exists.

Currently no electric power is available on the Property, and no power line comes within close proximity of the Property.

There is no immediate skilled labour force close to the Property. The location of the Property within northwestern Ontario and proximity to the Red Lake mining camp and Manitoba ensures that skilled mining personnel can be found.

Figure 5.1 Property Access



5.4 SITE TOPOGRAPHY, ELEVATION, AND VEGETATION

The Property is located in an area of variable topographic relief, with a series of ridges with the extensive development of cliff faces parallel the general regional strike of the geology surrounded by low-lying areas covered by swamps, lakes, and rivers. The mean elevation on the Property is approximately 320 masl.

The Property lies at the northern boundary of the Lac Seul Upland eco-region and the southern boundary of the Hayes River Upland eco-region of the Boreal Shield. The region is classified as having a sub humid mid-boreal eco-climate (*Ecological Stratification Working Group, 1998*).

The dominant vegetation is coniferous forest. Higher elevations are covered by stands of jack pine up to 6 m high, while swampy areas are dominated by black spruce. Upland areas are covered with discontinuous deposits of acidic sandy tills, while thin lacustrine clay deposits tend to cap the tills in low-lying areas. The resulting deadfall from a 1995 forest fire inhibits easy foot travel. Another forest fire burned a portion of the Pakeagama Lake project area in 2008, including the area around the pegmatite.

6 HISTORY

A. P. Low of the Geological Survey of Canada (GSC) completed the first geological reconnaissance mapping of the region in 1886. Additional geological surveys were carried out by G. V. Douglas (1925) and M. E. Hurst (1928) of the Ontario Department of Mines.

Most of the exploration activity in the region has been centred on the Favourable and Setting Net Lakes area located 25 to 40 km to the northwest of the Property. While prospecting, K. C. Murray identified gold in the Favourable Lake area in 1927. The gold property was developed as the Berens River Mine and produced 4,451 kg gold, 160,926 kg silver, 2,770 t lead, and 815,147 kg zinc from 508,665 tons of ore between 1939 and 1948 (*Stone, 1998*). Subsequent exploration by Golsil Mines Limited, Zahavy Mines Limited, Getty Mines Limited, and Noramco Mines Ltd. was carried out until the early 1990s.

Geological mapping of portions of the region was carried out by Ayres (1970, 1972a). He noted spodumene in a pegmatite dyke and holmquistite within granitic rocks near Setting Net Lake (25 km WNW of Pakeagama Lake). A grab sample from the pegmatite dyke contained 0.52% Li (*Ayres, 1972b*).

An airborne reconnaissance gamma-ray spectrometer survey was flown over the Pakeagama Lake area in 1977 as part of a regional coverage program by the Ontario Geological Survey (OGS) and the GSC in 1979. The survey was flown at a 120 m terrain clearance with 5 km line spacing and a 2.2 km station interval. No significant radiometric anomalies were detected in the immediate vicinity of Pakeagama Lake.

6.1 ONTARIO GEOLOGICAL SURVEY PROGRAMS

Geological mapping of the region was completed by D. Stone of the OGS in 1990 (*Stone et al., 1993; Stone, 1998*). Tourmaline-rich samples from the vicinity of Pakeagama Lake returned anomalous levels of lithium, cesium, tantalum, and beryllium during this work. Five rare metal mineral occurrences were detected over a 35 km trend along the Bear Head Lake Fault Zone, however, the Pakeagama Lake pegmatite occurrence became the main focus of detailed work.

In 1998 and 1999, Dr. F. Breaks and Dr. A. Tindle of the OGS, studied the Pakeagama pegmatite. Approximately 2,186 analyses had been conducted to establish that the Pakeagama rare metals pegmatite is potentially a world-class pegmatite suggesting the presence of a Tanco type mineralizing system. At the time, the Pakeagama pegmatite was thought to vary in width from 30 to 125 m, with a strike length of at least 260 m (open in both directions) that may extend another 300 m to an aplite dyke showing on the shores of Pakeagama Lake.

“The detailed documentation of a variety of tantalum-rich minerals coupled with the presence of pollucite (main cesium ore mineral) renders the Pakeagama Lake pegmatite and adjoining area one of the best exploration targets for tantalum and cesium in Northwestern Ontario” (*Breaks, 1999*).

6.2 HISTORIC EXPLORATION

There has been little exploration by publicly-traded or private companies prior to Frontier Lithium’s involvement.

Table 6.1 summarizes the work that has been completed on the Property. The information has been gathered from various assessment reports.

Table 6.1 Property Summary

Year	Company / Organization	Activity	Highlights
1886	GCS	First recorded work	First reconnaissance work.
1926	ODM	Reconnaissance survey	Reconnaissance scale mapping.
1929	ODM	Geological mapping	Reconnaissance scale mapping; gold identified in Favourable Lake area.
1937	ODM	Geological mapping	Gold property developed as Berens River Mine.
1970-1972	ODM	Geological mapping	Identified spodumene near Net-Setting Lake.
1977	OGS / GSC	Airborne radiometrics	Regional survey; 5 km line spacing at 2.2 km stations. No significant anomalies identified in the Pakeagama Lake area.
1977 - 1988	OGS	Geological mapping	Systematic mapping of the region.
1990-1993	OGS	Geological mapping	Identified anomalous Li, Cs, Ta, and Be in tourmaline-rich samples at Pakeagama Lake and discovered 5 rare metal occurrences over 35 km along the Bear Head Fault Zone.
1998-1999	OGS	Geological mapping - channel sampling	Completed detailed mapping and geochemistry (grab and channel samples) to establish Pakeagama Lake Pegmatite as world-class with Tanco-type mineralization. Significant mineralized zones were identified (285 ppm Ta ₂ O ₅ , 0.59% Rb ₂ O, 967 ppm Cs ₂ O, and 1.15% Li ₂ O over 11.0 m).
1999	HLM	Geological mapping and sampling	Confirmed work completed by the OGS.
2001	HLM	Ground geophysics	26-km magnetic and VLF survey; the survey was unsuccessful in delineating the pegmatite zone, however, defined the contacts between metasedimentary and granitic rock that contains the pegmatites in overburden covered areas.
2001	EFR	Geological mapping and sampling	Mapped and sampled the area immediately to the northwest of the pegmatite. No anomalies noted.
2001	HLM	Geological sampling (channel sampling)	Identified and confirmed high-grade lithium in the "Core Zone" of 4.5% Li ₂ O over 13.9 m.
2008	HLM	Line cutting - soil sampling	Re-established the grid for mapping the pegmatite and surrounding area. An Enzyme Leach survey was completed showing an apparent continuity of the anomalous zones away from the pegmatite to the southeast and east. This is most apparent with Cs, V, Ta, Li, Ga, and Nb.

(table continues on next page)

Year	Company / Organization	Activity	Highlights
2010	HLM	Acquisition of claims by option agreement	Three claims secured the land holdings immediately to the south and east of the pegmatite covering most of Pakeagama Lake.
2011	HLM	MMI soil sample survey	The regional survey was somewhat successful in delineating elevated cesium, lithium, and rubidium MMI concentrations both to the northwest and southeast directions coincident with the assumed orientation of the Pakeagama Lake pegmatite.
2012	HLM	Channel sampling; staking	Historical and 2 new channels were sampled across portions of the pegmatite verifying historical grades by using certified standards. Increased land tenure to the southeast along the pluton.
2013	HLM	Phase I diamond drilling; staking	Completed the first diamond drilling on the Property totaling 955 m in 6 holes. Intersected 154 m wide pegmatite zone grading 1.22% Li ₂ O, 111 ppm Ta ₂ O ₅ , and 0.41% Rb ₂ O and a high-grade Lithium zone of 18 m grading 4.22% Li ₂ O. Continued staking along the pluton.
2013	HLM	Spodumene study	Completed an electron microprobe study confirming low-inherent iron content of the spodumene at the Pakeagama Lake Pegmatite.
2014	HLM	Phase II diamond drilling; staking	Completed 1,489 m in 9 holes which confirmed continuity of the high-grade UIZ and extended the strike length and depth extent of the mineralized pegmatite zones. Continued staking to the southeast.
2014	HLM	Channel sampling; staking	Completed the twinning of outstanding historical channels and cut two new channels confirming the grades and width of the UIZ at surface. Staked to the northwest.
2015	HLM	Phase III diamond drilling	Completed 1,641 m in 8 holes which confirmed continuity of the grades and extended the strike length and depth extent of the mineralized pegmatite zones.
2015	HLM	Bulk sample of UIZ	In late February and early March, a drill-blast program of 67 holes was completed with an approximately 300-tonne sample extracted and hauled to Red Lake for crushing and transported to SGS in Lakefield, ON for final processing as a direct shipping ore product (DSO) for an industrial test in Europe.
2015	HLM	Initiated baseline sampling, staking	Established water sampling and monitoring stations within the PAK project area to be sampled three times annually (spring freshet, late summer, and winter). Also initiated flora and fauna study including species lists. Staked two additional claims along the access trail to the winter road.
2015	HLM	Phase IV diamond drilling	Completed 608 m in 2 holes which tested the eastern extension of the pegmatite. As predicted, the pegmatite body is continuous and plunging to the east at roughly 45 degrees.
2015	HLM	Channel sampling	Stripped overburden and extended surface exposures of the high-grade UIZ to the WNW and completed 70 m of new channel cuts in 8 separate channels.

(table continues on next page)

Year	Company / Organization	Activity	Highlights
2016	Frontier	Name change	Company changes name from Houston Lake Mining to Frontier Lithium.
2016	Frontier	Exploration agreement	Company signs Exploration Agreement with Deer Lake First Nation and Sandy Lake First Nation.
2016	Frontier	Prefeasibility study	Company initiated a prefeasibility study on the Project.
2017	Frontier	Exploration agreement	Company signs Exploration Agreement with North Spirit Lake First Nation.
2017	Frontier / QFIR	Tree core & Soil Study	Completed a study of available trees in and around the deposit area and also on two lines to the northwest to test an area of prospective geology away from the deposit
2017	Frontier	Geological Mapping	Began a process of systematic mapping within the Frontier claim area away from the deposit. Completed a petrographic study on selected hand samples collected
2018	Frontier / Blue Heron	Baseline Environmental Surveys	Finished with baseline surveys including areas designated in the PFS. This included aquatic studies plus flora and fauna.
2017	Frontier	Metallurgical test	Metallurgical test produces a spodumene concentrate with a grade of 7.13% Li ₂ O.
2017	Frontier	Phase V diamond drilling	Completed 1,288 m in 4 holes to delineate the eastern plunge of the pegmatite.
2017	Frontier	Hydrogeology / geotechnical	Completed 581 m in 5 holes to for hydrogeology and geotechnical support of the PFS.
2018	Frontier	Prefeasibility study	Publish results of prefeasibility study.
2018	Frontier	Geological Mapping	Continued with the geological mapping and discovered the new Spark pegmatite 2.3 km northwest of the PAK deposit.
2018	Frontier	Phase VI Diamond Drilling	Completed a 6-drillhole program focused on delineating the deposit beneath the eastern extension and the near-surface UIZ
2018	Frontier	Channel Sampling	Completed 8 channels on the exposed surface of the Spark Pegmatite
2019	Frontier	Phase VII Diamond Drilling	In February, completed drilling to test the Spark pegmatite with 4 holes from the south and one from the north.
2019	Frontier	Phase VIII Diamond Drilling	In August, completed an additional 3 holes from the north and one from the south on the Spark pegmatite
2019	Frontier	Channel Sampling	Completed 4 additional channels on the exposed surface of the Spark Pegmatite
2019	Frontier	Exploration agreement	Company signs Exploration Agreement with Keewaywin First Nation.

EFR - Emerald Fields Resources
 GSC - Geological Survey of Canada
 HLM - Houston Lake Mining
 ODM - Ontario Department of Mines
 OGS - Ontario Geological Survey

7 GEOLOGICAL SETTING AND MINERALIZATION

7.1 REGIONAL GEOLOGY

The Project area is situated along the boundary between the Berens River and Sachigo Subprovinces (Card and Ciesielski, 1986 and Card, 1990) of the Archean Superior Province of the Canadian Shield (Figure 7.1). These subprovinces comprise a series of relatively isolated volcano-sedimentary (greenstone) belts surrounded by extensive granitic and gneissic suites of rock. The subprovinces are separated by the Bear Head Lake Fault Zone (Figure 7.2).

Figure 7.1 Archean Subprovinces

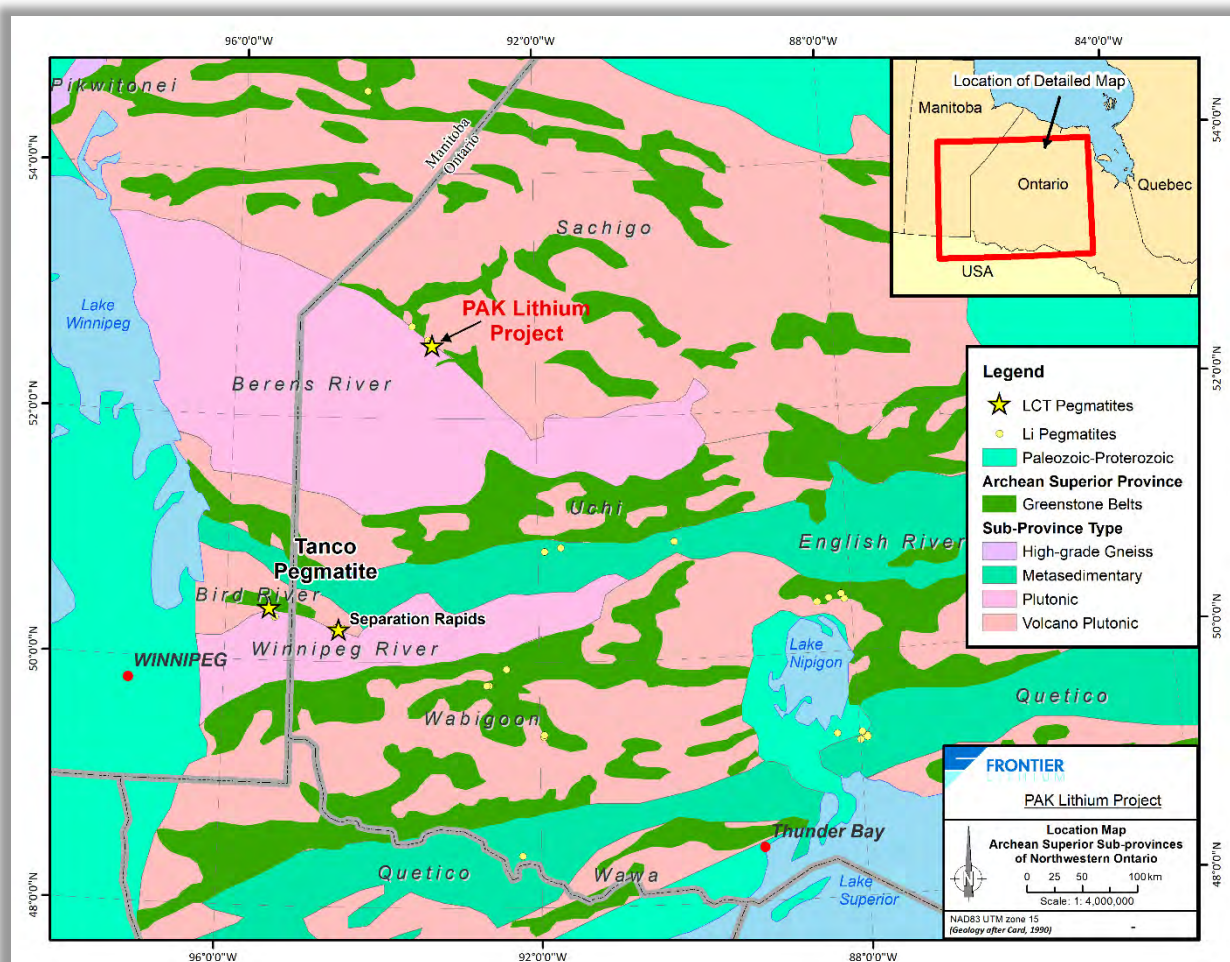
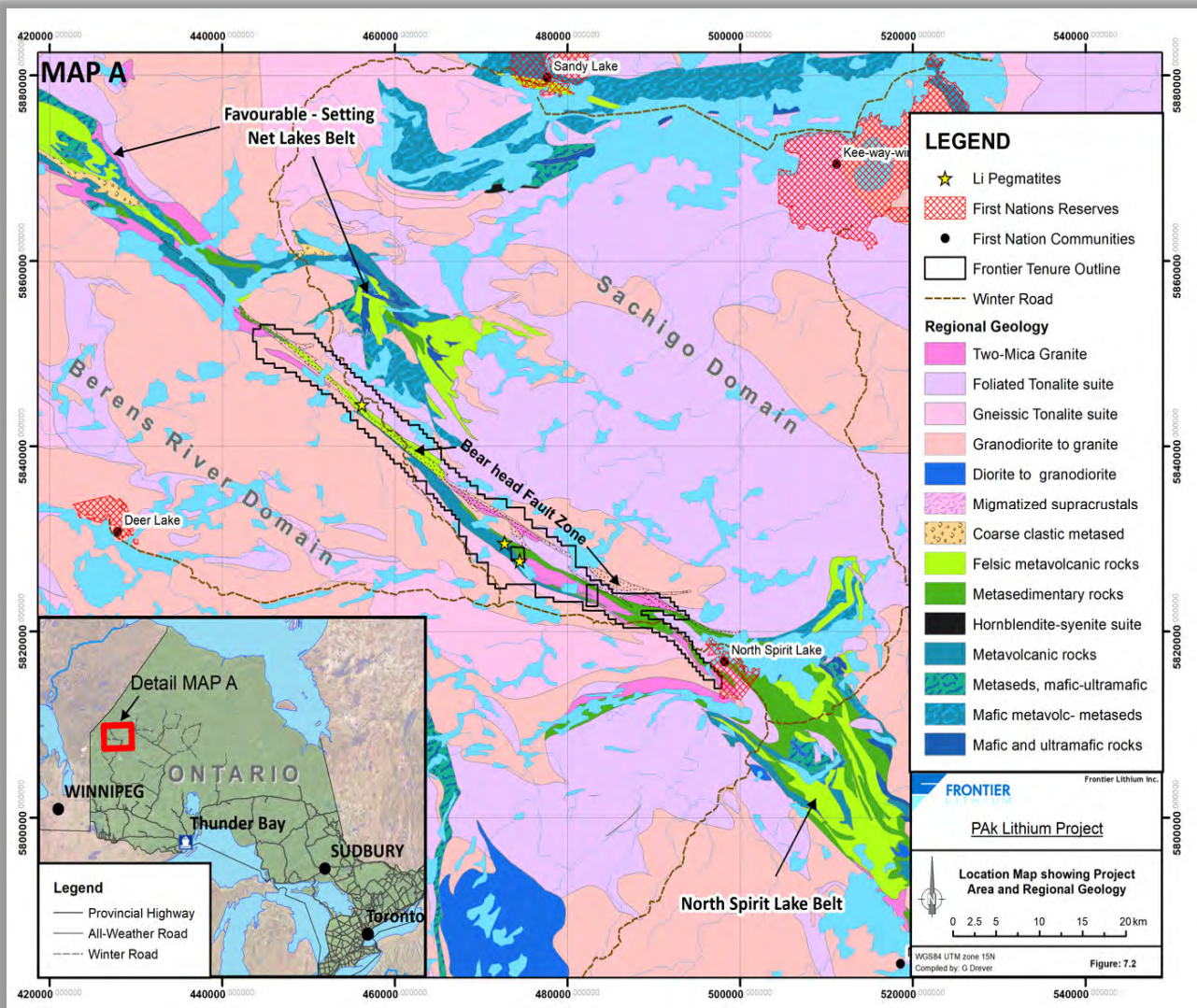


Figure 7.2 Regional Geology



Two of the greenstone belts that are located along the Bear Head Lake Fault Zone are the Favourable-Setting Net Lakes and the North Spirit Lake greenstone belts located to the northwest and southeast of the Property, respectively. The belts are connected through the Pakeagama Lake area by the Bear Head Lake Fault system. The main assemblages of volcanic and sedimentary rocks that are identified in each belt are, in part, correlated between the two belts (*Stone et al, 1993*). The assemblages of the Favourable Lake and North Spirit Lake greenstone belts have been metamorphosed under greenschist facies conditions, however an increase to amphibolite facies occurs in proximity to the Bear Head Lake Fault Zone. Amphibolite facies is the predominant metamorphic grade in the Project area outside of the greenstone belts.

The Bear Head Lake Fault is the dominant structural feature in the region and has been traced for over 140 km from northwest-southeast. The fault is composed of a several hundred metres thick zone of mylonite. The presence of cataclastites, tension gashes infilled by vuggy quartz-epidote-adularia, and potassic alteration indicate that brittle deformation has been superimposed on the mylonites. A dextral transcurrent dislocation of the Bear Head Lake Fault has been interpreted from microstructures (*Germundson, 2008*). The regional gneissosity trends northwest-southeast and generally is steeply dipping inward towards the core of the volcano-sedimentary assemblage in the vicinity of Pakeagama Lake. The Bear Head Lake Fault Zone appears to be the locus for a peraluminous suite of granitic plutons. Five major plutons consisting of two mica granites (fertile granites) are documented over the 140 km strike length of the fault. Fertile granites are interpreted to be the parental rocks that give rise to rare metal pegmatites.

7.2 PROJECT GEOLOGY

The area is underlain by the northwestern extension of the North Spirit Lake greenstone belt. The greenstone rocks are approximately 2 km wide in the vicinity of the pegmatites (Figure 7.3).

The greenstone belt is bounded to the north by biotitic tonalities and granites of the Whiteloon Lake Batholith (Sachigo Subprovince) and to the south by gneissic granodiorites and granites of the Bear Head Lake Batholith (Berens River Subprovince of the Superior Province).

There are three main lithological domains. To the northeast, rocks with metasedimentary origins are composed of pelitic sediments, iron formation, and conglomerate. The southwest region is comprised dominantly of mafic metavolcanic and related metasedimentary rocks. The elongate, 2.5 by 15 km, Pakeagama Lake peraluminous granite and mica pluton trending northwest-southeast was emplaced along the unconformable contact between metasedimentary and metavolcanic-metasedimentary rocks.

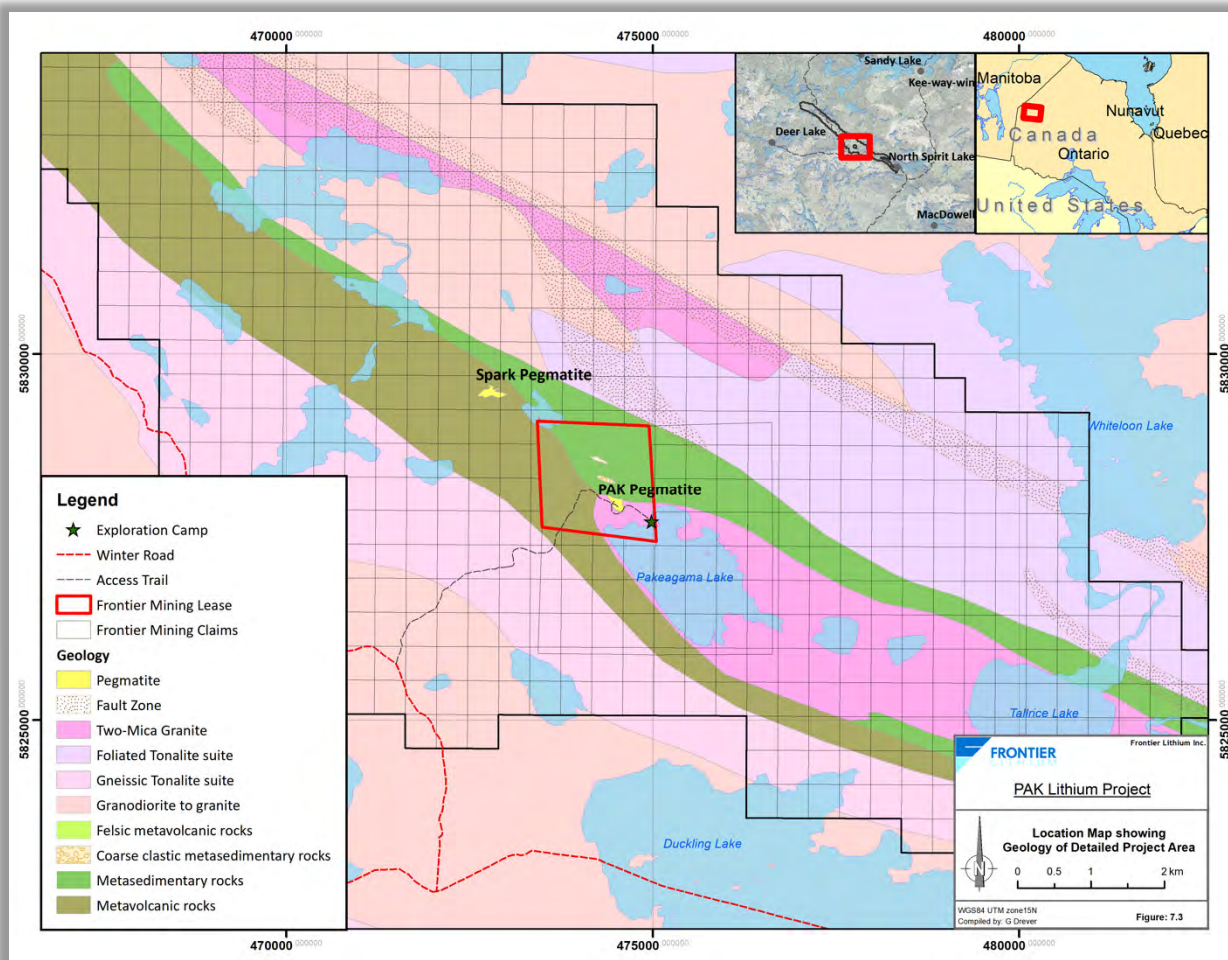
The Pakeagama Lake granitic pegmatite (PAK pegmatite) is a highly evolved, zoned, complex-type, petalite-subtype LCT pegmatite with highly anomalous values of lithium, cesium, tantalum, and rubidium (*Breaks et al., 1999*). The pegmatite body outcrops near the northwestern margins of the Pakeagama Lake pluton (Figure 7.3). A second pegmatite, the Spark Pegmatite occurs 2.3 km to the northwest close to the contact between the metavolcanics – metasedimentary sequences. Preliminary results suggest lithological similarities to the PAK pegmatite.

7.2.1 PAK PEGMATITE

On surface, a metasedimentary sequence with banded iron formation forms an apparent northern boundary to the pegmatite. Muscovite and tourmaline-bearing pegmatites and aplites occur up to 1 km from the main pegmatite mass (*Breaks et al, 1999*). The PAK pegmatite is described as the second largest complex-type petalite subtype pegmatite in Ontario (*Breaks et al, 1999*).

The relatively fresh-appearing pegmatite has irregular, steeply dipping contacts with the weakly foliated garnet-muscovite-biotite granite host rock. A 130° strike is inferred from the coincidence of the exposed 260 m strike length, the weak foliation in the host granite, and the general trend of the Bear Head Lake Fault. The pegmatite is open along strike in both directions.

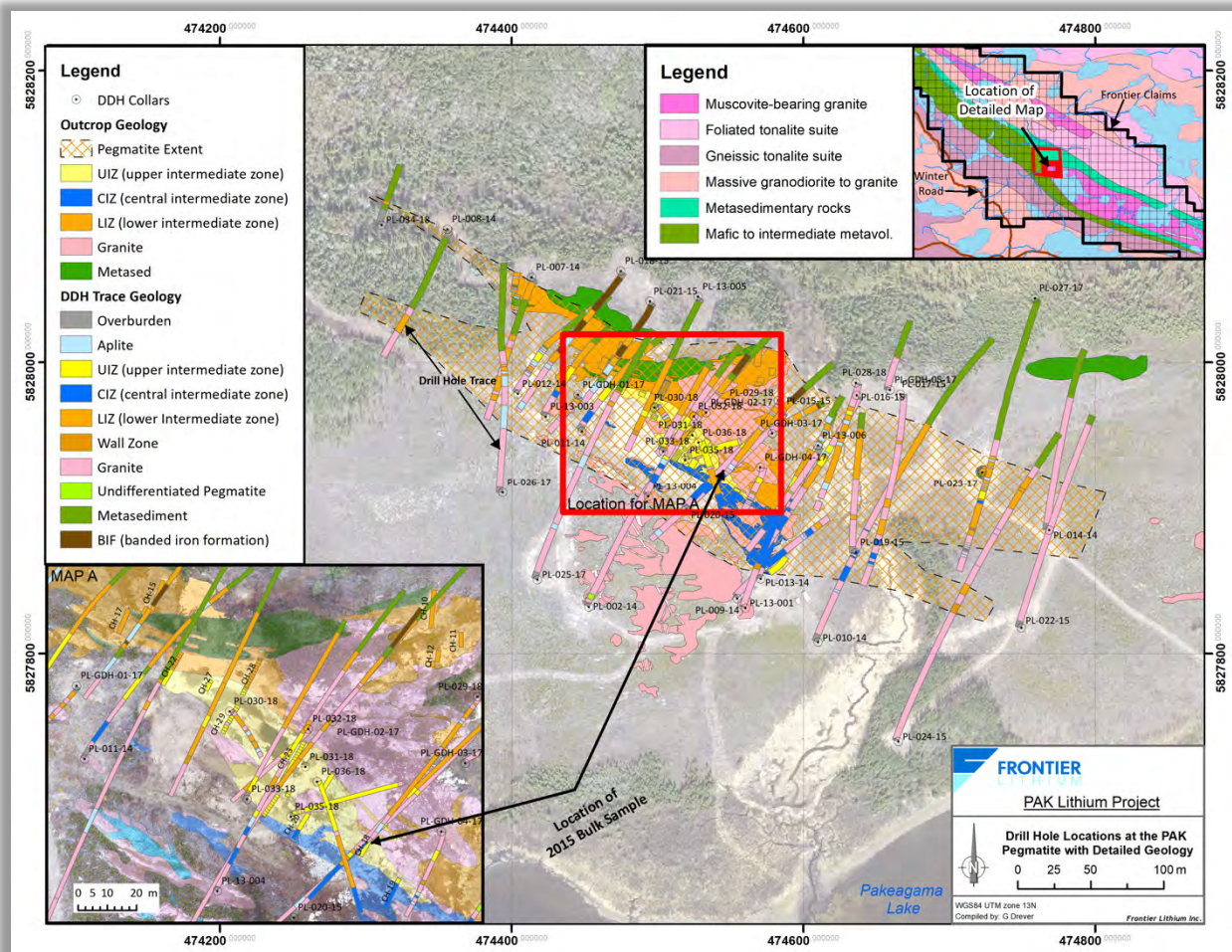
Figure 7.3 Property Geology



The exposed outcrop area was mapped initially by Dr. F. Breaks in 1999, and at least five separate zoned phases were identified (*Breaks et al, 1999*). More recently P. Vanstone, former chief geologist at Tanco, was contracted by Frontier Lithium and consolidated the pegmatite zones using commonly accepted pegmatite nomenclature and Tanco zone mineralogical criteria. (Figure 7.4). The three main pegmatite zones identified in this work are (from northwest to southwest and perpendicular to the strike of the pegmatite) the Central Intermediate Zone (CIZ – tantalum, rubidium, and cesium enriched), Upper Intermediate Zone (UIZ - lithium and rubidium enriched), and the Lower Intermediate Zone (LIZ – lithium and rubidium enriched). A lower and upper wall zone has also been described but not included as a separate mapped unit.

To date, six mineralogical zones have been identified in the exposed pegmatite. These zones include a Border Zone, Upper and Lower Wall Zones, and Upper, Central and Lower Intermediate Zones (UIZ, CIZ and LIZ). The zonation and some of the zone alterations display a number of similarities with the Tanco pegmatite as described by Černý, et al (1998).

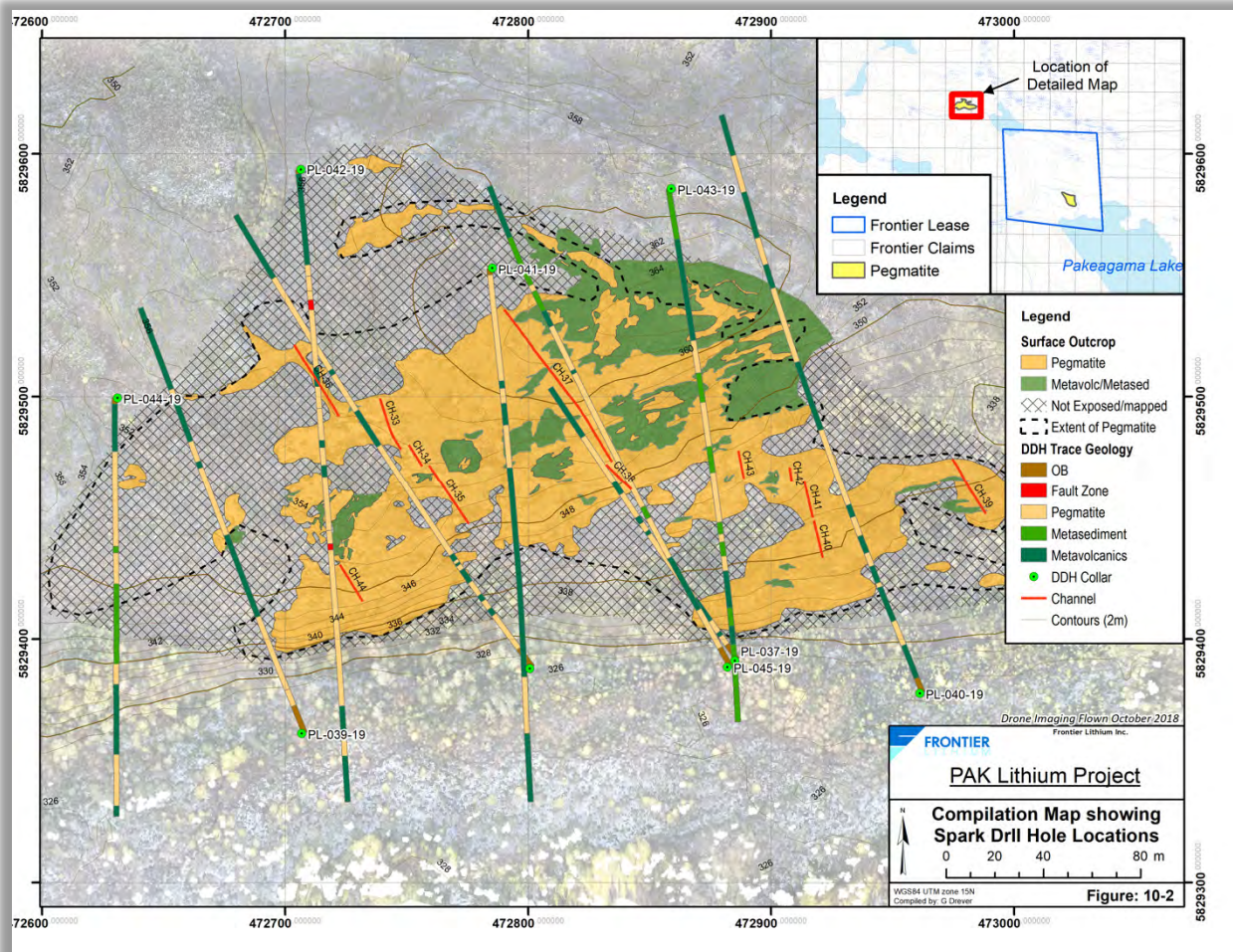
Figure 7.4 Detailed Geology of PAK Pegmatite



7.2.2 SPARK PEGMATITE

The Spark Pegmatite was discovered on September 17, 2018 during routine geological mapping of the area. The Spark pegmatite is less complex than the PAK pegmatite. It appears to be emplaced oblique to the dominant trend and near the contact of the host metavolcanics-metasedimentary sequences. Figure 7.5 is a compilation map showing the surface exposure of the pegmatite. Spodumene-bearing aplite is ubiquitous throughout the pegmatite, with narrow intervals consisting of coarse-grained feldspar-muscovite. A later phase of coarser grained feldspar-quartz-spodumene-muscovite overprints the aplite.

Figure 7.5 Detailed Geology of the Spark Pegmatite



7.3 PAK PEGMATITE MINERALIZATION

7.3.1 UPPER INTERMEDIATE ZONE (UIZ)

The Upper Intermediate Zone (“UIZ”) represents the lithium zone within the pegmatite and is dominated by “SQUI” (Spodumene + Quartz Intergrowth), a term used to describe an isochemical reversion resulting in the replacement of primary petalite by oriented spodumene + quartz (*London, 1984*), with lesser grey K-feldspar and primary white spodumene in quartz (Figure 7.6). Phosphate minerals such as montebrasite (*Breaks et al., 1999*) and apatite, and lithian mica are common accessory minerals.

7.3.2 CENTRAL INTERMEDIATE ZONE (CIZ)

The Central Intermediate Zone (CIZ) is located in structurally higher portions of the pegmatite, and represents the tantalum and rubidium zone of the pegmatite. The CIZ is in contact with both the Upper Intermediate Zone (UIZ) and Upper Wall Zone, and persists to the southeast edge of the outcrop where it is believed the pegmatite continues under the till cover. To the southeast, the CIZ is intersected by channels CH-1 and CH-7 where it consists of similarly-sized fragments of randomly oriented coarse K-feldspar + mica + quartz. Micas appear to alter primary K-feldspar. Blue apatite prisms up to 1 cm wide and several cm’s long accompany the mica-rich zones. In the adjoining area to the northeast of CH-7, the K-feldspars are more or less completely replaced with lithian mica + quartz. In this area, veinlets and patches of lepidolite are common. Channel 1 (CH-1) contains the highest tantalum grades found to date in the exposed pegmatite, which persist in the subsurface in drillholes PL13-001 and -006, in addition to high rubidium and elevated cesium grades. To the northwest, channels CH-8 and CH19 intersect the central portion of the exposed CIZ where it consists of predominantly grey K-feldspar with minor lithian mica + quartz alteration. Drillholes PL13-004 and -003 confirm the extension of the CIZ into the subsurface in this area, where it features notable cm-scale blebs of the rare cesium mineral pollucite, and high tantalum and rubidium grades. Figure 7.7 shows an outcrop and photomicrograph of the CIZ.

7.3.3 LOWER INTERMEDIATE ZONE (LIZ)

The Lower Intermediate Zone (LIZ) comprises the bulk of the exposed pegmatite and is considered an intermediate stage zone with significant lithium, tantalum and rubidium. The zone comprises predominantly K-feldspar, Na-feldspar, SQUI and lithian muscovite (Figure 7.8). Pollucite also occurs in an intersection of LIZ in drillhole PL13-005. The zone has undergone both ductile and brittle deformation at the apparently structurally lowest portions of the pegmatite. Ductile deformation is manifested as a banded appearance on surface, where seams of oriented mica provide a planar fabric.

Figure 7.6 Upper Intermediate Zone

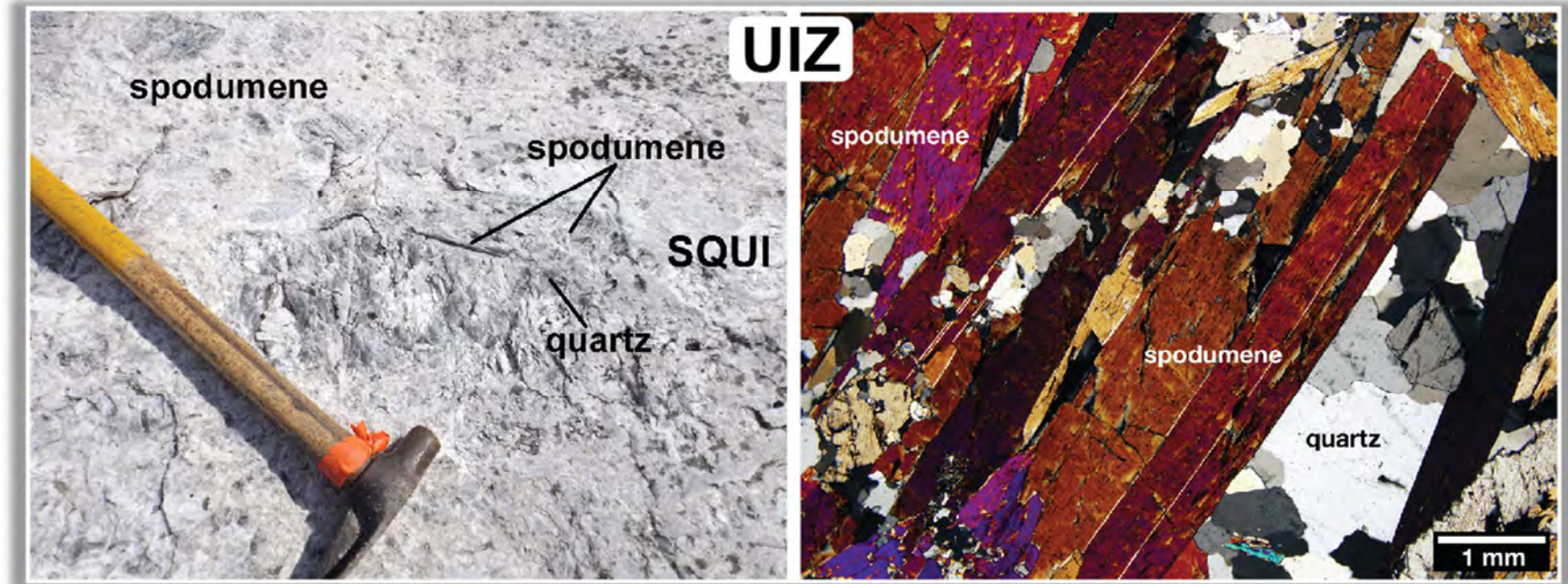


Figure 7.7 Central Intermediate Zone

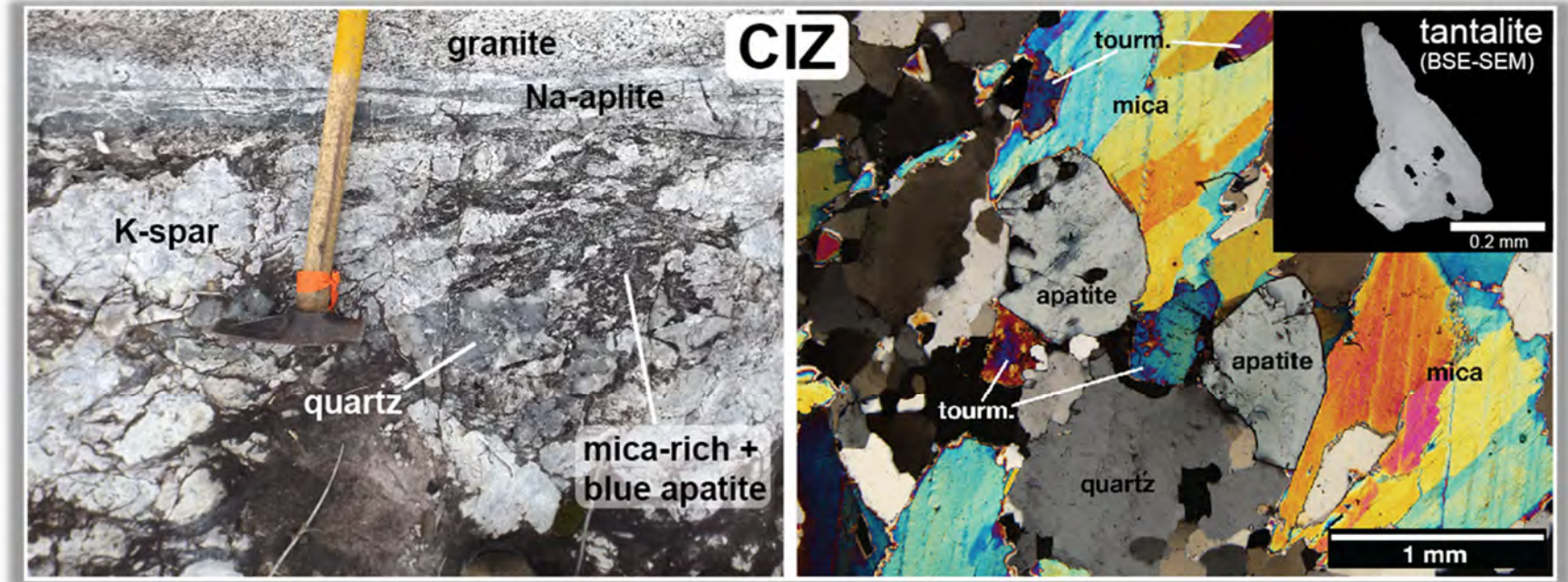
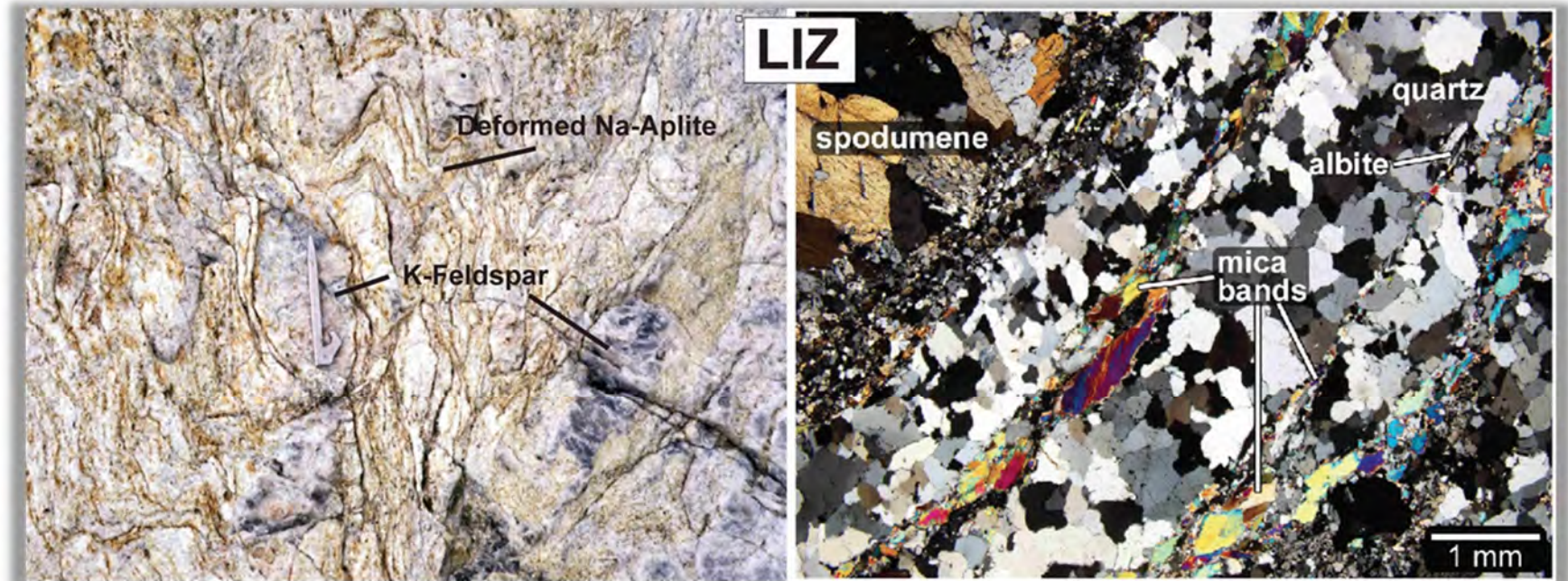


Figure 7.8 Lower Intermediate Zone



7.3.4 WALL ZONES

The Wall Zones (upper and lower) of complex LCT type pegmatites are generally characterized by the occurrence of brick-red K-feldspar (perthite) and simple mineralogy (Černý, 2005; Černý and Vanstone 1996). The zone mineralogy is simple, but the brick-red colouration of the K-feldspar is more common in the portion of the pegmatite in close proximity to the metasediments. The same colouration does not generally occur where the pegmatite is in contact with the granite. In this latter case, the sections of Wall Zone display a light to medium grey K-feldspar. It is assumed lower inherent iron levels of the Pakeagama Lake granite, unlike the metasediments, were not sufficient to generate the K-feldspar colour change in the adjoining pegmatite.

The Upper Wall Zone found in the southwest portion of the pegmatite exposure, is in contact with the lithium rich UIZ and is composed of quartz with lesser pale-red coloured K-feldspar, minor phosphates and accessory beryl and lithian mica. The exposure of this zone is limited.

The Lower Wall Zone is mineralogically similar to the Upper Wall Zone. A common feature of the footwall Wall Zone in the more complex LCT-type pegmatites is the presence of bands of sodic aplite (“footwall aplite”). These sodic bands are generally not common in the Upper Wall Zone. The Pakeagama Lake pegmatite is somewhat more complex as bands of what appears to be pre-existing banded sodic aplites are found throughout the pegmatite. The contact with the LIZ is gradational and is defined by the general absence of SQUI within the wall zones and the change in colour of the K-feldspars from pale-red to the light grey commonly found throughout the pegmatite. Like the LIZ, this zone has undergone deformation.

7.4 SPARK PEGMATITE MINERALIZATION

Currently mineralogical studies are underway at Queen’s University in Kingston, Ontario regarding the Spark pegmatite and are not available at the time of writing this report.

Two predominant lithologies occur within the Spark pegmatite. These are an early aplite that occurs ubiquitously throughout the pegmatite with what appears to be a later phase of coarser-grained feldspar-quartz-spodumene-muscovite overprinting the aplite. The aplite ranges from grey to greenish-grey to purplish-grey and is dominated by fine albite and quartz. Intervals containing abundant fine- to coarse-grained muscovite are common, and pink garnets a few millimetres in size are common predominantly in the more quartz-rich aplites. Coarse to megacrystic K-feldspar is scattered within the aplite, and spodumene abundance ranges from common to absent. Aplite exposed at surface and intersected in drill core in the eastern portion of the Spark pegmatite are conspicuously purple owing to lithian mica. Common accessory minerals in the aplites are black prismatic tourmaline, fluorapatite, and rare coarse-grained lollingite.

The later phase that appears to overprint the aplite at Spark has similar lithology and texture to the Lower Intermediate Zone (LIZ) at PAK, and has been geologically classified as such. The LIZ at Spark consists of coarse to megacrystic grey to tan K-feldspar up to 20 cm in size (typically 2-5 cm), common to abundant fine to coarse-grained white to light grey spodumene with varying textures, muscovite, and quartz. K-feldspar and quartz show graphic texture in some intersections. Intervals of aplite up to a couple meters thick also occur in the LIZ at Spark. Accessory minerals include beryl, black tourmaline, fluoro-apatite and locally arsenopyrite and rare lollingite. Contacts between host metavolcanic rocks and both the aplite and LIZ commonly display a deformed biotite-tourmaline-holmquistite-arsenopyrite contact zone. Greyish white to light grey spodumene occurs throughout the pegmatite varying from fine grained laths (1-3 mm) to coarse grained “Jackstraw” texture with crystal laths up to 3 cm in length. Locally megacrystic grey feldspar crystals up to 20 cm occur but typically are 2 to 5 cm in size. This later phase has been geologically logged as LIZ (Lower Intermediate Zone) because of similarity in texture and composition to the LIZ at the PAK deposit.

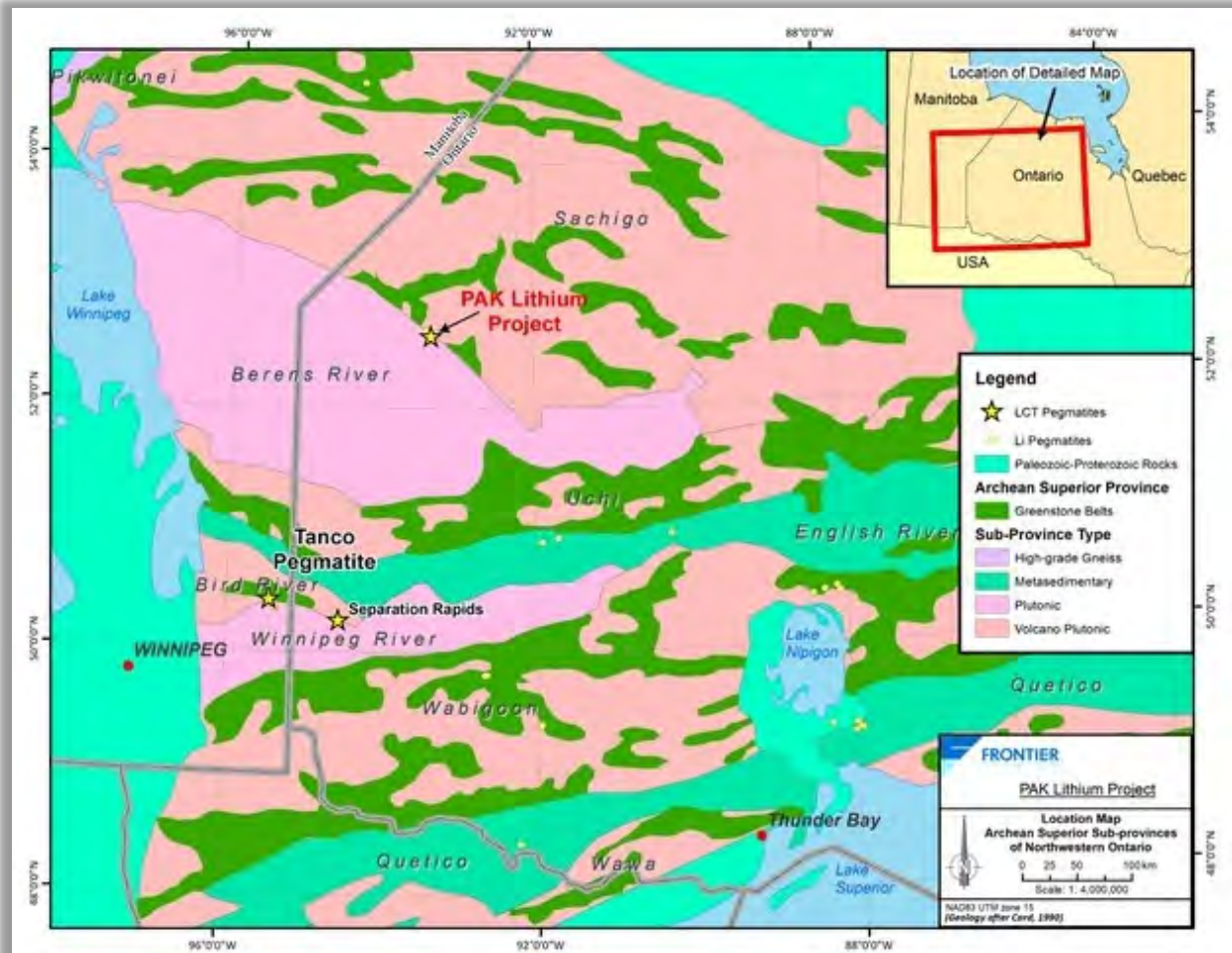
There is a narrow interval (around 3 m thick) present at surface and in the subsurface in the western portion of the Spark pegmatite consisting of dark-coloured muscovite, dark grey quartz, megacrystic grey K-feldspar, and common blue apatite. The mineralogy and texture of this interval is similar to the Central Intermediate Zone (CIZ) at PAK.

Both aplite and LIZ at Spark are weakly to moderately deformed with a preferred foliation steeply dipping to sub-vertical and trending 070 to 100°. Outcrops of aplite display tight folds with vertical axial planes.

8 DEPOSIT TYPES

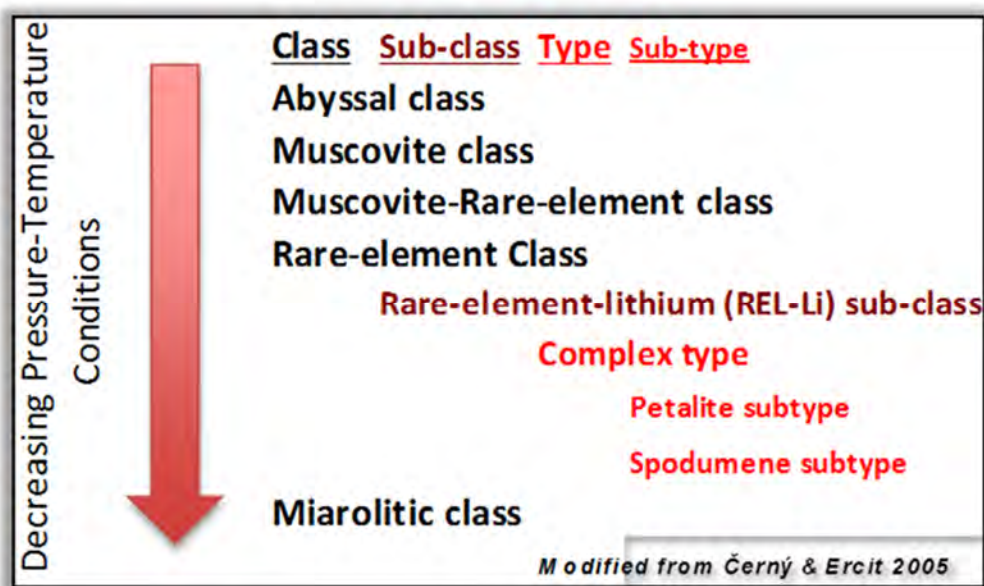
Frontier Lithium's target or deposit model is the highly-evolved, granitic, rare-element lithium-cesium-tantalum bearing (LCT) complex type, petalite subtype pegmatite. The Tanco pegmatite situated in the Bird River belt in southeastern Manitoba, is the best-known and a world-class example of this type of deposit model. Figure 8.1 shows the location of the Tanco pegmatite relative to the geological subprovinces of the western Superior Craton and Pakeagama Lake.

Figure 8.1 Tanco Pegmatite and PAK Pegmatite Location



Granitic pegmatites are relatively common and widespread, and have been divided into five classes based on the pressure-temperature conditions that characterize their host rock suites (Černý and Ercit, 2005). Criteria, including mineral assemblages, geochemical signature and conditions of consolidation or combinations thereof, are used to further divide the classes into sub-classes, types, and subtypes (Figure 8.2).

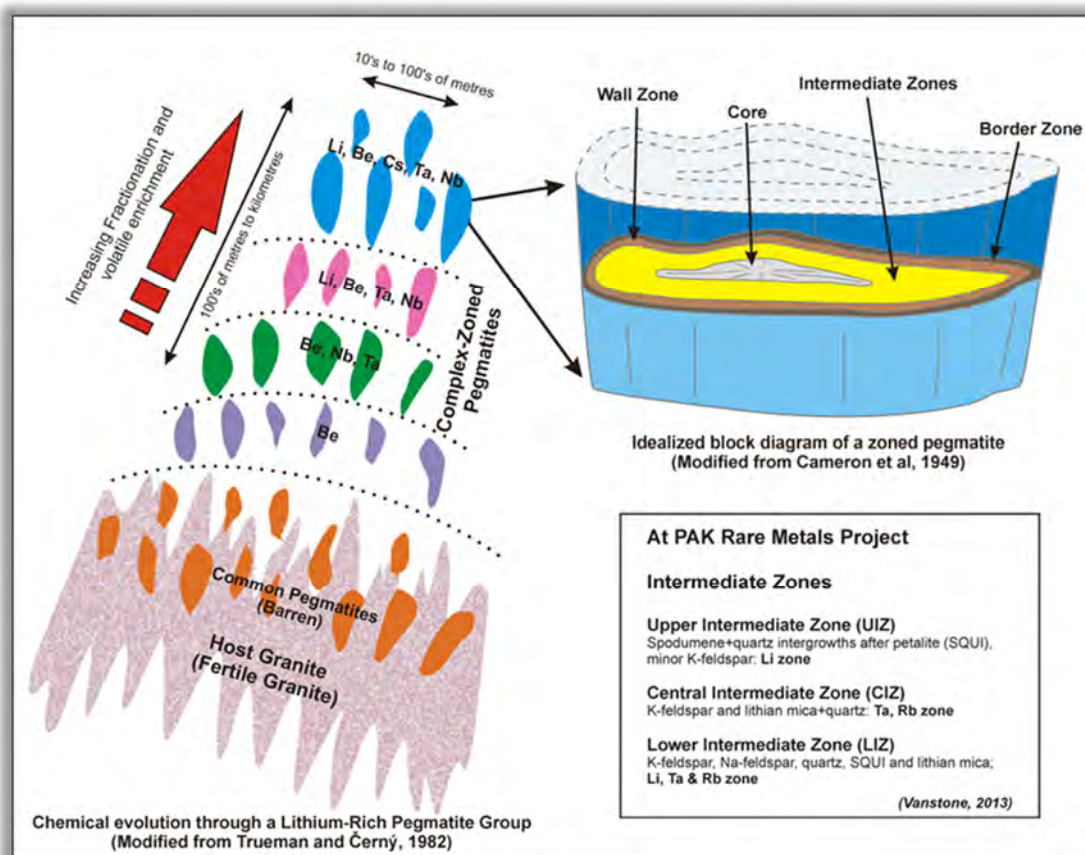
Figure 8.2 Division of Rare Metal Pegmatites



Of the five classes, the rare-element class is the group with the most attractive economic potential and can represent economic sources of tantalum, ceramic grade spodumene, rubidium, and the main cesium ore mineral, pollucite. The lithium rich, rare-element pegmatites are not common and comprise <0.1% of the total known pegmatites (Kesler *et al*, 2012).

The rare-element class of granitic pegmatites is generated by the differentiation of fertile, S-type granitic plutons. This differentiation process of the parental granite is accompanied by the progressive accumulation of lithophile rare-elements as well as elements such as thallium, tantalum, hafnium, gallium, germanium, boron, fluorine, and phosphorus (Černý and Ercit, 2005). The pegmatite field results when the lithophile rare-element enriched residual melt is expelled from the fertile granite and assuming suitable channels exist, migrates outward and upward away from the granite. A field can be comprised of many pegmatites over a distance of a few kilometres from the source granite. The field itself shows an increasing fractionation moving away from the source granite. Figure 8.3 illustrates this process.

Figure 8.3 Deposit Model



The internal structure of pegmatites varies from simple or un-zoned to complexly zoned. Zonation, or the lack thereof, provides the starting point for the pegmatite internal anatomy which is largely what distinguishes pegmatites from other ordinary plutonic igneous rocks and is manifested by variations in the spatial distribution of grain size, mineral assemblage, crystal habit, and / or rock fabric.

Pegmatites crystallizing from very highly-fractionated melts have the most evolved internal structure. These highly-fractionated pegmatitic melts are enriched in fluxes such as H, B, P and F, in addition to water, lithium, rubidium, cesium, tantalum, and beryllium which make the melts less viscous than a granitic melt and thus able to migrate farther from the source pluton (London, 2008).

The complex-type, petalite and spodumene subtype pegmatites are the products of the most highly-fractionated melts and as such, are the most complexly zoned with up to eleven different zones characterized by variable textures and mineral modes (Černý, 1991; Černý, 2005). As an example, the Tanco pegmatite has nine zones and its most notable geochemical anomalies being its high tantalum content along with high cesium and phosphorus contents, the latter two being the hallmark of a pelitic metasedimentary source (London, 2008).

The economic concentrations of the lithophile rare-elements will occur in pegmatites crystalizing from the most highly evolved melts. Some of the lithophile rare-elements may occur in separate zones, which may allow for selective exploitation. Economic tantalum mineralization can be complex and the host mineralogy for rubidium can be different in different zones, but pollucite is the main cesium mineral, and according to Kesler et al (2012) spodumene is the most economically important lithium mineral.

Figure 8.3 shows the internal zonation of a pegmatite from the outer border zone to the central core zone. The intermediate zones at the Pakeagama pegmatite appears to be similar to Tanco with respect to mineralogy and concentrations of lithium, tantalum, cesium and rubidium (*Vanstone, 2013*).

9 EXPLORATION

9.1 PAK EXPLORATION

9.1.1 2014 CHANNEL PROGRAM

Two channels (Channel 20 and 21) totaling 18.7 m were completed in July 2014, and twinning Channels 10 to 13 were completed in 2001 without a Quality Assurance/Quality Control program (Figure 9.1). A total of 45 samples were collected from 44.3 m of channel cuts.

Sampling was completed by HLM personnel along with personnel from Haveman Brothers of Kakabeka Falls, Ontario.

The channels were oriented perpendicular to the strike of the pegmatite's internal mineralogical zones and were cut continuously across the zones. The length of a channel was determined by the width of the pegmatite zone being sampled. The original cuts completed in 2001 consisted of a series of offset channels to achieve a full section across a zone.

The channels were wet-cut approximately 3.5-4 cm wide and 9-10 cm deep with a motorized circular diamond saw. Sample lengths were typically one metre or less, depending on zone mineralogy and boundaries. After cutting, the channels were washed to mitigate cross-contamination by the cuttings. The samples were then removed using a hammer and chisel. The samples were laid out in order next to the channel and were geologically described, washed, assigned a sample number, and then bagged. The sample number was also etched on a metal tag that was secured to the outcrop at the beginning of each sample cut. The start of each channel was assigned a GPS coordinate and the cut channel assigned a bearing.

Each sample bag was sealed using a plastic zip tie. The poly bags were then placed into rice bags, which were then labeled and closed off with zip ties. HLM personnel transported the bags of samples to Val Caron where sample blanks and standards were inserted into the sample stream. All samples were then shipped to ACME laboratories in Val-d'Or, Québec.

Table 9.1 summarizes the location of the 2014 channels, and Table 9.2 summarizes the results for the 2014 channel program.

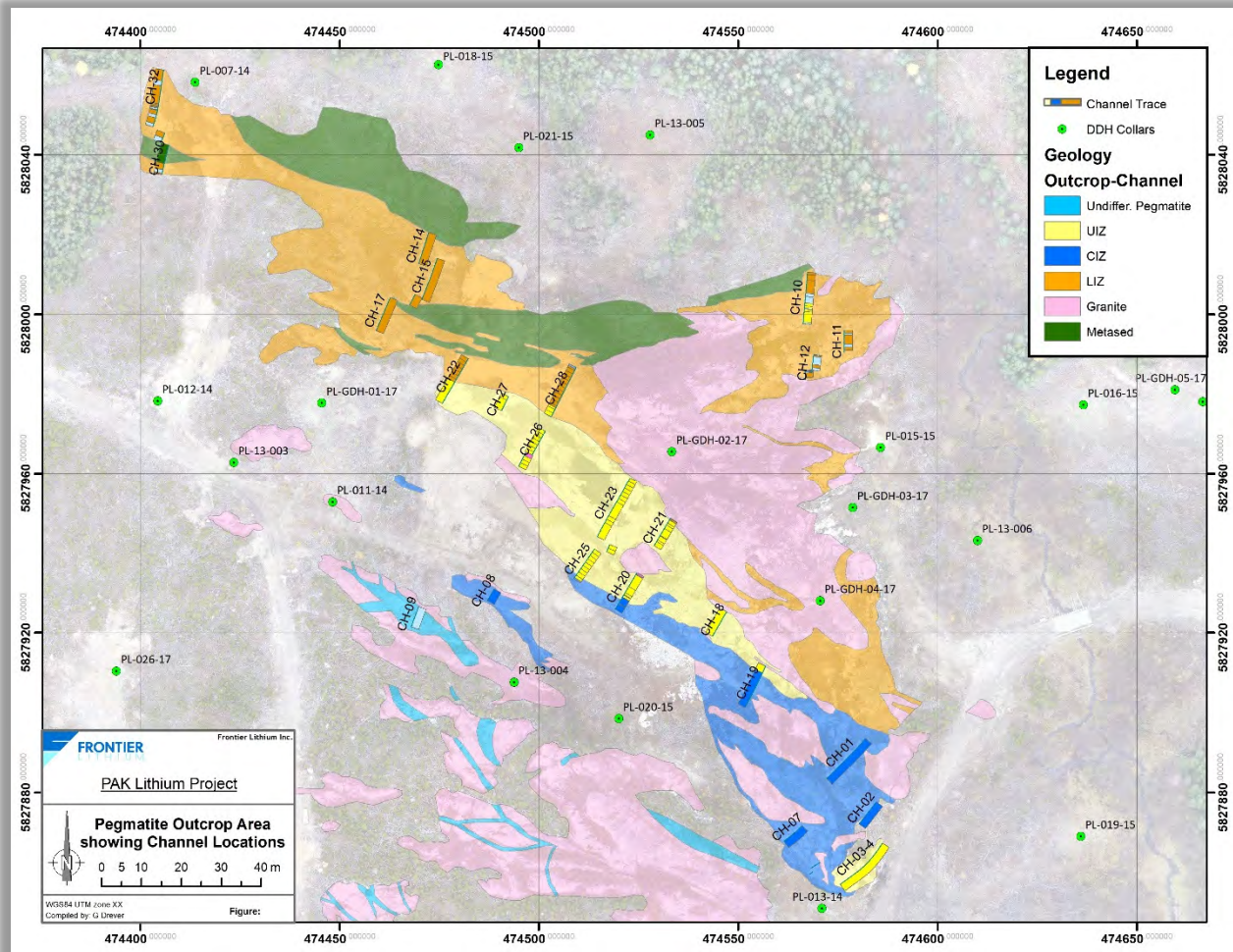
Table 9.1 2014 Channel Location

Channel No.	NAD83 UTM Zone 15N			Azimuth	Length (m)	No. of Samples
	Easting	Northing	Elevation (mASL)			
CH-10	474566	5828012	323	185	13	13
CH-11	474575	5827997	323	180	5.5	5
CH-12	474567	5827991	324	187	4.6	4
CH-13	474565	5827987	324	180	2.5	2
CH-20	474522	5827936	327	215	10.7	12
CH-21	474532	5827948	327	215	8	8

Table 9.2 2014 Channel Results Summary

Channel ID	From (m)	To (m)	Length (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Zone Sampled
Channel 10	0	13	13	1.34	0.018	101	61	425	0.29	LIZ/UIZ/Aplite
including	7	13	6	2.64	0.017	50	34	79	0.33	UIZ/Aplite
including	2	8	6	0.48	0.018	181	103	590	0.27	LIZ/Aplite
Channel 11	0	5	5	2.25	0.028	91	66	133	0.24	LIZ/Aplite
Channel 12	0	4	4	0.49	0.037	158	115	172	0.27	Aplite/LIZ
Channel 13	0	2	2	2.49	0.027	143	111	925	0.21	LIZ/Aplite/UIZ
Channel 20	0	10.7	10.7	3.51	0.054	54	20	97	0.24	UIZ/CIZ/granite
including	1	7.1	6.1	4.33	0.033	38	12	32	0.06	UIZ
including	7.1	10.7	3.6	2.51	0.085	61	20	37	0.56	CIZ
Channel 21	0	8	8	4.46	0.024	26	11	23	0.05	UIZ/granite
including	0.5	8	7.5	4.67	0.018	21	6	17	0.02	UIZ

Figure 9.1 PAK Channel Sample Locations



9.1.2 2015 CHANNEL PROGRAM

Eight channels (Channel 22 to 29) totaling 69.8 m were completed in the summer of 2015. (Figure 9.1). A total of 92 samples were collected.

Sampling was completed by Frontier Lithium personnel along with personnel from Chenier Drilling, Val Caron, Ontario.

The channels were oriented perpendicular to the strike of the pegmatite's internal mineralogical zones and were cut continuously across the zones. The length of a channel was determined by the width of the pegmatite zone being sampled.

The channels were wet-cut approximately 3.5 to 4 cm wide and 9 to 10 cm deep with a motorized circular diamond saw. Sample lengths were typically one metre or less, depending on zone mineralogy and boundaries. After cutting, the channels were washed to mitigate cross-contamination by the cuttings. The samples were then removed using a hammer and chisel. The samples were laid out in order next to the channel and were geologically described, washed, assigned a sample number, and then bagged. The sample number was also etched on a metal tag that was secured to the outcrop at the beginning of each sample cut. The start of each channel was assigned a GPS coordinate and the cut channel assigned a bearing.

Each sample bag was sealed using a plastic zip tie. The poly bags were then placed into rice bags, which were then labeled and closed off with zip ties. Frontier Lithium personnel transported the bags of samples to Val Caron where sample blanks and standards were inserted into the sample stream. All samples were then shipped to Actlabs or AGAT laboratories in Sudbury, Ontario.

Table 9.3 summarizes the location of the 2015 channels, and Table 9.4 summarizes the results for the 2015 channel program.

Table 9.3 2015 Channel Location

Channel No.	Easting	Northing	Elevation (masl)	Azimuth	Length (m)	No. of Samples
CH-22	474476	5827978	324	30	13	13
CH-23	474523	5827959	324	207	17	17
CH-24	474518	5827942	324	203	2	2
CH-25	474514	5827941	322	215	9	10
CH-26	474498	5827965	324	29	7	7
CH-27	474491	5827976	323	26	4	4
CH-28	474503	5827974	323	27	13.8	16
CH-29	474497	5827966	323	206	4	4

Table 9.4 2015 Channel Results

Channel ID	From (m)	To (m)	Length (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Zone Sampled
Channel 22	0	13	13	3.21	0.062	111	43	51	0.19	UIZ/LIZ
including	0	6.2	6.2	4.21	0.023	51	28	39	0.07	UIZ
including	6.2	13	6.8	2.29	0.098	166	57	62	0.3	LIZ
Channel 23	0	17	17	4.71	0.017	49	13	33	0.05	UIZ
Channel 24	0	2	2	4.2	0.036	111	77	52	0.16	UIZ
Channel 25	0	9	9	3.91	0.057	86	47	74	0.27	UIZ
Channel 26	0	7	7	4.69	0.018	51	13	30	0.02	UIZ
Channel 27	0	4	4	4.59	0.035	67	22	23	0.05	UIZ
Channel 28	0	13.8	13.8	2.49	0.036	108	56	131	0.32	LIZ/UIZ
including	0	11	11	2.29	0.04	114	59	68	0.34	LIZ
including	11	13.4	2.4	3.59	0.02	71	40	63	0.23	UIZ
Channel 29	0	4	4	3.35	0.026	52	36	86	0.11	UIZ/WZ
including	1	4	3	4.4	0.024	54	36	100	0.08	UIZ

9.1.3 2017 CHANNEL PROGRAM

Three channels (Channel 30 to 32) totaling 25.1 m were completed in the summer of 2017. (Figure 9.1). A total of 26 samples were collected.

Sampling was completed by Frontier Lithium personnel.

The channels were oriented perpendicular to the strike of the pegmatite's internal mineralogical zones and were cut continuously across the zones. The length of a channel was determined by the width of the pegmatite zone being sampled.

The channels were wet-cut approximately 3.5 to 4 cm wide and 9 to 10 cm deep with a motorized circular diamond saw. Sample lengths were typically one metre or less, depending on zone mineralogy and boundaries. After cutting, the channels were washed to mitigate cross-contamination by the cuttings. The samples were then removed using a hammer and chisel. The samples were laid out in order next to the channel and were geologically described, washed, assigned a sample number, and then bagged. The sample number was also etched on a metal tag that was secured to the outcrop at the beginning of each sample cut. The start of each channel was assigned a GPS coordinate and the cut channel assigned a bearing.

Each sample bag was sealed using a plastic zip tie. The poly bags were then placed into rice bags, which were then labeled and closed off with zip ties. Frontier Lithium personnel transported the bags of samples to Val Caron where sample blanks and standards were inserted into the sample stream. All samples were then shipped to Actlabs or AGAT laboratories in Sudbury, Ontario.

Table 9.5 summarizes the location of the 2017 channels, and Table 9.6 summarizes the results for the 2017 channel program.

Table 9.5 2017 Channel Location

Channel No.	Easting	Northing	Elevation (masl)	Dip	Azimuth	Length (m)	No. of Samples
CH-30	474405	5828035	324	-10	10	7.7	8
CH-31	474405	5828043	322	0	20	2.6	3
CH-32	474403	5828047	322	-10	18	14.8	15

Table 9.6 2017 Channel Results

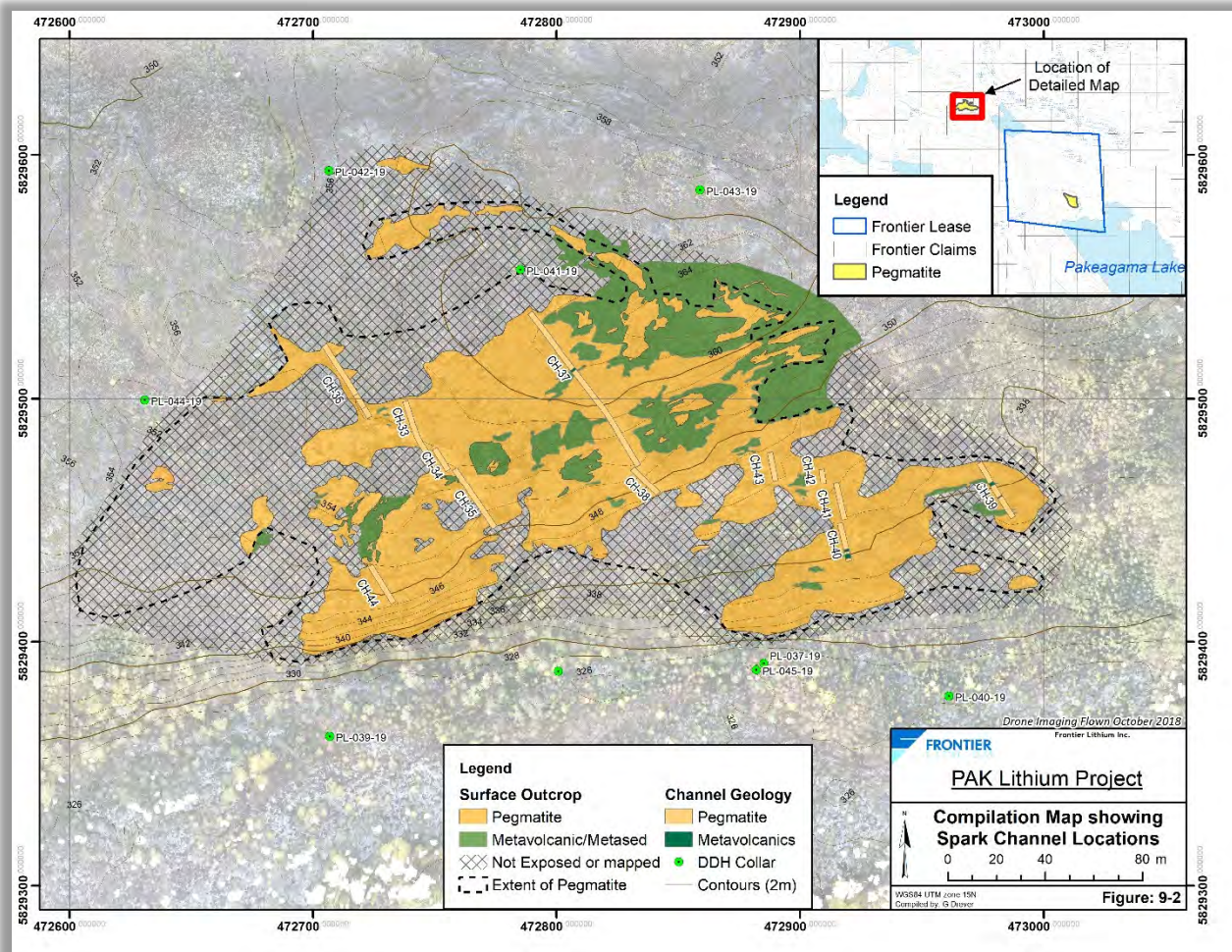
Channel ID	From (m)	To (m)	Length (m)	Li ₂ O (%)	CS ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Zone Sampled
CH 30	0	2.9	2.9	0.82	0.02	107	89	106	0.32	LIZ
CH 31-32	7.7	25.1	17.4	1.5	0.01	104	79	89	0.33	LIZ/Aplite

9.2 SPARK EXPLORATION

9.2.1 2018 CHANNEL PROGRAM

Eight channels (Channel 33 to 40) totaling 236.4 m were completed in the summer of 2018. (Figure 9.2). A total of 265 samples were collected.

Figure 9.2 Spark Channel Location



Sampling was completed by Frontier Lithium personnel.

The channels were oriented perpendicular to the strike of the pegmatite's internal mineralogical zones and were cut continuously across the zones. The length of a channel was determined by the width of the pegmatite zone being sampled.

The channels were wet-cut approximately 3.5 to 4 cm wide and 9 to 10 cm deep with a motorized circular diamond saw. Sample lengths were typically one metre or less, depending on zone mineralogy and boundaries. After cutting, the channels were washed to mitigate cross-contamination by the cuttings. The samples were then removed using a hammer and chisel. The samples were laid out in order next to the channel and were geologically described, washed, assigned a sample number, and then bagged. The sample number was also etched on a metal tag that was secured to the outcrop at the beginning of each sample cut. The start of each channel was assigned a GPS coordinate and the cut

Each sample bag was sealed using a plastic zip tie. The poly bags were then placed into rice bags, which were then labeled and closed off with zip ties. The channel samples were bagged in the field where field duplicates, sample blanks and standards were inserted. The sample bags were delivered to Red Lake where they were shipped to AGAT's facilities in Timmins and Thunder Bay for sample preparation prior to analysis at AGAT's facility in Mississauga, Ontario.

Table 9.7 summarizes the location of the 2018 channels, and Table 9.8 summarizes the results for the 2018 channel program.

Table 9.7 2018 Channel Location

Channel No.	Easting	Northing	Elevation (masl)	Dip	Azimuth	Length (m)	No. of Samples
CH-33	472739	5829499	357	-2	160	23	26
CH-34	472751	5829480	356	-2.2	148	11	13
CH-35	472759	5829472	355	-12	146	30	36
CH-36	472722	5829492	356	-2.2	330	35	31
CH-37	472790	5829536	361	-5	142	78.5	90
CH-38	472832	5829472	354	-53.7	140	16	19
CH-39	472974	5829474	341	-4.4	146	26.9	32
CH-40	472918	5829449	341	-6	168	16	18

Table 9.8 2018 Channel Results

Channel ID	From (m)	To (m)	Length (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Zone Sampled
CH-33	0	23	23	2.08	0.026	118	60	86	0.3	LIZ/Aplite
CH-34	0	11	11	2.39	0.021	173	49	97	0.29	LIZ
CH-35	0	30	30	1.9	0.016	137	46	99	0.31	LIZ/Aplite
CH-36	0	35	35	2.02	0.014	94	49	87	0.24	LIZ/Aplite
CH-37	0	78.5	78.5	1.87	0.022	191	81	89	0.3	LIZ/Aplite
CH-38	0	16	16	1.79	0.02	161	82	110	0.28	LIZ/Aplite
CH-39	0	26.9	26.9	1.58	0.012	141	50	66	0.23	LIZ/Aplite
CH-40	0	16	16	1.54	0.015	130	108	81	0.29	LIZ/Aplite
CH-41	0	16	16	1.69	0.017	146	112	88	0.35	Aplite
CH-42	0	6	6	1.58	0.015	142	161	84	0.39	Aplite

9.2.2 2019 CHANNEL PROGRAM

Four channels (Channel 41 to 44) totaling 52 m were completed in the summer of 2019. (Figure 9.2). A total of 56 samples were collected.

Sampling was completed by Frontier Lithium personnel.

The channels were oriented perpendicular to the strike of the pegmatite's internal mineralogical zones and were cut continuously across the zones. The length of a channel was determined by the width of the pegmatite zone being sampled.

The channels were wet-cut approximately 3.5 to 4 cm wide and 9 to 10 cm deep with a motorized circular diamond saw. Sample lengths were typically one metre or less, depending on zone mineralogy and boundaries. After cutting, the channels were washed to mitigate cross-contamination by the cuttings. The samples were then removed using a hammer and chisel. The samples were laid out in order next to the channel and were geologically described, washed, assigned a sample number, and then bagged. The sample number was also etched on a metal tag that was secured to the outcrop at the beginning of each sample cut. The start of each channel was assigned a GPS coordinate and the channel assigned a bearing.

Each sample bag was sealed using a plastic zip tie. The poly bags were then placed into rice bags, which were then labeled and closed off with zip ties. The channel samples were bagged in the field where field duplicates, sample blanks, and standards were inserted. The sample bags were delivered to Red Lake where they were shipped to AGAT's facilities in Timmins and Thunder Bay for sample preparation prior to analysis at AGAT's facility in Mississauga, Ontario.

Table 9.9 summarizes the location of the 2019 channels, and Table 9.10 summarizes the results for the 2019 channel program.

Table 9.9 2019 Channel Location

Channel No.	Easting	Northing	Elevation (masl)	Dip	Azimuth	Length (m)	No. of Samples
CH-41	472917	5829450	341	8	347	16	17
CH-42	472908	5829465	344	4	352	6	6
CH-43	472889	5829466	346	6	348.5	12	12
CH-44	472732	5829415	349	4	328	18	21

Table 9.10 2019 Channel Results

Channel ID	From (m)	To (m)	Length (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Zone Sampled
CH-41	0	16	16	1.69	0.017	146	112	88	0.35	Aplite
CH-42	0	6	6	1.58	0.015	142	161	84	0.39	Aplite
CH-43	0	12	12	1.51	0.014	141	117	89	0.34	Aplite
CH-44	0	18	18	1.77	0.017	101	35	77	0.27	Aplite

10 DRILLING

Eight phases of diamond drilling plus a program of geomechanical drilling have been completed on the Property since 2013. Phases I through VI were completed at the PAK deposit while Phase VII and VIII were performed on the newly-discovered Spark pegmatite. Table 10.1 provides the collar information for all eight phases. Figures 10.1 and 10.2 illustrate the location of the drill collars at PAK and Spark respectively.

Table 10.1 Drill Collar Summary

DDH No		Date Drilled		UTM Zone 15N (NAD83)			Collar Orient		Metres Drilled	
		Start	End	Easting	Northing	(mASL)	Azim	Dip	Start	End
Phase I	PL-13-001	2/20/2013	3/3/2013	474,558	5,827,832	319.5	20	-45	0	213.3
	PL-13-002	2/22/2013	2/24/2013	474,451	5,827,832	323.2	30	-45	0	191
	PL-13-003	2/24/2013	2/25/2013	474,421	5,827,963	327.6	30	-45	0	104
	PL-13-004	2/25/2013	2/27/2013	474,492	5,827,908	325.9	30	-45	0	167
	PL-13-005	2/27/2013	2/28/2013	474,526	5,828,046	320.8	210	-45	0	161
	PL-13-006	3/1/2013	3/2/2013	474,608	5,827,944	316.6	210	-45	0	119
Total metres drilled										955.3
Phase II	PL-002-14	2/11/2014	2/14/2014	474,451	5,827,832	323.2	30	-45	191	305
	PL-007-14	2/14/2014	2/18/2014	474,415	5,828,062	320.3	210	-45	0	140
	PL-008-14	2/18/2014	2/20/2014	474,355	5,828,089	320.9	210	-45	0	133.6
	PL-009-14	2/20/2014	2/23/2014	474,555	5,827,838	319.5	45	-45	0	116
	PL-010-14	2/23/2014	2/28/2014	474,609	5,827,807	315.5	20	-45	0	326
	PL-011-14	2/28/2014	3/2/2014	474,451	5,827,959	327	30	-45	0	119
	PL-012-14	3/2/2014	3/4/2014	474,403	5,827,979	327	30	-45	0	128
	PL-013-14	3/4/2014	3/8/2014	474,571	5,827,851	317	20	-60	0	233
	PL-014-14	3/8/2014	3/11/2014	474,768	5,827,885	320.8	7.5	-45	0	179
Total metres drilled										1488.6
Phase III	PL-015-15	2/18/2015	2/22/2015	474,586	5,827,967	316.1	220	-45	0	178.7
	PL-016-15	2/22/2015	2/24/2015	474,637	5,827,977	314.5	210	-60	0	247.5
	PL-017-15	2/24/2015	2/28/2015	474,667	5,827,978	317.5	180	-60	0	267
	PL-018-15	2/28/2015	3/2/2015	474,475	5,828,063	318.6	210	-45	0	171
	PL-019-15	3/2/2015	3/4/2015	474,636	5,827,869	313.2	0	-60	0	195
	PL-020-15	3/4/2015	3/5/2015	474,520	5,827,899	322.1	44	-45	0	198
	PL-021-15	3/6/2015	3/7/2015	474,495	5,828,042	319.3	210	-60	0	163.5
	PL-022-15	3/7/2015	3/10/2015	474,750	5,827,818	315.4	15	-45	0	220.5
Total metres drilled										1641.2
Phase IV	PL-023-15	8/28/2015	9/3/2015	474,723	5,827,925	316.8	0	-90	0	255.6
	PL-024-15	9/3/2015	9/9/2015	474,665	5,827,740	314.4	20	-48	0	358
Total metres drilled										613.6
Phase V	PL-023-17	9/22/2017	9/22/2017	474,723	5,827,925	316.8	0	-90	255.6	289.6
	PL-025-17	9/13/2017	9/18/2017	474,418	5,827,851	320.5	20	-50	0	320
	PL-026-17	9/18/2017	9/22/2017	474,394	5,827,910	320.9	0	-55	0	270
	PL-027-17	9/24/2017	9/28/2017	474,759	5,828,044	317.6	199	-62	0	408.6
Total metres drilled										1032.6

(table continues on next page)

DDH No		Date Drilled		UTM Zone 15N (NAD83)			Collar Orient		Metres Drilled	
		Start	End	Easting	Northing	(mASL)	Azim	Dip	Start	End
Phase VI	PL-028-18	6/20/2018	6/26/2018	474,636	5,827,986	315	196	-75	0	334.4
	PL-029-18	6/26/2018	6/29/2018	474,583	5,827,974	317.4	217	-79	0	291
	PL-030-18	6/29/2018	7/1/2018	474,498	5,827,969	323.5	142	-85	0	222
	PL-031-18	7/1/2018	7/2/2018	474,524	5,827,950	323.6	0	-90	0	24.8
	PL-032-18	7/2/2018	7/2/2018	474,525	5,827,963	323.2	228	-41.2	0	48
	PL-033-18	7/2/2018	7/3/2018	474,504	5,827,939	322.7	30	-41.5	0	92.3
	PL-034-18	7/3/2018	7/4/2018	474,311	5,828,094	316	20	-43.5	0	88.3
	PL-035-18	7/4/2018	7/5/2018	474,519	5,827,933	324.3	73	-43	0	54.6
	PL-036-18	7/5/2018	7/6/2018	474,528	5,827,945	323.9	160	-44	0	65.4
Total metres drilled										1220.8
Phase VII	PL-037-19	2/2/2019	2/5/2019	472,885	5,829,391	325.2	325	-41	0	178.8
	PL-038-19	2/6/2019	2/9/2019	472,801	5,829,388	326.2	324	-42	0	288.2
	PL-039-19	2/10/2019	2/11/2019	472,707	5,829,361	326.3	338	-44	0	250.5
	PL-040-19	2/12/2019	2/16/2019	472,961	5,829,378	325.4	338	-43	0	324
	PL-041-19	2/16/2019	2/19/2019	472,785	5,829,553	362	174	-45	0	298.5
Total metres drilled										1340
Phase VIII	PL-042-19	7/20/2019	7/24/2019	472,706	5,829,593	356	174	-45	0	357
	PL-043-19	7/25/2019	7/28/2019	472,859	5,829,586	359.5	171	-42	0	276
	PL-044-19	7/28/2019	7/30/2019	472,631	5,829,499	353.1	180	-44	0	231
	PL-045-19	7/31/2019	8/3/2019	472,882	5,829,388	325.3	331	-45	0	295.5
Total metres drilled										1159.5
Total metres drilled (Phase I to VIII)										9451.6

Figure 10.1 PAK Drill Collar Location

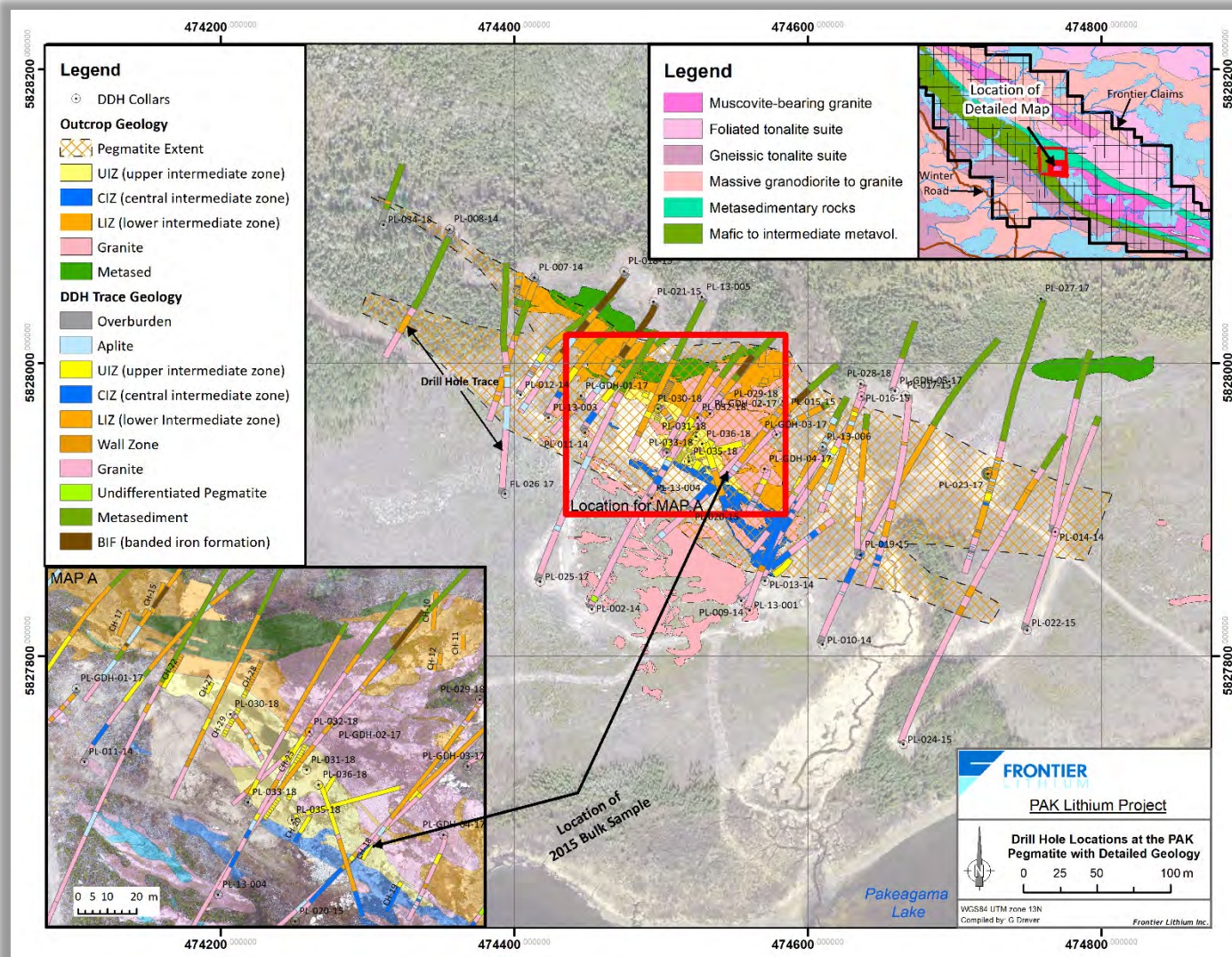
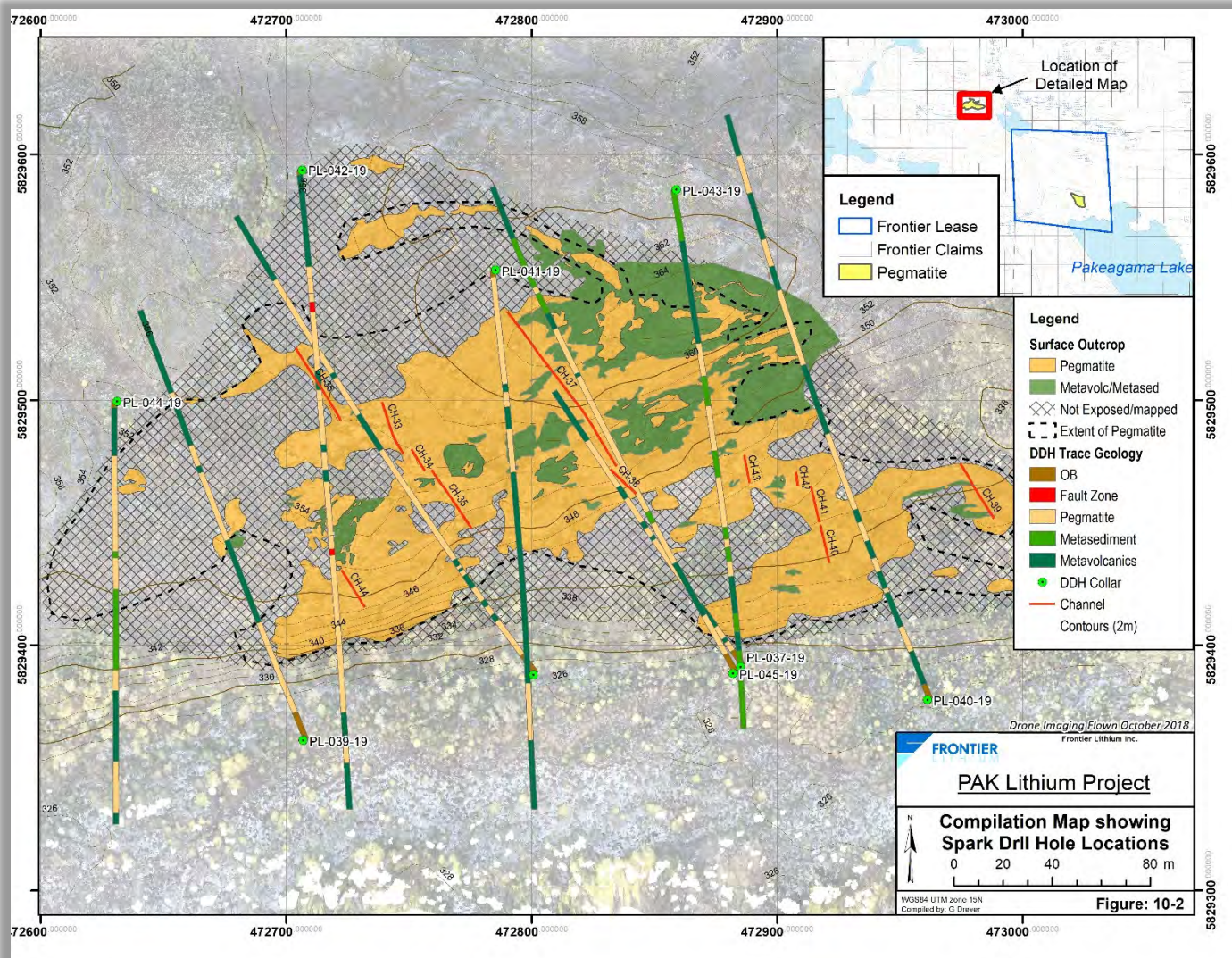


Figure 10.2 Spark Drill Collar Location



10.1 PHASE I - 2013 DRILL CAMPAIGN

During the period February 19 to March 3, 2013, Frontier Lithium completed a 6-hole diamond drill program, totaling 955 m, as a follow-up to the high-grade mineralization defined in the UIZ, LIZ, and CIZ zones during the 2012 Channel Sample Program. The objectives of the drill program were to determine the orientation, thickness, and zonation of the pegmatite and to refine the mineralogical characterization of these zones by better establishing the lithium, tantalum, cesium and rubidium potential.

Haveman Brothers of Kakabeka Falls, Ontario was contracted to provide camp logistics for the drill program. A 10-person winter camp was established next to the winter road 25 km northwest of the North Spirit Lake community. Element Drilling Ltd. of Gimli, Manitoba was awarded the diamond drilling contract. Drilling was completed using a skid mounted Boyles 37 drill using NQ (47.6 mm) rods for all holes. A D6 Caterpillar moved the drill from camp to the first drill site and between holes. Drill core was geologically logged and tagged for sampling in the Core Logging Facility at the campsite.

Under Frontier Lithium's QA/QC procedures, the diamond drill contract specified NQ-sized drill core providing a 47.6 mm diameter sample. The drillholes were oriented perpendicular to the strike of the pegmatite and drilled continuously across it.

Full disclosure of the results from the 2013 drill campaign was provided in the previous technical report (*McCracken, 2014*).

10.1.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates predetermined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place with the drillhole identification engraved on the top of each cap.

In August 2013, Frontier Lithium contracted Consbec Inc. to complete GPS surveying of all collars (sub-centimetre accuracy) using a LEICA CS15 field controller and GS15 Smart Antenna (base-station) system. Survey points were measured at the top-dead-centre (TDC) of the cap and TDC of the casing at the casing-surface interface.

DOWNHOLE SURVEY

Downhole orientation surveys measured using a Reflex EZ-Shot® single-shot electronic instrument supplied and operated by Element Drilling personnel.

The first reading was taken at least 6 m past the end of the casing and then at an interval of 50 m until the end of the hole. Readings were recorded by the driller and included the depth, azimuth (magnetic north), inclination, magnetic tool face angle, magnetic field strength, and temperature.

10.1.2 CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube and boxing of drill core at the drill site.
- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor, photographed and then re-closed.
- The core was stored securely until moved into the Val Caron core shack for processing.
- Groups of boxes were photographed with proper markings and compared to the photos taken on site.
- The company geologists logged the core, and then marked and tagged it for sampling and splitting.
- Minimum sample unit was 0.3 m; maximum sample length was 1.7 m. Variations from a standard length of 1.0 m were often necessary to accommodate variations in pegmatite zonation and lithology.
- Each core sample was assigned a tag with a unique identifying number.

10.1.3 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The core was then re-closed on site and shipped to the company's offsite core splitting facility in Val Caron, Ontario.
- Sample lengths were typically one metre, yet could vary somewhat depending on zone mineralogy and boundaries.
- Core marked for splitting was sawn using a diamond core saw with a mounted jig to assure the core was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to an analytical laboratory for quantitative analysis of select elements.
- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, offsite core library.

10.2 2014 DRILL CAMPAIGN

The 2014 drilling campaign was completed between February 6 and March 14, 2014. A total of eight new holes and one deepened hole were drilled, totaling 1,488.6 m. All holes were inclined at -45 degrees dip with the exception of one hole at -60 degrees. Only two holes were drilled from the north-northeast. All others were drilled from the south-southwest. All holes intersected and traversed the entire width of the pegmatite with the exception of the final hole, PL-014-14 which only intersected granite and metasediments. Hole PL-13-002, which in 2013 was terminated at 191 m in pegmatite, was re-entered and deepened and ended in metasediments at 305 m.

Both camp and diamond drilling equipment was contracted to Element Drilling Ltd. of Gimli, Manitoba. Drilling was completed using a Boyles 37A diamond drill. Holes were drilled using NQ drill rods. Garth Drever, Steve Beyer, and Trevor Walker were all involved for Frontier Lithium in supervision of the drilling and geological logging of the drill core.

The nomenclature of the drillholes was changed since 2013. “PL” still refers to Pakeagama Lake followed by three digits representing the sequence of the holes drill, followed by the two-digit year so PL-009-14 is the ninth hole drilled on the Pakeagama Lake project which was drilled in 2014.

The locations of the 2014 drill collars are displayed on Figure 10.1. Table 10.2 summarizes the results of the 2014 drill campaign.

Table 10.2 2014 Drill Summary

DDH PL-002-14 (PL-13-002)		In Phase I (PL-13-002 (from 0 to 191m)) the objective was to test Cs potential under pollucite-bearing aplite dyke at surface. In Phase II (PL-14-002 (from 191m to 304m)) the intent was to complete the cross-section of the pegmatite.						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Pegmatite/Aplite Dyke near surface (Tantalum enriched)</u>								
5.00 - 17.50 m	12.50	0.10	0.025	132	59	32	0.06	Pegmatite
<u>Lithium, Rubidium and Tantalum enriched zones</u>								
174.00 - 226.00 m	52.00	1.10	0.039	101	69	126	0.29	LIZ/Aplite/Granite
253.40 - 273.00 m	19.60	1.92	0.012	94	68	75	0.31	LIZ/Aplite

DDH PL-007-14		Designed to test continuity of pegmatite along strike (approximately 56 m WNW of DDH PL-13-003) and collared from NNE						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Pegmatites including metasediment and granite sheets/rafts</u>								
3.60 - 22.60	19.00	1.07	0.010	105	64	427	0.24	Pegmatite/Aplite/LIZ
3.60 - 14.00	10.40	1.80	0.014	92	72	77	0.33	LIZ/Aplite
<u>Lithium plus Tantalum and Rubidium enriched zones</u>								
70.85 - 87.90 m	17.05	1.44	0.021	115	97	72	0.14	Aplite/LIZ/UIZ
including 82.00 - 87.00 m	5.00	2.48	0.030	75	61	104	0.22	LIZ/UIZ
99.00 - 120.25 m	21.25	0.53	0.040	188	132	589	0.20	Aplite/LIZ/Granite/UIZ
including 99.00 - 112.65 m	13.65	0.76	0.050	250	187	899	0.25	Aplite/LIZ/UIZ/Granite

DDH PL-008-14		Designed to test continuity of pegmatite along strike (approximately 67 m WNW of DDH PL-007-14) and collared from NNE						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Total Pegmatite</u>								
89.00 - 107.00 m	18.00	0.66	0.130	271	126	149	0.19	Aplite/LIZ
including 89.50 - 106.00 m	16.50	0.68	0.133	286	130	159	0.19	Aplite/LIZ
<u>Tantalum, Lithium and Cesium enriched zone</u>								
89.50 - 92.00 m	2.50	1.94	0.640	829	87	156	0.28	Aplite/LIZ

DDH PL-009-14		Designed to test to the SSE (obliquely) of PL-001-13 to determine if the pegmatite exists beyond the visible surface exposure.						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Rubidium, Tantalum and Cesium enriched zones</u>								
38.50 - 64.60 m	26.10	0.81	0.100	108	40	242	0.78	CIZ
including 42.30 - 54.65 m	12.35	0.85	0.110	84	28	318	1.00	CIZ
<u>Rubidium enriched zone</u>								
89.25 - 96.50 m	7.25	0.62	0.100	53	29	52	0.95	CIZ
<u>Lithium enriched zone</u>								
100.35 - 106.50 m	6.15	1.77	0.060	131	69	94	0.37	LIZ

DDH PL-010-14		Designed to test continuity of zoned pegmatite zones along strike (approximately 56 m ESE of DDH PL-13-001 and PL-009-14 where only overburden is observed on surface)						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Rubidium, Tantalum and Lithium enriched zones</u>								
62.30 - 76.60 m	14.30	n/a	0.100	94	38	37	0.95	CIZ
87.00 - 94.95 m	7.95	1.03	0.060	54	45	72	0.47	LIZ
<u>Lithium, Rubidium and Tantalum enriched zones</u>								
168.30 - 229.00 m	60.70	2.01	0.040	108	65	139	0.38	LIZ/WZ
including 171.00 - 193.00 m	22.00	2.46	0.050	62	37	82	0.43	LIZ
including 193.00 - 227.00 m	34.00	1.82	0.054	146	87	182	0.35	LIZ/WZ

DDH PL-011-14		Designed to test continuity of pegmatite zonation beneath the enriched UIZ/CIZ surface zones near (approx. 25m ESE) DDH PL-003-13						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Total Pegmatite</u>								
9.10 -104.75 m	95.65	1.68	0.024	85	59	162	0.24	WZ/CIZ/UIZ/LIZ
<u>Tantalum, Rubidium and Cesium enriched zones</u>								
including 9.10 - 20.70 m	11.60	n/a	0.068	132	69	83	0.37	WZ/CIZ
including 9.85 - 14.00 m	4.15	n/a	0.077	188	123	113	0.38	WZ/CIZ
<u>Lithium enriched pegmatite</u>								
including 13.00 - 104.75 m	91.75	1.69	0.021	80	53	156	0.22	LIZ + UIZ
including 35.00 - 47.80 m	12.80	4.01	0.031	48	33	40	0.10	UIZ
including 54.00 - 104.75 m	50.75	1.73	0.023	114	84	274	0.33	LIZ

DDH PL-012-14		Designed to test continuity of pegmatite zonation beneath the enriched UIZ/CIZ surface zones near (approx. 25m WNW) DDH PL-003-13						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Total Pegmatite</u>								
19.50 - 74.40 m	54.90	1.42	0.030	96	76	87	0.24	Aplite/WZ/LIZ/UIZ
<u>Tantalum, Rubidium and Cesium enriched zones</u>								
including 19.50 - 36.45 m	16.95	1.31	0.036	130	78	146	0.23	WZ/LIZ
<u>Lithium enriched pegmatite</u>								
including 35.50 - 44.00 m	8.50	3.69	0.039	90	54	44	0.24	UIZ/Aplite
Also 102.00 - 107.20 m	5.20	2.16	0.012	107	80	50	0.27	Aplite/LIZ

DDH PL-013-14		Designed to test continuity of zoned pegmatite beneath the enriched UIZ/CIZ zones on surface near channel cuts 1 to 7 and approximately 60m under DDH PL-001-13.						
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Total Pegmatite</u>								
15.00 - 217.45 m	202.45	1.16	0.054	75	48	103	0.38	WZ/CIZ/UIZ/LIZ/Aplite
<u>Tantalum, Rubidium and Cesium enriched zones</u>								
15.00 - 111.80 m	96.80	n/a	0.073	94	50	138	0.52	WZ/CIZ/Aplite
including 15.00 - 50.25	35.25	n/a	0.109	111	47	209	0.77	WZ/CIZ
<u>Lithium enriched pegmatite</u>								
133.20 - 217.45 m	84.25	2.09	0.040	70	55	86	0.31	LIZ/UIZ/Aplite
including 133.20 - 182.00 m	48.80	2.75	0.047	62	44	60	0.33	LIZ/UIZ
including 164.00 - 182.00 m	18.00	3.11	0.049	61	36	84	0.37	UIZ

10.2.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates pre-determined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place with the drillhole identification engraved on the top of each cap.

Coordinates for collars of all holes drilled in 2014 were measured using a Garmin Rino 610 GPS (averaging function). Elevations were estimated based on proximity to existing surveyed collars and channel samples. The collar coordinates have an accuracy of approximately 2 m.

DOWNHOLE SURVEY

Downhole orientation surveys were measured using a Reflex EZ-Shot® single-shot electronic instrument supplied and operated by Element Drilling personnel. Part way through the 2014 program, the single-shot instrument was replaced with a Reflex EZ-Shot® multi-shot instrument.

For holes measured with the single-shot, the first reading was taken at least 6 m past the end of the casing and then at an interval of 50 m until the end of the hole. Readings were recorded by the driller and included the depth, azimuth (magnetic north), inclination, magnetic tool face angle, magnetic field strength, and temperature. For holes measured with the multi-shot instrument, the survey was completed when pulling rods out of the hole with readings taken at 6 m intervals.

10.2.2 CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube and boxing of drill core at the drill site.
- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor.
- The drill core was geologically logged, photographed and then marked and tagged for sampling and splitting.
- Each core sample was assigned a tag with a unique identifying number. Sample lengths were typically one metre yet could be less depending on zone mineralogy and boundaries.
- The core was stored securely until moved into the core shack for processing.

10.2.3 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The core was then re-closed on site and shipped to the company's offsite core splitting facility in Val Caron, Ontario.
- Sample lengths were typically one metre yet could vary somewhat depending on zone mineralogy and boundaries.
- Core marked for splitting was sawn using a diamond core saw with a mounted jig to assure the core was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to ACME Laboratories' facility in Val d'Or, Québec for sample preparation prior to completing multi-element analysis at ACME in Vancouver, BC.
- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, offsite core library.

10.3 2015 DRILL CAMPAIGN

The 2015 drilling campaign was completed in two phases. Phase III began on February 17, 2015 and ended on March 10, 2015. A total of eight holes were drilled totaling 1,641.2 m in Phase III. The Phase IV program began on August 20, 2015 and ended on September 19, 2015. A total of two holes were drilled totaling 608 m in Phase IV.

Both camp and diamond drilling equipment was contracted to Chenier Drilling Ltd of Val Caron. Drilling was completed using a Hydracore 2000 diamond drill. Holes were drilled using NQ drill rods. Garth Drever of Frontier Lithium supervised the drilling and geological logging of the drill core.

The locations of the 2015 drill collars are displayed on Figure 10.1. Table 10.3 summarizes the results of the 2015 drill campaigns.

Table 10.3 2015 Drill Results

DDH PL-015-15 From the NNE targeting 60m vertically below channels 18 and 19 and to test the depth extent of the granite/LIZ to the NE of channels 18 and 19. The hole is above DDH-020-15.								
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Lithium enriched zone</u>								
47.40 - 50.00 m	2.60	3.86	0.011	86	27	35	0.05	UIZ
<u>Lithium plus Tantalum and Rubidium enriched zone</u>								
68.75 - 73.05 m	4.30	1.28	0.040	185	59	58	0.22	UIZ/LIZ
<u>Rubidium and Tantalum enriched zone</u>								
82.60 - 110.30 m	27.70	0.59	0.062	168	93	316	0.49	CIZ
122.90 - 129.70 m	6.80	0.37	0.051	197	40	108	0.23	Aplite
DDH PL-016-15 Designed to test from the NNE, the thickness of granite beneath hole PL-13-006 and to define the northern boundary of the metasediments intersected at depth in holes PL-13-001 and PL-013-14								
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Lithium plus Tantalum and Rubidium enriched zones</u>								
77.45 - 147.85 m	70.40	2.64	0.040	90	39	63	0.28	UIZ/LIZ
including 89.00 - 94.00 m	5.00	0.36	0.025	247	65	115	0.15	Aplite
Including 96.00 - 111.45 m	15.45	3.68	0.041	79	30	73	0.23	UIZ
<u>Rubidium, Tantalum and Tin enriched zone</u>								
178.20 - 188.00 m	9.80	0.36	0.036	180	164	442	0.24	Aplite/Altered granite
Including 182.85 - 188.00 m	5.15	0.51	0.052	293	265	787	0.31	Transition Zone
195.35 - 229.00 m	33.65	0.49	0.048	157	85	328	0.29	CIZ/Altered Granite
Including 195.35 - 212.00 m	16.65	0.47	0.048	180	119	383	0.27	CIZ
Including 195.35 - 200.00 m	4.65	0.46	0.050	244	164	524	0.28	CIZ
DDH PL-017-15 Designed to test from the NNE, the upward extension of the LIZ intersected in hole PL-010-14.								
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Lithium plus Tantalum and Rubidium enriched zones</u>								
63.00 - 66.80 m	3.80	1.94	0.034	161	62	230	0.46	LIZ
144.75 - 159.00 m	14.25	2.17	0.034	58	28	63	0.12	LIZ/Altered Granite
Including 144.75 - 156.00 m	11.25	2.66	0.041	72	33	77	0.13	LIZ
173.30 - 194.60 m	21.30	1.60	0.095	97	28	79	0.41	LIZ
Including 173.30 - 188.60 m	15.30	2.12	0.096	102	29	85	0.30	LIZ
<u>Rubidium plus Tantalum and Tin enriched zone</u>								
202.10 - 238.70 m	36.60	0.51	0.060	88	40	123	0.21	WZ/Granite/Aplite
Including 233.65 - 238.70 m	5.05	0.63	0.051	203	88	364	0.30	WZ/Aplite
DDH PL-018-15 Designed to test from the NNE, the continuity of the LIZ above hole PL-13-003 and the UIZ 50m below. (Scissored PL-012-14; DDH-03 is 25-30m away to the ESE)								
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Lithium plus Tantalum and Rubidium enriched zones</u>								
46.60 - 60.20 m	13.60	1.60	0.014	107	65	70	0.29	LIZ
77.60 - 93.40 m	15.80	0.54	0.022	162	88	85	0.26	Aplite/LIZ
100.55 - 122.00 m	21.45	0.75	0.025	80	57	115	0.21	Aplite/LIZ
<u>Rubidium plus Tantalum and Tin enriched zone</u>								
137.65 - 143.85 m	6.20	0.34	0.056	136	89	339	0.27	WZ/CIZ
160.75 - 168.15 m	7.40	0.22	0.027	144	98	196	0.11	Aplite
DDH PL-019-15 Designed to test from the south, the upward extension of the LIZ intersected in hole PL-010-14 from the south.								
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology
<u>Lithium plus Tantalum, Tin and Rubidium enriched zones</u>								
45.90 - 52.35 m	6.45	1.99	0.044	204	88	514	0.30	LIZ
103.15 - 173.70 m	70.55	2.25	0.035	77	54	131	0.33	LIZ
Including 123.00 - 134.00 m	11.00	3.03	0.043	58	40	89	0.31	LIZ/UIZ
Including 153.00 - 170.00 m	17.00	2.47	0.017	73	57	94	0.25	LIZ

DDH PL-020-15		Targeting from the SSW, 30m vertically below channel 18 and to test the depth extent of the granite/LIZ to the NE of channels 18 and 19.							
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology	
<u>Rubidium plus Tantalum, Cesium and Lithium enriched zones</u>									
11.60 - 44.20 m	32.60	1.35	0.079	75	30	118	0.58	CIZ/LIZ/UIZ	
Including 11.60 - 36.00 m	24.40	0.60	0.083	70	25	114	0.69	WZ/CIZ/LIZ	
Including 36.00 - 44.20 m	8.20	3.59	0.067	91	43	132	0.24	UIZ	
<u>Lithium plus Tantalum and Rubidium enriched zones</u>									
79.50 - 145.55 m	66.05	2.02	0.045	103	61	121	0.30	LIZ/UIZ	
Including 80.05 - 85.90 m	5.85	4.15	0.050	48	21	65	0.10	UIZ	

DDH PL-021-15		Designed to test from the NNE, the continuity of the LIZ above hole PL-011-14 and the UIZ below.							
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology	
<u>Lithium plus Tantalum and Rubidium enriched zones</u>									
53.60 - 68.75 m	15.15	1.20	0.017	107	61	101	0.32	LIZ	
86.20 - 121.20 m	35.00	1.24	0.024	94	78	100	0.26	LIZ/Aplite	
128.90 - 149.00 m	20.10	0.97	0.040	129	79	92	0.15	Aplite	
Including 131.00 - 146.00 m	15.00	1.20	0.024	150	97	81	0.13	Aplite	

DDH PL-023-15		The vertical hole was designed to test the hypothesis that the main pegmatite body is plunging to the east under holes PL-014-14 and PL-022-15. The collar was placed in line with the main trend from scissored holes PL-017-15 and PL-019-15 and the tourmaline veinlets/fractures in PL-022-15							
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology	
<u>Rubidium plus Tantalum, Tin and Lithium enriched zones</u>									
103.25 - 116.80 m	13.55	1.14	0.037	171	81	264	0.24	WZ/LIZ/CIZ	
Including 103.80 - 109.25 m	5.45	1.14	0.028	233	94	150	0.21	WZ/CIZ	
Including 111.80 - 116.80 m	5.00	1.47	0.030	167	93	499	0.26	WZ/CIZ	
<u>Lithium plus Rubidium enriched zones</u>									
154.55 - 250.00 m	95.45	1.98	0.030	93	68	136	0.25	LIZ/UIZ/Aplite	
Including 197.00 - 209.00 m	12.00	3.07	0.032	36	35	59	0.30	UIZ/LIZ	
Including 157.00 - 180.00 m	23.00	2.94	0.031	79	54	106	0.23	UIZ/LIZ	

DDH PL-024-15		After successfully intersecting pegmatite in hole PL-023-15, this hole was designed to step back and test the width and attitude of the pegmatite zone on both the footwall (metasediment side) and hangingwall (granite side).							
Zone	Width (m)	Li ₂ O (%)	Cs ₂ O (%)	Ta ₂ O ₅ (ppm)	Nb ₂ O ₅ (ppm)	SnO ₂ (ppm)	Rb ₂ O (%)	Geology	
<u>Rubidium plus Cesium and Lithium enriched zones</u>									
143.00 - 176.15 m	33.15	0.77	0.049	79	59	65	0.54	WZ/Granite/LIZ	
Including 143.00 - 153.15 m	10.15	0.32	0.081	103	62	94	1.00	WZ	
Including 159.45 - 176.15 m	16.70	1.22	0.036	72	56	59	0.39	LIZ/Granite	
<u>Lithium plus Rubidium, Tantalum and Cesium enriched zone</u>									
264.00 - 304.00 m	40.00	2.59	0.041	87	71	84	0.34	LIZ/UIZ	
Including 265.90 - 289.00 m	23.10	3.33	0.046	76	53	72	0.36	UIZ/LIZ	
Including 265.90 - 275.00 m	9.10	3.65	0.037	58	43	39	0.30	UIZ/LIZ	

10.3.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates pre-determined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place with the drillhole identification engraved on the top of each cap.

Two surveyors were flown from Red Lake to the drill camp at Pakeagama Lake while Phase IV drilling was in progress. They utilized a Total Station GPS system with the Precise Point Positioning (PPP) Service to establish sub-cm accuracy for survey points. In addition to the claim survey, they surveyed all diamond drillhole collars and new channels plus several of the 2012 and 2014 channels in order to re-align the survey points completed in 2013. The coordinates were measured from the TDC of the casing-ground surface contact.

DOWNHOLE SURVEY

Downhole orientation surveys were completed on all holes using the Ranger Discovery Multi-shot instrument with reading taken every 6 m during Phase III, and every 15 m during Phase IV.

The instrument and the operation were provided by Chenier Drilling. Depth, azimuth (magnetic north), inclination, temperature, and magnetic field strength were recorded digitally at each station.

10.3.2 CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube and boxing of drill core at the drill site.
- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor.
- The drill core was geologically logged, photographed and then marked and tagged for sampling and splitting.
- Each core sample was assigned a tag with a unique identifying number. Sample lengths were typically one metre yet could be less depending on zone mineralogy and boundaries.
- The core was stored securely until moved into the core shack for processing.

10.3.3 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The core was then re-closed on site and shipped to the company's offsite core splitting facility in Val Caron, Ontario during Phase III. During Phase IV, the drill core was cut and samples stored on site in a locked sea-container until ready to be shipped to the laboratory.
- Sample lengths were typically one metre yet could vary somewhat depending on zone mineralogy and contacts.
- Core marked for splitting was sawn using a diamond core saw with a mounted jig to assure the core was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to Actlab Laboratories' facility (Phase III) in Sudbury, Ontario or AGAT Laboratories' Facility (Phase IV) for sample preparation prior to completing multi-element analysis at Actlabs in Ancaster, Ontario (Phase III) or AGAT in Mississauga, Ontario (Phase IV).
- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, offsite core library.

10.4 2017 DRILL CAMPAIGN

The 2017 drilling campaign was completed between September 13, 2017 and September 28, 2017. A total of four holes were drilled totaling 1,288.2 m in Phase V.

Both camp and diamond drilling equipment was contracted to Chenier Drilling Ltd of Val Caron. Drilling was completed using a Hydracore 2000 diamond drill. Holes were drilled using NQ drill rods. Garth Drever of Frontier Lithium supervised the drilling and geological logging of the drill core.

The locations of the 2017 drill collars are displayed on Figure 10.1. Table 10.4 summarizes the results of the 2017 drill campaigns.

Table 10.4 2017 Drill Results

DDH PL-023-17			Vertical hole PL-023-15 was re-entered and deepened to determine the depth extent of the pegmatite. All data from the 2015 hole was transferred and recorded with the new PL-023-17 hole. Metasediments were intersected at 262.2 m. The metasediments appear altered indicating proximity to the pegmatite intrusion.							
UTM Zone 15N WGS84										
474,723E	Azim	190°								
5,827,925N	Dip	-75°								
Zone	From (m)	To (m)	Width (m)	Li₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Cs₂O %	Unit
Lithium Enriched	105.6	119.4	13.9	1.14	171	264	81	0.24	0.04	LIZ
Lithium Enriched	158.4	263.0	104.6	1.95	92	135	68	0.25	0.03	LIZ/UIZ
including	160.5	213.7	53.2	2.49	78	104	62	0.27	0.03	LIZ/UIZ
Including	160.5	174.8	14.3	3.18	75	72	52	0.22	0.02	UIZ/LIZ
DDH PL-027-17			Designed to test the continuity, width and depth extent of the pegmatite near the vertical hole (PL-023-15) drilled in 2015. DDH PL-027-17 was projected to intersect the pegmatite 15 m above the lower extent of the pegmatite in the vertical hole. The vertical hole clipped the NNE edge of the pegmatite.							
UTM Zone 15N WGS84										
474,759E	Azim	200°								
5,828,044N	Dip	-62°								
Zone	From (m)	To (m)	Width (m)	Li₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Cs₂O %	Unit
Total pegmatite	237.3	356.0	118.7	2.47	78	110	73	0.32	0.04	LIZ/aplite/UIZ
Lithium Enriched	287.0	340.0	53.0	3.30	63	85	64	0.27	0.03	LIZ/UIZ
including	290.0	304.0	14.0	4.41	32	53	25	0.12	0.02	UIZ
<i>* Based on vertical orientation of pegmatite</i>										
Channel	From (m)	To (m)	Width (m)	Li₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Cs₂O %	Unit
Channels 30 to 32	0.0	25.1	25.1	1.17	85	75	75	0.27	0.01	LIZ/ Metasediments
Channel 30	0.0	2.9	2.9	0.82	107	89	106	0.32	0.02	LIZ
Channels 31-32	7.7	25.1	17.4	1.50	104	79	89	0.33	0.01	LIZ/Aplite
including	18.1	25.1	7.0	2.27	89	71	78	0.34	0.01	LIZ/Aplite
<i>Note: Channels 30 through 32 is a continuous section with off-sets</i>										
DDH PL-GDH-01-17			To characterize the fabric that controls the south walls of the proposed open pit.							
UTM Zone 15N WGS84										
474,446E	Azim	218°								
5,827,978N	Dip	-70°								
Zone	From (m)	To (m)	Width (m)	Li₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Cs₂O %	Unit
Lithium Enriched	5.9	14.4	8.5	3.14	102	41	35	0.40	0.06	LIZ/Aplite/UIZ
Including	9.0	14.4	5.4	4.18	84	114	29	0.16	0.04	LIZ/UIZ

(table continues on next page)

DDH PL-GDH-02-17			To characterize the fabric that controls the north walls of the proposed open pit.							
UTM Zone 15N WGS84										
474,533E	Azim	038°								
5,827,966N	Dip	-70°								
Zone	From (m)	To (m)	Width (m)	Li ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Cs ₂ O %	Unit
Lithium Enriched	38.3	75.3	33.9	2.09	94	111	81	0.28	0.02	LIZ/Aplite/UIZ
Including	53.0	75.3	22.3	2.56	71	120	73	0.28	0.02	LIZ/UIZ
Including	53.0	62.0	9.0	3.22	51	87	54	0.24	0.02	LIZ/UIZ
DDH PL-GDH-03-17			To characterize the northeast and explore possible pit wall slope angles.							
UTM Zone 15N WGS84										
474,579E	Azim	060°								
5,827,951N	Dip	-72°								
Zone	From (m)	To (m)	Width (m)	Li ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Cs ₂ O %	Unit
Lithium Enriched	34.0	113.7	1.1	1.36	127	189	92	0.26	0.02	LIZ/Aplite
Including	55.0	78.8	23.8	2.12	107	81	75	0.22	0.01	LIZ/Aplite
Including	59.0	64.0	5.0	3.35	63	39	56	0.20	0.01	LIZ/UIZ
DDH PL-GDH-04-17			To characterize the southeast wall of the proposed open pit.							
UTM Zone 15N WGS84										
474,571E	Azim	190°								
5,827,928N	Dip	-75°								
Zone	From (m)	To (m)	Width (m)	Li ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Cs ₂ O %	Unit
Lithium Enriched	24.8	40.0	15.3	4.32	42	69	21	0.04	0.02	UIZ
including	25.8	38.5	12.7	4.71	35	75	13	0.03	0.01	UIZ
Rb Ta Enriched	84.6	92.6	8.0	0.60	177	319	114	0.45	0.04	Aplite/CIZ
Including	89.5	92.6	3.1	0.44	109	140	69	0.81	0.07	CIZ

10.4.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates pre-determined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place, with the drillhole identification engraved on the top of each cap.

The 2017 collars were picked up based on high-resolution drone imagery with high-precision ground control points. Accuracy is less than 5 cm horizontal and less than 10 cm vertical for the 2017 drilling (based on surveyed collar sample locations).

DOWNHOLE SURVEY

Downhole orientation surveys were completed on all holes using the Ranger Discovery Multi-Shot instrument with reading taken every 6 to 15 m during Phase V.

The instrument and the operation were provided by Chenier Drilling. Depth, azimuth (magnetic north), inclination, temperature, and magnetic field strength were recorded digitally at each station.

10.4.2 CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube and boxing of drill core at the drill site.
- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor.
- The drill core was geologically logged, photographed and then marked and tagged for sampling and splitting.
- Each core sample was assigned a tag with a unique identifying number. Sample lengths were typically one metre yet could be less depending on zone mineralogy and boundaries.
- The core was stored securely until moved into the core shack for processing.

10.4.3 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The drill core was cut and samples stored on site in a locked sea-container until ready to be shipped to the laboratory.
- Sample lengths were typically one metre yet could vary somewhat depending on zone mineralogy and contacts.
- Core marked for splitting was sawn using a diamond core saw with a mounted jig to assure the core was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to AGAT Laboratories' facility in Mississauga, Ontario for sample preparation and multi-element analysis.

- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, offsite core library.

10.5 2018 DRILL CAMPAIGN

The 2018 drilling campaign was completed between June 20, 2018 to July 6, 2018. A total of nine holes were drilled totaling 1,220.8 m in Phase VI drill program at the PAK deposit.

Frontier's Exploration camp was used as a base of operation and diamond drilling equipment was contracted to Chenier Drilling Ltd of Val Caron. Drilling was completed using a Hydracore 2000 diamond drill. Holes were drilled using BTW drill rods. Garth Drever of Frontier Lithium supervised the drilling and geological logging of the drill core.

The locations of the 2018 drill collars are displayed on Figure 10.1. Table 10.5 summarizes the results of the 2018 drill campaigns.

Table 10.5 2018 Drill Results

DDH PL-028-18	Designed to test the continuity of the pegmatite at depth and to upgrade Inferred Resource to Indicated and Measured. Intersected over 220m of continuous spodumene mineralization. The drillhole appears to pierce the southern hanging wall of the pegmatite and not the bottom.										
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit
Lithium Enriched	62.25	282	219.75	56.9	2.07	0.03	99	100	69	0.27	LIZ/uz/Aplite
including	72.8	85	12.2	3.2	3.73	0.01	66	42	50	0.16	UIZ
including	168	270	102	26.4	2.45	0.04	93	103	54	0.3	LIZ/Aplite
DDH PL-029-18	Designed to test the extent of the "heel" between Holes PL-025-17 and PL-028-18 and to upgrade Inferred to Indicated and Measured. The hole potentially intersected the base of the pegmatite. Over 220m of pegmatite was intersected at an average grade of 1.69% Li ₂ O.										
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit
Li and Rb Enriched	23.15	245	221.85	42.3	1.69	0.04	92	102	72	0.27	LIZ/Aplite
including	59	212	153	29.2	2.2	0.04	85	117	57	0.3	LIZ/Aplite
including	116	212	96	18.3	2.67	0.05	73	111	43	0.35	LIZ/Aplite
DDH PL-030-18	Designed to test the continuity and extent of the exposed high grade UIZ on surface near the channels cut in 2015. The hole did not extend into UIZ but rather into "rafts" of granite and significant zones of LIZ										
Zone	From (m)	To (m)	Width (m)		Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit
Li and Rb Enriched	0.4	198.6	198.2		1.43	0.04	81	46	63	0.22	LIZ/aplite/granite
including	25	162	137		1.72	0.05	92	53	60	0.27	LIZ/aplite
including	25	70	45		2.86	0.05	99	63	45	0.33	LIZ
DDH PL-031-18	Designed to test the continuity, width and depth extent of the UIZ closer to Channel 21 and the area of the 2015 Bulk sample. Intersected UIZ from surface down to 14.4m then into LIZ and granite "rafts". The hole at was terminated at 25m in granite.										
Zone	From (m)	To (m)	Width (m)		Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit
Lithium Enriched	0.4	24.8	24.4		2.95	0.06	31	18	17	0.08	UIZ/liz/granite
including	0.4	14.4	14		4.32	0.08	35	13	7	0.05	UIZ

(table continues on next page)

DDH PL-032-18		Designed to test the extent of the UIZ zone mapped on surface by drilling from the NNE across the zone. Intersected narrower intervals of UIZ within granite and some LIZ.									
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li₂O %	CS₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit
Lithium Enriched	4.9	18.1	13.2	9.9	2.99	0.02	28	19	18	0.08	Granite/UIZ/liz
<i>including</i>	7.2	18.1	10.9	8.2	3.42	0.02	30	17	18	0.05	UIZ/granite
<i>including</i>	7.2	13.3	6.2	4.6	4.28	0.01	28	20	19	0.04	UIZ
DDH PL-033-18		Designed to test the extent of the UIZ zone exposed on surface by drilling from the SSW across the zone. Intersected narrower intervals of UIZ near surface as expected then 25m of granite before intersecting 50m of LIZ									
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li₂O %	CS₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit
Lithium Enriched	3	11.2	8.2	6.1	3.48	0.05	44	33	18	0.16	UIZ
Li and Rb Enriched	36.3	86	49.7	37.2	1.86	0.05	121	123	72	0.35	LIZ/granite
<i>including</i>	36.3	46	9.7	7.3	3.09	0.07	114	45	43	0.3	LIZ
<i>including</i>	56	72	16	12	2.36	0.04	118	117	82	0.33	LIZ
DDH PL-034-18		Designed to test the extent the LIZ intersected in metasediments in hole PL-007-14 and at surface in Channels 30, 31 and 32. Intersected a narrow zone (3m) of pegmatite near surface with elevated tin and minor spodumene.									
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li₂O %	CS₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit
Sn Enriched	19.8	22.8	3	2.2	0.51	0.02	112	514	66	0.21	pegmatite
DDH PL-035-18		Designed to test the extent of the UIZ zone exposed on surface by drilling from west to east across the zone immediately north of the 2015 Bulk sample Pit. Intersected 52.5m of high-grade UIZ with 1.4m of granite near surface before ending the hole in granite									
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li₂O %	CS₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit
Lithium Enriched	1.1	52.5	51.4	37.6	4.05	0.02	28	30	16	0.05	UIZ
<i>including</i>	1.1	50	48.9	35.8	4.11	0.02	29	31	17	0.05	UIZ
<i>including</i>	7.5	46	38.5	28.2	4.32	0.01	23	19	9	0.03	UIZ
DDH PL-036-18		Designed to test the extent of the high grade UIZ near hole PL-031-18 and under the 2015 Bulk sample pit. Intersected 23m of UIZ grading 4.25% Li ₂ O before intersecting LIZ and ended in Rb enriched CIZ at 65.4m (1.08% Rb ₂ O over 12.4m)									
Zone	From (m)	To (m)	Width (m)	Horiz (m)*	Li₂O %	CS₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit
Li and Rb Enriched	0	65.4	65.4	47	2.38	0.05	56	110	31	0.43	UIZ/LIZ/CIZ
<i>including</i>	0	23	23	16.5	4.25	0.02	39	37	16	0.06	UIZ
<i>including</i>	53	65.4	12.4	8.9	0.43	0.1	62	117	36	1.08	CIZ

* Assuming the Pakeagama Lake pegmatite is vertically oriented the Horizontal distance equals the "true width" when the Azimuth of the drillhole is perpendicular to the strike of the deposit (020 to 030 degrees).

10.5.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates predetermined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place with the drillhole identification engraved on the top of each cap.

The 2018 collars were picked up based on high-resolution drone imagery with high-precision ground control points. Accuracy is less than 5 cm horizontal and less than 10 cm vertical for the 2018 drilling (based on surveyed control points).

DOWNHOLE SURVEY

Downhole orientation surveys were completed on all holes using a Reflex ACT III oriented core system. Using the Reflex system, the drill core was oriented and marked as it was retrieved at the drill with reading taken every 1.5 m during Phase VI. The instrument and the operation were provided by Chenier Drilling. Depth, azimuth (magnetic north), inclination, temperature, and magnetic field strength were recorded digitally at each station.

CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube, orientation marking by the drill contractor and boxing of drill core at the drill site.
- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor.
- The drill core was geologically logged, photographed and then marked and tagged for sampling and splitting.
- Each core sample was assigned a tag with a unique identifying number. Sample lengths were typically one metre but could be more or less depending on zone mineralogy and boundaries.
- When completed, the boxes were closed and stacked for sampling.

10.5.2 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The core boxes requiring sampling were transported to the onsite facility for cutting.

- Core marked for splitting was sawn using a diamond core saw and was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to AGAT Laboratories' facility Timmins, Ontario for sample preparation prior to completing multi-element analysis at AGAT's facility in Mississauga, Ontario.
- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, onsite core library.

10.6 2019 DRILL CAMPAIGN

The 2019 drilling campaign was completed between February 2, 2019 to February 19, 2019, and July 20, 2019 to August 3, 2019. A total of nine holes were drilled totaling 2,499.5 m in Phase VII and VIII drill programs at the Spark pegmatite.

Frontier's Exploration camp was used as a base of operation, and the diamond drilling equipment was contracted to Chenier Drilling Ltd of Val Caron. Drilling was completed using a Hydracore 2000 diamond drill. An Astar B2 helicopter contracted from Panorama Helicopters in Alma, Québec was used to transport the drill crew to and from the drill and to retrieve drill core from the drill. Holes were drilled using BTW drill rods. Garth Drever of Frontier Lithium supervised the drilling and geological logging of the drill core.

The locations of the 2019 drill collars are displayed on Figure 10.2. Table 10.6 summarizes the results of the 2019 drill campaigns.

Table 10.6 2019 Drill Results

DDH PL-037-19	Designed to test the extent of the Spark pegmatite underneath Channels 37 and 38 drilling from the south. Intersected 2 major pegmatite zones plus others totalling 117.8 m averaging 1.2% Li ₂ O. Host rock is metavolcanic schist. Hole was abandoned due to "jammed corebarrel" and was lengthened next program.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	9.8	15.6	5.8	4.4	1.12	0.01	115	80	87	0.38	Aplite
<i>including</i>	9.8	14	4.2	3.2	1.21	0.01	110	71	83	0.39	Aplite
Li Enriched	36	109.9	73.9	56.6	1.19	0.01	88	96	77	0.25	LIZ
<i>including</i>	45.6	83	37.4	28.7	1.4	0.01	103	129	80	0.29	LIZ
<i>including</i>	97.5	104.5	7	5.4	2.17	0.01	71	33	83	0.21	LIZ
Li Enriched	117.3	155.4	38.1	29.2	1.23	0.02	84	42	82	0.25	LIZ
<i>including</i>	121	147	26	19.9	1.36	0.01	93	41	98	0.29	LIZ
<i>including</i>	121	130	9	6.9	1.55	0.01	81	29	75	0.25	LIZ

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DDH PL-038-19	Designed to test the extent of the Spark pegmatite underneath Channels 33, 34, 35 and 36 from the south. Intersected 3 major pegmatite zones plus others totalling 215 m averaging 1.4% Li ₂ O. Host rock is metavolcanic schist.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit**
Li Enriched	16.3	37	20.7	15.1	1.26	0.01	79	42	92	0.22	LIZ
	40	45.5	5.6	4.1	1.3	0.01	78	35	74	0.17	LIZ
	49.2	57.9	8.7	6.4	1.63	0.01	91	39	89	0.27	LIZ
Li-Ta Enriched	66	146.3	80.3	58.7	1.58	0.04	223	75	91	0.28	LIZ/ciz
<i>including</i>	79	141	62	45.3	1.81	0.02	95	45	92	0.29	LIZ
<i>including</i>	141	146.3	5.3	3.8	0.33	0.36	2085	487	117	0.43	CIZ
Li Enriched	158	258	100	73.1	1.25	0.04	90	70	80	0.24	LIZ/aplite
<i>including</i>	196	216	20	14.6	1.83	0.02	95	31	94	0.16	LIZ
<i>including</i>	212	216	4	2.9	3.64	0.01	25	17	35	0.15	LIZ
DDH PL-039-19	Designed to test the extent of the Spark pegmatite underneath the western extent of surface-mapped pegmatite from the south. Intersected 2 major pegmatite zones totaling 84.7 m averaging 1.65% Li ₂ O. Host rock is metavolcanic schist.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit**
Lithium Enriched	41	70.6	29.6	21.3	1.56	0.01	97	71	100	0.24	LIZ
<i>including</i>	43	68	25	18	1.62	0.01	88	72	100	0.24	LIZ
Lithium Enriched	119.2	174.3	55.1	39.6	1.7	0.03	141	46	85	0.33	LIZ
<i>including</i>	121	158.9	37.9	27.2	2.07	0.04	157	24	49	0.38	LIZ
<i>including</i>	124	149	25	18	2.32	0.03	143	49	48	0.41	LIZ
DDH PL-040-19	Designed to test the eastern extent of the Spark pegmatite underneath Channel 40 from the south. Intersected 2 significant pegmatite zones plus other narrower intervals totalling 155 m averaging 1.46% Li ₂ O. Host rock is metavolcanic schist.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li ₂ O %	Cs ₂ O %	Ta ₂ O ₅ ppm	SnO ₂ ppm	Nb ₂ O ₅ ppm	Rb ₂ O %	Unit**
Li Enriched	74.7	103	28.3	20.7	1.25	0.01	139	60	61	0.28	LIZ/aplite
<i>including</i>	74.7	82	7.3	5.3	1.67	0.01	201	25	95	0.22	LIZ
<i>including</i>	93	103	10	7.3	1.78	0.02	196	74	72	0.47	LIZ/aplite
Li Ta Enriched	109.9	170.6	60.8	44.4	1.29	0.02	257	84	80	0.26	Aplite/LIZ
<i>including</i>	109.9	152.5	42.7	31.2	1.61	0.02	208	91	85	0.31	Aplite/LIZ
Li Ta Enriched	190.4	222.3	31.9	23.3	1.33	0.03	222	47	71	0.25	LIZ/Aplite
<i>including</i>	191.5	213	21.5	15.7	1.67	0.02	258	38	73	0.23	LIZ/aplite
<i>including</i>	193.5	205.5	12	8.8	2.27	0.01	355	31	98	0.31	LIZ
Li Ta Enriched	243.7	258.1	14.5	10.6	2.49	0.1	312	141	61	0.67	LIZ/aplite
<i>including</i>	246.5	258.1	11.6	8.5	3.07	0.12	354	165	61	0.79	LIZ
<i>including</i>	246.5	250.5	3.9	2.9	4.01	0.14	187	102	22	0.5	LIZ
Li Ta Enriched	282.7	302.4	19.7	14.4	1.77	0.07	336	231	64	0.52	LIZ
	282.7	295	12.3	9	2.54	0.1	327	232	46	0.64	LIZ
<i>including</i>	285	289	4	2.9	3.39	0.05	238	218	36	0.48	LIZ

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DDH PL-041-19	Designed to test from the north, the extent of the Spark pegmatite underneath Channels 37 south towards the collar of DDH PL-038-19. Intersected 62m of pegmatite at the top of the hole and a 30m zone 230m down hole plus narrower intervals totalling 112.6 m averaging 1.73% Li ₂ O. Host rock is metavolcanic schist										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	3.7	65.9	62.2	44	1.92	0.03	82	57	87	0.26	LIZ
<i>including</i>	3.7	21	17.3	12.2	2.45	0.02	43	46	63	0.19	LIZ
<i>including</i>	3.7	11	7.3	5.2	3.11	0.01	58	26	51	0.13	LIZ
Li Enriched	70.2	75.9	5.6	4	1.55	0.01	94	55	94	0.27	Aplite
	102	116.1	14.1	10	1.53	0.02	170	47	111	0.31	Aplite
Li Enriched	232.2	262.8	30.6	21.6	1.48	0.01	55	53	97	0.24	LIZ
<i>including</i>	243	255	12	8.5	1.73	0.01	49	53	88	0.24	LIZ
DDH PL-042-19	Designed to test from the north, the extent of the Spark pegmatite underneath the northern exposed arm of the pegmatite and Channels 36 south towards the collar of DDH PL-039-19. Intersected predominately pegmatite 55m to 305m totalling 231.05 m averaging 1.61% Li ₂ O. Host rock is metavolcanic schist										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	55.4	114.7	59.4	42.7	1.88	0.01	106	47	92	0.2	LIZ/aplite
<i>including</i>	77	102	25	18	2.75	0.01	79	32	65	0.17	LIZ/aplite
Li Enriched	125.7	170.8	45.2	32.5	1.42	0.03	147	96	79	0.27	Aplite/liz
<i>including</i>	127.5	141.5	14	10.1	2.3	0.01	156	52	71	0.21	LIZ/aplite
Li Enriched	178.7	305.3	126.6	91	1.55	0.01	89	44	92	0.26	Aplite
<i>including</i>	178.7	219	40.3	29	1.84	0.02	113	127	98	0.28	Aplite
DDH PL-043-19	Designed to test from the north, the extent of the Spark pegmatite between Channel 37 and DDH PL-040-19 to the east. Intersected three narrow (<25m) pegmatite zones from 89m to 178m totalling 60 m averaging 1.34% Li ₂ O. Host rock is metavolcanic schist.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	89	100.1	11.1	8.2	0.99	0.02	280	42	120	0.15	Aplite
<i>including</i>	89	95	6	4.5	1.66	0.03	202	50	85	0.23	Aplite
Li Enriched	115.7	138.8	23.2	17.2	1.34	0.02	117	113	82	0.35	Aplite
<i>including</i>	124	138.8	14.8	11	1.55	0.02	129	122	100	0.38	Aplite
Li Enriched	152.4	178.1	25.8	19.1	1.49	0.01	116	97	87	0.32	Aplite
<i>including</i>	156	170	14	10.4	1.84	0.01	104	100	85	0.36	Aplite
DDH PL-044-19	Designed to test the extent of the pegmatite west of the DDH PL-039-19 intersection. Intersected predominately pegmatite from 31 to 106m totalling 75m averaging 1.4% Li ₂ O. Two additional intervals of 12 and 27.4 m were intersected in spodumene-bearing aplite averaging 0.74% and 0.87% Li ₂ O respectively. Host rock is a mix of metavolcanic and metasedimentary rock.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	31	84.9	53.9	38.8	1.54	0.01	51	43	64	0.18	LIZ/aplite
<i>including</i>	31	60	29	20.9	2.54	0.01	44	36	62	0.1	LIZ/aplite
<i>including</i>	33	52	19	13.7	3.39	0.01	36	20	50	0.08	LIZ
Li Ta Enriched	90	106	16	11.5	1.34	0.02	200	56	101	0.33	LIZ/aplite
<i>including</i>	92	106	14	10.1	1.5	0.03	201	59	90	0.37	LIZ
Li Enriched	148.8	160.8	12	8.6	0.74	0.01	79	59	116	0.18	Aplite
<i>including</i>	148.8	156	7.2	5.2	1.12	0.01	70	49	88	0.18	Aplite
Li Enriched	198	225.4	27.4	19.7	0.87	0.01	57	56	106	0.15	Aplite
<i>including</i>	200	214	14	10.1	1.32	0.01	51	51	105	0.15	Aplite

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DDH PL-045-19	Designed to extend DDH PL-037-19 that was abandoned. Intersected a 17m zone of spodumene-bearing aplite from 11.9 to 29m averaging 0.78% Li ₂ O before intersecting predominately pegmatite over 144.2m (70.8m to 215m) averaging 1.4% Li ₂ O. Host rock is a mix of metavolcanic and metasedimentary rock.										
Zone	From (m)	To (m)	Width (m)	Horiz. (m)*	Li₂O %	Cs₂O %	Ta₂O₅ ppm	SnO₂ ppm	Nb₂O₅ ppm	Rb₂O %	Unit**
Li Enriched	11.9	29	17.1	12.1	0.78	0.01	112	173	84	0.21	Aplite
<i>including</i>	17	26	9	6.4	1.21	0.01	127	162	93	0.23	Aplite
Li Enriched	32	37	5	3.5	1.18	0.01	98	124	92	0.25	Aplite
Li Enriched	70.8	96	25.2	17.8	1.48	0.01	156	101	88	0.34	Aplite
<i>including</i>	79	96	17	12	1.61	0.02	163	99	90	0.34	Aplite
Li Enriched	103	215	112	79.2	1.53	0.05	182	107	89	0.35	LIZ/aplite
<i>including</i>	130	145	15	10.6	2.47	0.02	108	61	86	0.3	LIZ
<i>Including (Ta, Rb)</i>	175	186.2	11.2	7.9	1.13	0.25	659	520	89	0.88	Aplite

* Assuming the Spark pegmatite is vertically oriented the Horizontal distance equals the "true width" when the Azimuth of the drillhole is perpendicular to the strike of the deposit (070 to 090 degrees).

** Units within the Spark pegmatite resemble the Lower Intermediate Zone (LIZ) and aplite at the PAK Pegmatite

10.6.1 SURVEYING

COLLAR SURVEY

Diamond drillhole collar locations were physically marked and flagged prior to drilling. Frontier Lithium geologists using hand-held Garmin GPS units would locate and mark the site based on coordinates predetermined from the detailed geological GIS compilation. Drill collar azimuth was determined by Silva compass and verified by line of sight (outcrop feature, channel cut, etc.).

Frontier Lithium personnel verified the position and orientation of the drill once set-up was completed and prior to commencement of drilling.

Casing was left in all holes and an aluminum cap was screwed in place with the drillhole identification engraved on the top of each cap.

The 2019 collars were surveyed to sub-centimetre accuracy using total station survey equipment in August 2019 by Rugged Geomatics surveyors based out of Kenora, Ontario.

DOWNHOLE SURVEY

Downhole orientation surveys were completed on all holes using a Reflex ACT III oriented core system. Using the Reflex system, the drill core was oriented and marked as it was retrieved at the drill with reading taken every 1.5 m during Phase VI. The instrument and the operation were provided by Chenier Drilling. Depth, azimuth (magnetic north), inclination, temperature, and magnetic field strength were recorded digitally at each station.

10.6.2 CORE LOGGING PROCEDURE

The following is a summary of the Frontier Lithium logging procedure.

- Sample security and chain of custody started with the removal of core from the core tube, orientation marking by the drill contractor and boxing of drill core at the drill site.

- The boxed core remained under the custody of the drill contractor until it was transported from the drill to the secure onsite core shack facility by either the drill contractor or one of the Frontier Lithium's designated personnel.
- At the onsite core shack, core boxes were opened and inspected to ensure correct boxing and labeling of the core by the drill contractor.
- The drill core was geologically logged, photographed and then marked and tagged for sampling and splitting.
- Each core sample was assigned a tag with a unique identifying number. Sample lengths were typically one metre but could be more or less depending on zone mineralogy and boundaries.
- When completed, the boxes were closed and stacked for sampling.

10.6.3 SAMPLING APPROACH

The following is a summary of the Frontier Lithium sampling procedure.

- The core boxes requiring sampling were transported to the onsite facility for cutting.
- Core marked for splitting was sawn using a diamond core saw and was cut lengthwise into equal halves.
- Half of the cut core was placed in clean individual plastic bags with the appropriate sample tag.
- QA/QC samples were inserted into the sample stream at prescribed intervals. Full description of the QA/QC program is provided in Section 11.
- The samples were then placed in rice bags for shipment to AGAT Laboratories' facility in Thunder Bay or Timmins, Ontario for sample preparation prior to completing multi-element analysis at AGAT's facility in Mississauga, Ontario.
- The remaining half of the core was retained and incorporated into Frontier Lithium's secure, onsite core library.

10.7 QP'S OPINION

It is the QP's opinion that the drilling and logging procedures put in place by Frontier Lithium meet acceptable industry standards and that the information can be used for geological and resource modeling.

11 SAMPLE PREPARATION, ANALYSES AND SECURITY

11.1 SAMPLES PREPARATION

11.1.1 2013 SAMPLE PREPARATION

All channel samples were shipped to Thunder Bay, Ontario. In Thunder Bay, sample blanks and standards were inserted into the sample stream by Frontier Lithium personnel and then delivered to the Actlabs facility in Thunder Bay for analysis. Actlabs is an ISO (ISO/IEC) 17025 accredited facility and includes CAN-P-1579 (Mineral Analysis).

All diamond drill core samples were shipped from Frontier Lithium's Val Caron site to ACME Labs in Vancouver, British Columbia. The Vancouver facility for ACME is an ISO 9001:2008 certified.

Table 11.1 summarizes the steps completed in the sample preparation of the channel and diamond drill core samples. At no time was an employee of Frontier Lithium involved in the preparation of the samples.

Table 11.1 2013 Sample Preparation Procedure - ACME

Sample Preparation	ACME Channel Samples	ACME Drill Core Samples
Receiving	Samples were received, sorted in order, dried.	Samples were received, sorted in order, dried.
Crushing and pulverizing	Crush remainder of sample to >90% -2mm, pulverize (hardened steel) 250 g to >95% 105 µm.	Crush remainder of sample to >80% - 2 mm, pulverize (ceramic) 250 g to >85% 75 µm.
Cleaning equipment	Cleaner sand was used between each sample.	Cleaner sand was used between each sample.
Sample Prep Code	RX1-Terminator	R200-250

11.1.2 2014 SAMPLE PREPARATION

All 2014 samples were shipped from Frontier Lithium's Val Caron site to ACME Labs in Val-d'Or, Québec for preparation. The sample pulps were then sent to ACME's Vancouver facility for Analysis. Table 11.2 summarizes the steps completed in the sample preparation of the channel and diamond drill core samples. At no time was an employee of Frontier Lithium involved in the preparation of the samples.

Table 11.2 2014 Sample Preparation Procedure - ACME

Sample Preparation	ACME 2014 Drill Core and Channel Samples	Code
Receiving	Samples were received, sorted in order, dried and stage-crushed to 1/2".	CRUPR
Riffle split	Riffle split 1 kg and save.	SPTRF
Crushing and pulverizing	Crush remainder of sample to >80% -2mm, pulverize (ceramic) 250 g to >85% 75 µm.	PLU-CB
Cleaning equipment	Extra wash with glass between each sample in pulverizer.	PULSW

11.1.3 2015 SAMPLE PREPARATION

All samples from the 2015 winter Phase III drill program and production hole samples for the bulk sampling test were shipped from Frontier Lithium's Val Caron site to Activation Laboratories (Actlabs) facility in Sudbury and Thunder Bay, respectively, for preparation. The sample pulps were then sent to Actlabs' Ancaster, Ontario facility for analysis. Samples from the summer Phase IV drill program and the channel sampling were delivered to the AGAT facility in Thunder Bay, Ontario. The sample pulps were then sent to AGAT's facility in Mississauga, Ontario. Table 11.3 summarizes the steps completed in the sample preparation of the diamond drill core samples. At no time was an employee of Frontier Lithium involved in the preparation of the samples.

Table 11.3 2015 Sample Preparation Procedure – Actlabs and AGAT

Process	Actlabs 2015 Winter Program	AGAT 2015 Summer Program
Receiving	Samples were received, sorted in order, dried and crushed to -3 mesh (1/4 inch) and if greater than 2 kg, a 1 kg sample is riffle split and saved.	Samples were received, sorted in order, dried
Crushing and pulverizing	The remainder of the sample is crushed to 80% -10 mesh (2 mm), riffle split and pulverize (mild steel) a 250 g sample to 95% -200 mesh (75 µm).	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.
Cleaning equipment	Actlabs uses white lightning SiO ₂ under saturated (no free quartz) material as a cleaner sand between every pulverized sample.	All equipment is cleaned using quartz and air from a compressed air source.

11.1.4 2017 SAMPLE PREPARATION

Samples from the winter Phase V drill program and summer channel sampling program were delivered to the AGAT facility in Thunder Bay, Ontario. The sample pulps were then sent to AGAT's facility in Mississauga, Ontario. Table 11.4 summarizes the steps completed in the sample preparation of the diamond drill core samples. At no time was an employee of Frontier Lithium involved in the preparation of the samples.

Table 11.4 2017 Sample Preparation Procedure – AGAT

Process	AGAT 2017 Winter Program	AGAT 2017 Summer Program
Receiving	Samples were received, sorted in order, dried.	Samples were received, sorted in order, dried.
Crushing and pulverizing	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.
Cleaning equipment	All equipment is cleaned using quartz and air from a compressed air source.	All equipment is cleaned using quartz and air from a compressed air source.

11.1.5 2018 SAMPLE PREPARATION

Samples from the winter Phase VI drill program and summer channel sampling program were delivered to the AGAT facility in Thunder Bay, Ontario. The sample pulps were then sent to AGAT's facility in Mississauga, Ontario. Table 11.5 summarizes the steps completed in the sample preparation of the diamond drill core samples. At no time was an employee of Frontier Lithium involved with the preparation of the samples.

Table 11.5 2018 Sample Preparation Procedure – AGAT

Process	AGAT 2018 Winter Program	AGAT 2018 Summer Program
Receiving	Samples were received, sorted in order, dried	Samples were received, sorted in order, dried
Crushing and pulverizing	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.
Cleaning equipment	All equipment is cleaned using quartz and air from a compressed air source.	All equipment is cleaned using quartz and air from a compressed air source.

11.1.6 2019 SAMPLE PREPARATION

Samples from the winter Phase VII drill program and summer Phase VIII drill program and channel sampling programs were delivered to the AGAT facility in Thunder Bay, Ontario. The sample pulps were then sent to AGAT's facility in Mississauga, Ontario. Table 11.6 summarizes the steps completed in the sample preparation of the diamond drill core samples. At no time was an employee of Frontier Lithium involved in the preparation of the samples.

Table 11.6 2019 Sample Preparation Procedure – AGAT

Process	AGAT 2019 Winter Program	AGAT 2019 Summer Program
Receiving	Samples were received, sorted in order, dried.	Samples were received, sorted in order, dried.
Crushing and pulverizing	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.	Samples are crushed to 75% -10 mesh (2 mm) and split to 250g. Samples are pulverized to 85% -200 mesh (75 µm). After drying sample are shaken on an 80 mesh sieve with the plus fraction stored and the minus fraction sent to the laboratory for analysis.
Cleaning equipment	All equipment is cleaned using quartz and air from a compressed air source.	All equipment is cleaned using quartz and air from a compressed air source.

11.2 ANALYTICAL PROCEDURE

11.2.1 2013 ANALYTICAL PROCEDURE

All samples were assayed by an ISO accredited laboratory. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.7 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.8. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.7 2013 Analytical Methodology

Analytical Method	Actlabs Channel Samples	ACME Drill Core Samples
ICP-ES with LiBO₂ / Li₂B₄O₇ flux	Code 8: Al ₂ O ₃ , Be, C, CaO, Fe ₂ O ₃ , K ₂ O, LOI, MgO, MnO, Na ₂ O, P ₂ O ₅ , S, Sc, SiO ₂ , TiO ₂ , V, Y, Zr	4A: Al ₂ O ₃ , C, CaO, Cr ₂ O ₃ , Fe ₂ O ₃ , K ₂ O, MgO, MnO, Na ₂ O, P ₂ O ₅ , S, Sc, SiO ₂ , TiO ₂ , LOI
ICP-MS with LiBO₂ / Li₂B₄O₇ flux	Code 8: Ag, As, Ba, Bi, Ce, Co, Cr, Cs , Cu, Dy, Er, Eu, Ga, Gd, Ge, Hf, Ho, In, La, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb , Sb, Sm, Sn, Ta , Tb, Th, Tl, Tm, U, Yb, W, Zn	4B: Ba, Be, Co, Ce, Cs, Dy, Eu, Er, Ga, Gd, Hf, Ho, La, Lu, Nb, Nd, Pr, Rb, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W, Y, Yb, Zn, Zr
ICP-ES with Na₂O₂ fusion	Code 8: Al, As, Be, Ca, Co, Cr, Cu, Fe, K, Li , Mg, MgO, Mn, Ni, Pb, S, Si, Ti, W, Zn	7PF: B and Li
ICP-MS with Na₂O₂ fusion	Code 8: Cs (>1000 ppm) (Code -8)	
XRF with LiBO₂ fusion		8X: Cs , Rb , and Ta

Note: Elements used in resource calculation in **bold italics**

Table 11.8 Analytical Detection Limits

Element	Channel Sampling		Diamond Drill Core	
	Detection Limit	Analytical Method	Detection Limit	Analytical Method
Cs	0.5 ppm	ICP-MS	0.01%	XRF
Rb	2.0 ppm	ICP-MS	0.01%	XRF
Ta	0.1 ppm	ICP-MS	10.0 ppm	XRF
Li	0.00%	ICP-OES	0.01%	ICP-MS

11.2.2 2014 ANALYTICAL PROCEDURE

The ACME Vancouver Facility is an ISO 9001:2008 certified. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.9 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.10. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.9 2014 Analytical Methodology - ACME

Analytical Method	ACME: 2014 Drill Core and Channel Samples	Code
ICP Finish; Lithium metaborate / tetraborate fusion	Standard suite Major Oxides plus Refractory and REE: Al ₂ O ₃ , C, CaO, Cr ₂ O ₃ , Fe ₂ O ₃ , K ₂ O, MgO, MnO, Na ₂ O, P ₂ O ₅ , S, Sc, SiO ₂ , TiO ₂ , LOI, Ba, Be, Co, Ce, Cs, Dy, Eu, Er, Ga, Gd, Hf, Ho, La, Lu Nb, Nd, Pr, Rb, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W, Y, Yb, Zn, Zr	LF200
ICPES Finish; Peroxide Fusion	Ore grade Li and B	PF370
XRF Finish; Lithium Metaborate/ Tetraborate Fusion	Cs, Rb, and Ta	LF700
Fusion; Specific Ion Electrode	F	GC840

Note: Elements used in resource calculation in **bold italics**.

Table 11.10 2014 Analytical Detection Limits - ACME

Element	Detection Limit	Analytical Method
Cs	0.01%	XRF
Rb	0.01%	XRF
Ta	10.0 ppm	XRF
Li	0.01%	ICP-MS

11.2.3 2015 ANALYTICAL PROCEDURE

Both the Actlabs and AGAT facilities are ISO 9001:2008 certified. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.11 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.12. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.11 2015 Analytical Methodology – Actlabs and AGAT

Analytical Method	Actlabs: 2015 Winter Drill Core and Production Drill Samples	Code
ICP Finish; Lithium metaborate / tetraborate fusion	Standard suite Major Oxides plus Refractory and REE: Al ₂ O ₃ , CaO, Fe ₂ O ₃ , K ₂ O, MgO, MnO, Na ₂ O, P ₂ O ₅ , SiO ₂ , TiO ₂ , LOI, Ag, As, Ba, Be, Bi, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Ga, Gd, Hf, Ho, In, La, Lu, Mo, Nb, Nd, Ni, Pb, Pr, Rb, Sb, Sc, Sm, Sn, Sr, Ta, Tb, Th, Tl, Tm, U, V, W, Y, Yb, Zn, Zr	8 REE
ICP Finish; Peroxide Fusion	Ore grade Li	8 Peroxide-Li
Fusion; Specific Ion Electrode	F	8-F
Analytical Method	AGAT 2015 Drill Core and Channel Samples	Code
ICP-OES/ICP-MS Finish; Sodium Peroxide fusion	Cs, Fe, K, Li, Nb, Rb, Sn and Ta	201-378
ICP-OES Finish; Lithium Borate Fusion	Na ₂ O and P ₂ O ₅	201-076
Fusion; Specific Ion Electrode	F	201-044
LECO	Total C and Total S	201-043

Table 11.12 2015 Analytical Detection Limits - Actlabs and AGAT

Element	Actlabs Detection Limits and Finish	AGAT Detection Limits and Finish
Cs	0.5 ppm by ICP-MS	0.1 ppm by ICP-MS
Rb	2 ppm by ICP-MS	0.2 ppm by ICP-MS
Ta	0.1 ppm by ICP-MS	0.5 ppm by ICP-MS
Li	0.001% by ICP-OES	10 ppm by ICP-OES

11.2.4 2017 ANALYTICAL PROCEDURE

The AGAT facilities are ISO 9001:2008 certified. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.13 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.14. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.13 2017 Analytical Methodology – AGAT

Analytical Method	AGAT 2017 Drill Core & Channel Sample	Code
ICP-OES/ICP-MS Finish; Sodium Peroxide fusion	Cs, Fe, K, Li, Nb, Rb, Sn and Ta	201-378
ICP-OES Finish; Lithium Borate Fusion	Na ₂ O and P ₂ O ₅	201-076
Fusion; Specific Ion Electrode	F	201-044
LECO	Total C and Total S	201-043

Table 11.14 2017 Analytical Detection Limits - AGAT

Element	AGAT Detection Limits and Finish
Cs	0.1 ppm by ICP-MS
Rb	0.2 ppm by ICP-MS
Ta	0.5 ppm by ICP-MS
Li	10 ppm by ICP-OES

11.2.5 2018 ANALYTICAL PROCEDURE

The AGAT facilities are ISO 9001:2008 certified. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.15 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.16. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.15 2018 Analytical Methodology – AGAT

Analytical Method	AGAT 2018 Drill Core & Channel Sample	Code
ICP-OES/ICP-MS Finish; Sodium Peroxide fusion	Cs, Fe, K, Li, Nb, Rb, Sn and Ta	201-378
ICP-OES Finish; Lithium Borate Fusion	Na ₂ O and P ₂ O ₅	201-076
Fusion; Specific Ion Electrode	F	201-044
LECO	Total C and Total S	201-043

Table 11.16 2018 Analytical Detection Limits - AGAT

Element	AGAT Detection Limits and Finish
Cs	0.1 ppm by ICP-MS
Rb	0.2 ppm by ICP-MS
Ta	0.5 ppm by ICP-MS
Li	10 ppm by ICP-OES

11.2.6 2019 ANALYTICAL PROCEDURE

The AGAT facilities are ISO 9001:2008 certified. Sample blanks along with tantalum, lithium, rubidium, and cesium certified reference material were routinely inserted into the sample stream in accordance with industry recommended practices. Field duplicate samples were also taken in accordance with industry recommended practices.

Table 11.17 summarizes the analytical methods used on the channel and diamond drill core samples. The detection limit for the four elements is summarized in Table 11.18. At no time was an employee of Frontier Lithium involved in the analytical process.

Table 11.17 2019 Analytical Methodology – AGAT

Analytical Method	AGAT 2019 Drill Core & Channel Sample	Code
ICP-OES/ICP-MS Finish; Sodium Peroxide fusion	Cs, Fe, K, Li, Nb, Rb, Sn and Ta	201-378
ICP-OES Finish; Lithium Borate Fusion	Na ₂ O and P ₂ O ₅	201-076
Fusion; Specific Ion Electrode	F	201-044
LECO	Total C and Total S	201-043

Table 11.18 2019 Analytical Detection Limits - AGAT

Element	AGAT Detection Limits and Finish
Cs	0.1 ppm by ICP-MS
Rb	0.2 ppm by ICP-MS
Ta	0.5 ppm by ICP-MS
Li	10 ppm by ICP-OES

11.3 QUALITY ASSURANCE / QUALITY CONTROL

11.3.1 2013 - 2014 QUALITY ASSURANCE / QUALITY CONTROL

The 2013 drill data and all the historic channel samples were reviewed in the previous technical report and deemed acceptable.

The 2014 QA/QC data set is comprised of 90 sample blanks, 70 duplicates, and 122 standards.

BLANKS

For both the channel sampling and diamond drill programs, blank samples were inserted into the sample stream at an approximate interval of every 14 to 22 samples.

Lump carbonate purchased from Canadian Tire Corp. was used as a blank. A failure of a blank is deemed to be 3 times the detection limit. Figures 11.1 to 11.4 display the results of the blank analysis.

The results are in the acceptable range. Blank # 74 shows an issue has taken place with failure for lithium, tantalum and rubidium and elevated cesium. There also appears to be a carry-over on to Blank #75. This should be investigated with the laboratory.

Figure 11.1 2014 Cesium Blank Chart

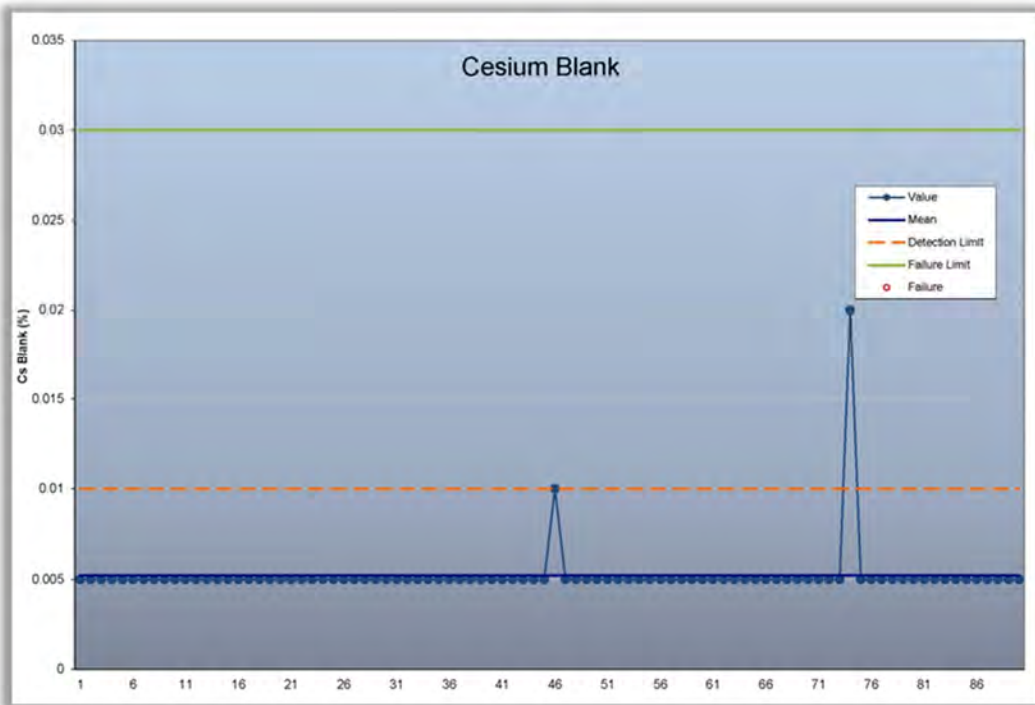


Figure 11.2 2014 Rubidium Blank Chart

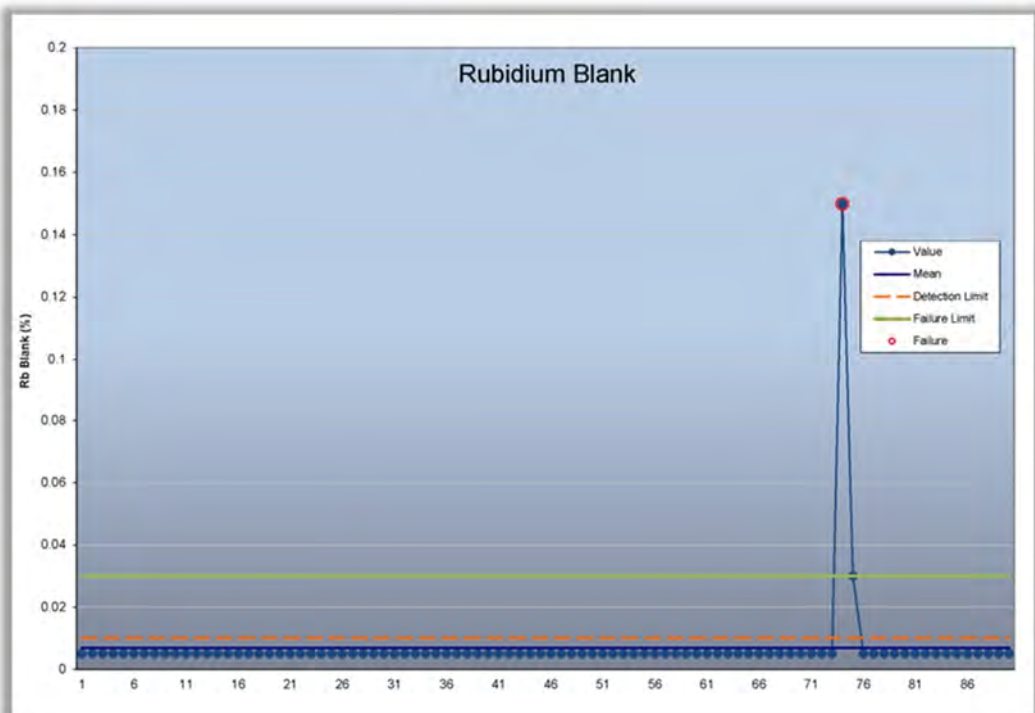


Figure 11.3 2014 Tantalum Blank Chart

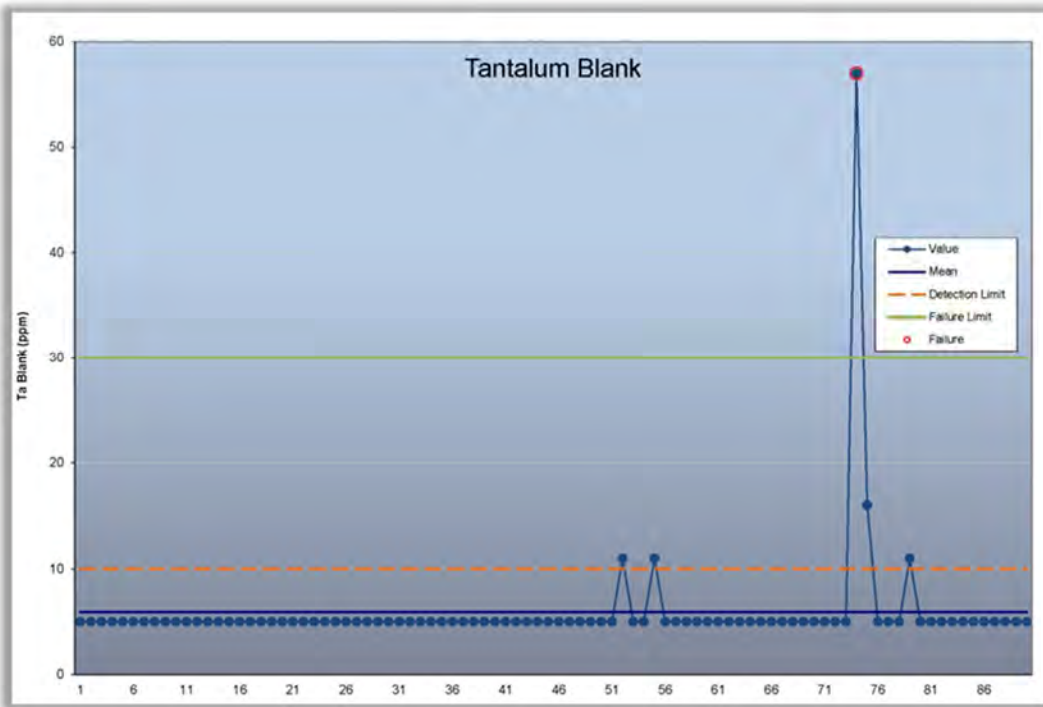
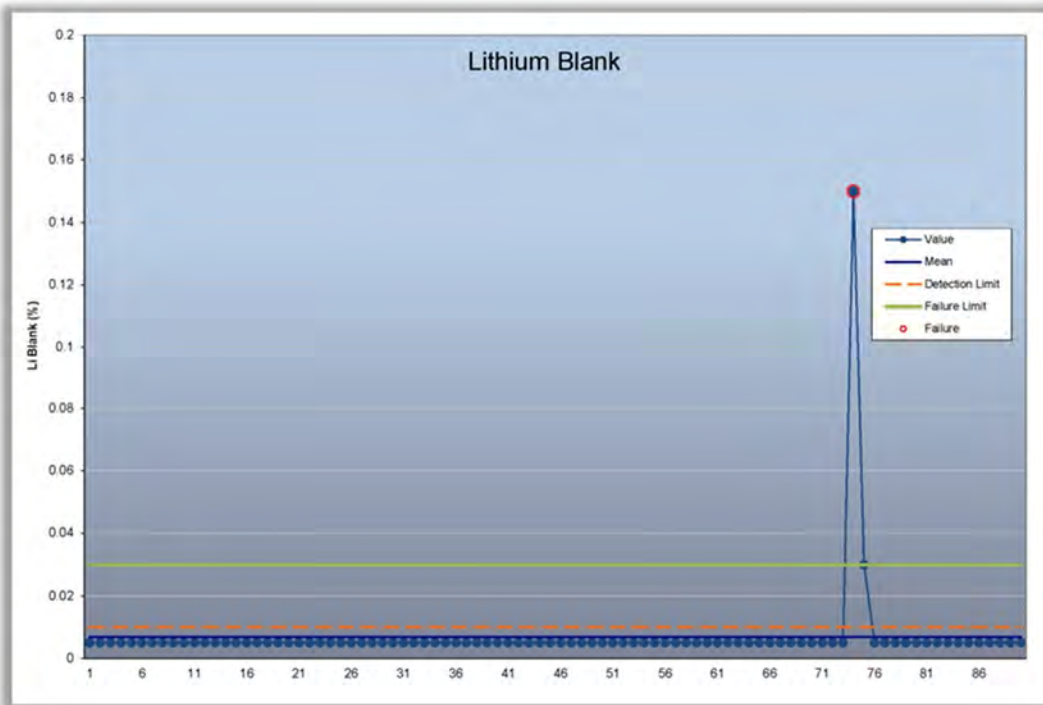


Figure 11.4 2014 Lithium Blank Chart



DUPLICATES

During the diamond drill program, 70 field duplicate samples were taken by quartering the drill core for the selected samples. The duplicate samples were inserted into the sample stream with a unique sample number. Figures 11.5 to 11.8 display the results of the duplicate analysis.

Figure 11.5 2014 Cesium Duplicate Chart

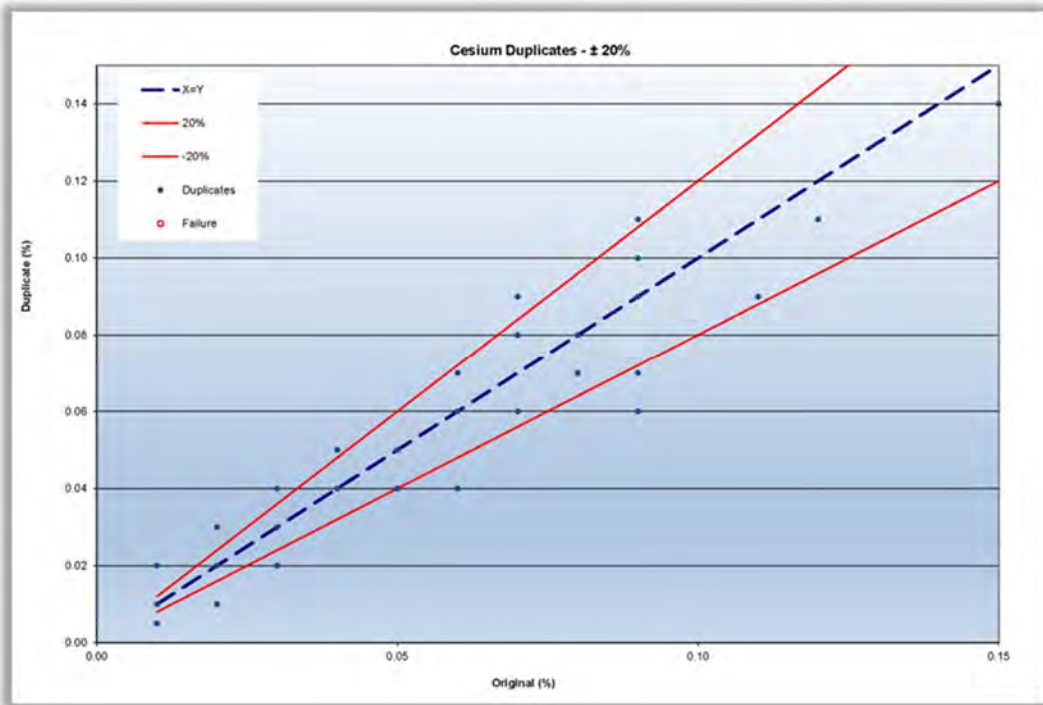


Figure 11.6 2014 Rubidium Duplicate Chart

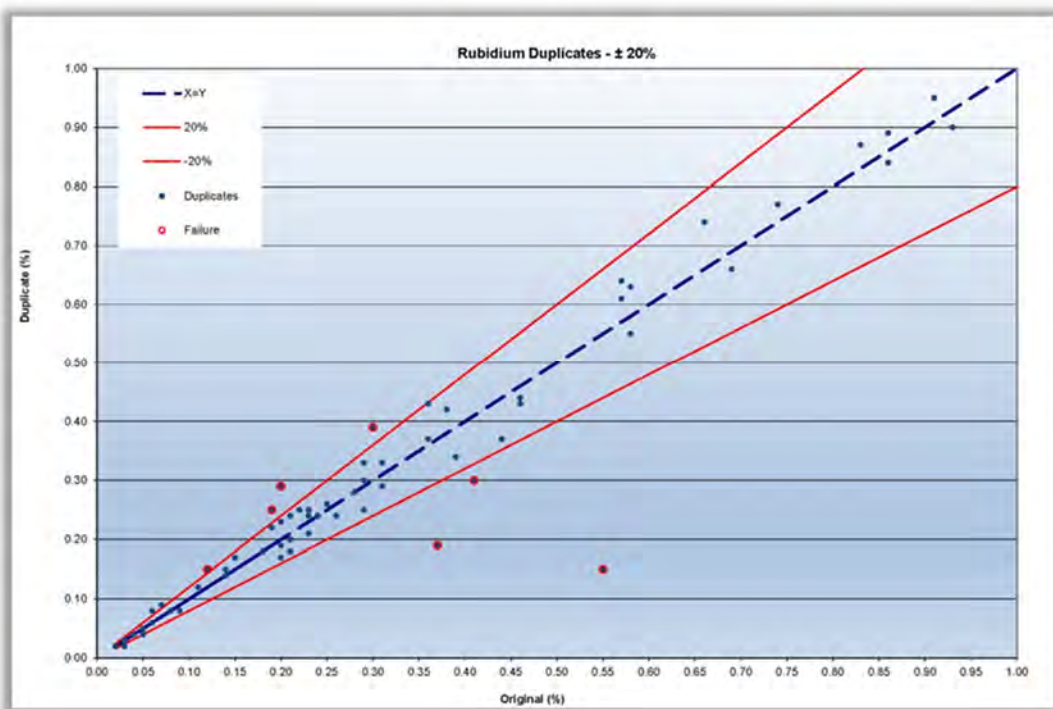


Figure 11.7 2014 Tantalum Duplicate Chart

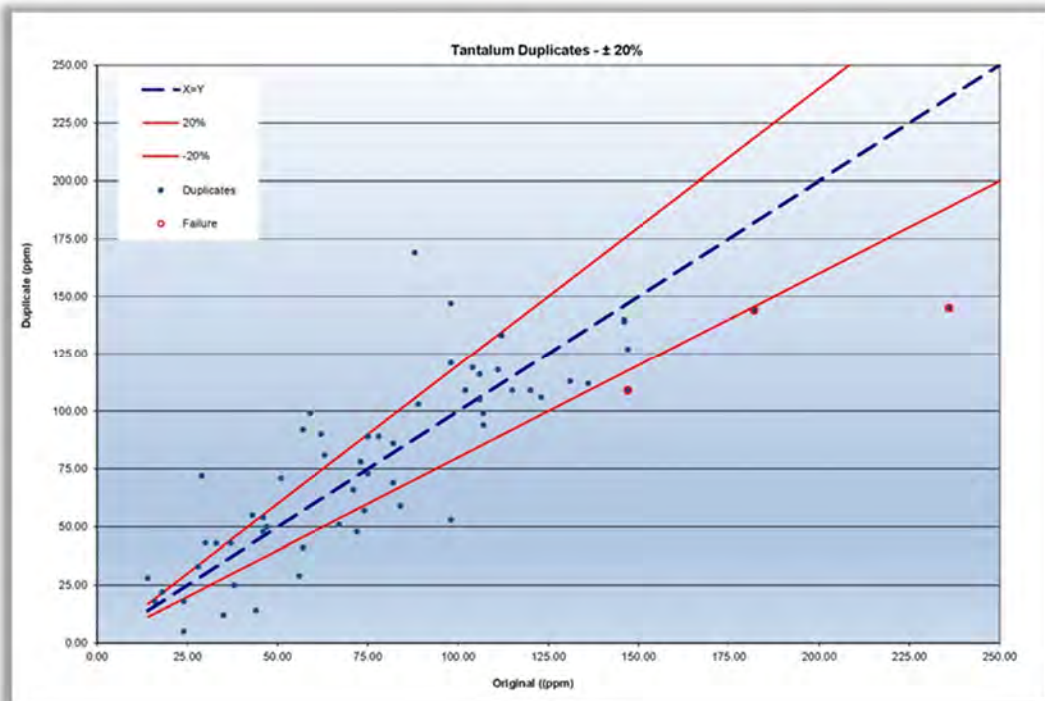
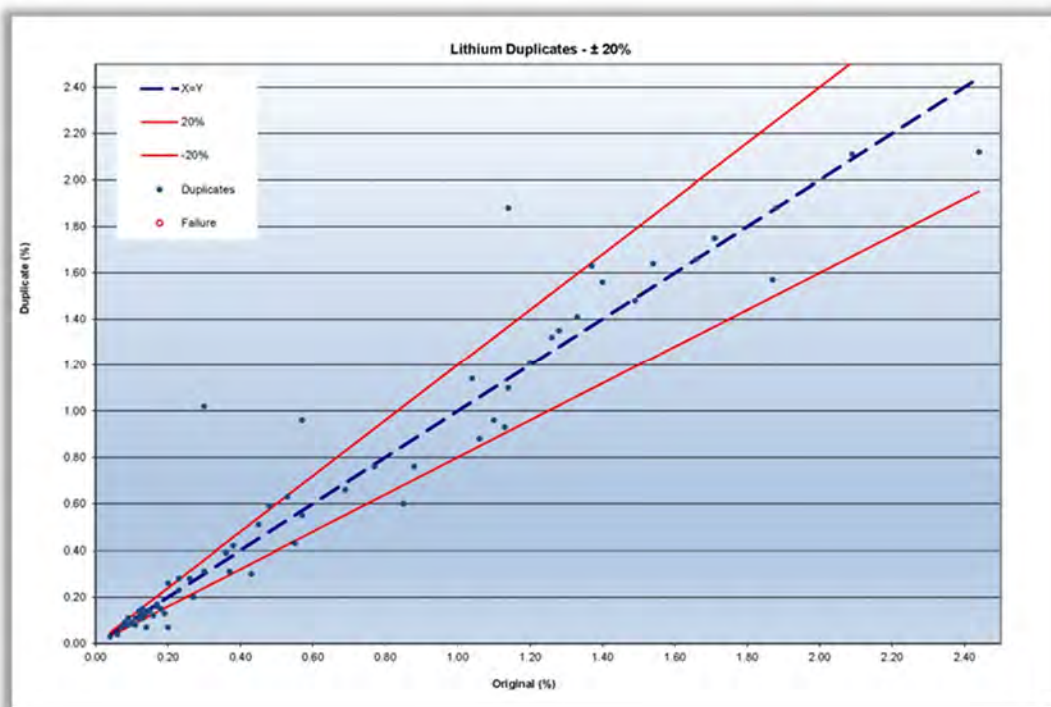


Figure 11.8 2014 Lithium Duplicate Chart



STANDARDS

Prior to the program, a set of in-house lithium-rubidium-cesium (LRC) standards was developed at Actlabs in Ancaster, Ontario, using material from the Tanco pegmatite. This material was deemed appropriate as both pegmatites have very similar mineralogy with respect to both the economic mineralogy and the matrix. The materials were blended for Li_2O and Cs_2O composition with target compositions for Li and Cs as listed in Table 11.19. No blending was done for the rubidium. The rubidium value is the inherent rubidium from the pollucite (Cs source) and the K-feldspar in the matrix.

Tantalum certified reference material (TAN-01) was purchased from Canmet in Ottawa, Ontario and used during the 2013 drilling program only. The TAN-01 standard is approximately 10 times greater than the average Ta concentration of the pegmatite so an in-house tantalum standard (PLTA-01) was developed and used during the 2014 drilling and channel sampling. The tantalum value for the PLTA-01 reference material is found in Table 11.19.

Table 11.19 Composition of Standards

CRM Designation	Target Composition			
	$\text{Li}_2\text{O}\%$	$\text{Cs}_2\text{O}\%$	$\text{Rb}_2\text{O}\%$	$\text{Ta}_2\text{O}_5\%$
LRC-1	0.86	0.66	0.80	-
LRC-2	2.38	2.23	0.60	-
LRC-3	3.39	4.34	0.48	-
LRC-4	3.36	8.49	0.45	-
PLTA-01	-	-	0.43	0.02

11.3.2 2015 QUALITY ASSURANCE / QUALITY CONTROL

The 2015 QA/QC data set is comprised of 57 sample blanks, and 80 standards.

BLANKS

For both the channel sampling and diamond drill programs, blank samples were inserted into the sample stream at an approximate interval of every 14 to 22 samples.

Lump carbonate to be used as blank material was purchased from Home Hardware in Val Caron for the Phase III program, and from Canadian Tire Corp. in Dryden for the Phase IV program. A failure of a blank is deemed to be 3 times the detection limit. Figures 11.9 to 11.12 display the results of the blank analysis.

In all four elements there is a considerable amount of noise and failures. This can be attributed to the variation in the material and the low detection limit being used in a high-grade environment. The Phase IV program was completed at AGAT and shows greater amount of variation in the results. Frontier Lithium has had discussions with AGAT on how to resolve the issues. Despite the number of failures, the values remain well below the threshold of material that could be reasonably extracted.

Figure 11.9 2015 Cesium Blank Chart

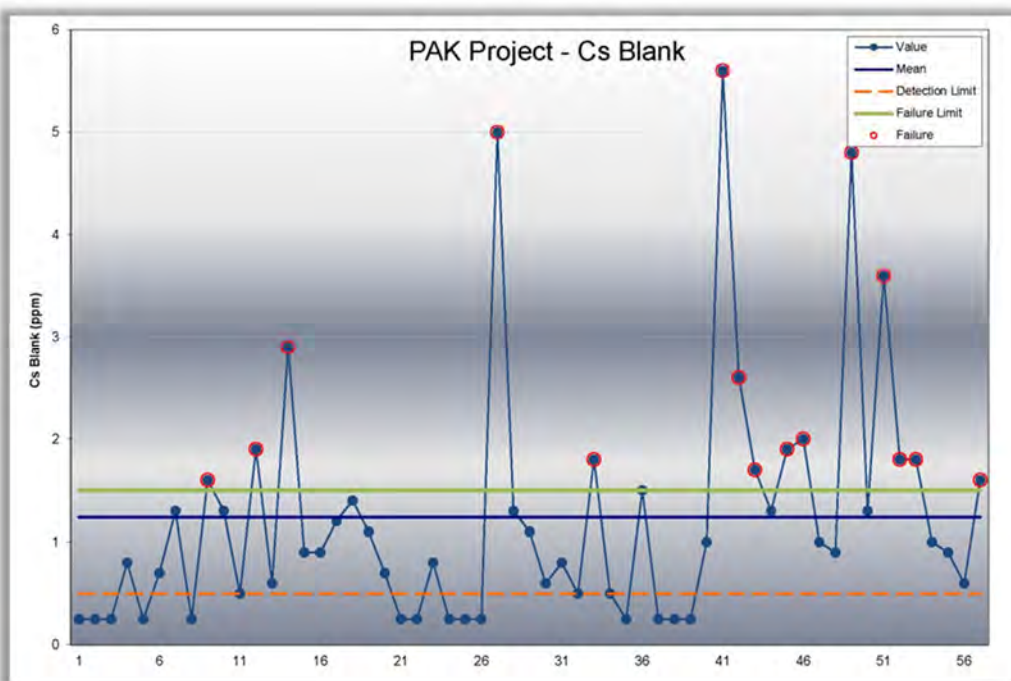


Figure 11.10 2015 Rubidium Blank Chart

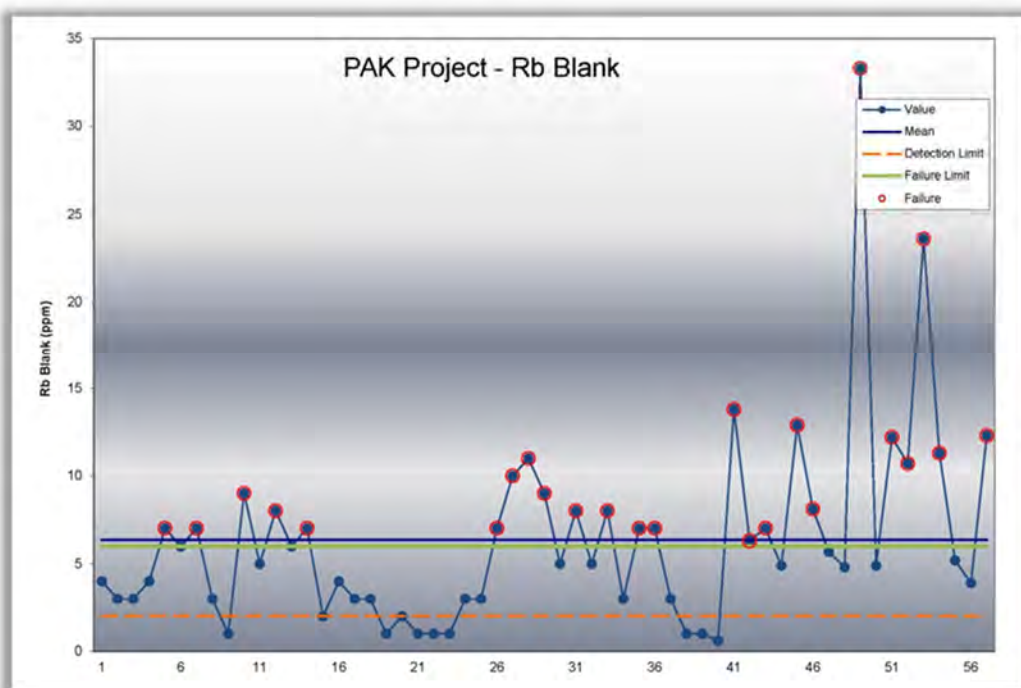


Figure 11.11 2015 Tantalum Blank Chart

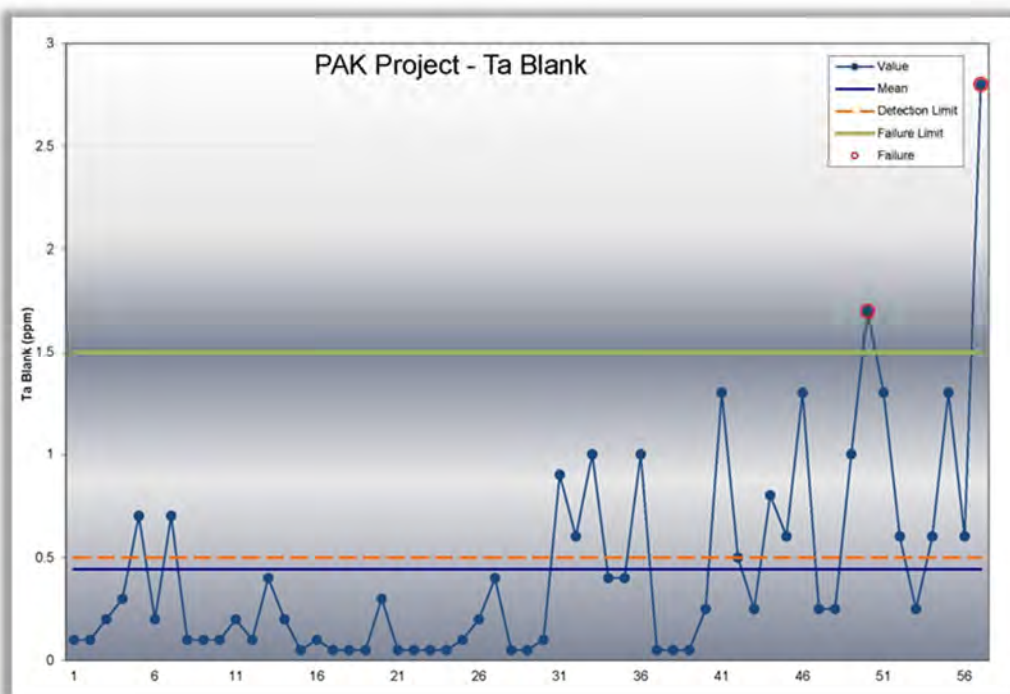
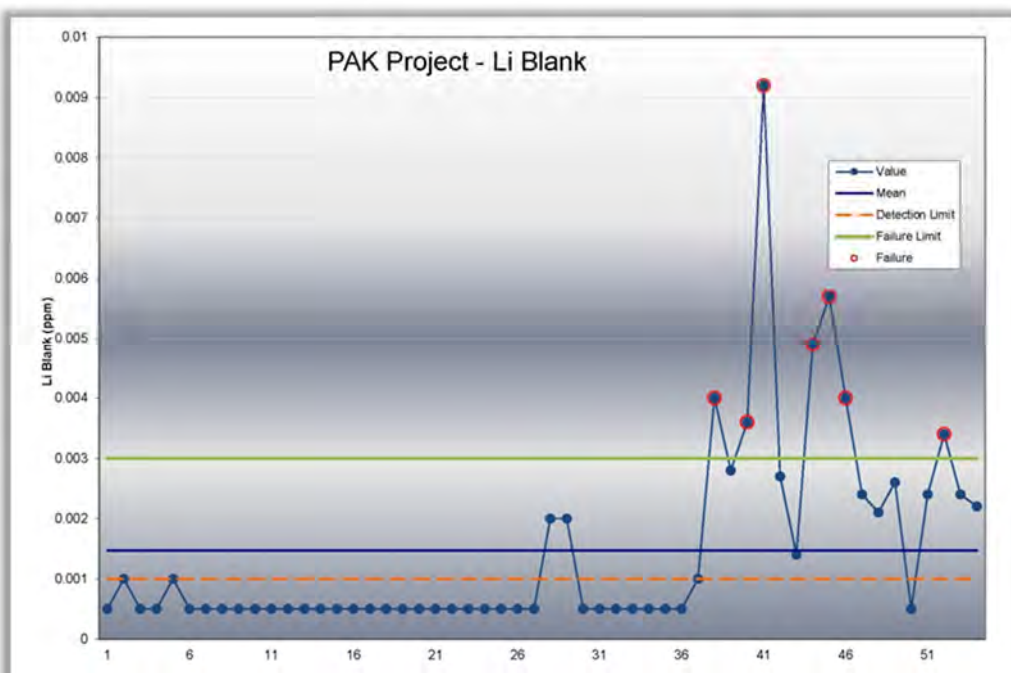


Figure 11.12 2015 Lithium Blank Chart



STANDARDS

The in-house standards developed in 2013 continue to be used in 2015.

All elements with each standard performed within the acceptable parameters for the material. The same standards were used for both Phase III and Phase IV programs despite the fact that testing was carried out in different laboratories.

The 2015 SRM control charts are found in Appendix B.

11.3.3 2017 QUALITY ASSURANCE / QUALITY CONTROL

The 2017 QA/QC data set is comprised of 17 sample blanks, and 17 standards.

BLANKS

For the diamond drill programs, blank samples were inserted into the sample stream at an approximate interval of every 14 to 22 samples.

Lump carbonate to be used as blank material was purchased from Canadian Tire Corp. in Dryden for the Phase V program. A failure of a blank is deemed to be 3 times the detection limit. No blank samples failed.

STANDARDS

The in-house standards developed in 2013 continue to be used in 2017.

No control charts were generated during the 2017 program due to the low number of samples involved. All elements with each standard performed within the acceptable parameters for the material.

11.3.4 2018 QUALITY ASSURANCE / QUALITY CONTROL

The 2018 QA/QC data set is comprised of 39 sample blanks, and 40 standards.

BLANKS

For the diamond drill program, blank samples were inserted into the sample stream at an approximate interval of every 14 to 22 samples.

Lump carbonate to be used as blank material was purchased from Canadian Tire Corp. in Dryden for the Phase VI. A failure of a blank is deemed to be 3 times the detection limit. The failure at sample B00100437 has been investigated and is a result of the material used.

STANDARDS

The in-house standards developed in 2013 continue to be used in 2018.

The charts display the typical variance within the data set.

The 2018 SRM control charts are found in Appendix B.

11.3.5 2019 QUALITY ASSURANCE / QUALITY CONTROL

The 2019 QA/QC data set is comprised of 80 sample blanks, and 82 standards.

BLANKS

For the diamond drill programs, blank samples were inserted into the sample stream at an approximate interval of every 14 to 22 samples.

Lump carbonate to be used as blank material was purchased from Canadian Tire Corp. in Dryden for the Phase VII and VIII programs. A failure of a blank is deemed to be 3 times the detection limit. Sporadic samples had individual fails. Of interest are samples 97587, 97605, and 97624. These three samples are consecutive failures.

STANDARDS

The in-house standards developed in 2013 continue to be used in 2019.

The results of the standards fell within the control limits. There is a cyclic frequency displayed with each element indicating potential analytic machine drift.

The 2019 SRM control charts are found in Appendix B.

11.4 QP'S OPINION

It is the QP's opinion that the sample preparation and analytical procedures put in place by Frontier Lithium meet acceptable industry standards and that the information can be used for geological and resource modeling.

12 DATA VALIDATION

12.1 SITE VISIT

Mr. Todd McCracken, P.Geo. visited the Property, on October 1 to 2, 2013 and again on July 13 to 14, 2015. Mr. McCracken examined the project setting, the bulk sample site, reviewed numerous drill collar sites, and channel samples.

Mr. McCracken also visited the Frontier Lithium cutting facility and core storage in Val Caron on September 30, 2013; June 7, 2014; June 20, 2015; and December 19, 2019.

12.2 INDEPENDENT SAMPLING

WSP has not collect any independent samples from drill core or channel samples.

12.3 DATABASE VALIDATION

WSP validated 100% of the digital database against the drill logs and assay certificates. No errors were identified.

All assays in the database were converted to oxide values using the conversion available on the British Columbia's Ministry of Energy and Mines website (www.empr.gov.bc.ca). Table 12.1 lists the conversion factors used.

Table 12.1 Conversion Factors

Element	Conversion	Oxide
Cs	1.06	Cs ₂ O
Rb	1.094	Rb ₂ O
Ta	1.221	Ta ₂ O ₅
Li	2.153	Li ₂ O

12.4 QP'S OPINION

It is the QP's opinion that the sampling practices of Frontier Lithium meets current industry standards. The QP also believes that the sample database provided by Frontier Lithium and validated by QP is suitable to support the resource estimation.

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 INTRODUCTION

Ore types, associated mineralogy, metallurgical sample selection, test work, process flowsheet development, and final flowsheet results are reviewed based on the following reports from SGS and XPS:

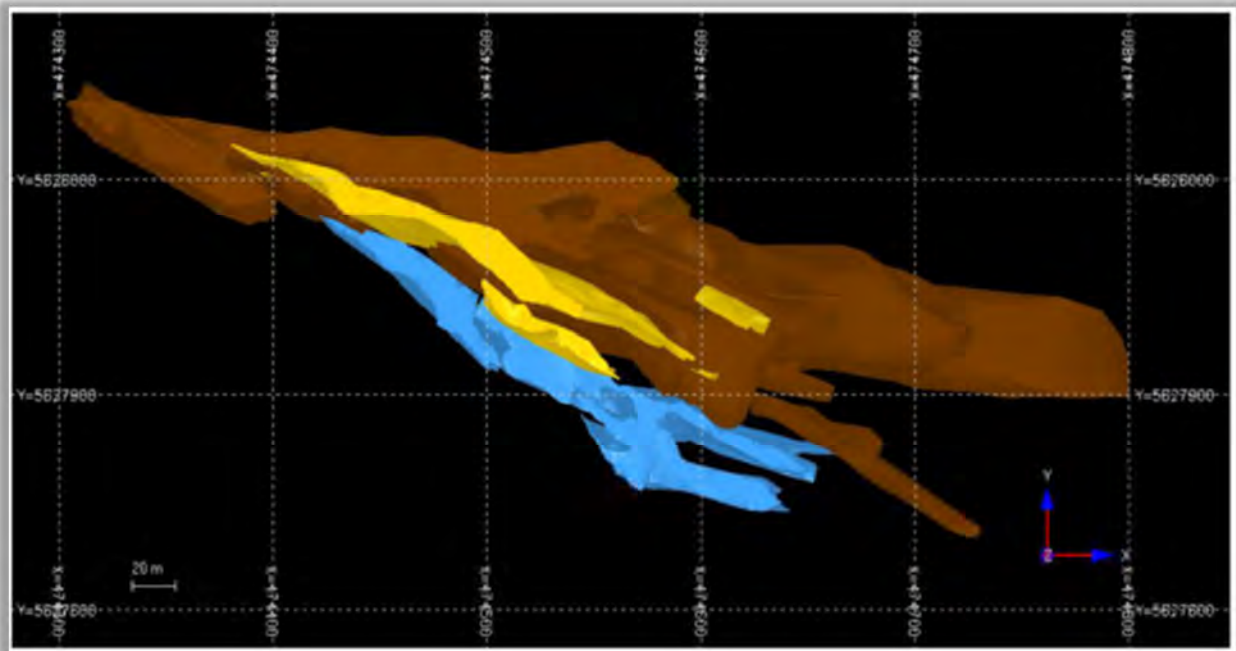
- 1 “Sample Selection Report for PAK – Ontario” SGS report 20160708 to Houston Lake Mining by Matthew Halliday, BSc, P.Ge, August 7, 2016.
- 2 “The mineralogical characteristics of fifteen (15) variability samples from the Pakeagama Lake pegmatite, NW Ontario, Canada”; SGS Report CALR-14464-004 to Houston Lake Mining, September 12, 2016.
- 3 “PAK Project Mineralogical Characterisation: LIZ, CIZ and HIZ Ore Zones”; Report to Frontier Lithium Ltd. from XPS , 17 November 2016.
- 4 “PAK Project Heavy Liquid Separation: LIZ, CIZ and HIZ Ore Zones”; Report to Frontier Lithium Ltd. from XPS; 9 January 2017.
- 5 “PAK Project Metallurgical Review: Testing on Composites FRON-10, FRON-11, FRON-12”; Report to Frontier Lithium Ltd. from XPS, April 2, 2018.

The test work referenced here has been performed well and to acceptable standards of data management and interpretation. With consideration for a few comments listed at the end of this section, the results are adequate and appropriate for the level of economic evaluation that has been performed in this study.

13.2 ORE TYPES AND DOMAIN SAMPLES

SGS completed a block model validation based on the three ore zones identified by Frontier Mining (Houston Lake Mining at the time of the report). The three ore zones, Upper Intermediate Zone (UIZ), Central Intermediate Zone (CIZ), and Lower Intermediate Zone (LIZ), are shown in plan view on Figure 13.1. The report concluded that *“The blocks are a good statistical base to represent the characteristic of the deposit at this stage”*.

Figure 13.1 CIZ Zone in Blue, UIZ in Yellow, and LIZ in Brown in Plan View



Within the three ore zones some minor sub-zonation was identified based primarily on Li_2O grades but also considering Cs, Rb, Ta, and F- assays. While spatial distribution of samples often represents the largest concern in selecting metallurgical testing, SGS concluded that “a deposit like PAK, that does not suffer greatly from various alternations, may be less likely to encounter spatial issues or large changes with depth.” SGS identified a series of variability samples for the ore zones as well as samples of the hosting granitic rock and metasediments that were sent for further characterization. The ore variability samples proved to be quite consistent mineralogically within each ore zone and support the assumption of low variability within each zone.

SGS also identified a protocol for collection and preparation of metallurgical samples that was followed for the metallurgical composites. The sample material chosen for the metallurgical composites for the PAK project were all limited to within the ultimate pit shell. One of the goals is to achieve a certain percentage of material from within the 5-year pit shell, since the first 5 years represent significant risk. For the UIZ bulk sample this is not problematic since there is plenty of sample. For the LIZ bulk sample, there needs to be some level of added channel material above the drilling to achieve a representative portion of the material from the 5-year pit shell. The addition of channel sampling makes it more difficult to match a target head grade for the ore zone or the overall composite for future testing.

The variability samples were characterized mineralogically by SGS. Subsequently additional mineralogy, hardness testing and dense media separation work was conducted on the bulk samples collected for testing by XPS.

13.2.1 UPPER INTERMEDIATE ZONE (UIZ)

The Upper Intermediate Zone (UIZ) represents the lithium zone within the pegmatite and is dominated by “SQU” (Spodumene + Quartz Intergrowth), a term used to describe an isochemical replacement of primary petalite by oriented spodumene + quartz with lesser grey K-feldspar and primary white spodumene in quartz. Phosphate minerals such as montebrasite, apatite, and lithian mica are common accessory minerals present in trace amounts.

Three variability composites were created for the UIZ zone (high fluorine, low fluorine and high lithium), and are shown in Table 13.1. The high-fluorine composite is also a low(er) grade lithium composite, but that is a function of the fluorine content. The high-fluorine composite was over 1500 ppm and the low-fluorine composite was below 800 ppm. The mineralogy was consistent between these composites.

Table 13.1 **Variability Samples in the UIZ**

Composite	Li ₂ O	Fluorine
UIZ_HF	Low	High
UIZ_LF	Medium-high	Low
UIZ_HGL	High	Low-medium

13.2.2 CENTRAL INTERMEDIATE ZONE (CIZ)

The Central Intermediate Zone (CIZ) is located in structurally higher portions of the pegmatite and represents the tantalum and rubidium zone of the pegmatite. It is the smallest of the three zones and is in contact with both the Upper Intermediate Zone (UIZ) and Upper Wall Zone. The K-feldspars are more or less completely replaced with lithian mica + quartz. In this area, veinlets and patches of lepidolite are common. Channel 1 (CH-1) contains the highest tantalum grades found to date in the exposed pegmatite, which persist in the subsurface in drillholes PL13-001 and -006, in addition to high rubidium and elevated cesium grades. Channels CH-8 and CH19 intersect the central portion of the exposed CIZ where it consists of predominantly grey K-feldspar with minor lithian mica + quartz alteration. Drillholes PL13-004 and -003 confirm the extension of the CIZ into the subsurface in this area, where it features notable centimetre-scale blebs of the rare cesium mineral pollucite, and high tantalum and rubidium grades.

In the CIZ, variability samples as shown in Table 13.2 were chosen on the rubidium to Caesium ratio above and below 8, and also on the fluorine content. Again, the variations identified for sampling were not material in the mineralogical evaluations.

Table 13.2 **Variability Samples Identified for CIZ Ore**

Composite	Rb/Cs	Fluorine	Tantalum	Rubidium
CIZ_GT8	High	-	Low	High
CIZ_LT8_High-F	Low	High	High	Med
CIZ_LT8_Low-F	Low	Low	Med	Low

13.2.3 LOWER INTERMEDIATE ZONE (LIZ)

The Lower Intermediate Zone (LIZ) comprises the bulk of the exposed pegmatite and is considered an intermediate stage zone with significant lithium, tantalum, and rubidium. The zone comprises predominantly K-feldspar, Na-feldspar, SQU, and lithian muscovite.

Variability samples were chosen on lithium grade only as shown in Table 13.3. Note that there are some small subpopulations but not of major statistical consequence. There appears to be some high fluorine samples that are associated with high P_2O_5 and potentially high Nb_2O_5 and normal lithium grades, as well as a high rubidium population with low-grade lithium and high K_2O . As the project continues, it may be important to monitor sub-populations. The medium grade selected was 1.7% Li_2O however with dilution the final medium grade was around 1.45% Li_2O . This variability in head grade has the greatest potential to impact metallurgical performance but can be mitigated by a robust flowsheet design.

Table 13.3 Variability Samples Identified in the LIZ

Composite	Li_2O
LIZ_HGL	High
LIZ_MGL	Medium
LIZ_LGL	Low

13.3 MODAL MINERALOGY AND LITHIUM CONTENT

Examination of three samples (UIZ, CIZ, LIZ) provided by Frontier Lithium has shown the lithium in both UIZ and LIZ ore to be predominantly associated with quartz-spodumene intergrowth (SQUI). In the UIZ ore this is virtually the only mineral texture, but in LIZ there is a mixture of SQUI and about 50% feldspars, unassociated quartz, and muscovite. In the CIZ sample there is relatively little SQUI, with much more feldspar/quartz and micas, including lepidolite which carries about half of the lithium values for this ore type.

The mineral constituents the three ore zones are summarized on Figure 13.2, and the average characterization of Li_2O as determined by laser ablation (LA-ICMS) in each mineral species is shown in Table 13.4. No systematic difference was observed between the analyses from zone to zone, so that the compositional analyses presented here are believed to represent “average” mineral compositions valid for all ore zones.

The UIZ sample consisted almost entirely of spodumene (55.5%) and quartz (40%), with minor feldspars, micas and accessory minerals making up the balance. The LIZ sample had less spodumene (24.7%), coincident with the appearance of significantly more feldspars (27.5%) and micas (10%), again with minor accessory minerals. In the CIZ sample, there was considerably less spodumene (6.2%), and an increase in the mica quantity (18%), notably with the appearance of significant quantities of lepidolite.

Figure 13.2 Modal Mineralogy for Three Ore Zones Showing Dominant Mineral Phases

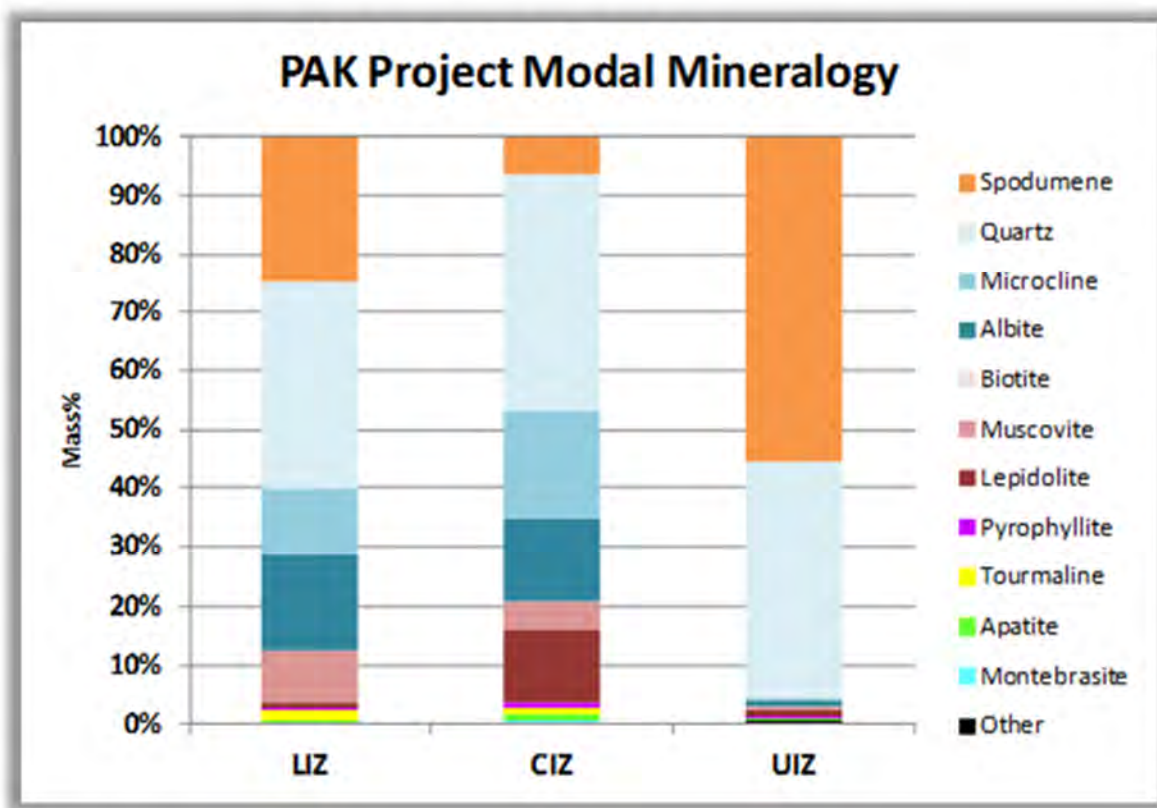
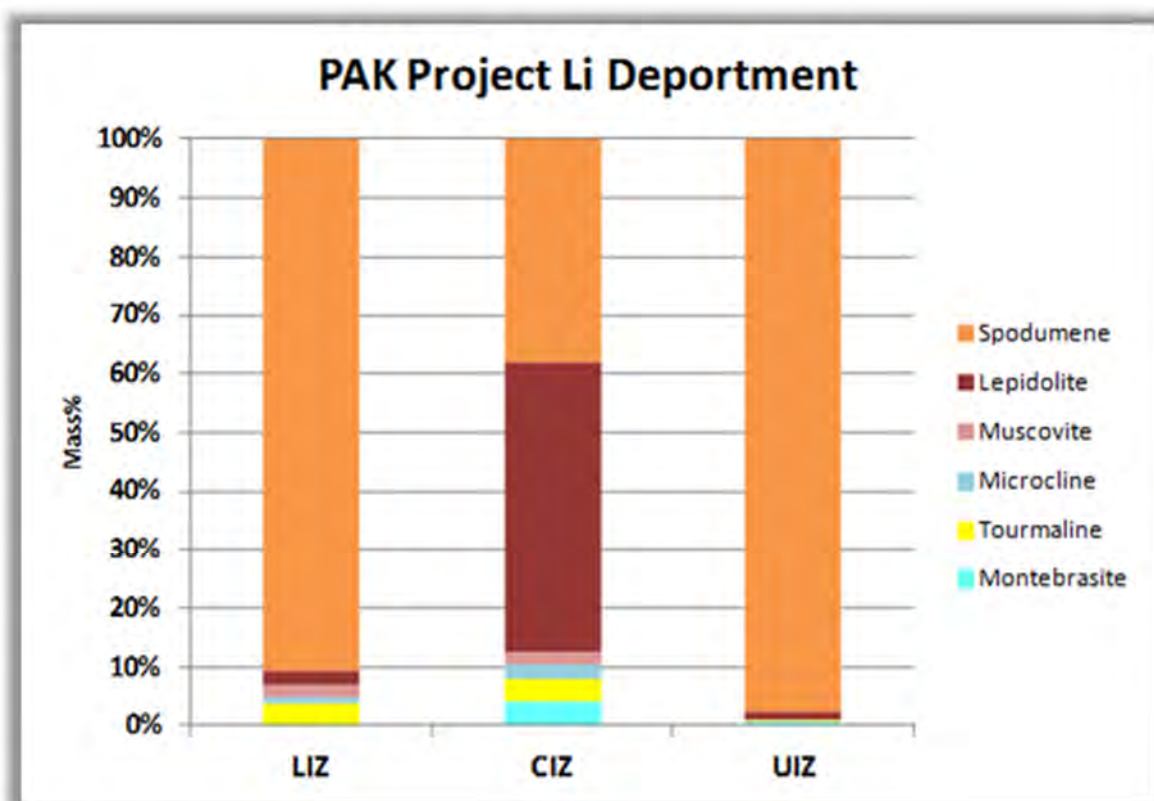


Table 13.4 Average Li Concentrations Determined by LA-ICP-MS (wt%)

	Li ₂ O%	Min	Max	SD	n
Spodumene	7.9	4.2	9.0	1.1	44
Li Mica 1 (Lepidolite)	5.3	4.6	6.5	1.0	3
Li Mica 2 (Muscovite)	0.5	0.3	7.9	0.2	9
Microcline	0.2	0.1	0.4	0.1	12
Albite	ND	ND	0.0	ND	ND
Tourmaline (Elbaite)	4.2	4.0	4.4	0.2	3
Montebrazite	11.1	11.0	11.2	0.1	3
Apatite	ND	ND	ND	ND	1

The lithium deportment (percent of total Li in present each sample) is illustrated on Figure 13.3. Spodumene is overwhelmingly the dominant lithium carrier in UIZ ore, accounting for 97.7% of the lithium content. In the LIZ ore, there is a slightly higher importance of secondary mineral carriers for Li, with spodumene deportment falling to 90.6% and the remainder found in secondary carriers including tourmaline (3.8%) and micas (4.6%). The CIZ ore zone shows different properties from the other two, in this case presenting only 37.8% of the lithium in the form of spodumene. For the CIZ sample, lepidolite is the most important carrier at 49.7%, with other accessory minerals contributing just over 10% of the lithium.

Figure 13.3 Lithium Department by Mineral in Each Ore Zone



It is clear from Figure 13.3 that the recovery of lithium in the process will be dependent on the recovery of spodumene and lepidolite. Lithian muscovite mica and tourmaline will need to be rejected to meet concentrate quality targets and their rejection will result in some lithium losses.

13.4 METALLURGICAL TEST WORK

Bulk samples from each of the ore zones were collected following the guidelines from the SGS sample selection report, including some channel samples from within the pit shell of the deposit, and these were sent to XPS for metallurgical test work. Samples of the hosting granite and metasediments were included in the sample suite. The original samples provided by Frontier were crushed and blended into individual ore components, which were assayed in duplicate. The average assays are shown in Table 13.5.

Table 13.5 PAK Project Bulk Samples for Metallurgical Testing

	Li ₂ O %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	K ₂ O %	P ₂ O ₅ %	Cs ppm	Rb ppm	Ta ppm	Nb ppm	F- ppm	B ppm
CIZ	1.23	14.3	75.5	0.30	1.97	4.82	0.62	967	5925	142	69	9930	336
UIZ	4.68	17.4	77.4	0.11	0.35	0.24	0.11	304	309	14	2	700	20
LIZ	1.89	16.0	73.3	0.47	2.36	2.78	0.20	271	2750	135	46	1275	286
Granite	0.18	13.4	75.7	0.94	3.65	4.27	0.07	425	875	7	12	1080	71
Metaseds	0.17	8.0	62.5	20.7	0.35	0.60	0.16	80	358	8	8	920	320

The Li₂O grades for the samples from each ore zone are undiluted and weighted slightly to the higher-grade samples within the variability range that will be mined in the early pit life. In several cases, the higher Li₂O grades come with higher associated tourmaline and mica. While these samples may not be an ideal representation of the zones, they are adequate for the test work that has been completed at this stage of the project. Risks and issues for consideration for further test work are discussed later in this section of the report.

Ultimately, the sample of LIZ material was exhausted in early stage test work and a second LIZ sample was provided that was used for the blended composite for locked cycle testing. This second LIZ sample was similar but not identical to the first received from Frontier. The sample was taken from a higher-grade section of Channel 28 with a head grade of 2.51 Li₂O. While this is significantly higher than the 1.89% originally provided, this channel also contains higher tourmaline. It is still within the variability anticipated from the LIZ.

13.4.1 HARDNESS TESTING

A summary of the measured hardness data for the samples is presented in Table 13.6.

Table 13.6 Summary of Hardness Parameters from PAK Project Samples

Sample Name	JK Parameters		Hpi	RWI	BWI	AI
	Rel.	A x b	kWh/t	kWh/t	kWh/t	g
UIZ Comp 1	2.93	55.0	12.2	14.7	17.7	1.078
LIZ Comp 2	2.74	85.2	9.6	9.2	16.1	0.573
CIZ Comp 3	2.69	82.8	10.9	10.2	16.9	0.515

For coarse breakage the rock is relatively soft. The SAG work index (SMC and JK Parameters in the Table) as measured by the Axb shows the UIZ ore to be hardest at 55.0, but this still represents a moderately soft ore (36 percentile in the SGS database). The other ores fall in the 16-17 hardness percentile, indicating soft coarse ore.

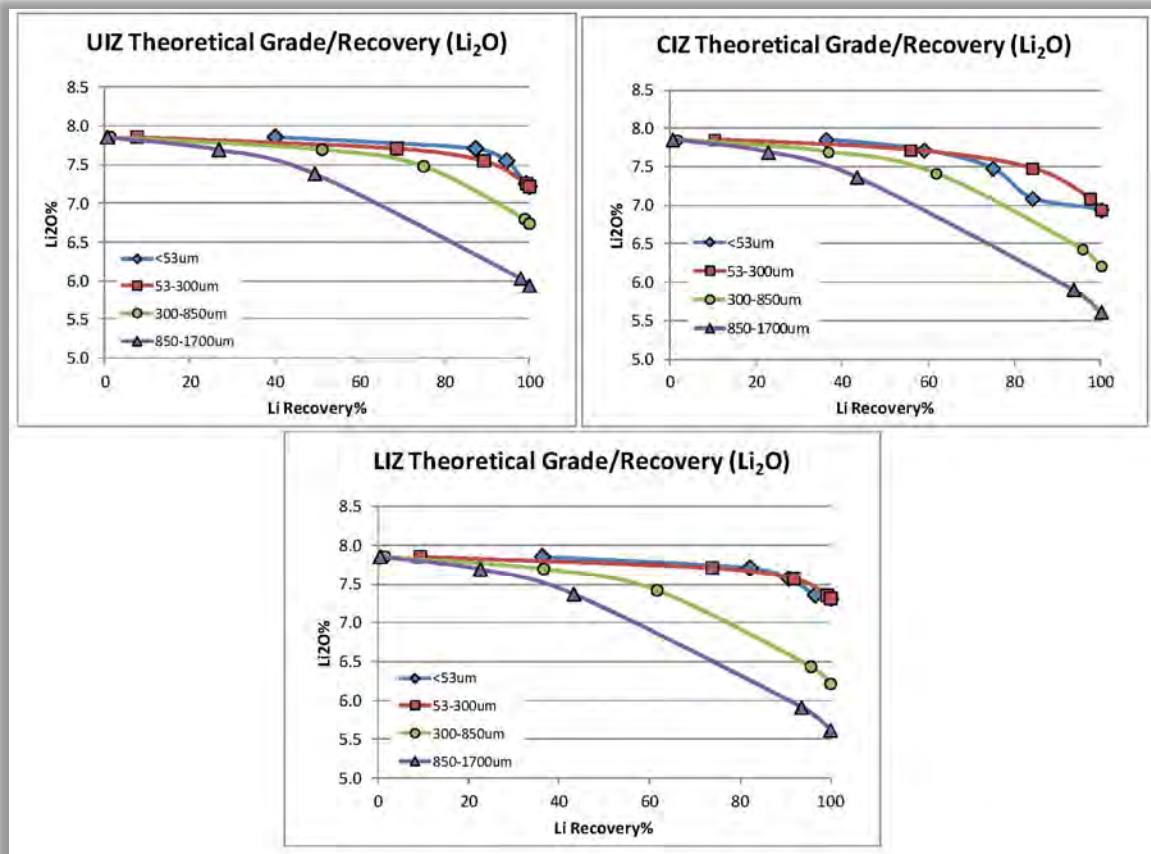
As with the SAG characterization, the Rod Mill Work Index shows the UIZ ore to be the most competent ore with a RMWI of 14.7 kWh/t, which is considered to be an “average” ore hardness. The other ores (LIZ, CIZ) are distinctly softer, at 9.2 and 10.2 kWh/t, respectively, which places them approximately below the 10th percentile of Rod Mill hardness.

Fine breakage parameters show that the hardness of the ore at fine sizes is distinctly greater than the coarse hardness. The Bond Ball Mill work index for UIZ ore remains the largest of the three, at 17.7 kWh/t. The LIZ and CIZ ores are softer at 16.1 and 16.9 kWh/t respectively, but all of the ore types are hard in fine grinding, falling between the 70th and 82nd percentile in the hardness database.

13.4.2 TARGET GRIND / LIBERATION SIZE

Spodumene separability curves as a function of particle size can be calculated from the detailed size by size liberation and grain size data obtained from the crushing and mineralogical data for each zone. The respective separability curves are presented on Figure 13.4. It should be noted that these charts represent spodumene separability rather than lithium separability, which is significant for CIZ ore where only about half of the lithium is in the form of spodumene. Liberation data indicates that the “liberation size” of spodumene in SQUI is in the order of 300 μm . It is still possible to do a partial separation at sizes greater than this. For example, at a threshold grade target of 7% Li_2O it is possible to achieve 60% spodumene recovery from particles in the 850-1700 μm size range, and 80-90% recovery from particles in the 300-850 μm size range.

Figure 13.4 Spodumene Grade / Recovery Relationship as a Function of Particle Size



13.4.3 DENSE MEDIA SEPARATION

Overall, there is little prospect of upgrading the UIZ ore to a direct saleable concentrate but test work was completed to evaluate the rejection of barren rock material from the LIZ. Ultimately the LIZ sample that was used to create the composite for locked cycle testing (FRON-12) was upgraded based on a 2.65 specific gravity float/sink process in the laboratory using -6.5 mm crushed material. The balance is shown in Table 13.7 and demonstrates that greater than 90% of the Li_2O was recovered into less than 60% of the mass from this bulk sample. The upgrading (2.51 to 3.98% Li_2O) is significant and represents an important design consideration to reduce the equipment size and energy requirements in the grinding circuit.

Table 13.7 DMS on LIZ Ore Sample

SG=2.65		Mass	Li_2O	Al_2O_3	SiO_2	Fe_2O_3	Na_2O	K_2O	P_2O_5	Cs	Rb	Ta	Nb	F-	B
	Recalc Head	205780	2.51	16.85	74.05	0.13	1.35	4.40	0.23	414	5368	57	28	854	59
	1.0 – 6.5 mm	157880	2.42	17.18	73.19	0.12	1.36	4.90	0.23	447	6013	56	28	898	51
	0.3 – 1.0 mm	27250	3.13	17.16	74.31	0.14	1.06	3.19	0.20	343	4037	45	18	741	81
	<0.3 mm	20650	2.39	13.90	80.30	0.18	1.68	2.24	0.25	256	2190	80	44	670	90
Floats	1.0 – 6.0 mm	72300	0.41	16.2	72	0.082	2.16	8.81	0.252	689	11000	54	26	860	56
Floats	0.3 – 1.00 mm	15520	1.02	12.9	78.7	0.084	1.55	4.88	0.182	474	6280	11	8	840	25
Sinks	1.0 – 6.0 mm	85580	4.11	18	74.2	0.16	0.675	1.59	0.21	242	1800	58	29	930	47
Sinks	0.3 – 1.0 mm	11730	5.92	22.8	68.5	0.222	0.401	0.957	0.216	169	1070	91	32	610	155
Undersize	<0.3 mm	20650	2.39	13.9	80.3	0.184	1.68	2.24	0.246	256	2190	80	44	670	90
Floats		87820	0.52	15.6	73.2	0.08	2.05	8.12	0.24	651	10166	46	23	856	51
Sinks+USize		117960	3.99	17.8	74.7	0.17	0.82	1.64	0.22	237	1796	65	32	853	65
R%(Sinks+UF)		57.3	91.2	60.4	57.8	73.5	35.0	21.4	54.9	32.9	19.2	65.4	65.3	57.2	63.4
Calculated Upgraded LIZ			3.99	17.8	74.7	0.17	0.82	1.64	0.22	237	1796	65	32	853	65
Measured Upgraded LIZ			3.98	17.6	74.9	0.21	0.81	1.50	0.20	236	1690	131	42	770	66
Call Factor															

This DMS-upgraded LIZ composite was blended with the other ore components to create sample FRON-12 that was used to demonstrate the flowsheet for the economic evaluation.

Based on the assays of the float fractions and a modeling exercise, it is reasonable to expect that a lower-grade spodumene sample could incorporate significantly increased levels of granitic material either from in-situ ore association or host rock dilution and perform the same upgrade with minimal additional losses of Li_2O recovery to the DMS sinks.

13.4.4 METALLURGICAL COMPOSITE FOR FLOWSHEET DEMONSTRATION

The recipe and assay of the composite FRON-12 that was used to develop, demonstrate, and validate the proposed mill flowsheet is shown in Table 13.8. The FRON-12 sample used the original UIZ and CIZ component samples received by XPS. The second LIZ bulk sample was upgraded by DMS to reduce the mass and increase the Li_2O content in the blended composite. Granite was added as a dilution element.

Early test work highlighted the detrimental impact that the metasediments had on concentrate quality because of the high iron content present in very low mass. This led to a decision to take advantage of the clear contacts between the ore zones and the metasediments, and alter mine plans and methods to eliminate contamination in the feed blend. As such, while the metasediments were a part of the early testing program, they were omitted from this composite.

Table 13.8 FRON-012 Blend of FRON-010 Components with New Sample of DMS-Upgraded LIZ

FRON-012	Mass %	Li ₂ O %	Al ₂ O ₃ %	SiO ₂ %	Fe ₂ O ₃ %	Na ₂ O %	K ₂ O %	P ₂ O ₅ %	Cs ppm	Rb ppm	Ta ppm	Nb ppm	F ppm	B ppm
CIZ	1	0.01	0.1	0.8	0.00	0.02	0.05	0.01	10	59	1	1	99	3
UIZ	15	0.70	2.6	11.6	0.02	0.05	0.04	0.02	46	46	2	0	105	3
Upgr. LIZ	80	3.15	14.1	59.9	0.17	0.64	1.20	0.16	189	1352	105	34	616	53
Granite	4	0.01	0.5	3.0	0.04	0.15	0.17	0.00	17	35	0	0	43	3
Metaseds	0	0.00	0.0	0.0	0.00	0.00	0.00	0.00	0	0	0	0	0	0
	Calc	3.87	17.4	75.3	0.22	0.86	1.45	0.18	261	1493	109	35	864	62
	Assay	3.94	16.7	75.1	0.20	0.84	1.42	0.22	247	1540	83	24	850	28
Call Factor	Percent	102%	96%	100%	89%	98%	98%	120%	95%	103%	76%	68%	98%	45%

13.5 PROCESS OBJECTIVES AND IMPURITY ELEMENTS

Spodumene is often used in glasses, glass-ceramics, porcelain enamels, and glazes. There are multiple product specifications depending on clients and end uses. Ultimately, contracts are negotiated directly with purchasers and some flexibility exists to trade premium pricing for impurity elements depending on the application. Two potential markets are driving the concentrate production for this project. The first is a high-purity, technical grade product suitable for glass making. The second is a chemical grade product that is used for the production of precipitated lithium carbonate or hydroxide.

Typical specifications for technical grade concentrate can be found in public sources; for example, one such specification is presented for Abermarle Product 402200 (Spodumene Concentrate SC 7.0, CAS 1302-37-0) in which the chemical specifications are as shown in Table 13.9.

Table 13.9 Abermarle SC 7.0 Chemical Specification

	Specification	Method
Li ₂ O	Min 7.0%	AAS
Al ₂ O ₃	Min 24.5%	XRF
SiO ₂	Min 63.5%	XRF
Fe ₂ O ₃	Max 0.17%	XRF
Na ₂ O	Max 0.5%	XRF
K ₂ O	Max 0.5%	XRF
P ₂ O ₅	Max 0.5%	XRF

It is reiterated that in practice, there are a variety of product grades and specifications that are negotiated specifically between suppliers and individual consumers. Table 13.9 is provided for illustrative purposes only.

Chemical grade spodumene has less rigorous specifications than technical grade, since the spodumene itself is only an intermediate product used in the production of final product carbonates or hydroxides. In general, the economics of spodumene decrepitation, leaching and precipitation for the chemical industry requires the spodumene concentrate to present a Li₂O grade in excess of 5.0-5.5%, with a target iron content lower than 1%.

Tantalum is present in the ore and could represent a desirable (potentially marketable), value-added product. Currently, the sample population is too small to gather usable data regarding precise mineralogy or grain sizes but this may be considered in further development work.

13.6 FLOWSHEET DEVELOPMENT

Figure 13.5 Conceptual Mill Flowsheet



13.6.1 LOCKED CYCLE PROCESS VALIDATION AND REAGENT SUITE

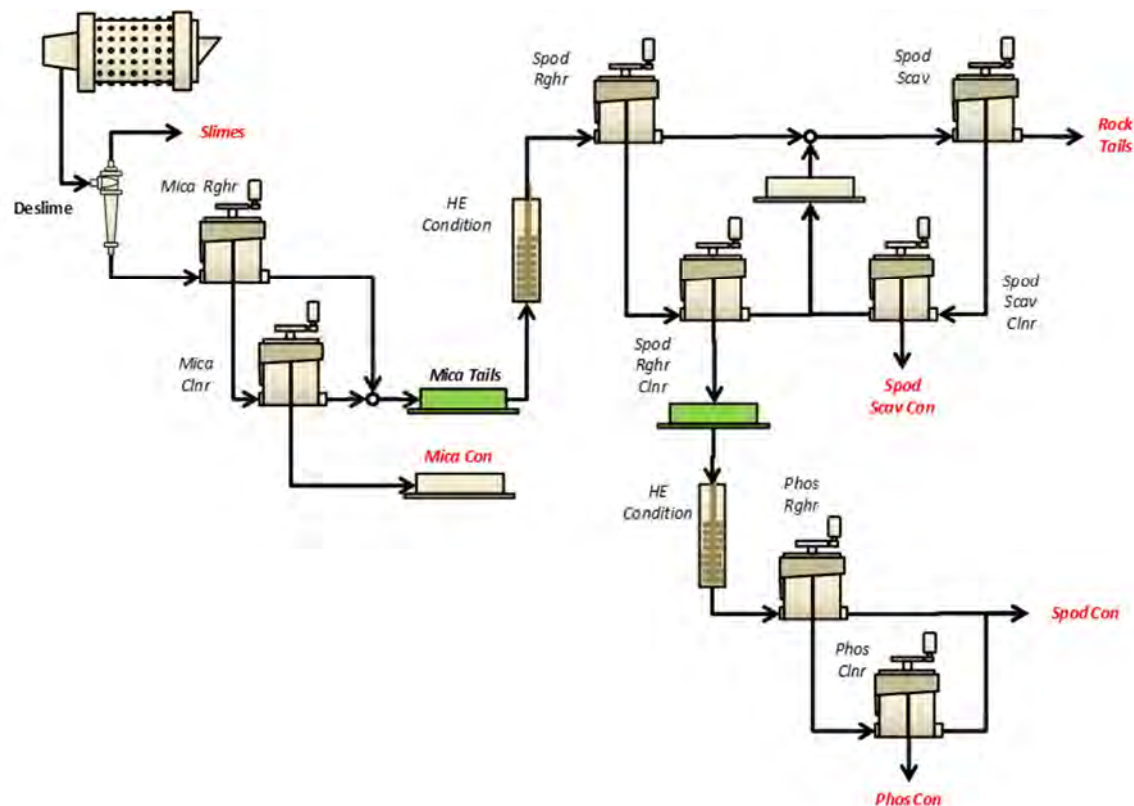
Sample FRON-12 was used to demonstrate the conceptual flowsheet in a locked cycle process evaluation.

While there are several steps involved, the flowsheet is relatively simple with only one recycle loop in the scavenger cleaner circuit. The mass flows in the locked cycle test were very stable.

The detailed locked cycle flowsheet is shown on Figure 13.6. The feed at a grind P80 of 200 μm was deslimed at $\sim 10 \mu\text{m}$, then floated at pH 3.5 (mica float) in the presence of 200 g/t Clariant Flotigam EDA and 100 g/t oleylamine. The mica tailings were dewatered, repulped, and energetically conditioned at 50% solids in an attrition cell. Spodumene was then floated at pH 8.5 (NaOH) using a mixture of 30% Clariant FS/2 and 70% oleic acid (700 g/t in the spodumene rougher, and the same quantity in the spodumene scavenger). The cleaned spodumene rougher concentrate was conditioned with 100 g/t WW82 dextrine prior to reverse flotation of phosphates from spodumene. The reverse flotation tailings and the cleaner scavenger concentrate comprised the high-grade (technical) spodumene concentrate, and the phosphate concentrate comprises the chemical-grade spodumene concentrate.

For the flowsheet to be complete, one needs to include gravity removal of tantalum and WHIMS removal of iron. Both of these unit operations require more mass than was generated in the locked cycle test; therefore, a series of concentrate generation tests was conducted to create sufficient bulk to do a conceptual gravity and magnetic separation on concentrates to demonstrate the viability of contaminant removal.

Figure 13.6 Detailed Locked Cycle Process Flowsheet



13.6.2 LOCKED CYCLE PERFORMANCE RESULTS

Table 13.10 lists the products of the locked cycle test on a cycle by cycle basis. During the course of the experiment, a change was made after Cycle 3 to the reagent dosage in the spodumene rougher and scavenger, reducing the collector from 700 g/t per stage down to 350 g/t per stage. This change was made in response to visual appearance of the froth, but proved to be a detrimental move. The rock tailings lithium content in Cycles 1, 2, 3 was 0.48%, 0.97%, and 0.44% Li₂O for the first three cycles. After cutting the collector by half, the rock tailings grades rose to 1.59%, 1.15%, and 1.05% Li₂O, and the mass increased significantly for the last three cycles indicating that insufficient collect was available to recover the spodumene.

Table 13.10 FRON-12 Float 18 Locked Cycle Product Assays

			Mass	Li2O	Al2O3	SiO2	Fe2O3	Na2O	K2O	P2O5	Cs	Rb	Ta	Nb	F-	B
CYCLE 1	ASSAY 0118	Slimes	38.3	2.86	16.6	68.7	1.50	1.25	2.69	0.45	512	2690	47	23	2040	91
	ASSAY 0119	Mica Con	261.3	2.43	16.9	69.4	0.79	1.37	3.62	0.22	740	4250	57	33	4810	102
	ASSAY 0120	ScavClnr Con	366.2	7.00	24.0	64.1	0.36	0.34	0.23	0.20	66	255	93	37	370	75
	ASSAY 0122	Phos Tails	245.9	7.04	24.8	63.7	0.24	0.28	0.30	0.11	85	423	162	63	560	54
	ASSAY 0123	Phos Con	196.2	7.10	25.0	62.3	0.59	0.27	0.19	0.67	54	261	51	23	680	280
CYCLE 2	ASSAY 0121	Rock Tails	702.3	0.48	6.4	86.5	0.03	1.47	2.06	0.04	283	1840	12	4	250	10
	ASSAY 0124	Slimes	34.9	2.93	16.9	67.8	1.65	1.25	2.77	0.47	522	2890	56	27	2090	107
	ASSAY 0125	Mica Con	303.8	2.48	16.6	68.9	0.78	1.34	3.59	0.25	712	4400	54	32	4600	128
	ASSAY 0126	ScavClnr Con	684.6	7.22	24.1	64.1	0.35	0.30	0.15	0.19	47	162	153	54	280	65
	ASSAY 0128	Phos Tails	147.4	7.20	24.8	63.4	0.36	0.24	0.10	0.21	39	134	174	58	280	101
CYCLE 3	ASSAY 0129	Phos Con	118.0	7.10	23.8	59.7	1.04	0.28	0.13	1.60	44	198	55	22	1000	615
	ASSAY 0127	Rock Tails	822.1	0.97	7.8	85.1	0.06	1.39	2.00	0.04	300	1890	22	7	330	10
	ASSAY 0130	Slimes	29.4	2.93	16.2	67.5	1.67	1.28	2.71	0.48	526	2970	56	27	1980	107
	ASSAY 0131	Mica Con	276.8	2.80	18.1	65.7	0.81	1.26	3.70	0.35	810	4890	70	43	5310	154
	ASSAY 0132	ScavClnr Con	480.4	7.00	23.9	64.9	0.31	0.31	0.17	0.14	52	170	123	44	230	46
CYCLE 4	ASSAY 0134	Phos Tails	254.7	7.20	25.2	64.8	0.33	0.25	0.07	0.15	30	73	132	56	180	64
	ASSAY 0135	Phos Con	43.4	7.26	25.3	63.1	0.69	0.23	0.07	0.94	29	87	39	17	560	394
	ASSAY 0133	Rock Tails	763.3	0.44	6.3	87.5	0.03	1.48	2.12	0.04	285	1960	23	7	260	10
	ASSAY 0136	Slimes	27.0	2.80	17.1	68.1	1.76	1.24	2.79	0.51	550	3140	52	25	2040	109
	ASSAY 0137	Mica Con	254.9	2.71	19.9	70.4	0.96	1.36	4.26	0.37	885	5600	66	42	5560	176
CYCLE 5	ASSAY 0138	ScavClnr Con	612.3	7.20	24.6	64.7	0.41	0.27	0.14	0.22	51	175	81	33	270	74
	ASSAY 0140	Phos Tails	119.1	7.10	25.5	64.4	0.43	0.25	0.12	0.44	42	181	49	17	430	202
	ASSAY 0141	Phos Con	23.4	7.16	24.6	60.5	0.97	0.27	0.18	1.54	53	283	28	11	1140	636
	ASSAY 0139	Rock Tails	960.9	1.59	9.3	83.8	0.04	1.26	1.78	0.03	242	1690	76	28	210	10
	ASSAY 0142	Slimes	28.4	2.80	17.4	68.3	1.82	1.23	2.86	0.53	520	3110	53	25	2160	111
CYCLE 6	ASSAY 0143	Mica Con	133.1	1.90	19.9	63.4	1.10	1.41	5.79	0.23	1230	7700	60	44	8920	143
	ASSAY 0144	ScavClnr Con	689.8	6.90	23.4	64.0	0.40	0.29	0.27	0.22	76	345	114	46	460	74
	ASSAY 0146	Phos Tails	141.9	6.90	25.9	65.1	0.39	0.25	0.26	0.28	74	380	40	20	550	137
	ASSAY 0147	Phos Con	47.9	6.49	25.1	59.2	0.79	0.27	0.82	1.70	186	1360	24	12	2240	742
	ASSAY 0145	Rock Tails	937.0	1.15	8.4	86.3	0.07	1.37	1.96	0.04	243	1790	42	14	200	10
CYCLE 7	ASSAY 0148	Slimes	25.4	2.63	17.5	65.7	1.84	1.15	2.91	0.52	555	3010	50	23	2220	114
	ASSAY 0149	Mica Con	141.2	1.69	20.5	62.7	0.99	1.44	6.00	0.20	1270	7580	57	46	8260	131
	ASSAY 0152	ScavClnr Con	337.8	6.89	24.6	62.7	0.43	0.23	0.26	0.17	80	318	91	39	400	53
	ASSAY 0154	Phos Tails	412.9	7.17	25.4	63.6	0.30	0.19	0.18	0.07	63	229	131	54	250	26
	ASSAY 0155	Phos Con	215.5	6.74	25.7	61.5	0.72	0.17	0.46	0.89	123	735	42	18	1240	359
CYCLE 8	ASSAY 0153	Rock Tails	926.0	1.05	8.3	84.0	0.07	1.34	2.00	0.04	265	1820	35	13	230	10
	ASSAY 0150	Cleaner Tls	62.27	4.63	18.2	70.7	0.41	0.76	1.01	0.13	193	966	116	40	410	10
CYCLE 9	ASSAY 0151	ScavClnr Tls	48.11	2.99	13.5	74.4	0.38	1.08	1.47	0.06	235	1390	44	13	220	10
	Total		11914	3.83	16.4	73.6	0.33	0.89	1.47	0.18	253	1568	71	29	986	71
CYCLE 10	Head Assay		12000	3.94	16.7	75.1	0.20	0.84	1.42	0.22	247	1540	83	24	850	28
	Call Factor		99	97	98	98	166	106	104	83	102	102	85	120	116	252

Because the relatively simple circuit configuration results in such a stable locked cycle test, and considering the reagent dosage change for Cycles 4 through 6, the process balance is based on aggregate results from Cycles 2 and 3. The circuit performance during these cycles is shown in Table 13.11.

The technical concentrate (phosphate cleaner tails + scavenger cleaner concentrate) produced a grade of 7.15% Li₂O, representing 73.7% of the lithium in mill feed in 39.5% of the mass. The concentrate had a P₂O₅ assay of 0.16%, well within target specifications, and (K₂O+Na₂O) was 0.43%. This concentrate, as produced, has no gravity separation or WHIMS iron removal because of the small masses that were produced. Consequently, these elements were both above the desired target at 142 ppm Ta and 0.33% Fe₂O₃ but there is no concern about meeting those market guidelines in a final, commercial product.

The chemical concentrate produced a grade of 7.14% Li₂O, representing 7.6% of the lithium in mill feed in 4.1% of the mass. The concentrate had a P₂O₅ assay of 1.42%, showing the phosphorus removal to be successful. Fluorine came in at 882 ppm, higher than the technical concentrate, reflecting the fluorine content of phosphates (apatite) and tourmaline. Potassium and sodium (K₂O+Na₂O) came in at 0.39%. This concentrate as produced has no gravity separation or WHIMS iron removal and so it is very reasonable to expect the quality of a commercially produced concentrate to show lower grades than the 51 ppm Ta and 0.95% Fe₂O₃ achieved in this test.

Table 13.11 FRON-12 Float 018 Locked Cycle Test, Cycle 2&3 Combined Results

			Mass	Li ₂ O	Al ₂ O ₃	SiO ₂	Fe ₂ O ₃	Na ₂ O	K ₂ O	P ₂ O ₅	Cs	Rb	Ta	Nb	F-	B
Cycle 2 and 3	Grade	Tech Conc	1567.1	7.15	24.3	64.4	0.33	0.29	0.14	0.17	45	147	142	52	248	62
		Chem Conc	161.4	7.14	24.2	60.6	0.95	0.27	0.12	1.42	40	168	51	21	882	556
		Tails	2230.3	1.28	10.0	80.8	0.29	1.39	2.49	0.12	421	2658	34	15	1555	47
	Recovery	Tech Conc	39.6	73.7	59.1	34.7	39.8	12.6	3.7	34.7	6.9	3.7	72.8	68.2	9.7	33.5
		Chem Conc	4.1	7.6	6.1	3.4	11.6	1.2	0.3	30.3	0.6	0.4	2.7	2.8	3.6	30.7
		Tails	56.3	18.7	34.8	61.9	48.6	86.2	96.0	35.0	92.4	95.8	24.5	29.0	86.7	35.7

Combined lithium recovery to saleable products was (73.7% + 7.6%) = 81.3%. The feed to flotation (FRON-12) was DMS-upgraded, representing 92.8% of the lithium in ore. Thus, the adjusted recoveries (basis = ore) become:

Technical grade (73.7* 0.928) = 68.4%
Chemical grade (7.6* 0.928) = 7.0%
Combined Products (81.3* 0.928) = 75.4%

13.6.3 FURTHER DEVELOPMENT POTENTIAL

It is worth noting that while the locked cycle flowsheet configuration discussed in the previous section and demonstrated on FRON-12 has been used as the basis of the economic evaluation and process design in this report, additional work has subsequently been performed on a lower-grade composite that is more representative of the average mine life grades, using a simpler flowsheet and achieving better overall metallurgical performance for both lithium recovery and concentrate quality.

13.7 COMMENTS

The proposed flowsheet is robust and deals well with the different ore zones in the PAK project. Some grade variability within the zones has been identified but does not represent significant mineralogical variations that require testing at this stage of the evaluation. The process flowsheet should be evaluated more rigorously on samples that represent the variability in the ore as part of a feasibility study program.

Although some of the component samples used for the creation of the FRON-12 composite appear to be higher grade than the reserve grades for the deposit, they are within the expected grade ranges for the respective ore zones and in some cases, carry additional deleterious material that was adequately managed in the process to generate these strong metallurgical results.

The exclusion of metasediments in the composite based on changes in the mine plan is noted and should be reviewed carefully as part of a subsequent feasibility program.

Enhanced gravity separation and high-intensity magnetic separation for impurity control in the concentrates needs to be properly tested and demonstrated at a scale that can adequately address the impact and the economics.

14 MINERAL RESOURCES ESTIMATE

14.1 PAK RESOURCE ESTIMATE

WSP completed a resource estimation of the PAK Property. The effective date of the resource is March 2, 2018.

14.1.1 DATABASE

Frontier maintains all borehole data in a Microsoft Access® relational database. Header, survey, assays, and lithology information are saved as individual tables in the database. The database information in CSV format was provided to WSP originally on December 17, 2015 with an updated dataset provided on November 27, 2017.

The database contains 34 boreholes, 67 rotary blastholes, and 31 channels. There is a total of 2,401 assays records in the database, with 2,009 samples from the boreholes 195 samples from rotary blastholes, and 197 samples from the channels. The channel data was reviewed and incorporated into the borehole dataset as a form of boreholes. Table 14.1 summarizes the borehole and trench data within each geological unit.

The resource estimation was conducted using Surpac™ version 6.7.1.

Table 14.1 Database Summary

	Number of Drillholes	Length
Project Total	132	7,460
Channel samples	31	244
Other samples (PLP)	67	294
Boreholes	34	6,922
Host Rock (hr)		
UIZ - Channel samples	12	75
UZI - Boreholes	12	374
UZI - PLP	57	267
CIZ - Channel samples	9	59
CIZ - Boreholes	9	459
CIZ - PLP	12	54
LIZ - Channel samples	12	89
LIZ - Boreholes	25	2,388
Aplite - Channel samples	4	11
Aplite - Boreholes	19	326
BX UIZ - Boreholes	1	28
Granite - Channel samples	3	2
Granite - Boreholes	35	3,761
Metasediment - Channel samples	2	5
Metasediment - Boreholes	17	211
OVB - Boreholes	33	143
PEG - Boreholes	2	11
TZ - Boreholes	1	1
WZ - Channel samples	2	1
WZ-Boreholes	3	26

14.1.2 SPECIFIC GRAVITY

Frontier collected a total of 1,541 samples from the 14 diamond drillholes for specific gravity (SG) measurements.

Frontier Lithium used the following procedure to determine the average SG for each the mineral domains.

- Sample selected for SG measurement.
- The Borehole ID, row number, From, To and rock type were entered into a spreadsheet.
- The sample was weighted dry on the scale.
- The sample was then weighted submerged saturated in tap water at a constant 22 °C.
- The specific gravity is determined using the following equation:

$$SG = \frac{W_d}{(W_d - W_s)/CF}$$

W_d = Dry Weight, *W_s* = Submerged Weight, *CF* = correction factor for water temperature

Figure 14.1 illustrates the SG measuring set-up employed by Frontier during this round of SG data collection.

Table 14.2 summarizes the results of the SG measurements.

Figure 14.1 Specific Gravity Station



Table 14.2 PAK Specific Gravity Summary

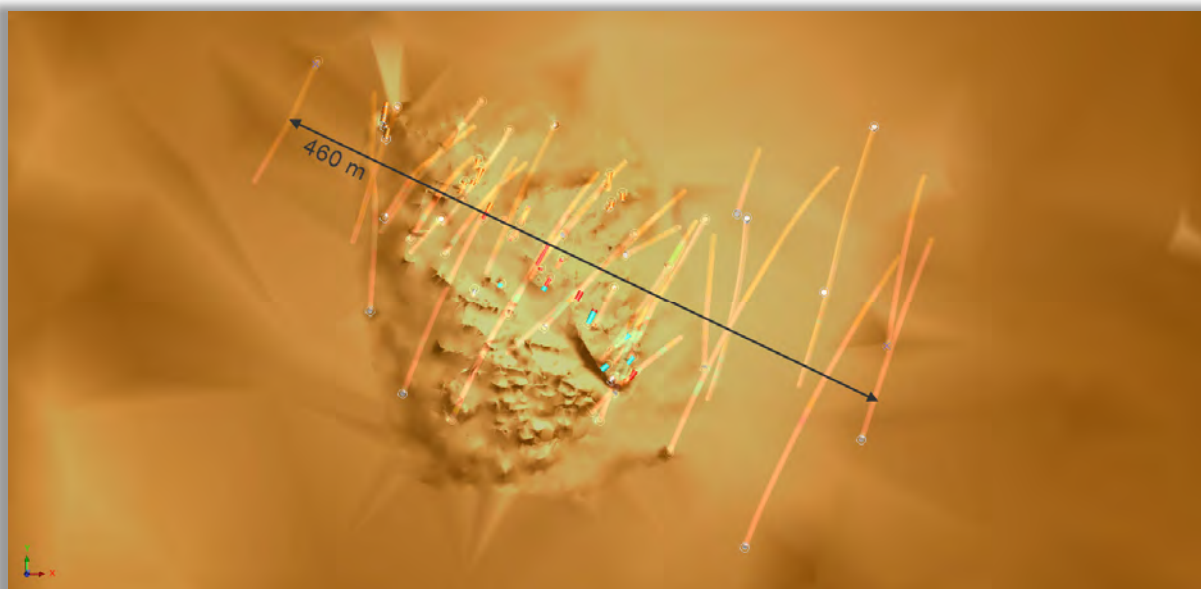
Lithology	No. of Samples	Avg Rock Density
CIZ	148	2.66
UIZ	76	2.86
LIZ	218	2.75
Aplite	144	2.69
Granite	570	2.64
Metasediment	271	2.95

14.1.3 TOPOGRAPHIC DATA

Topographic data was generated as a Digital Terrain Model (DTM) created using contour lines generated from a combination of the total station survey data completed in August 2013, 1:50,000 scale topographic data, and photographic images collected in July 2014 with a PX4-700 UAV (unmanned airborne vehicle).

The area covered by the DTM is sufficient to cover the area defined by the current resource model (Figure 14.2).

Figure 14.2 PAK Topographic Image



14.1.4 GEOLOGICAL INTERPRETATION

Three-dimensional wireframe models of mineralization were developed in Surpac™ by WSP. The wireframes were based on the geological interpretation of the zones as distinct domains and not strictly on grade intervals.

Sectional interpretations were completed in SurpacTM version 6.7.1 software, and these interpretations were linked with control strings and triangulated to build three dimensional solids. Table 14.3 tabulates the solids and associated volumes. The solids were validated in the SurpacTM software and no errors were found.

The modeling is broken into three separate zones; LIZ, UIZ, and CIZ. The UIZ and CIZ were wireframes as separate and distinct solids. The LIZ was generated to cover the bulk of the pegmatite and surrounds the UIZ and CIZ to ensure that no voids existed between solids. Figures 14.3 to 14.8 illustrate the model solid for each of the domains.

The wireframes extend at depth, below the deepest diamond drillholes. This is to provide a target for future exploration. The resource model did not estimate grades into the full volume of the wireframes due to sheer size of the wireframes.

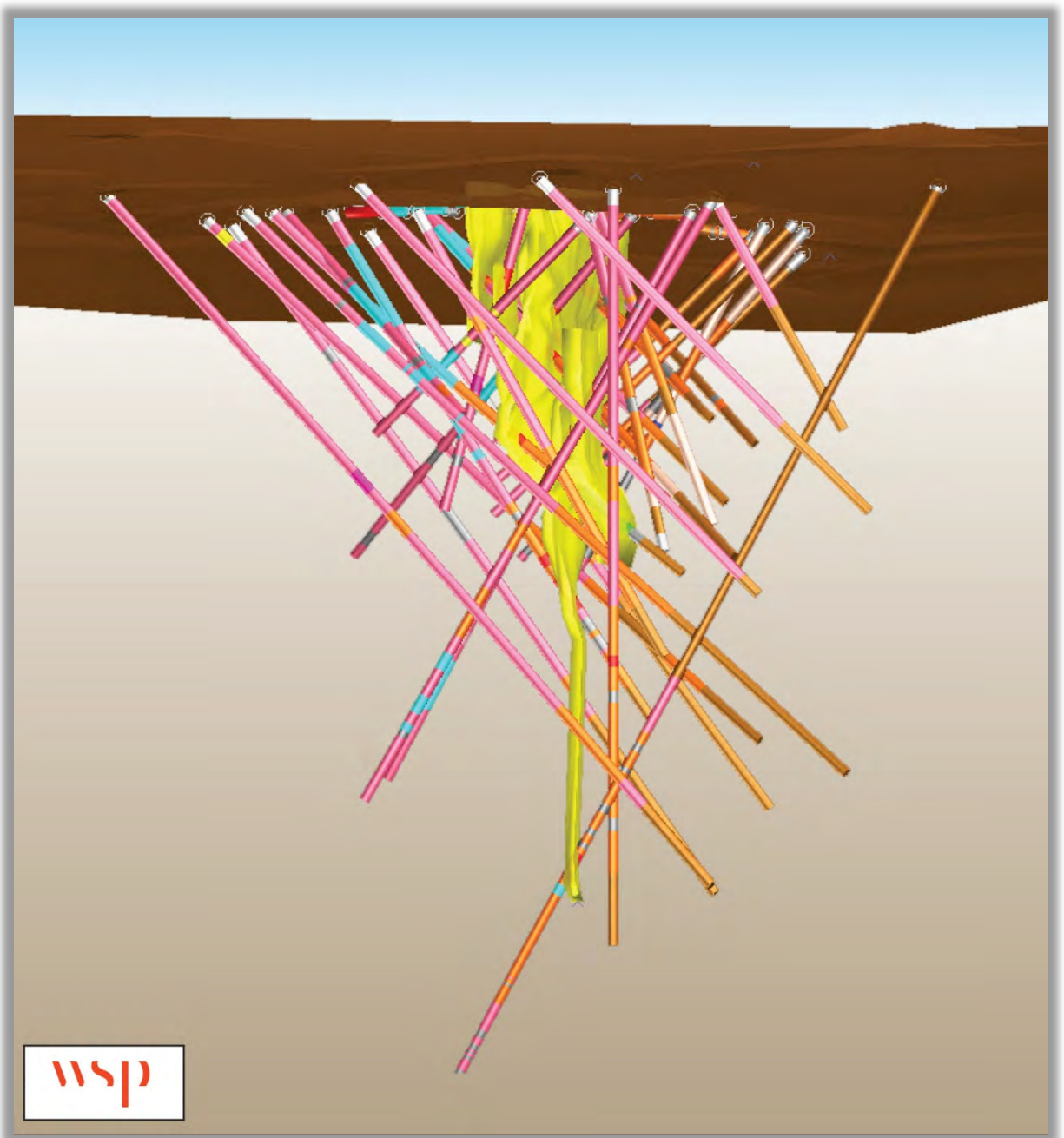
The non-assayed intervals were assigned void (-) value. WSP believes that non-assayed material should not be assigned a zero value, as this does not reflect the true value of the material.

Each domain was modeled using the same principal assumptions and methodology.

Table 14.3 Wireframe Summary

Domain	Minimum X	Maximum X	Minimum Y	Maximum Y	Minimum Z	Maximum Z	Surface Area (m ²)	Volume (m ³)
APLITE	474,389.47	474,517.14	5,827,873.52	5,828,012.59	190	348.554	70,824	173,452
CIZ	474,421.51	474,666.42	5,827,843.28	5,827,983.09	110	340	27,692	404,874
LIZ 1	474,264.46	474,945.83	5,827,833.53	5,828,162.04	-30	340	684,720	5,086,662
LIZ 2	474,264.46	474,945.83	5,827,971.27	5,828,162.04	135.493	340	324,688	1,975,813
UIZ	474,380.13	474,760.58	5,827,900.06	5,828,016.75	44.107	330	90,025	246,698
METASEDIMENT	474,237.75	474,940.85	5,827,918.35	5,828,154.06	20	350	606,350	17,395,893

Figure 14.3 UIZ Wireframe (looking southeast - not to scale)



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Figure 14.4 UIZ Wireframe (looking northwest - not to scale)

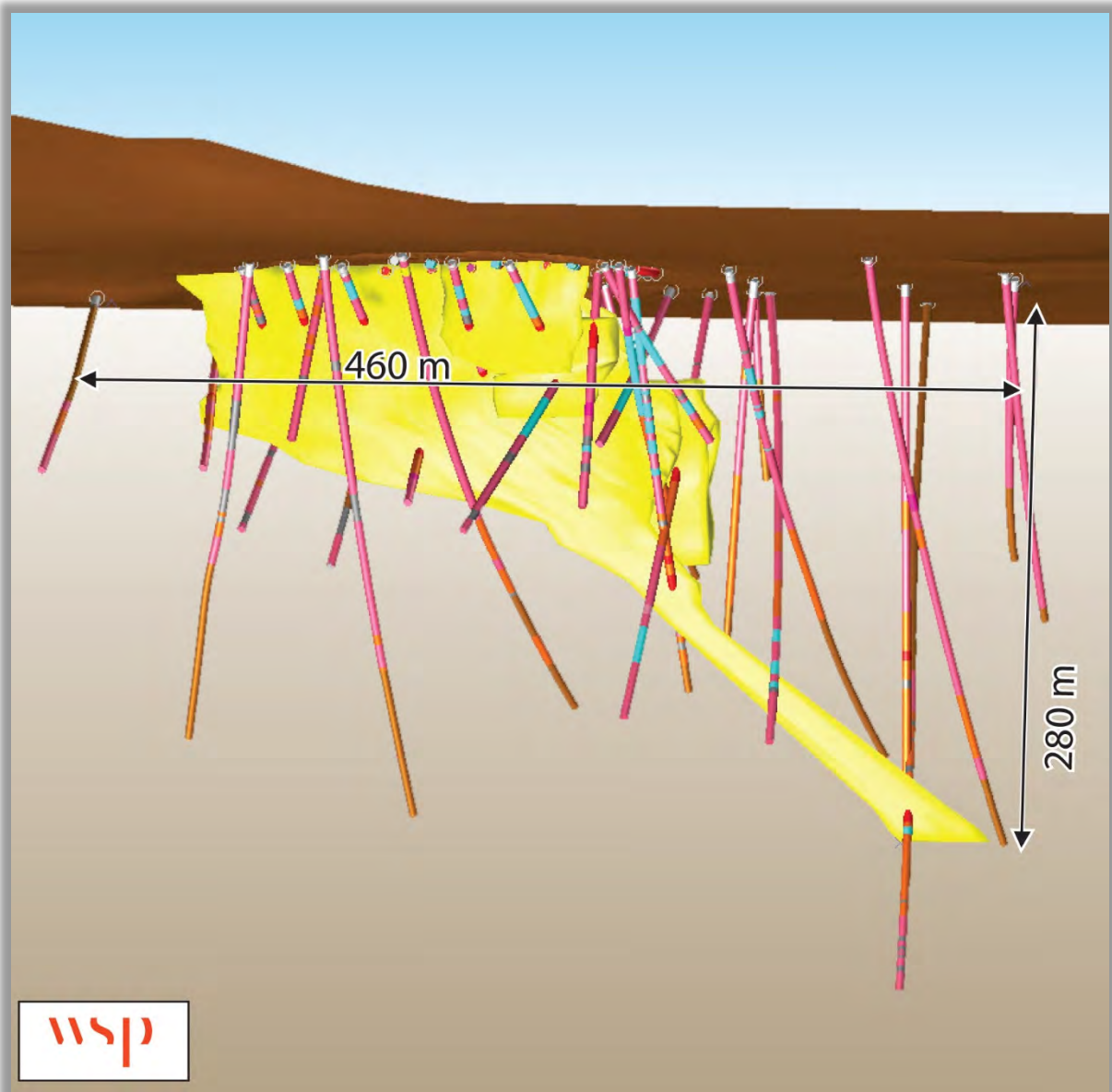


Figure 14.5 CIZ Wireframe (looking southeast - not to scale)

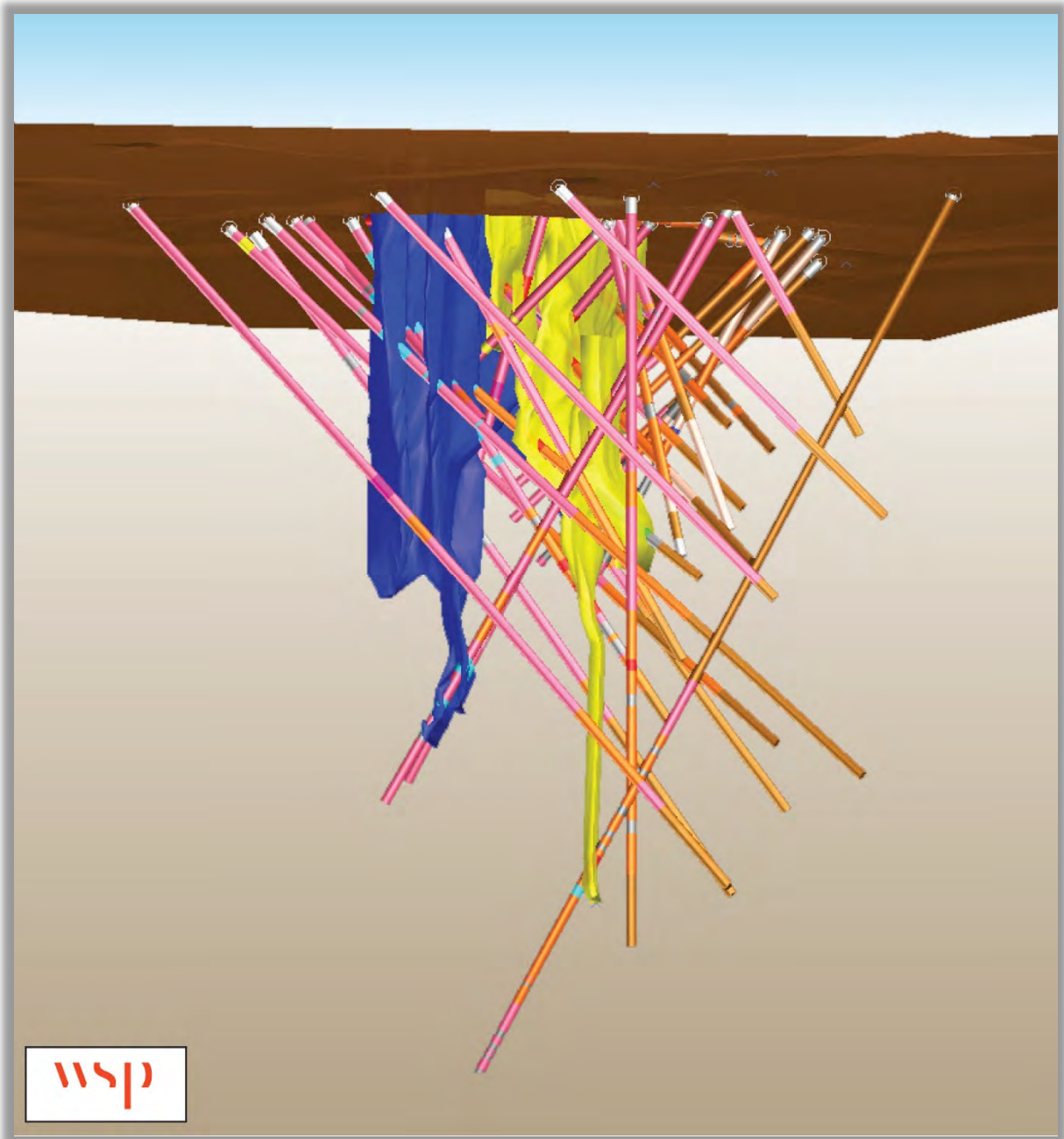


Figure 14.6 CIZ Wireframe (looking northeast - not to scale)

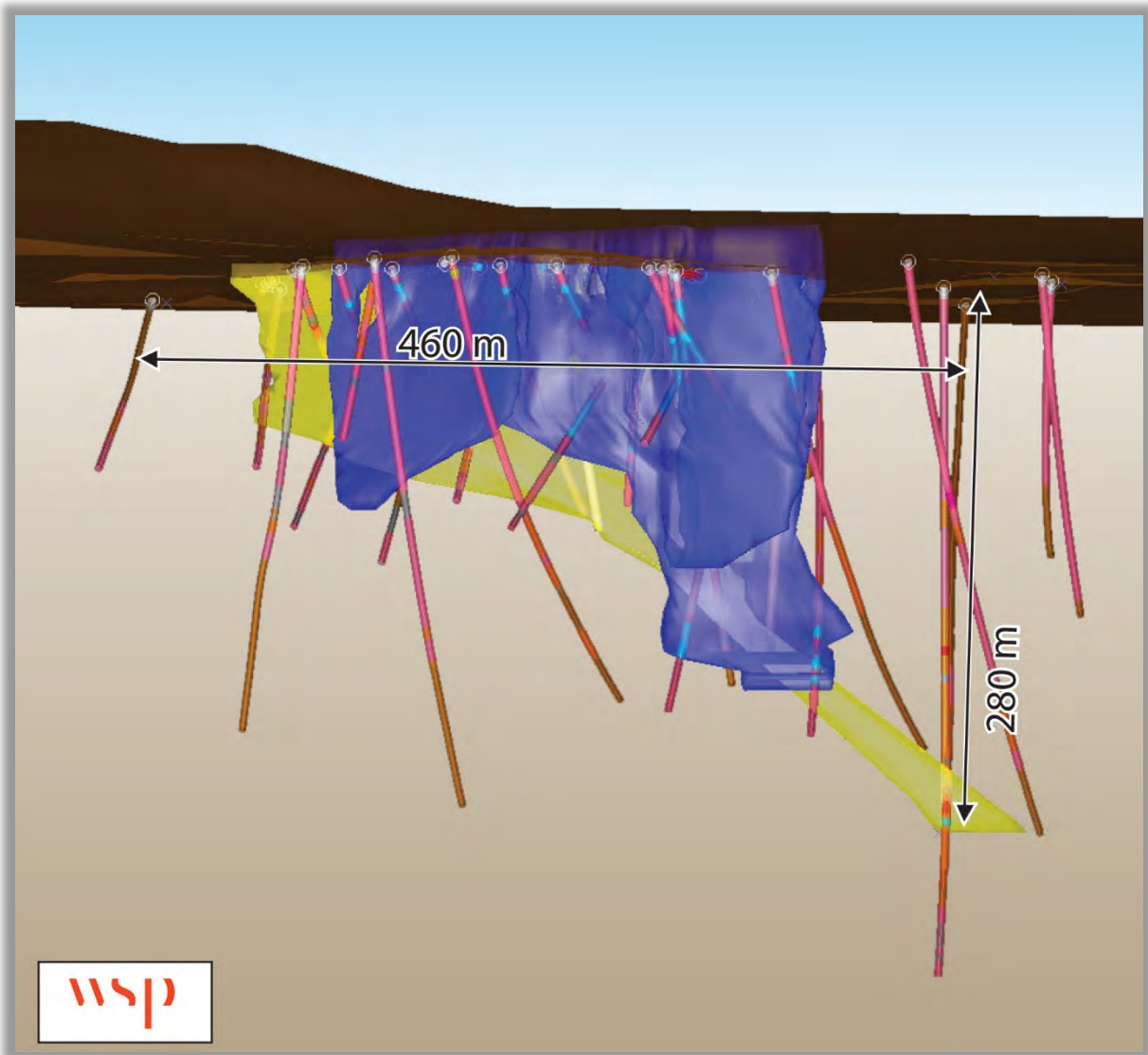
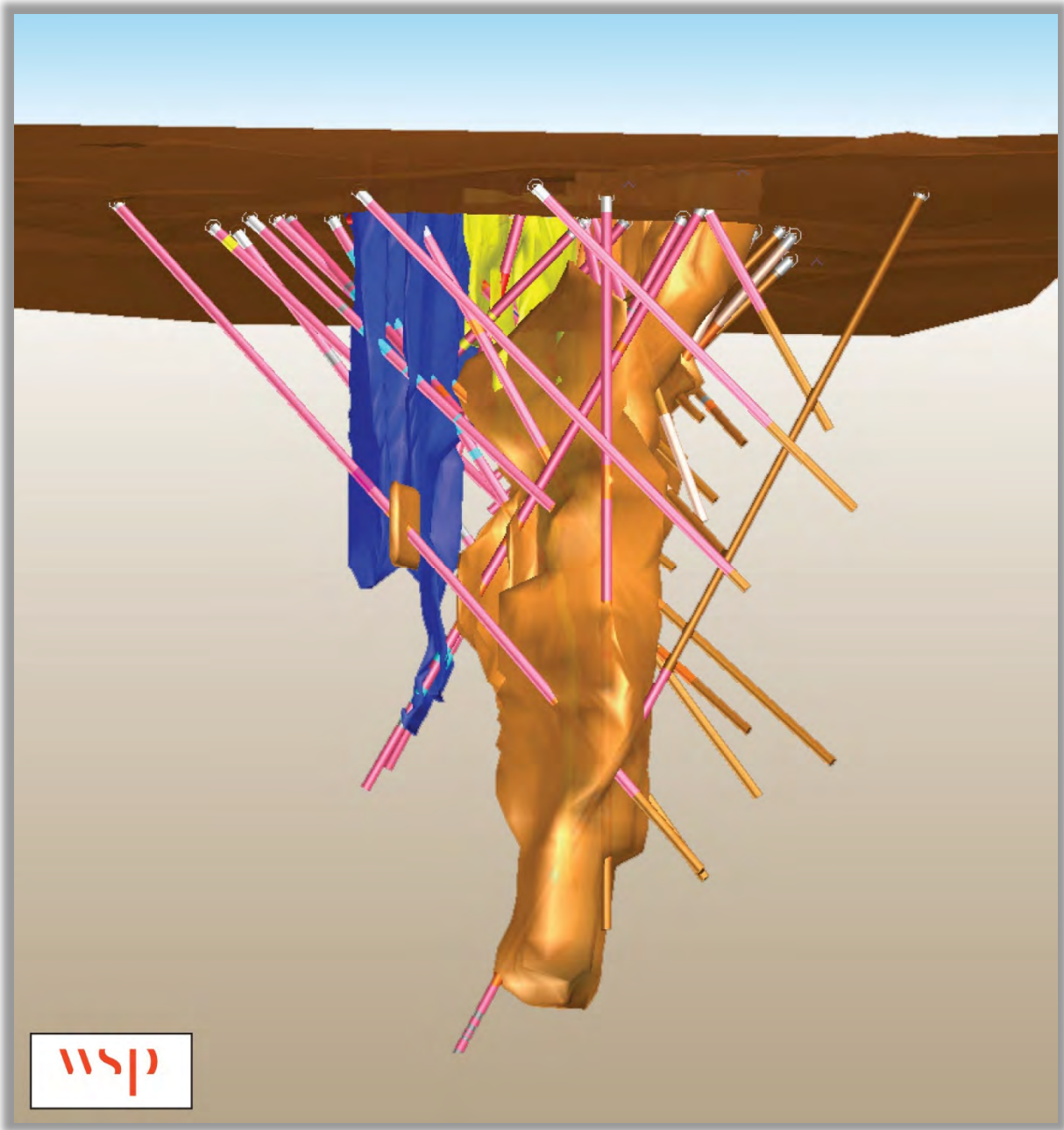


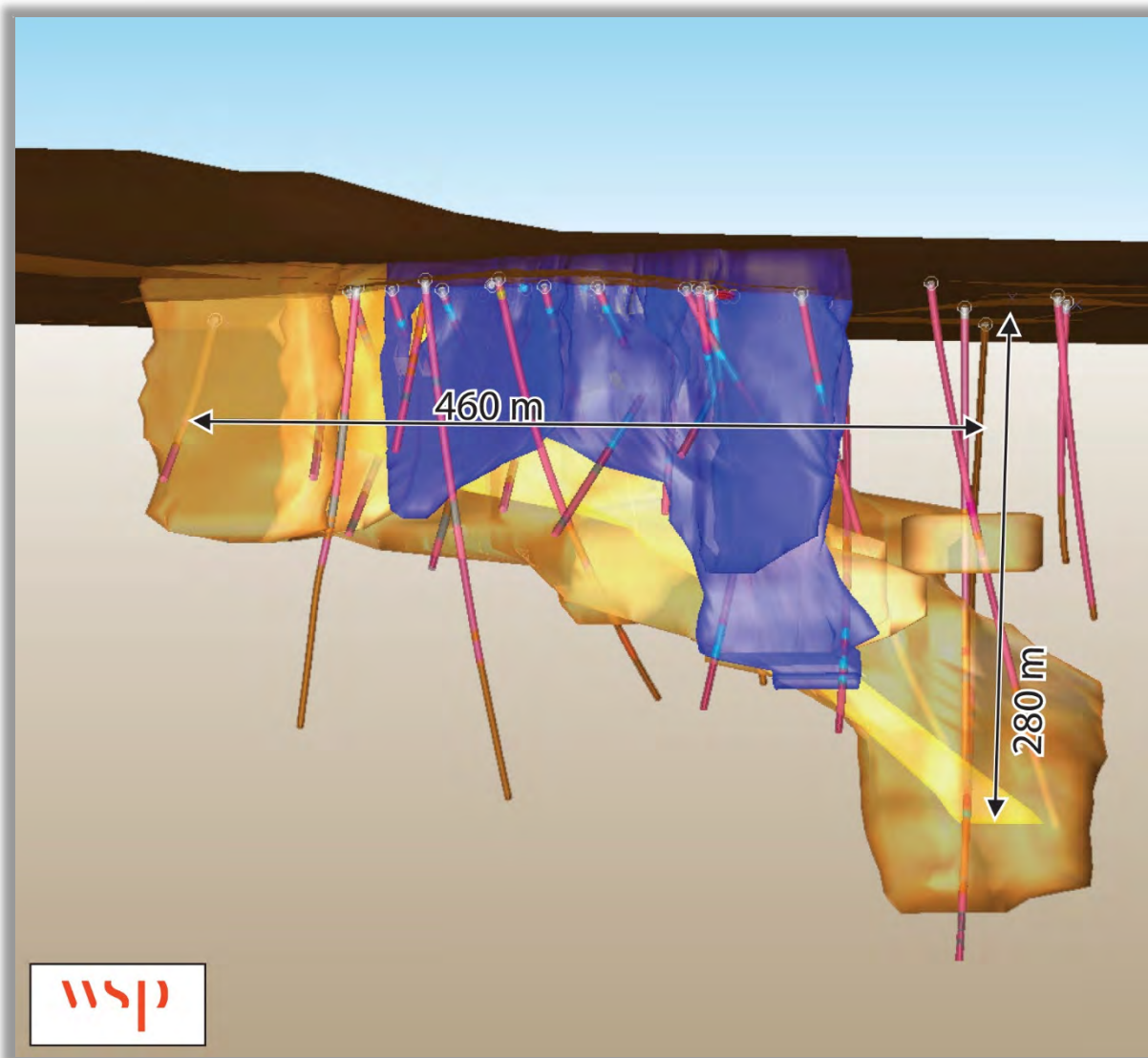
Figure 14.7 LIZ Wireframe (looking southwest – not to scale)



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Figure 14.8 LIZ Wireframe (looking northeast – not to scale)



14.1.5 EXPLORATORY DATA ANALYSIS

ASSAYS

The three domains included in the mineral resource were sampled by a total of 2,089 Li_2O assays, and 1,892 samples for Rb_2O , Ta_2O_5 and Cs_2O . The assay intervals within each mineral domain were captured using a Surpac™ routine to flag the intercept into a new table in the database. These intervals were reviewed to ensure all the proper assay intervals were properly captured. Table 14.4 summarizes the basic statistics for the assays intervals for each of the mineral domains on the Property.

Table 14.4 Sample Summary by Domain

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation
CIZ	Li ₂ O (%)	390	0.108	4.435	0.902	0.885
	Rb ₂ O (%)	356	0.022	1.269	0.594	0.319
	Ta ₂ O ₅ (ppm)	356	1.709	387.089	115.759	78.629
	Cs ₂ O (%)	348	0.005	0.456	0.079	0.04
LIZ	Li ₂ O (%)	1263	0.043	4.887	1.829	1.221
	Rb ₂ O (%)	1263	0.007	1.115	0.299	0.184
	Ta ₂ O ₅ (ppm)	1263	1.587	1653.234	101.989	84.242
	Cs ₂ O (%)	1263	0.004	0.341	0.037	0.028
UIZ	Li ₂ O (%)	436	0.086	5.769	3.585	1.268
	Rb ₂ O (%)	273	0.007	0.92	0.175	0.171
	Ta ₂ O ₅ (ppm)	273	5.617	308.913	66.689	51.428
	Cs ₂ O (%)	273	0.004	0.265	0.035	0.026

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.

SurpacTM uses a length weighted option which allows all the composite segments less than 0.75 m to be used in the estimate on a length weighted basis. Table 14.5 summarizes the statistics for the boreholes after compositing.

Table 14.5 Compositing Summary by Domain

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation
CIZ	Li ₂ O (%)	411	0.108	4.435	0.962	0.917
	Rb ₂ O (%)	356	0.026	1.181	0.598	0.295
	Ta ₂ O ₅ (ppm)	356	2.105	387.089	116.236	69.472
	Cs ₂ O (%)	348	0.011	0.286	0.079	0.034
LIZ	Li ₂ O (%)	1234	0.043	4.887	1.837	1.106
	Rb ₂ O (%)	1234	0.011	1.063	0.301	0.16
	Ta ₂ O ₅ (ppm)	1234	6.105	880.829	101.183	67.933
	Cs ₂ O (%)	1234	0.004	0.247	0.037	0.025
UIZ	Li ₂ O (%)	529	0.209	5.343	3.654	1.168
	Rb ₂ O (%)	529	0.008	0.92	0.173	0.158
	Ta ₂ O ₅ (ppm)	259	6.105	274.725	66.304	48.176
	Cs ₂ O (%)	259	0.00400	0.172	0.035	0.022

GRADE CAPPING

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

WSP elected to apply a variable top cut by element by domain. Table 14.6 summarizes the results of the capping procedure.

Table 14.6 Grade Capping Summary by Domain

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation	No. of Records Capped
CIZ	Li ₂ O (%) Uncapped	411	0.108	4.435	0.962	0.917	
	Li ₂ O (%) Capped	411	0.108	4.396	1.003	0.984	9
	Rb ₂ O (%) - Uncapped	356	0.026	1.181	0.598	0.295	
	Rb ₂ O (%) - Capped	356	0.025	1.136	0.589	0.299	8
	Ta ₂ O ₅ (ppm) - Uncapped	356	2.105	387.089	116.236	69.472	
	Ta ₂ O ₅ (ppm) - Capped	356	2.105	292.166	114.050	67.820	8
	Cs ₂ O (%) - Uncapped	348	0.011	0.286	0.079	0.034	
	Cs ₂ O (%) - Capped	348	0.008	0.156	0.078	0.032	8.000
LIZ	Li ₂ O (%) Uncapped	1234	0.043	4.887	1.837	1.106	
	Li ₂ O (%) Capped	1234	0.043	4.176	1.831	1.093	25
	Rb ₂ O (%) - Uncapped	1222	0.011	1.063	0.299	0.158	
	Rb ₂ O (%) - Capped	1222	0.011	0.710	0.297	0.152	23
	Ta ₂ O ₅ (ppm) - Uncapped	1234	6.105	880.829	101.183	67.933	
	Ta ₂ O ₅ (ppm) - Capped	1234	6.105	291.373	99.606	60.043	25
	Cs ₂ O (%) - Uncapped	1234	0.004	0.247	0.037	0.025	
	Cs ₂ O (%) - Capped	1234	0.004	0.2467	0.036746	0.025381	25
UIZ	Li ₂ O (%) Uncapped	529	0.209	5.343	3.654	1.168	
	Li ₂ O (%) Capped	529	0.209	4.951	3.640	1.163	13
	Rb ₂ O (%) - Uncapped	529	0.008	0.92	0.173	0.158	
	Rb ₂ O (%) - Capped	259	0.008	0.551	0.173	0.149	6
	Ta ₂ O ₅ (ppm) - Uncapped	259	6.105	274.725	66.304	48.176	
	Ta ₂ O ₅ (ppm) - Capped	259	6.105	206.898	66.40696	44.46113	6
	Cs ₂ O (%) - Uncapped	259	0.004	0.172	0.035	0.022	
	Cs ₂ O (%) - Capped	259	0.00400	0.094	0.035	0.020	5.000

SPATIAL ANALYSIS

Variograms for lithium were created for each domain in order to be used to search ellipse dimensions. Currently, WSP is of the opinion that additional samples are required before kriging would be an effective estimation method.

The variography for the Project was determined using Surpac™ version 6.8 software. Each domain was modeled for lithium, rubidium, tantalum, and cesium using a downhole variogram to determine nugget effect, then a pair-wise variogram was used to determine spatial continuity in the domains.

Even though the samples were flagged for each of the mineralized domains, the variograms for the two domains were so similar that the same variogram could be used for the two domains. It was deemed appropriate to use an anisotropic variogram for the updated resource estimation. Table 14.7 summarizes the results of the variogram model for each element in each domain. The variogram rotation and maximum range governed the search ellipse rotation and size.

Table 14.7 Variogram Summary

Domain	Element	Geostats Parameters				
		Nugget	Sill		Range	
			1st. S	2nd. S	1st. S	2nd. S
CIZ	Li ₂ O	0.391	0.395	0.341	27.604	105.875
	Rb ₂ O	0.003	0.017	0.000	108.496	0.000
	Ta ₂ O ₅	316.719	2345.783	3202.499	44.381	89.833
	Cs ₂ O	0.000	0.000	0.003	48.522	115.947
LIZ	Li ₂ O	0.391	0.395	0.341	27.604	105.875
	Rb ₂ O	0.003	0.017	0.000	108.496	0.000
	Ta ₂ O ₅	316.719	2345.783	3202.499	44.381	89.833
	Cs ₂ O	0.000	0.000	0.003	48.522	115.947
UIZ	Li ₂ O	0.391	0.395	0.341	28	105.875
	Rb ₂ O	0.003	0.017	0.000	108.496	0.000
	Ta ₂ O ₅	316.719	2345.783	3202.499	44.381	89.833
	Cs ₂ O	0.000	0.000	0.003	48.522	115.947

14.1.6 RESOURCE BLOCK MODEL

Individual block models were established in Surpac™ for each of the mineral domains using one parent model as the origin. The model was not rotated.

A block size of 2.5 m x 2.5 m x 2.5 m was selected in order to accommodate a small-scale open pit mining potential. Sub-blocking of the block was not used.

Table 14.8 summarizes details of the parent block model.

Table 14.8 Summary of Parent Block Model

Parameter	
Minimum X Coordinate	474200
Minimum Y Coordinate	5827800
Minimum Z Coordinate	80
Maximum X Coordinate	474900
Maximum Y Coordinate	5828240
Maximum Z Coordinate	400
Block Size (m)	2.5 x 2.5 x 2.5
Rotation	0
Sub-block	none
Total No. Blocks	6,307,840

ESTIMATION PARAMETERS

The interpolations of the zones were completed using the estimation methods nearest neighbour (NN), and inverse distance squared (ID²). The estimations were designed for a single pass. In each estimation, a minimum and maximum number of samples were required as well as a maximum number of samples from a borehole in order to satisfy the estimation criteria. All estimation passes used the capped and composted dataset for the appropriate domain being estimated.

An anisotropic search ellipse was used for the estimation. Only the samples within the domain wireframe were used in the estimation. The result is that the search ellipse will not locate samples outside the domain wireframe. Table 14.9 summarizes the search ellipse size and rotations, and Table 14.10 summarizes the interpolation criteria for each domain.

Table 14.9 Search Ellipse Summary

Elements		Bearing	Plunge	Dip	Major Axis	Semi-major Axis	Minor axis	Anisotropy Ratio	
								Major / Semi-major	Major / Minor
CIZ	Li ₂ O	115.00	0.00	-80.00	105.88	75.41	28.72	1.40	3.69
	Rb ₂ O	320.00	0.00	80.00	108.50	62.18	25.84	1.75	4.20
	Ta ₂ O ₅	202.27	67.73	0.00	89.83	55.04	33.85	1.63	2.65
	Cs ₂ O	177.63	-47.73	65.00	115.95	55.00	29.78	2.11	3.89
LIZ	Li ₂ O	115.00	0.00	-80.00	105.88	75.41	28.72	1.40	3.69
	Rb ₂ O	320.00	0.00	80.00	108.50	62.18	25.84	1.75	4.20
	Ta ₂ O ₅	202.27	67.73	0.00	89.83	55.04	33.85	1.63	2.65
	Cs ₂ O	177.63	-47.73	65.00	115.95	55.00	29.78	2.11	3.89
UIZ	Li ₂ O	115.00	0.00	-80.00	105.88	75.41	28.72	1.40	3.69
	Rb ₂ O	320.00	0.00	80.00	108.50	62.18	25.84	1.75	4.20
	Ta ₂ O ₅	202.27	67.73	0.00	89.83	55.04	33.85	1.63	2.65
	Cs ₂ O	177.63	-47.73	65.00	115.95	55.00	29.78	2.11	3.89

Table 14.10 Estimation Criteria Summary

Domains	Estimation Pass No.	Search Ellipse Factor	Minimum No. of Composites	Maximum No. of Composites	Maximum No. of Composites per BH
CIZ	1	0.25	4	15	2
	2	0.5	4	15	2
	3	0.75	3	15	2
	4	1.5	2	15	2
LIZ	1	0.25	4	15	2
	2	0.5	4	15	2
	3	0.75	3	15	2
	4	1.5	2	15	2
UIZ	1	0.25	4	15	2
	2	0.5	4	15	2
	3	0.75	3	15	2
	4	1.5	2	15	2

14.1.7 RESOURCE CLASSIFICATION

Several factors are considered in the definition of a resource classification:

- NI 43-101 requirements;
- Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Estimation of Mineral Resource and Mineral Reserve Best Practice Guidelines;
- Author's experience with intrusion hosted deposits;
- Spatial continuity based on the assays within the drillholes;
- Understanding of the geology of the deposit; and
- Drillhole and channel spacing and the estimation runs required to estimate the grades in a block.

Material in the block model is considered Measured when:

- $\text{Li}_2\text{O}_{\text{eq}}$ is greater than 0;
- The Z coordinate is greater than or equal to 270;
- The block was estimated in the first two passes; and
- The block does not have a rock code of 520 (CIZ).

Material in the block model is considered Indicated when:

- $\text{Li}_2\text{O}_{\text{eq}}$ is greater than 0;
- The block was estimated in the first three passes; and
- The block has not been classified as measured.

Material in the block model is considered Inferred when:

- All remaining blocks not assigned to measured or indicated.

No environmental, permitting, legal, title, taxation, socio-economic, marketing, or other relevant issues are known to WSP 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. As per NI 43-101, mineral resources which are not mineral reserves, do not have to demonstrate economic viability.

14.1.8 MINERAL RESOURCE TABULATION

The resource reported is effective as of March 4, 2016 and has been tabulated in terms of a Li_2O equivalent ($\text{Li}_2\text{O}_{\text{eq}}$) cut-off grade. The resources are tabulated using various cut-off grades to demonstrate the robust nature of the resource for each of the domains (Tables 14.11 to 14.13).

The $\text{Li}_2\text{O}_{\text{eq}}$ formula was based on the following price and recovery assumptions and is displayed below:

- \$400/tonne of 6% Li_2O concentrate;
- \$150/kg of 30% Ta_2O_5 concentrate;
- 78.5% recovery of Li_2O ;
- 50% recovery of Ta_2O_5 ; and

- No credits were applied to the cesium or rubidium as it is currently unclear if these elements will be recoverable from the pegmatite.

$$Li2O_{eq} = Li2O_{id} + \frac{\left(\frac{150 * 300}{0.3 * \frac{Ta2O5_{id}}{100000} / 0.5} \right)}{\left(\frac{400}{(0.06 / \frac{Li2O_{id}}{100} / 0.785)} * Li2O \right)}$$

Table 14.11 UIZ Measured Resource Grade Tonnage

Cut-off	Tonnes	Li ₂ O %	Ta ₂ O ₅ ppm	Cs ₂ O %	Rb ₂ O %
0.1	655,049	3.57	65.51	0.03	0.16
0.2	654,916	3.57	65.51	0.03	0.16
0.3	654,695	3.57	65.50	0.03	0.16
0.4	653,899	3.57	65.46	0.03	0.16
0.5	652,175	3.58	65.39	0.03	0.16
0.6	649,213	3.59	65.23	0.03	0.16
0.7	640,549	3.61	64.73	0.03	0.16
0.8	629,852	3.65	64.12	0.03	0.16
0.9	618,624	3.68	63.44	0.03	0.15
1.0	613,938	3.69	63.16	0.03	0.15
1.1	612,877	3.70	63.09	0.03	0.15
1.2	612,214	3.70	63.06	0.03	0.15
1.3	610,357	3.70	63.01	0.03	0.15
1.4	608,810	3.71	62.96	0.03	0.15
1.5	606,290	3.71	62.87	0.03	0.15
1.6	602,444	3.72	62.70	0.03	0.15
1.7	593,294	3.74	62.45	0.03	0.15
1.8	575,392	3.77	62.11	0.03	0.15
1.9	561,380	3.79	61.90	0.03	0.14
2.0	542,461	3.82	61.69	0.03	0.14

Table 14.12 CIZ Indicated Resource Grade Tonnage

Cut-off	Tonnes	Li ₂ O %	Ta ₂ O ₅ ppm	Cs ₂ O %	Rb ₂ O %
0.1	1,095,905	0.83	119.77	0.08	1.47
0.2	1,094,032	0.83	119.90	0.08	1.47
0.3	1,074,343	0.84	121.07	0.08	1.48
0.4	1,011,115	0.86	124.60	0.08	1.52
0.5	896,813	0.90	130.63	0.07	1.58
0.6	760,782	0.95	138.29	0.07	1.65
0.7	644,981	1.00	145.14	0.07	1.73
0.8	525,018	1.06	152.54	0.07	1.81
0.9	427,074	1.13	158.23	0.07	1.90
1.0	351,275	1.20	162.84	0.07	1.97
1.1	283,010	1.31	165.33	0.07	2.05
1.2	235,141	1.42	165.46	0.07	2.11
1.3	194,848	1.50	166.10	0.08	2.16
1.4	150,725	1.59	169.27	0.08	2.23
1.5	112,846	1.70	169.47	0.08	2.29
1.6	62,230	1.81	162.95	0.07	2.40

(table continues on next page)

Cut-off	Tonnes	Li ₂ O %	Ta ₂ O ₅ ppm	Cs ₂ O %	Rb ₂ O %
1.7	40,627	2.08	149.06	0.07	2.48
1.8	26,433	2.23	139.98	0.07	2.56
1.9	14,653	2.45	121.67	0.06	2.64
2.0	7,452	2.57	123.35	0.06	2.74

Note: Li₂O% is not recoverable in the CIZ

Table 14.13 LIZ Resource Grade Tonnage

Cut-off	Tonnes	Li ₂ O %	Ta ₂ O ₅ ppm	Cs ₂ O %	Rb ₂ O %
0.1	5,571,808	1.80	105.72	0.04	2.08
0.2	5,571,509	1.80	105.73	0.04	2.08
0.3	5,570,740	1.80	105.74	0.04	2.08
0.4	5,569,373	1.80	105.75	0.04	2.08
0.5	5,564,674	1.80	105.79	0.04	2.08
0.6	5,553,738	1.81	105.85	0.04	2.08
0.7	5,522,724	1.81	105.96	0.04	2.09
0.8	5,421,908	1.83	106.05	0.04	2.10
0.9	5,209,083	1.87	105.70	0.04	2.13
1.0	4,903,558	1.93	104.60	0.04	2.18
1.1	4,515,629	2.00	103.02	0.04	2.23
1.2	4,132,912	2.06	101.82	0.04	2.28
1.3	3,690,559	2.14	100.20	0.04	2.35
1.4	3,282,210	2.21	98.90	0.03	2.41
1.5	2,851,306	2.29	97.38	0.03	2.48
1.6	2,446,418	2.37	95.88	0.03	2.55
1.7	2,045,503	2.46	94.45	0.04	2.63
1.8	1,638,265	2.56	92.54	0.04	2.72
1.9	1,307,366	2.66	91.95	0.04	2.82
2.0	1,053,232	2.75	90.72	0.04	2.91

Although a bulk pegmatite is likely the method of extraction, a cut-off of 0.4% Li₂Oeq was selected for final resource tabulation (Table 14.14).

Note that although the CIZ reports a Li₂O grade, the source of the lithium is not spodumene. Therefore, the resource reports no contained Li₂O in the CIZ and is reported as a separate line item. The Bulk Pegmatite grade does not include the lithium content from the CIZ.

Table 14.14 PAK Resource Summary

Cut-off	Resource Category	Commodity	Geologic Zone	Tonnes (t)	Li ₂ O (%)	Ta ₂ O ₅ (ppm)	CS ₂ O (%)	Rb ₂ O (%)	Contained Li ₂ O (t)
0.4% Li ₂ Oeq	Measured	Lithium	Upper Intermediate Zone (UIZ)	324,720	3.95	60	0.03	0.12	12,830
		Lithium	Lower Intermediate Zone (LIZ)	920,330	1.72	104	0.03	0.29	15,848
		Lithium	Total Lithium Zone	1,245,050	2.3	93	0.03	0.24	28,678
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	1,245,050	2.3	93	0.03	0.24	28,678
0.4% Li ₂ Oeq	Indicated	Lithium	Upper Intermediate Zone (UIZ)	333,200	3.23	70	0.04	0.2	10,776
		Lithium	Lower Intermediate Zone (LIZ)	5,909,500	1.89	102	0.04	0.31	111,690
		Lithium	Total Lithium Zone	6,242,700	1.96	100	0.04	0.3	122,465
		Tantalum / Rubidium	Central Intermediate Zone (CIZ)	1,011,300	0.8	117	0.08	0.58	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	7,254,000	1.69	102	0.04	0.34	122,465
0.4% Li ₂ Oeq	Measured + Indicated	Lithium	Upper Intermediate Zone (UIZ)	657,920	3.59	65	0.03	0.16	23,605
		Lithium	Lower Intermediate Zone (LIZ)	6,829,830	1.87	102	0.04	0.3	127,538
		Lithium	Total Lithium Zone	7,487,750	2.02	99	0.04	0.29	151,143
		Tantalum / Rubidium	Central Intermediate Zone (CIZ)	1,011,300	0.8	117	0.08	0.58	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	8,499,050	1.78	101	0.04	0.33	151,143
0.4% Li ₂ Oeq	Inferred	Lithium	Upper Intermediate Zone (UIZ)	13,000	3.56	44	0.03	0.12	463
		Lithium	Lower Intermediate Zone (LIZ)	1,819,000	2.09	95	0.02	0.29	37,982
		Lithium	Total Lithium Zone	1,832,000	2.1	95	0.02	0.28	38,439
		Tantalum /Rubidium	Central Intermediate Zone (CIZ)	85,000	1.16	151	0.08	0.49	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	1,917,000	2.01	97	0.02	0.29	38,439
Grand Total			Bulk Pegmatite	10,416,050	1.82	100	0.04	0.32	189,582

14.1.9 VALIDATION

The PAK model was validated by 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 ID², NN, and composites.
3. Swath plots.

VISUAL VALIDATION

The visual comparisons of block model grades with composite grades for each of the zones show a reasonable correlation between the values (Figures 14.9 to 14.11). No significant discrepancies were apparent from the sections reviewed, yet grade smoothing is apparent in some of the lower elevations due to the distance between drill samples being broader in these regions.

Figure 14.9 PAK Validation Section 00SE

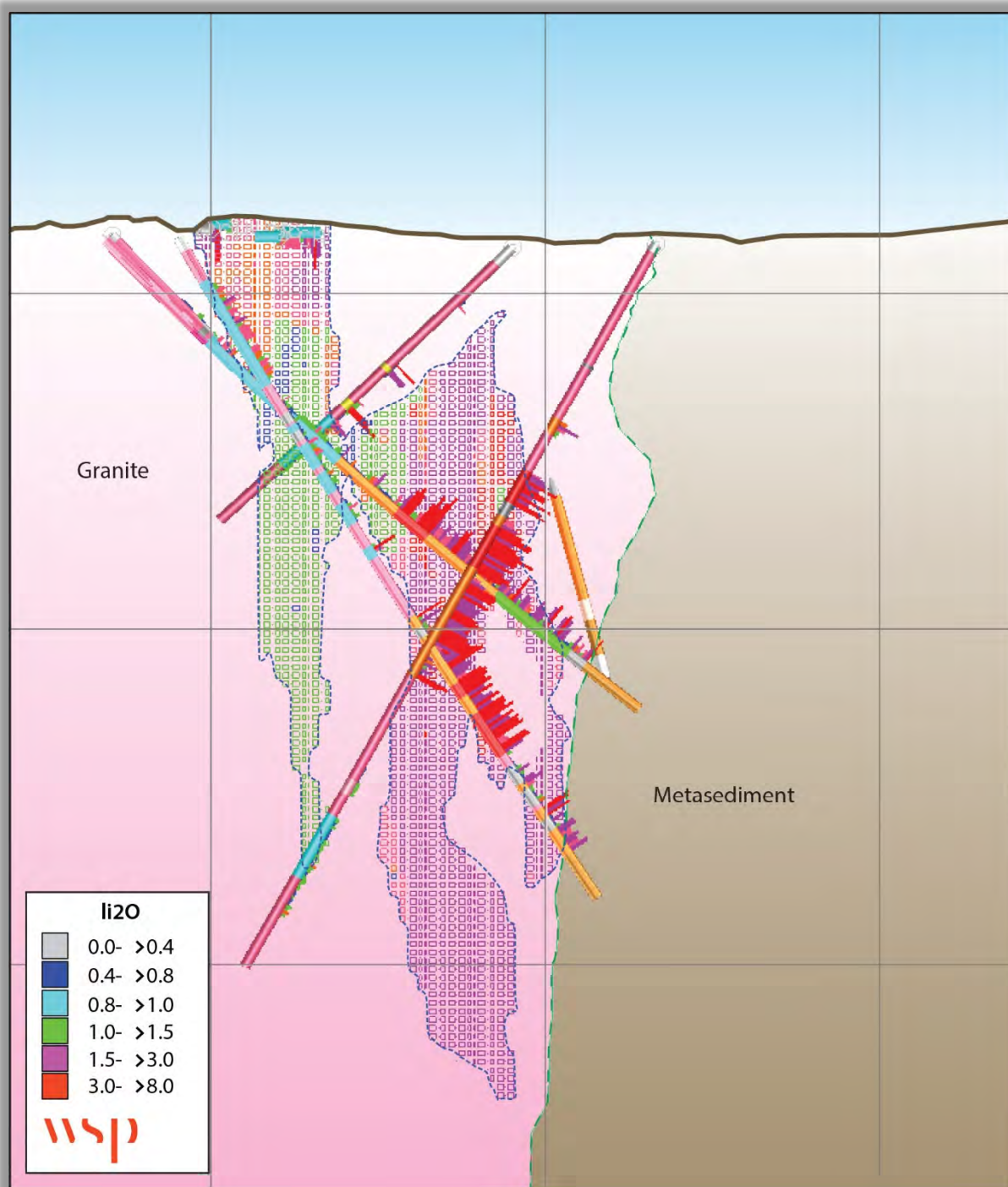


Figure 14.10 PAK Validation Section 050 NW

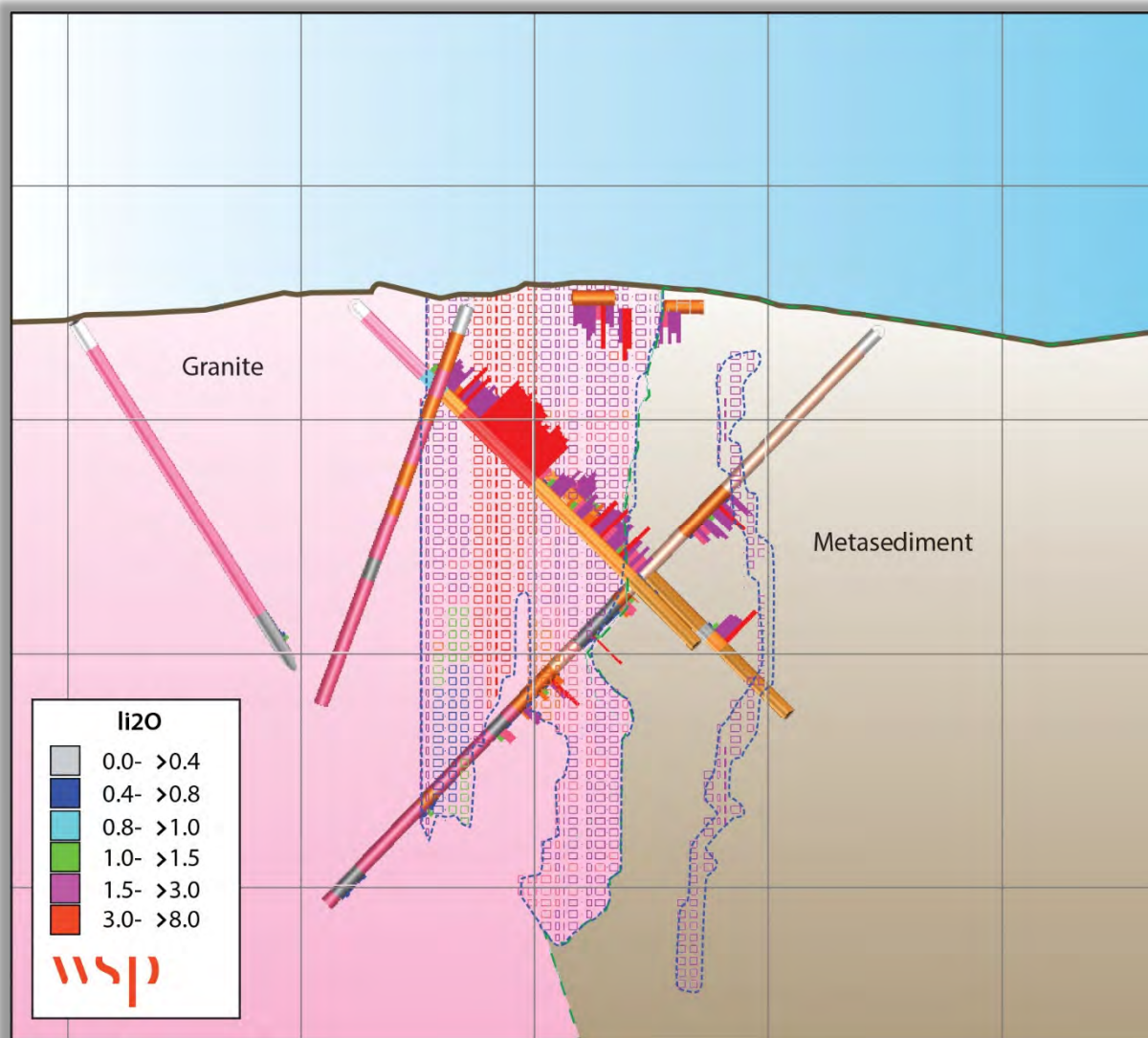
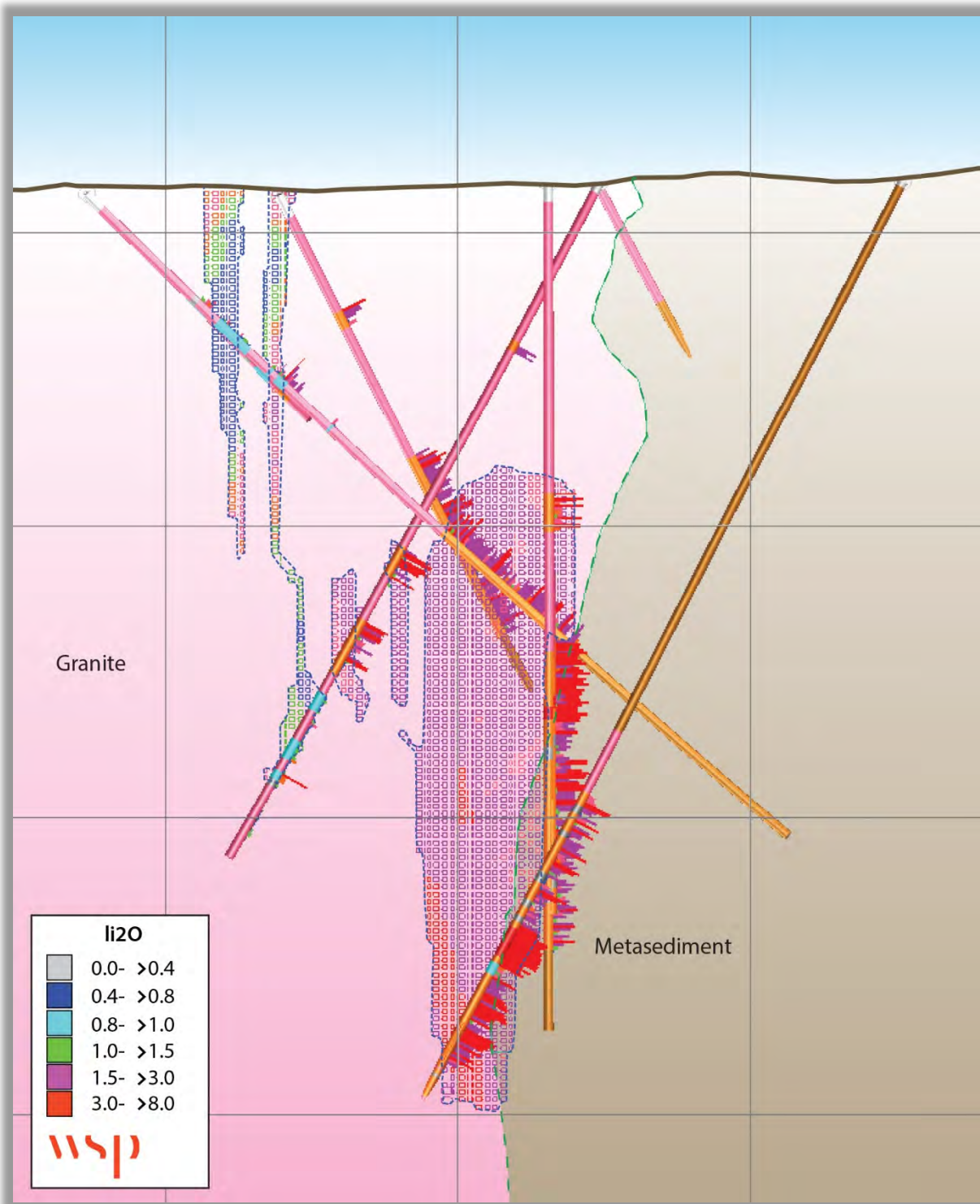


Figure 14.11 PAK Validation Section 150 SE



GLOBAL COMPARISON

The global block model statistics for the ID² model was compared to the global NN and OK model values as well as the composite capped drillhole data. Table 14.15 shows this comparison of the global estimates for the three estimation method calculations. In general, the ID², NN, and OK results are lower than the drillhole dataset. Larger discrepancies are reflected as a result of lower drill density in some portions of the model. There is a degree of smoothing apparent when compared to the diamond drill statistics. Comparisons were made using all blocks at a 0% Li₂O cut-off.

Table 14.15 Global Comparison

Domain	Element	DDH	NN	ID ²	OK
CIZ	Li ₂ O (%)	0.96	0.83	0.85	0.83
	Rb ₂ O (%)	0.59	0.54	0.57	0.58
	Ta ₂ O ₅ (ppm)	115	119	118	120
	Cs ₂ O (%)	0.08	0.07	0.08	0.08
LIZ	Li ₂ O (%)	1.84	1.80	1.78	1.80
	Rb ₂ O (%)	0.30	0.29	0.30	0.30
	Ta ₂ O ₅ (ppm)	101	105	108	106
	Cs ₂ O (%)	0.04	0.04	0.04	0.04
UIZ	Li ₂ O (%)	3.65	3.46	3.57	3.57
	Rb ₂ O (%)	0.18	0.16	0.16	0.16
	Ta ₂ O ₅ (ppm)	67	65	62	66
	Cs ₂ O (%)	0.04	0.03	0.04	0.03

SWATH PLOTS

Figures 14.12 to 14.15 display the comparison between ID² estimate with the NN estimate and the drillhole composites in a swath plot format.

As expected, there is a strong degree of grade smoothing with the ID² methodology. In general, the ID² model has similar trends as the boreholes.

Figure 14.12 Li_2O Swath Plot

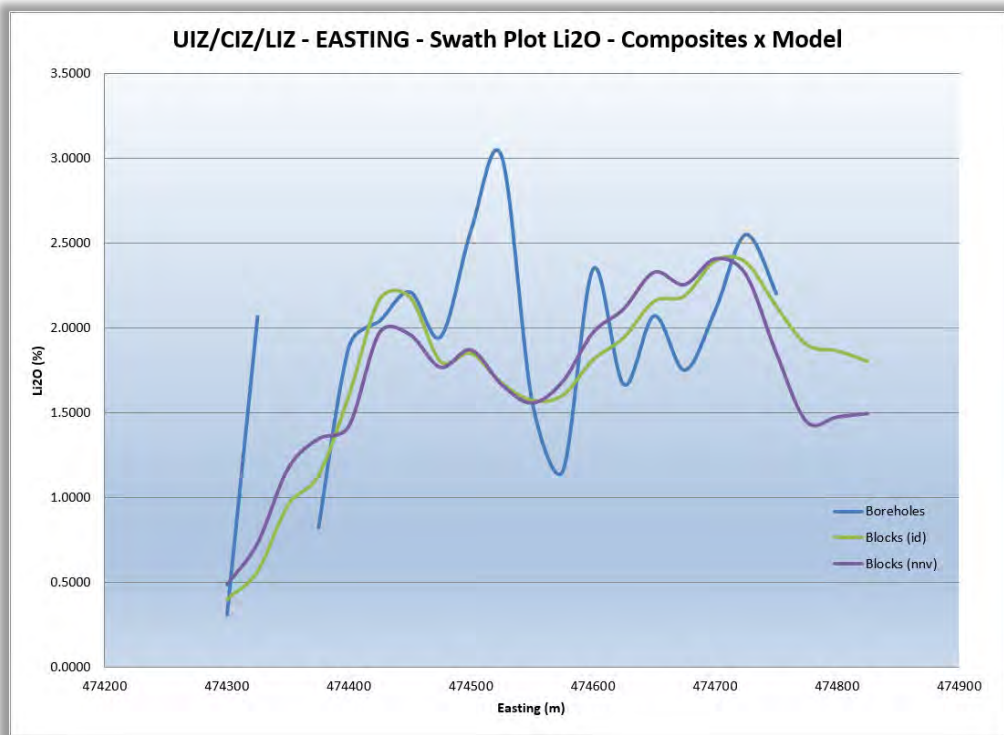


Figure 14.13 Ta_2O_5 Swath Plot

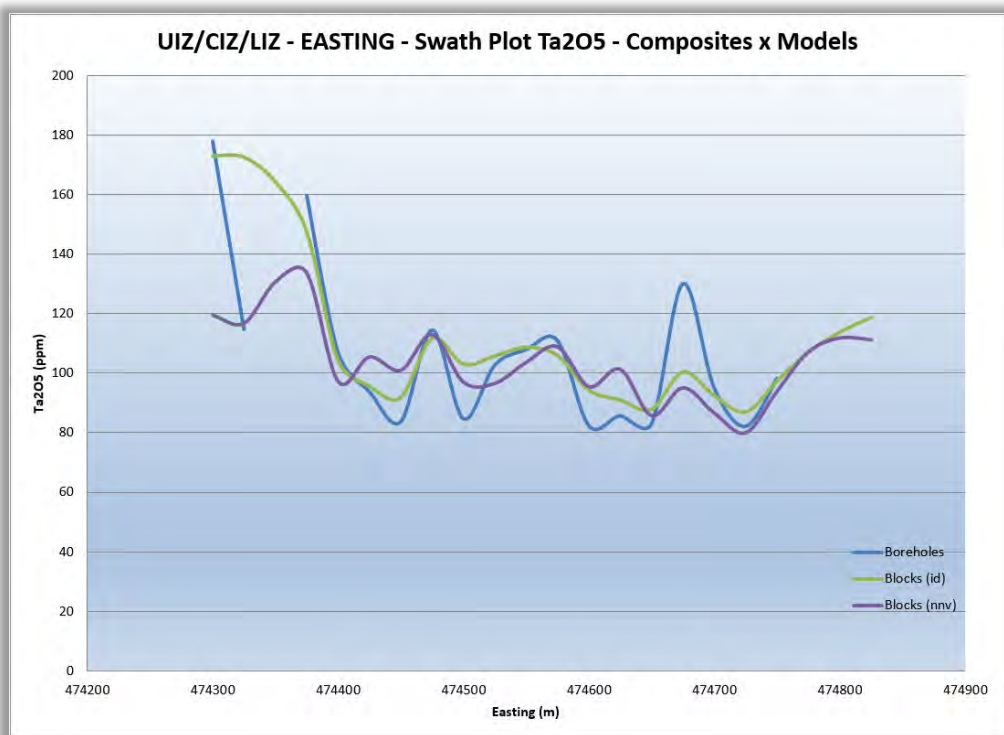


Figure 14.14 Cs₂O Swath Plot

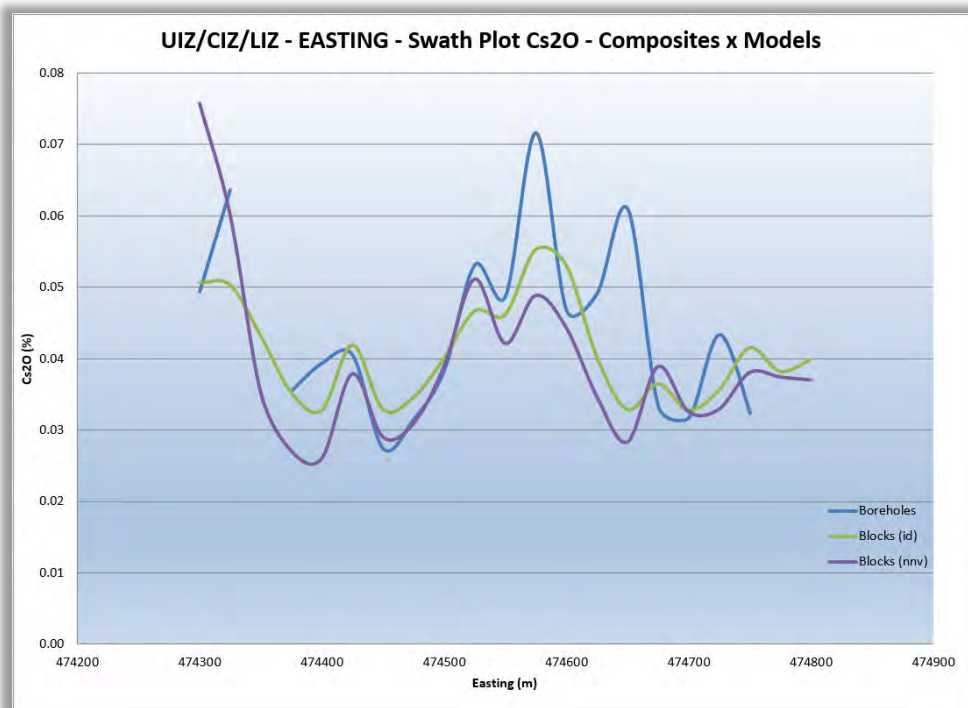
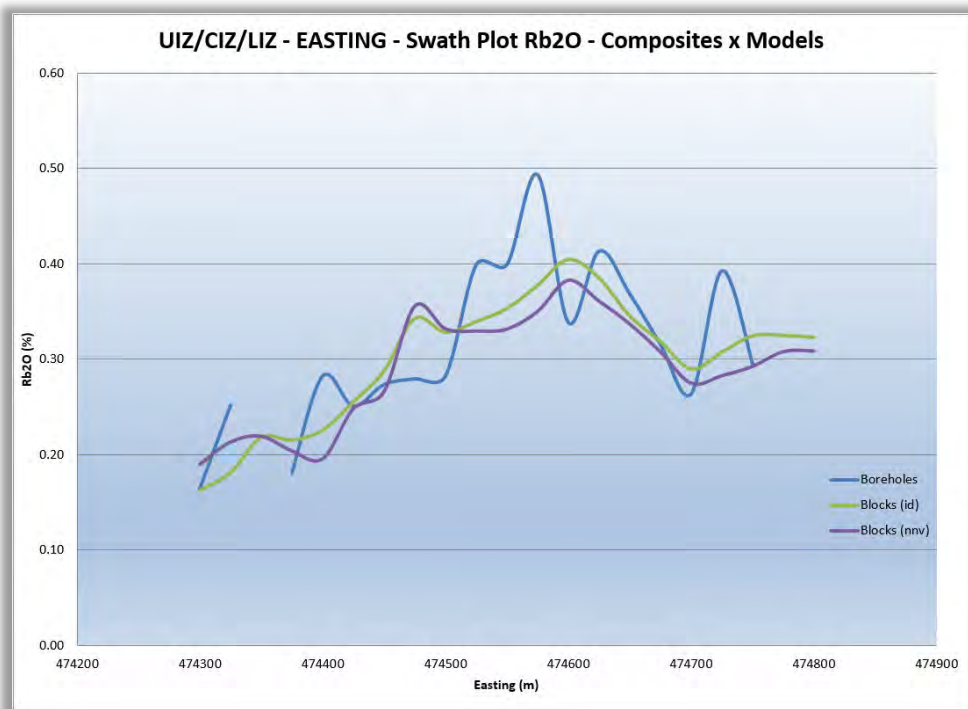


Figure 14.15 Rb₂O Swath Plot



14.1.10 PREVIOUS ESTIMATES

Frontier had commissioned WSP to generate a resource estimate in 2015 (*McCracken, 2015*). The 2105 estimate was based on 21 channels and 15 diamond drillholes.

Table 14.16 compares the basic parameters of the previous 2015 estimate with the current 2018 NI 43-101 compliant resource.

Table 14.16 Comparison of Parameters

	2015 Resource	2018 Resource
Number of Drillholes	24	34
Number of Channels	29	31
Number of Samples	1,888	2,174
Volume of UIZ (m³)	232,070	246,698
Volume of CIZ (m³)	498,653	404,874
Volume of LIZ (m³)	2,577,191	1,975,813
Grade Capping Li₂O (%)	UIZ - 4.75, CIZ - 2.00, LIZ - 3.92	UIZ - 4.95, CIZ - 4.40, LIZ - 4.18
Grade Capping Ta₂O₅ (ppm)	UIZ - 118, CIZ - 211, LIZ - 472	UIZ - 206, CIZ - 292, LIZ - 291
Block Size	2.5 x 2.5 x 2.5	2.5 x 2.5 x 2.5

The factors that led to the differences between the WSP 2018 resource model and the WSP 2015 resource model were the addition of drilling to the dataset which resulted in modifications to the domain solids which in turn resulted in volume changes and a changed estimation strategy.

14.2 SPARK RESOURCE ESTIMATE

WSP completed a resource estimation of the Spark deposit. The effective date of the resource is January 22, 2020.

14.2.1 DATABASE

Frontier maintains all borehole data in a Microsoft Access® relational database. Header, survey, assays, and lithology information are saved as individual tables in the database. The database information in CSV format was provided to WSP originally on January 14, 2020, with an updated dataset provided on January 22, 2020.

The database contains 9 boreholes and 12 channels. There is a total of 1,213 assay records in the database. The channel data was reviewed and incorporated into the borehole dataset as a form of boreholes. Table 14.17 summarizes the borehole and trench data within each geological unit.

The resource estimation was conducted using Surpac™ 2020 64 Bit version 7.2.22022.0.

Table 14.17 Spark Summary of Borehole and Trench Data

	Number of Drillholes	Length
Project Total	21	2,788
Channel samples	12	288
Boreholes	9	2,500

14.2.2 SPECIFIC GRAVITY

Frontier collected a total of 321 samples from the four diamond drillholes for specific gravity (SG) measurements. Frontier used the following procedure to determine the SG for each the mineral domains.

- Sample selected for SG measurement.
- The Borehole ID, row number, From, To and rock type were entered into a spreadsheet.
- The sample was weighted dry on the scale.
- The sample was then weighted submerged saturated in tap water at a constant 22 °C.
- The specific gravity is determined using the following equation:

$$SG = \frac{Wd}{(Wd - Ws)/CF}$$

Wd = Dry Weight, Ws = Submerged Weight, CF = correction factor for water temperature

Figure 14.1 illustrates the SG measuring set-up employed by Frontier during this round of SG data collection.

Table 14.18 summarizes the results of the SG measurements.

Table 14.18 Spark Specific Gravity Summary

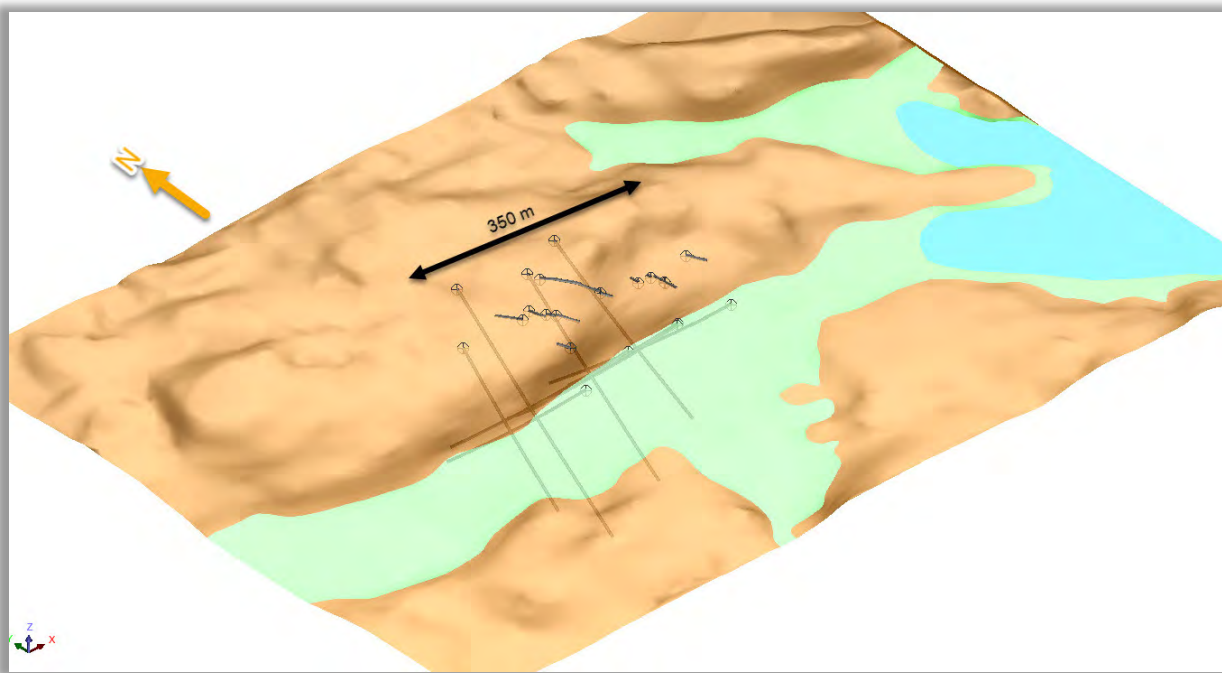
Lithology	No. of Samples	Median Rock Density
LIZ	234	2.718
Aplite	7	2.690
Metavolcanics	80	3.064

14.2.3 TOPOGRAPHY

Topographic data was generated as a Digital Terrain Model (DTM) created using contour lines generated from a combination of the total station survey data completed in August 2019, and photographic images collected by DJI Phantom 4 Pro drone taken in October 2018 (unmanned airborne vehicle). To extend the coverage for the pit shell, imagery from a May 2016 drone survey was stitched to the detailed image.

The area covered by the DTM is sufficient to cover the area defined by the current resource model (Figure 14.16).

Figure 14.16 Spark Topographic Image



14.2.4 GEOLOGY INTERPRETATION

A three-dimensional wireframe model of mineralization was developed in Surpac™ by WSP. The wireframe was based on the geological interpretation of the zone as a distinct domain and not strictly on grade intervals.

Sectional interpretations were completed in Surpac™ 2020 64 Bit version 7.2.22022.0 software, and these interpretations were linked with control strings and triangulated to build the three-dimensional solid. Table 14.19 tabulates the solid and associated volume. The solid were validated in the Surpac™ software, and no errors were found.

The modeling developed a single zone to cover the bulk of the pegmatite. The non-assayed intervals of metavolcanics within the solid were assigned a default value of half detection limit for all elements.

Figures 14.17 and 14.18 illustrate the model solid.

The wireframes extend at depth, below the deepest diamond drillholes. This is to provide a target for future exploration. The resource model did not estimate grades into the full volume of the wireframes due to sheer size of the wireframes.

Table 14.19 Spark Wireframe Summary

Domain	Minimum X	Maximum X	Minimum Y	Maximum Y	Minimum Z	Maximum Z	Surface Area (m ²)	Volume (m ³)
Spark Solid	472,621.49	472,997.37	5,829,332.06	5,829,554.21	116.471	362.805	497,101	8,329,872

Figure 14.17 Spark Wireframe (oblique view – not to scale)

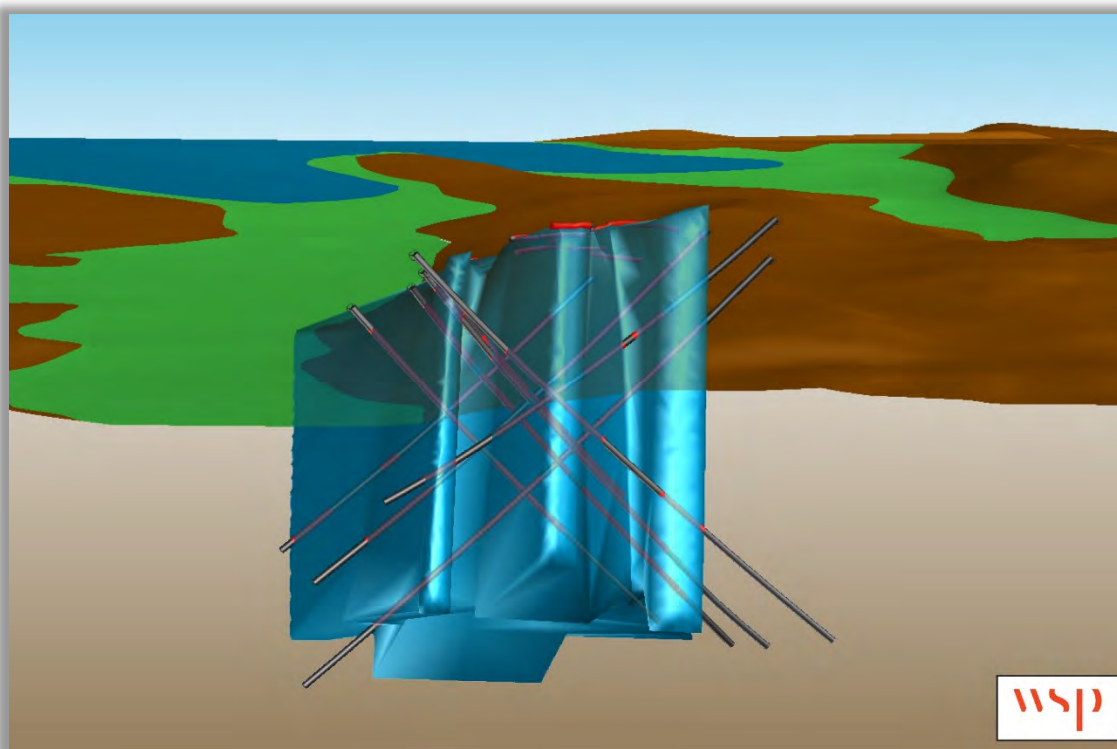
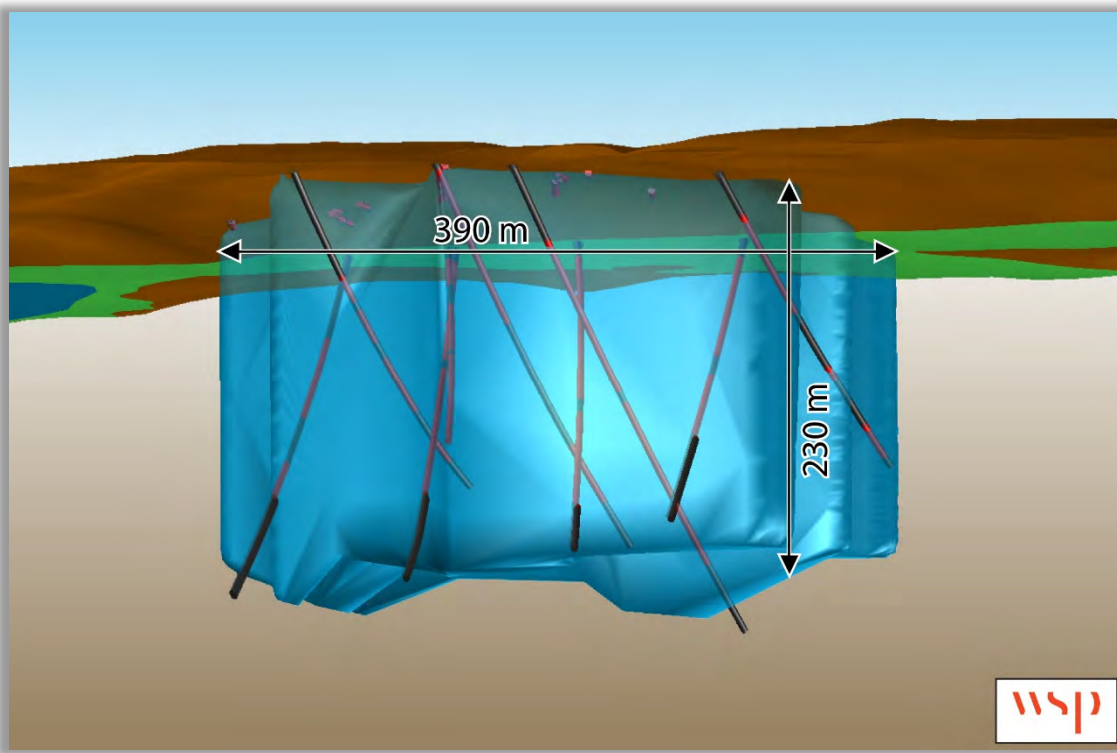


Figure 14.18 Spark Wireframe (with dimensions)



14.2.5 EXPLORATORY DATA ANALYSIS

ASSAYS

The domain included in the Spark mineral resource was sampled by a total of 1,213 Li₂O, Cs₂O, Rb₂O, SnO₂, and Nb₂O₅ assays. The assay intervals within the mineral domain was captured using a Surpac™ routine to flag the intercept into a new table in the database. These intervals were reviewed to ensure all the proper assay intervals were properly captured. Table 14.20 summarizes the basic statistics for the assay intervals within the Spark mineral domain.

Table 14.20 Spark Sample Summary

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation
Spark Solid	length (m)	1213	0.4	40.95	1.6	2.4
	LiO ₂ (%)	1213	0.00183	4.21929	1.48001	0.87259
	Cs ₂ O (%)	1213	0.00001	0.98387	0.01959	0.04093
	Rb ₂ O (%)	1213	0.00001	1.32326	0.25979	0.14072
	SnO ₂ (ppm)	1213	0.3174	1063.841	65.1529	66.4122
	Ta ₂ O ₅ (ppm)	1213	0.1527	5335.77	125.3782	202.3411
	Nb ₂ O ₅ (ppm)	1213	0.3577	353.3335	84.6752	39.8119

COMPOSITING

Compositing of all the assay data within the domain 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. Composites were generated at 2 m best fit option, allowing all the material to be used in the compositing process. Table 14.21 summarizes the statistics for the boreholes after compositing.

Table 14.21 Spark Composite Summary

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation
Spark Solid	LiO ₂ (%)	853	0.0018	4.0445	1.32562	0.83508
	Cs ₂ O (%)	853	-	0.4821	0.01823	0.03235
	Rb ₂ O (%)	853	-	1.0914	0.23542	0.13826
	SnO ₂ (ppm)	853	0.3174	1,026.8790	61.11153	68.75969
	Nb ₂ O ₅ (ppm)	853	0.3576	234.4904	76.35676	38.21381
	Ta ₂ O ₅ (ppm)	853	0.1527	4,375.1801	112.75343	177.51038

GRADE CAPPING

The composite assay data for each element within the domain was examined to assess the amount of metal that is bias from high-grade assays. A combination of viewing the histogram, QQ, and cumulative frequency plots was used to assist in determining if grade capping was required on each element in the domain.

WSP applied a top cut for each element summarizes in Table 14.22

Table 14.22 Spark Grade Capping Summary

Domain	Field	No of Records	Minimum	Maximum	Mean	Standard Deviation	Samples Capped
Spark Solid	LiO ₂ (%) - Non Capped	853	0.0018	4.0445	1.32562	0.83508	
	LiO ₂ (%) - Capped	853	0.0018	3.5473	1.32353	0.82911	11
	Cs ₂ O (%) - Non Capped	853	-	0.4821	0.01823	0.03235	
	Cs ₂ O (%) - Capped	853	0.00001	0.1853	0.01718	0.02153	6
	Rb ₂ O (%) - Non Capped	853	-	1.0914	0.23542	0.13826	
	Rb ₂ O (%) - Capped	853	0.00001	0.7989	0.23489	0.13559	4
	SnO ₂ (ppm) - Non Capped	853	0.3174	1,026.8790	61.11153	68.75969	
	SnO ₂ (ppm) - Capped	853	0.3174	380.8836	59.16068	51.31513	6
	Nb ₂ O ₅ (ppm) - Non Capped	853	0.3576	234.4904	76.35676	38.21381	
	Nb ₂ O ₅ (ppm) - Capped	853	0.3576	177.9499	76.19710	37.69165	7
	Ta ₂ O ₅ (ppm) - Non Capped	853	0.1527	4,375.1801	112.75343	177.51038	
	Ta ₂ O ₅ (ppm) - Capped	853	0.1527	672.6888	107.70962	98.10289	8

SPATIAL ANALYSIS

Variograms for each element were created to be used to generate the search ellipse dimensions. The variograms were also used to assign kriging weights during the estimation process.

The variography for Spark was determined using Surpac™ 2020 64 Bit version 7.2.22022.0 software. Each element was modeled using a downhole variogram to determine nugget effect, then a spherical pair-wise variogram was used to determine spatial continuity in the domain.

Table 14.23 summarizes the results of the variogram models for each element. The variogram rotation and maximum range governed the search ellipse rotation and size. The variogram models can be found in Appendix C.

Table 14.23 Spark Variogram Summary

Domain	Element	Nugget	Sill			Range		
			1st. S	2nd. S	3rd. S	1st. S	2nd. S	3rd. S
Spark Solid	LiO ₂ (%)	0.159903	0.084037	0.278955	-	59.173	156.015000	-
	Cs ₂ O (%)	0.000043	0.000047	0.000398	-	41.002	220.705000	-
	Rb ₂ O (%)	0.002306	0.005389	0.005167	-	33.685	120.053000	-
	SnO ₂ (ppm)	1,017.592593	239.814815	1,393.518519	-	38.529	160.448000	-
	Nb ₂ O ₅ (ppm)	474.629630	260.740741	61.111111	-	26.279	70.984000	-
	Ta ₂ O ₅ (ppm)	1,319.489733	2,742.468855	5,252.086583	-	40.534	123.067000	-

14.2.6 RESOURCE BLOCK MODEL

A separate block model was established in Surpac™ for the Spark deposit. The model was not rotated.

A block size of 2 m x 2 m x 2 m was selected in order to accommodate a small-scale open pit mining potential. Sub-blocking of the block was not used.

Table 14.24 summarizes details of the parent block model.

Table 14.24 Spark Parent Model

Parameter	
Minimum X Coordinate	5829200
Minimum Y Coordinate	472400
Minimum Z Coordinate	0
Maximum X Coordinate	5829800
Maximum Y Coordinate	473200
Maximum Z Coordinate	400
Block Size (m)	2 x 2 x 2
Rotation	0
Sub-block	none
Total No. Blocks	24,000,000

ESTIMATION PARAMETERS

An anisotropic search ellipse was used for the estimation. Only the samples within the domain wireframe were used in the estimation.

The interpolations of the zones were completed using the estimation methods ordinary kriging (OK), nearest neighbour (NN), and inverse distance squared (ID²). The estimations were designed for multiple passes. In each estimation pass, a minimum and maximum number of samples were required as well as a maximum number of samples from a borehole in order to satisfy the estimation criteria.

Table 14.25 summarizes the search ellipse size and rotations, and Table 14.26 summarizes the interpolation criteria.

Table 14.25 Spark Search Ellipse Summary

Domain	Elements	Bearing	Plunge	Dip	Major axis	Semi-major axis	Minor axis	Anisotropy Ratio	
								Major / Semi-major	Major / Minor
Spark Solid	LiO ₂ (%)	294.27	-72.04	-30.03	156.02	81.64	43.42	1.91	3.59
	Cs ₂ O (%)	30.58	58.53	10.03	220.71	102.51	75.79	2.15	2.91
	Rb ₂ O (%)	295.00	-90.00	-90.00	120.05	111.47	26.50	1.08	4.53
	SnO ₂ (ppm)	295.00	-90.00	85.00	160.45	101.10	54.46	1.59	2.95
	Nb ₂ O ₅ (ppm)	225.00	72.00	-15.00	70.98	21.65	20.95	3.28	3.39
	Ta ₂ O ₅ (ppm)	100.00	-80.00	75.00	123.07	93.44	48.15	1.32	2.56

Table 14.26 Spark Estimation Strategy

Domain	Estimation Pass No.	Search Ellipse Factor	Minimum No. of Composites	Maximum No. of Composites	Maximum No. of Composites per BH
Spark Solid	1	0.3	6	15	2
	2	0.5	5	15	2
	3	0.75	4	15	2
	4	1	3	15	2
	5	1	2	15	3

14.2.7 RESOURCE CLASSIFICATION

Several factors are considered in the definition of a resource classification:

- NI 43-101 requirements;
- Canadian Institute of Mining, Metallurgy and Petroleum (CIM) Estimation of Mineral Resource and Mineral Reserve Best Practice Guidelines (CIM 2019);
- Author's experience with pegmatite deposits;
- Spatial continuity based of the assays within the drillholes and channel;
- Understanding of the geology of the deposit; and
- Drillhole and channel spacing, and the estimation runs required to estimate the grades in a block.

No material in the block was considered as Measured.

Material in the block model is considered Indicated when:

- Li_2O is greater than 0;
- The block was estimated in pass 1 or pass 2 and
- Seven or more composites were used in the estimate.

Or

- Li_2O is greater than 0; and
- Blocks are located inside the DTM Spark_Pegmatite_Limits_Rescat_Complement (Figure 14.19); or
- Blocks are located inside the DTM Spark_Pegmatite_Limits_Rescat_Solid which correlates with the surface exposure of the pegmatite (Figure 14.20).

Material in the block model is considered Inferred when:

- All remaining blocks not assigned to Measured or Indicated.

No environmental, permitting, legal, title, taxation, socio-economic, marketing, or other relevant issues are known to WSP 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. As per NI 43-101, mineral resources which are not mineral reserves do not have to demonstrate economic viability.

Figure 14.19 Spark Pegmatite Limits Rescat Complement

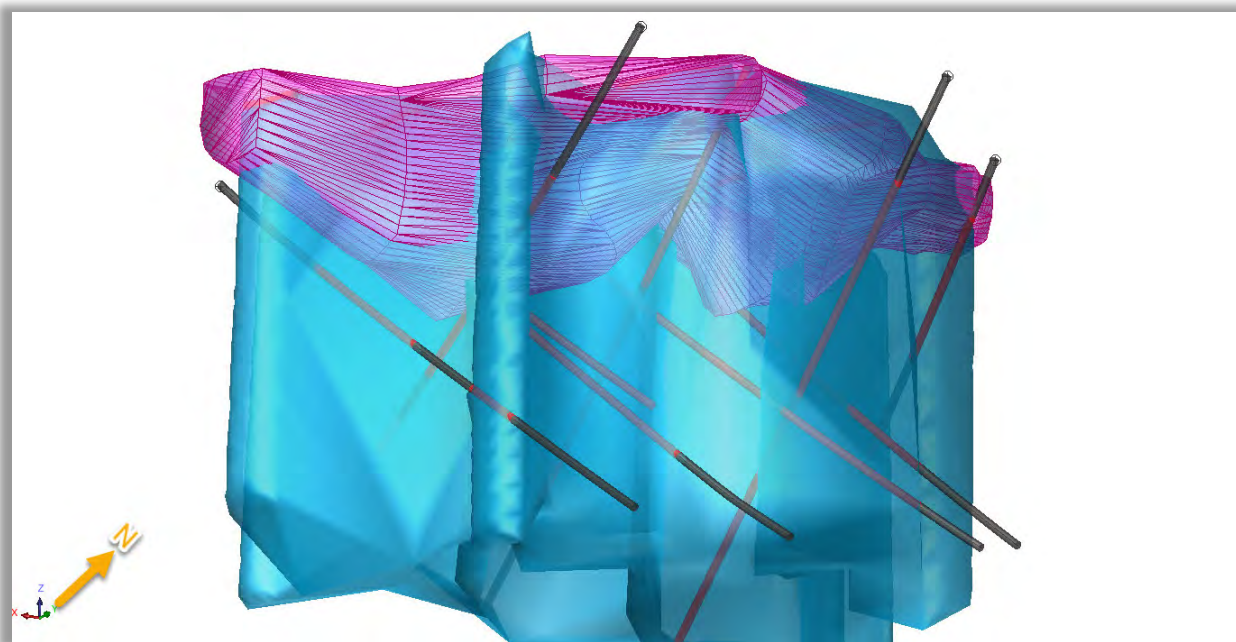
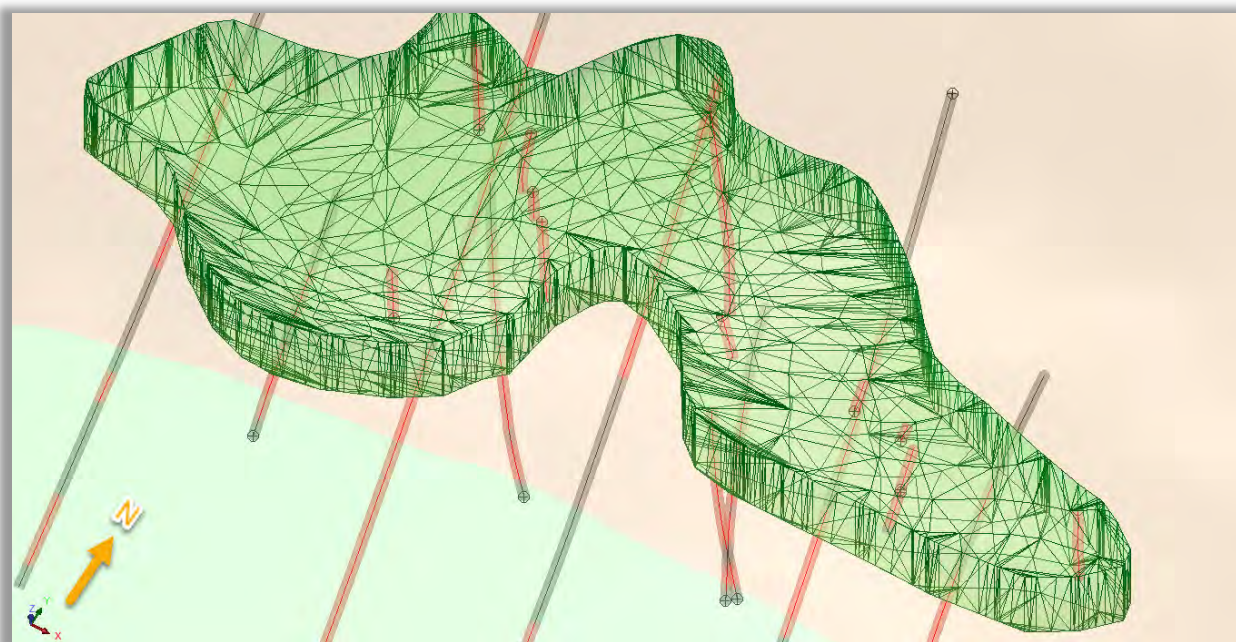


Figure 14.20 Spark Pegmatite Limits Rescat Solid



14.2.8 MINERAL RESOURCE TABULATION

The effective date of the mineral resource is January 22, 2020 and has been tabulated in terms of a Li₂O cut-off grade of 0.65%. The mineral resources are tabulated using a pit shell generated using similar mining parameters used for the PAK mine plan (Table 14.27)

Table 14.27 Spark Pit Shell Parameters

Mining cost (CAN\$/t)	7.50
Processing cost (CAN\$/t)	65.00
G&A cost (CAN\$/t)	10.00
Pit angle (degree)	49
Dilution (%)	5
Recovery (%)	95
Li₂O (US\$/t - 6.5% con)	700.00
Exchange Rate	1.30

The mineral resource constrained within in a pit shell is summarized in Table 14.28.

Table 14.28 Spark Mineral Resource Summary

Cut-Off	Resource Category	Tonnes (t)	Li₂O (%)	Nb₂O₅ (ppm)	CS₂O (%)	Ta₂O₅ (ppm)	Rb₂O (%)	SnO₂ (ppm)	Contained Li₂O (t)
0.65% Li₂O	Indicated	3,248,246	1.59	56.08	0.015	123.242	0.256	67.553	51,712
	Inferred	12,227,880	1.36	44.66	0.02	107.209	0.228	53.141	166,177

Mineral Resource was prepared in accordance with NI 43-101 and the CIM Definition Standards (2019). 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, or other relevant issues.

14.2.9 VALIDATION

The Spark model was validated by 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 ID², NN, and composites.
3. Swath plots.

VISUAL VALIDATION

The visual comparisons of block model grades with composite grades for each of the zones show a reasonable correlation between the values (Figures 14.21 and 14.22). No significant discrepancies were apparent from the sections reviewed, yet grade smoothing is apparent in some of the lower elevations due to the distance between drill samples being broader in these regions.

Figure 14.21 Validation of Model vs. PL-038-19

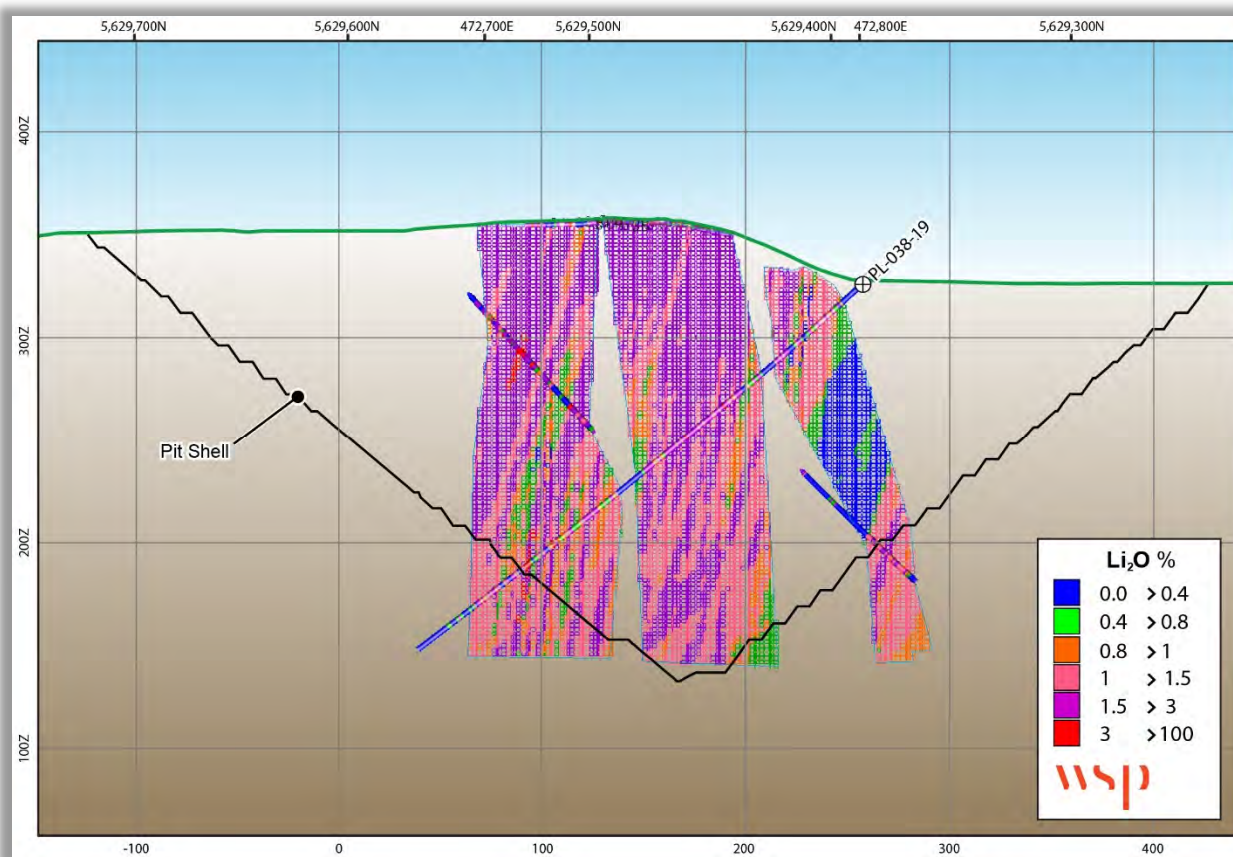
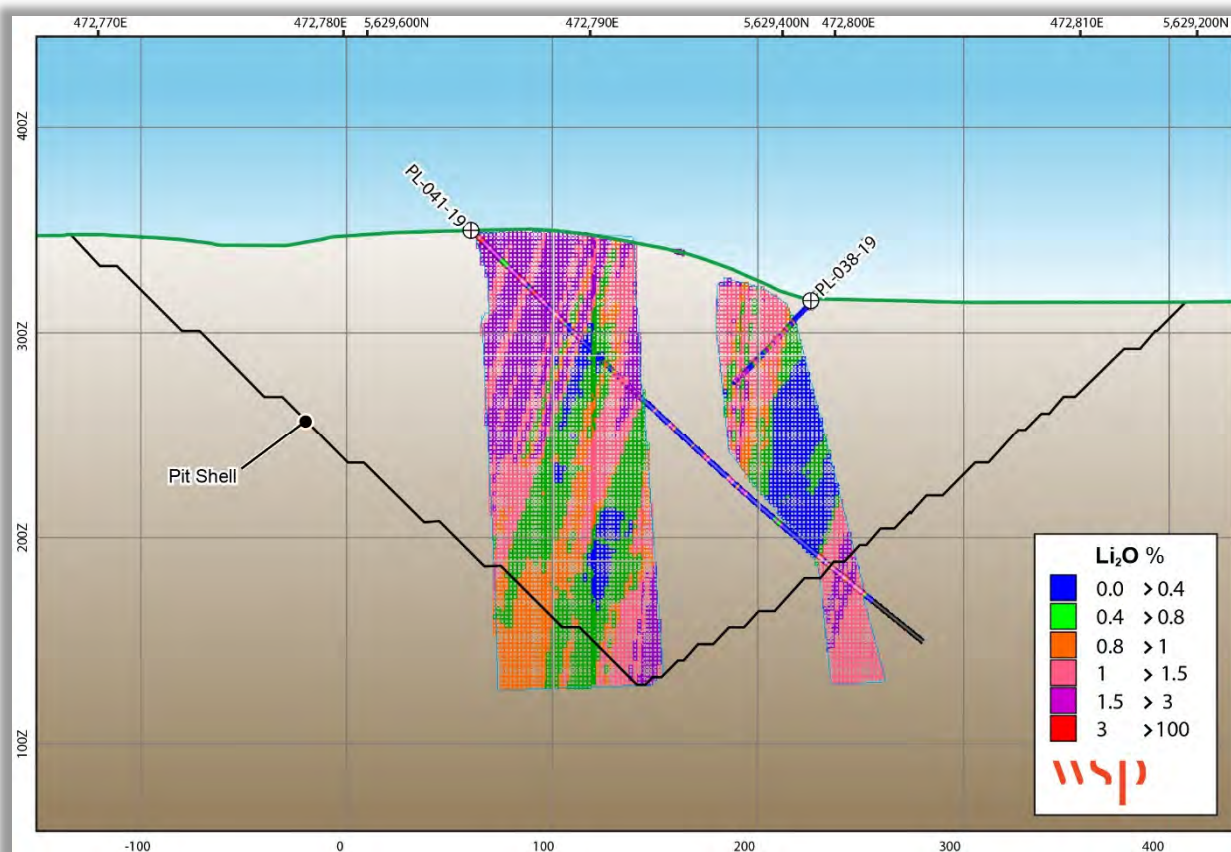


Figure 14.22 Validation of Model vs. PL-041-19



GLOBAL COMPARISON

The global block model statistics for the OK model was compared to the global NN and ID² model values as well as the composite capped drillhole data. Table 14.29 shows this comparison of the global estimates for the three estimation method calculations. In general, the OK, ID², and NN results are lower than the drillhole dataset. Larger discrepancies are reflected as a result of lower drill density in some portions of the model. There is a degree of smoothing apparent when compared to the diamond drill statistics. Comparisons were made using all blocks at a 0% Li₂O cut-off.

Table 14.29 Spark Global Statistics

Domain	Element	DDH	NN	ID ²	OK
Spark	LiO ₂ (%)	1.324	1.209	1.217	1.203
	Cs ₂ O (%)	0.017	0.018	0.018	0.018
	Rb ₂ O (%)	0.235	0.221	0.223	0.217
	SnO ₂ (ppm)	59.161	54.213	55.117	54.518
	Nb ₂ O ₅ (ppm)	76.197	39.944	40.011	40.221
	Ta ₂ O ₅ (ppm)	107.710	105.598	106.673	109.160

SWATH PLOTS

Figures 14.23 and 14.24 display the comparison between OK estimate with the ID² and NN estimates, and the drillhole composites in a swath plot format.

As expected, there is a strong correlation between the three estimation methods and the composite drill data.

Figure 14.23 Spark LiO₂ Easting Swath

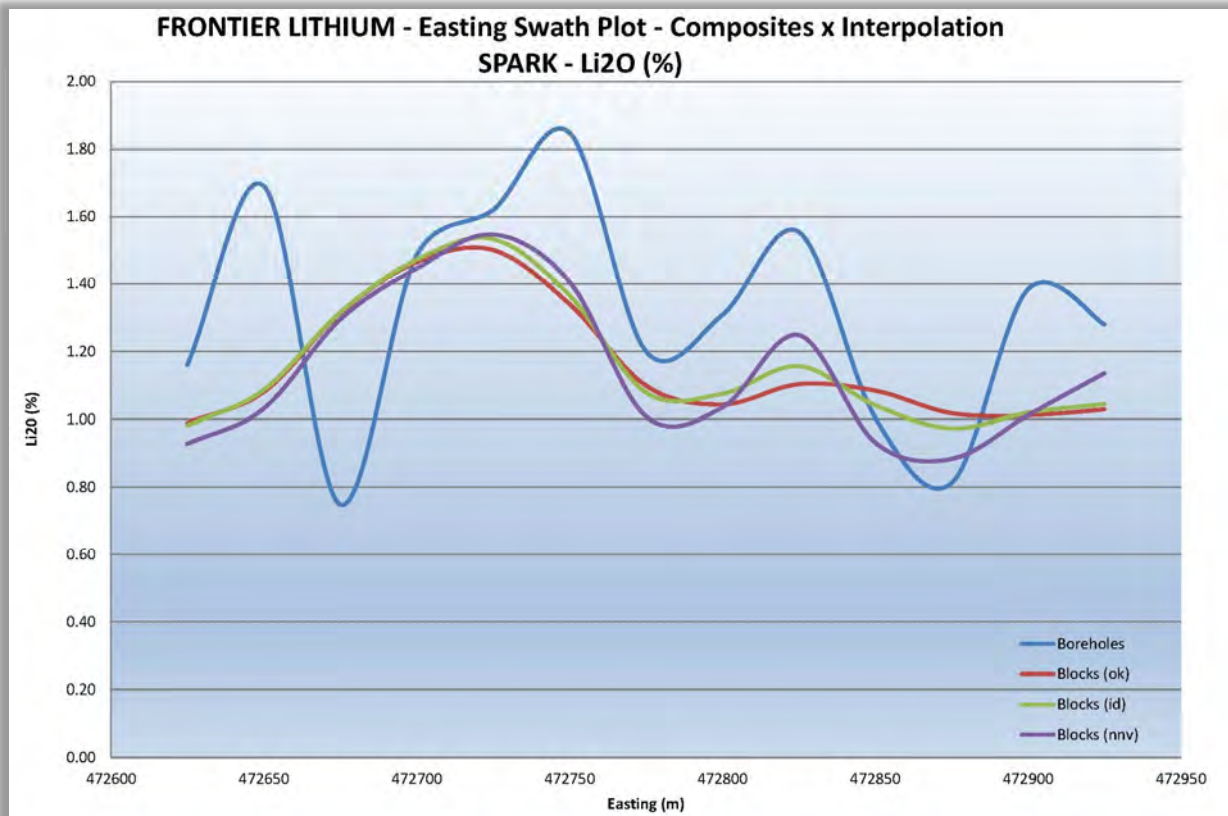
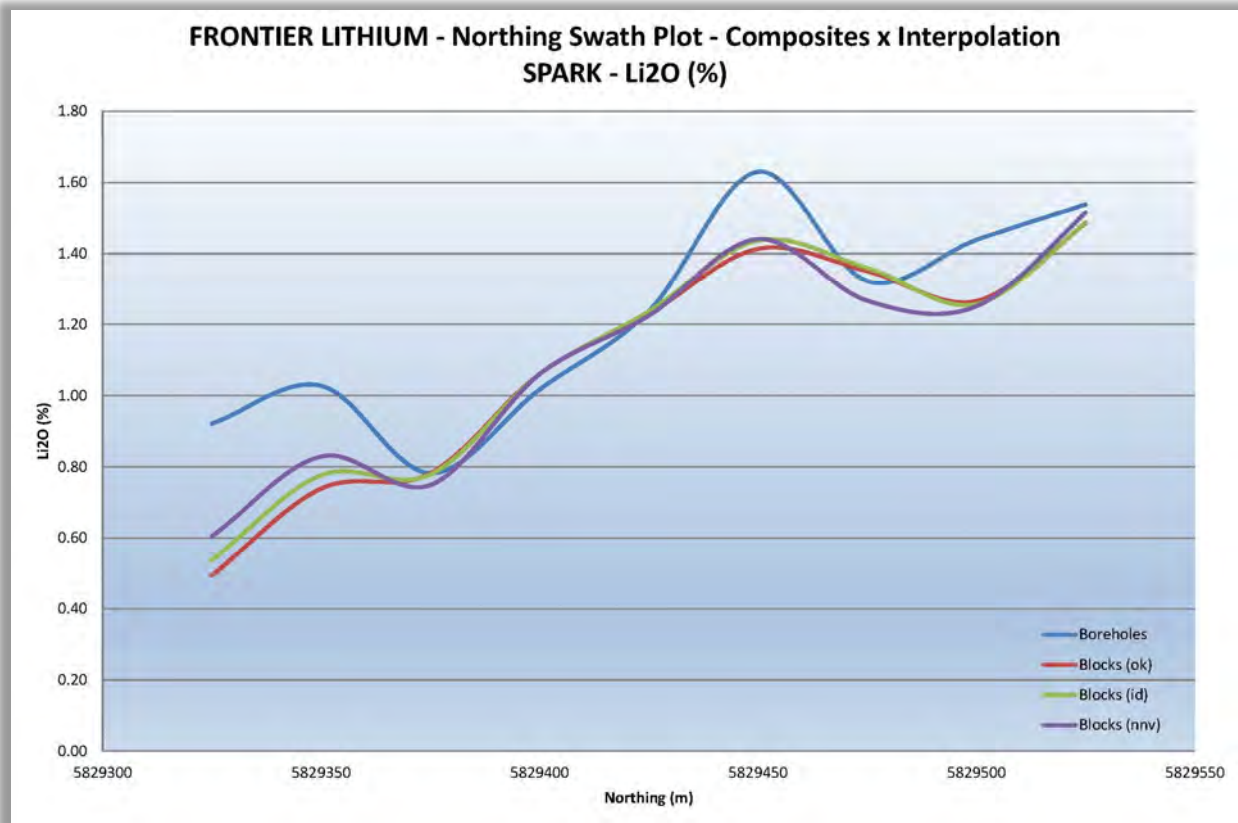


Figure 14.24 Spark LiO₂ North Swath



14.2.10 PREVIOUS ESTIMATE

There is no previous mineral resource estimation on the Spark deposit.

15 MINERAL RESERVE ESTIMATES

The open pit Mineral Reserves were classified in accordance with the CIM Definition Standards for Mineral Resources and Mineral Reserves. Only Measured and Indicated Mineral Resources that were identified as being economically extractable were included. The Mineral Reserves for the PAK deposit incorporated appropriate dilution and recovery for the selected mining method. The Mineral Reserves form the basis for the mine plan presented in Section 16.0.

The Mineral Reserve estimate for the PAK (Pakeagama) deposit is based on the resource block model provided by WSP, with an effective date of March 2, 2018.

Mineral Reserves are the estimate of the tonnage and grade that can be economically mined and processed. The estimated material in the Mineral Reserves must pay for all the costs incurred during mining, processing, and concentrate selling. The following section outlines the procedure used to estimate the Mineral Reserves. The mine plan is based on the detailed mine design derived from the optimal pit shell produced by applying the NPV scheduler. The underground mine plan was derived using Datamine Studio 5D Planner.

15.1 MINERAL RESERVES

As defined by the Canadian Institute of Mining, Metallurgy and Petroleum within the CIM Definition Standards on Mineral Resources and Mineral Reserves (CIM Definition Standards for Mineral Resources & Mineral Reserves 2014), the definition of a mineral reserve is as follows:

“A Mineral Reserve is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at Pre-Feasibility or Feasibility level as appropriate that include the application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified.

Modifying Factors are considerations used to convert Mineral Resources to Mineral Reserves. These include, but are not restricted to, mining, processing, metallurgical, infrastructure, economic, marketing, legal, environmental, social and governmental factors.

The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.”

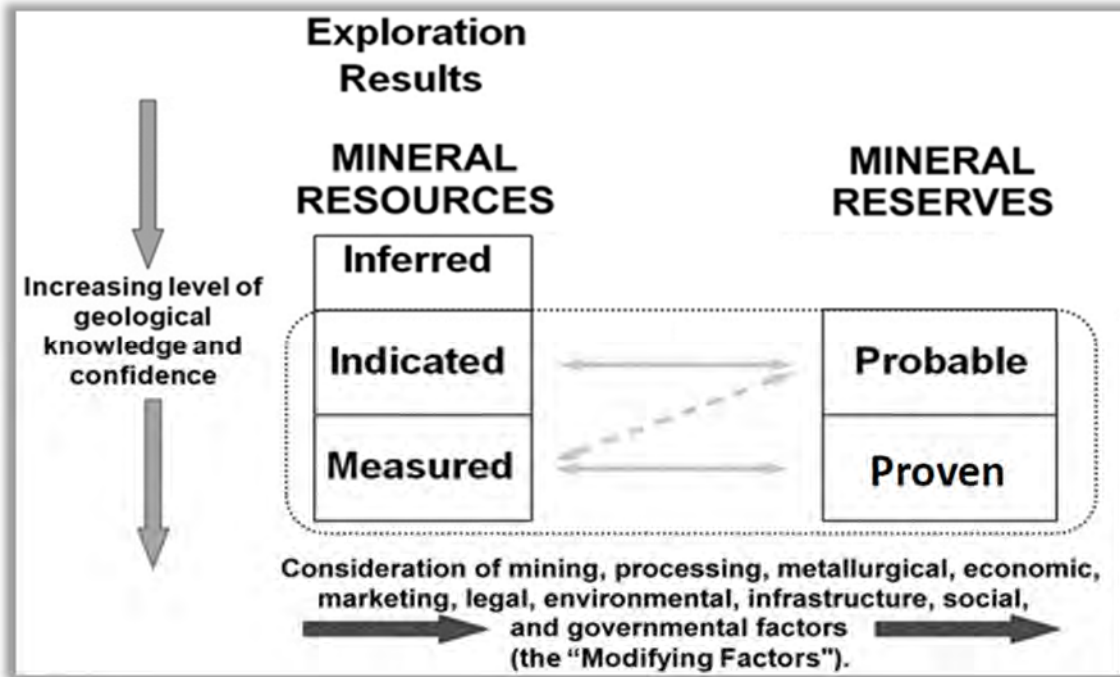
Mineral reserve classifications are further subdivided to indicate the degree of certainty that can be attached to the estimate. For mineral reserve, the following definitions are from the CIM Definition Standards and apply to this report:

A “Probable Mineral Reserve” is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proven Mineral Reserve.

A “Proven Mineral Reserve” is the economically mineable part of a Measured Mineral Resource. A Proven Mineral Reserve implies a high degree of confidence in the Modifying Factors.

The CIM Definition Standards provide for a direct relationship between Indicated Mineral Resources and Probable Mineral Reserves and between Measured Mineral Resources and Proven Mineral Reserves. In other words, the level of geoscientific confidence for Probable Mineral Reserves is the same as that required for the in-situ determination of Indicated Mineral Resources, and for Proven Mineral Reserves it is the same as that required for the in-situ determination of Measured Mineral Resources. Figure 15.1 displays the relationship between the Mineral Resource and Mineral Reserve categories.

Figure 15.1 Relationship between Mineral Resources and Mineral Reserves



This section presents the estimated mineral reserves for the PAK deposit. The PAK deposit has been designed for extraction by open pit mining method and underground. The basis for the open pit design to support the mineral reserve estimates of the pit are discussed in 15.2.4.

15.2 OPEN PIT

The open pit reserves were calculated using NPV Scheduler® Version 4.27.19.0 to optimize the mineral resource block model using the mining parameters in 15.2.2.1 and 15.2.2.2 to obtain economic mining shapes or shells. An analysis of the optimized shells created by the NPV Scheduler® was then conducted to select the optimized pit shell to be used as a guide to the detailed pit design. Table 15.1 presents a summary of the open pit reserves.

Table 15.1 Summary of Open Pit Reserve Tonnes and Grade

Classification	Geologic Zone	Tonnage (t)	LiO ₂ (%)
Proven	Upper Intermediate Zone (UIZ)	324,716	3.99
	Lower Intermediate Zone (LIZ)	867,713	1.79
Probable	Upper Intermediate Zone (UIZ)	302,042	3.14
	Lower Intermediate Zone (LIZ)	2,640,277	1.79

15.2.1 GEOLOGICAL BLOCK MODEL

WSP Canada Inc. (WSP) provided the block model data in CSV format, and the QP's validated the block model after the data were imported to Datamine Studio 5D Planner Version 14.25.76.0.

15.2.2 PIT OPTIMIZATION AND DESIGN

Mine planning for the PAK open pit was conducted using a combination of Datamine Studio 5D Planner and NPV Scheduler®. Calculation of economic ultimate pit limits for the deposit using the NPV Scheduler®. This software applies the Lerchs-Grossman algorithm to define optimal mining shells. A series of nested envelopes was produced within a range of economic conditions.

WSP provided the block model data which was imported and processed in Datamine Studio 5D Planner. NPV Scheduler® was used for the open pit optimization and life-of-mine data broken down by bench, while Datamine Studio 5D Planner was used to create detailed pit design. As discussed in Section 15.2.1, the mineral inventory geologic block model for the PAK open pit was used with NPV Scheduler® to determine optimal mining shells and pit phasing based on the design criteria summarized in 15.2.4.

A series of optimized shells were generated based on varying revenue factors. The results were analyzed with the optimal shell chosen as the basis for ultimate pit limits and preliminary phase selection.

The total feed tonnes and Li₂O% were returned from the final pit design. Note that the NPV values in this optimization summary do not take into account capital expenditures and is used only as a guide in the shell selection and determination of the mining shapes. The actual NPV of the Project is summarized in Section 22 of this report.

NPV Scheduler® produces both a best case (i.e., mine out Shell 1, the smallest shell, and then mine out each subsequent shell from the top down, before starting the next shell), and a worst case (mine each bench completely to final limits before starting next bench) scenarios. These scenarios provide a bracket for the range of possible outcomes. The shells were produced based on varying revenue factors to produce the series of nested pit shells.

GEOTECHNICAL PARAMETERS

The open pit recommended slope angles were derived from the PAK Lithium Geotechnical Drilling and Prefeasibility Slope Design Recommendations for the PAK Lithium Deposit Golder report dated October 31, 2017. The report provides slope parameters by domain and design sector for the PAK Lithium deposit. The summary includes the outline of the field program, in-situ hydraulic conductivity testing, rock mass characterization, strength testing results and stereo nets of the oriented core data. The kinematic assessment of controls on the slope design summarized in the report is based on the discontinuity population from oriented core collected during the 2017 winter geotechnical drilling of PL-GHD-17-01, PL-GHD-17-02, PL-GHD-17-03, and PL-GHD-17-04 between February 14 and February 28, 2017. The purpose of PL-GHD-17-01 & PL-GHD-17-02 borehole was used to characterize the fabric that was expected to control the north and south walls of the provided pit shell, PL-GDH-17-03, to characterize the northeast pit wall, and lastly PL-GDH-17-04, used to characterize the southeast wall.

Based on the report, the following slope assumptions were made for the PAK open pit optimized shell.

- Operating benches of 10 m in height – may be double benched on ultimate slopes in good rock but need to be confirmed in future work.
- Bench Face Angle (BFA) of 75 degrees achieved where kinematics is favourable and operational controlled blasting is implemented with vertical or 80 degrees pre-shear.
- The achieved BFA will be reduced to 70 or 65 degrees to control potential wedge or planar failure.
- BFA 75 degrees to control bench scale toppling, developed with the inclined pre-shear at 75 degrees.
- The catchment bench width for single benches shall be a minimum of 8 m. For double benches minimum 8.5 m width (Modified Ritchie Formula)
- Catchment bench recommended to be increased to reduce the inter-ramp angle to control potential planes or wedge failures at the inter-ramp scale or to control potential unraveling.
- For slopes greater than 150 m in height not transacted by a ramp, wider catch bench of with 15 m is recommended every 150 m vertical separation as a safety control to rock falls.
- Potential toppling planar failures are assumed to apply to +/- 20 degrees of strike; and potential wedges are assumed to apply to +/- 45 degrees of the wedge's plunge. Planes or wedges with the limit of equilibrium FOS (Factor of Safety) of 1.2 or less under dry conditions were considered potential controls on slope design.
- Potential planes, wedges and toppling are based on deterministic assessments of the peak orientations from oriented core.
- On some design sectors, an inter-ramp angle steeper than the plunge or dip of the potential wedge or plane failures be recommended where they involve joint sets considered discontinuous or widely spaced. Localized failures on planes and wedges of these sets may still occur.
- In the open pit-controlled blasting, if the strong structural control at the flatter angles is lacking, the following BFA ranges are typically achievable, depending on rock quality and blasting methods:
 - Standard production blasting – 55 - 65 degrees
 - Effective controlled blasting – 65 – 70 degrees (trim and cushion blasting)
 - Best Case controlled blasting – 70 - 75 degrees (pre-shearing)

Table 15.2 shows Golder slope design recommendations for the optimized pit shell. Figure 15.2 displays the four domains. Figure 15.3 displays the Section Structural Domain angles.

Table 15.2 Slope Design Recommendations for Optimized Pit Shell

Design Sector	Azimuth (degrees)	Operational Practices	Inter-ramp Angle (IRA) (degrees)	Overall Slope Angle (OSA) (degrees)
North Wall to East	005 to 080	Pre-split blasting	51.7	47
East Wall to South	080 to 190	Pre-split blasting	55.3	50
West Wall	190 to 280	Pre-split blasting	55.3	50
West Wall to North	280 to 005	Pre-split blasting	51.7 (55.3)	47 (50)

Figure 15.2 Plan Drawing Structural Domains

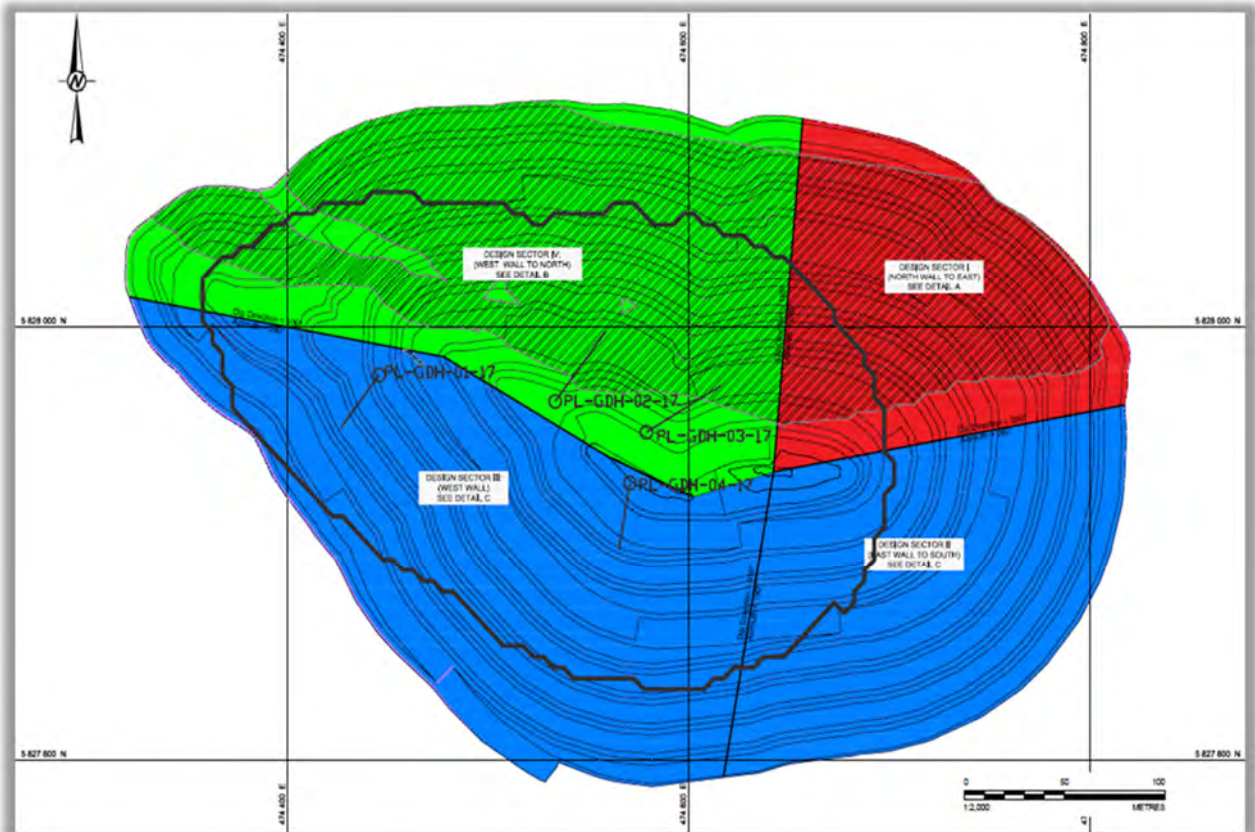
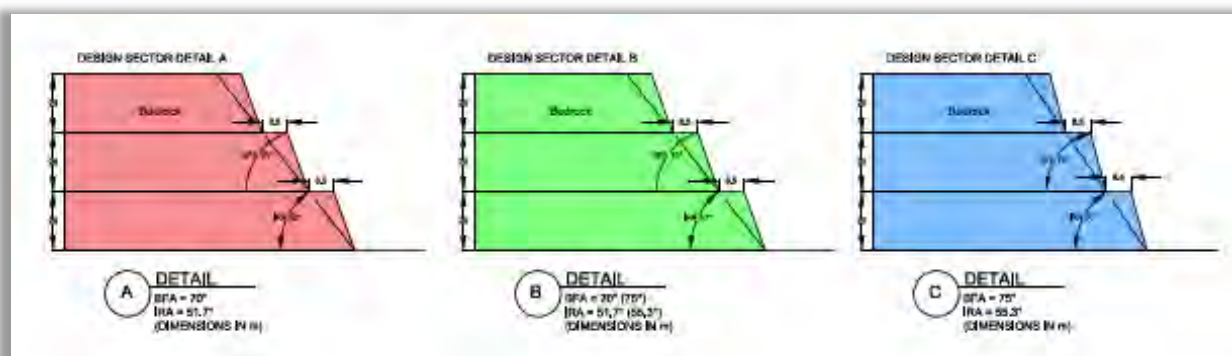


Figure 15.3 Section Structural Domains



ECONOMIC PARAMETERS

The QP completed the required economic parameter data for the input unto the NPV Scheduler. The economic and operating parameters used in the open pit optimization are detailed in Table 15.3.

Table 15.3 Economic and Operating Parameters

Cost (\$/t)	
Mining (\$/t mined)	7.5
Processing Cost (\$/t milled)	75
Conversion	
US\$=CAN\$ Exchange	1.25
Market Price	\$CAD
Li ₂ O % Price (\$)	13,800
Selling (\$/tonne)	2405
NPVS Data Input	
North Wall to East	45°
East Wall to South	49°
West Wall	49°
West Wall to North	49°
Mining Dilution	5%
Recovery (% mining recovery)	100%
Haul Road Width Double Lane	16.2 m
Single Lane	10.8 m

15.2.3 PIT OPTIMIZATION RESULTS

In order to determine the optimum pit shell, cash flow analyses were performed taking into account the sequence of mining for all the nested pit shells. This process considers the information in the geological block model, the pit slope angles by geotechnical sector, the commodity prices, the mining and processing costs, the process recovery and the sales cost for the lithium concentrate produced.

The optimization run included 100 pit shells according to different revenue factors, where a revenue factor of 1% is the base case. To select the optimal pit shell that defines the ultimate pit limit, the QP conducted a pit-by-pit analysis to evaluate the contribution of each incremental shell to NPV. The data from the NPV Scheduler® Table 15.4, shows a summary of the calculated pit shells. After reviewing the series of optimized pit shells generated based on the varying revenue factors, the pit phase number 96 (96%-factor) was selected as an optimized pit. This pit shell contains 4,219,371 tonnes of ore that generates a cashflow of \$307 M at a cash flow/ore tonne of \$72.8, and a cash flow/waste tonne of \$20.23 with a strip ratio of 3.60. Mining additional resources beyond the limits of this pit shell increases the strip ratio but does not significantly increase the NPV of the project.

Table 15.4 Summary of Pit Shells

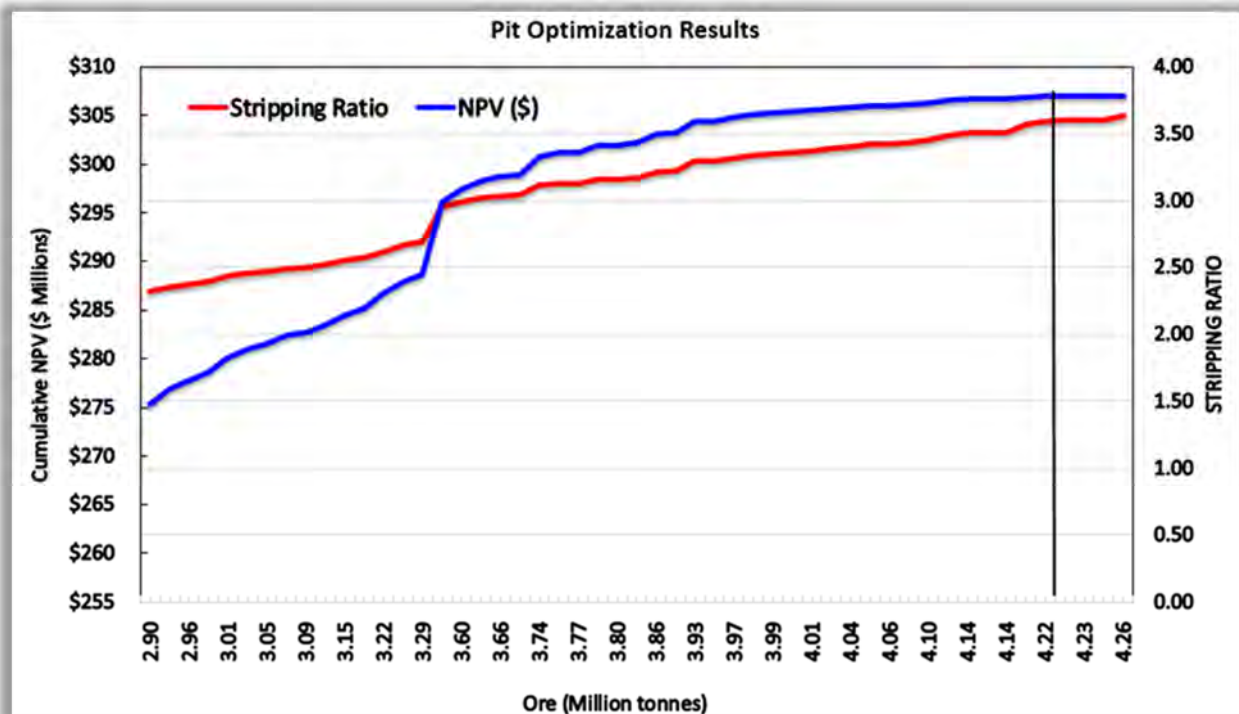
Pit	Factor	NPV		Ore		Waste		Strip
		\$	M\$	tonnes	Mt	tonnes	Mt	
Pit 50	50%	275,355,986	275.36	2,899,295	2.90	6,708,222	6.71	2.31
Pit 51	51%	276,839,678	276.84	2,932,304	2.93	6,889,168	6.89	2.35
Pit 52	52%	277,794,162	277.79	2,958,637	2.96	7,005,746	7.01	2.37
Pit 53	53%	278,650,542	278.65	2,981,163	2.98	7,119,469	7.12	2.39
Pit 54	54%	280,114,700	280.11	3,011,076	3.01	7,320,480	7.32	2.43
Pit 55	55%	281,001,278	281.00	3,035,557	3.04	7,447,194	7.45	2.45
Pit 56	56%	281,589,163	281.59	3,053,224	3.05	7,535,460	7.54	2.47
Pit 57	57%	282,381,608	282.38	3,077,667	3.08	7,659,338	7.66	2.49
Pit 58	58%	282,704,804	282.70	3,086,455	3.09	7,711,645	7.71	2.50
Pit 59	59%	283,395,781	283.40	3,114,618	3.11	7,829,383	7.83	2.51
Pit 60	60%	284,419,514	284.42	3,146,052	3.15	8,012,514	8.01	2.55
Pit 61	61%	285,100,035	285.10	3,169,987	3.17	8,139,072	8.14	2.57
Pit 62	62%	286,675,395	286.68	3,222,813	3.22	8,435,085	8.44	2.62
Pit 63	63%	287,934,860	287.93	3,262,517	3.26	8,691,319	8.69	2.66
Pit 64	64%	288,637,382	288.64	3,285,674	3.29	8,839,873	8.84	2.69
Pit 65	65%	296,135,466	296.14	3,550,601	3.55	10,506,382	10.51	2.96
Pit 66	66%	297,482,368	297.48	3,604,004	3.60	10,800,443	10.80	3.00
Pit 67	67%	298,266,641	298.27	3,638,650	3.64	10,986,679	10.99	3.02
Pit 68	68%	298,761,497	298.76	3,658,217	3.66	11,110,182	11.11	3.04
Pit 69	69%	298,872,695	298.87	3,662,054	3.66	11,138,978	11.14	3.04
Pit 70	70%	300,707,353	300.71	3,737,883	3.74	11,644,566	11.64	3.12
Pit 71	71%	301,145,035	301.15	3,756,301	3.76	11,756,260	11.76	3.13
Pit 72	72%	301,271,658	301.27	3,765,614	3.77	11,792,133	11.79	3.13
Pit 73	73%	301,988,087	301.99	3,802,096	3.80	12,024,178	12.02	3.16
Pit 74	74%	301,994,317	301.99	3,802,523	3.80	12,026,229	12.03	3.16
Pit 75	75%	302,228,707	302.23	3,815,937	3.82	12,108,658	12.11	3.17
Pit 76	76%	303,038,923	303.04	3,861,711	3.86	12,415,789	12.42	3.22
Pit 77	77%	303,181,434	303.18	3,867,649	3.87	12,457,037	12.46	3.22
Pit 78	78%	304,331,588	304.33	3,927,370	3.93	12,938,897	12.94	3.29
Pit 79	79%	304,436,059	304.44	3,935,320	3.94	12,977,438	12.98	3.30
Pit 80	80%	304,847,629	304.85	3,965,366	3.97	13,174,846	13.17	3.32
Pit 81	81%	305,134,865	305.13	3,984,675	3.98	13,314,160	13.31	3.34

(table continues on next page)

Pit	Factor	NPV		Ore		Waste		Strip
		\$	M\$	tonnes	Mt	tonnes	Mt	
Pit 82	82%	305,208,996	305.21	3,990,613	3.99	13,353,948	13.35	3.35
Pit 83	83%	305,355,251	305.36	4,002,068	4.00	13,437,044	13.44	3.36
Pit 84	84%	305,524,544	305.52	4,014,713	4.01	13,529,128	13.53	3.37
Pit 85	85%	305,756,542	305.76	4,033,338	4.03	13,688,019	13.69	3.39
Pit 86	86%	305,832,880	305.83	4,037,738	4.04	13,734,638	13.73	3.40
Pit 87	87%	306,004,927	306.00	4,055,303	4.06	13,865,154	13.87	3.42
Pit 88	88%	306,053,736	306.05	4,064,582	4.06	13,907,976	13.91	3.42
Pit 89	89%	306,156,476	306.16	4,075,903	4.08	14,004,474	14.00	3.44
Pit 90	90%	306,336,008	306.34	4,095,940	4.10	14,148,125	14.15	3.45
Pit 91	91%	306,552,753	306.55	4,123,634	4.12	14,380,348	14.38	3.49
Pit 92	92%	306,655,845	306.66	4,140,721	4.14	14,507,542	14.51	3.50
Pit 93	93%	306,662,606	306.66	4,141,960	4.14	14,517,692	14.52	3.51
Pit 94	94%	306,669,188	306.67	4,144,268	4.14	14,528,637	14.53	3.51
Pit 95	95%	306,890,412	306.89	4,202,411	4.20	15,021,458	15.02	3.57
Pit 96	96%	307,001,486	307.00	4,219,371	4.22	15,177,727	15.18	3.60
Pit 97	97%	307,007,507	307.01	4,223,129	4.22	15,197,006	15.20	3.60
Pit 98	98%	307,011,661	307.01	4,226,932	4.23	15,213,931	15.21	3.60
Pit 99	99%	307,012,714	307.01	4,228,384	4.23	15,224,452	15.22	3.60
Pit 00	100%	307,024,020	307.02	4,260,553	4.26	15,493,921	15.49	3.64

The graph on Figure 15.4 show cumulative revenue, total ore and stripping ratio. To maximize the NPV, the QP selected the pit phase number 96 (96%-factor) to be used for the PAK open pit design to maximize the total ore tonnage as shown in the blue line of the graph. Subsequent pit phase number 97 (97% to 100% factor), not significant difference in ore tonnes and revenue.

Figure 15.4 Pit Optimization Results Graph



15.2.4 PIT DESIGN

The next step in the Mineral Reserve estimation process was to design an operational pit that will be the form for the basis of the production plan. This pit shell as a guideline and includes smoothing the pit wall, adding the ramps to access the pit bottom and ensuring that the pit can be mined using the initially selected equipment.

The mine design parameters were:

- 36 nominal tonnes capacity haul trucks (based on process rate 1118 tpd)
- 10 m high working benches
- Double bench at final walls
- Ramp grade of 10%
- 16.2 m wide ramp in passing lane traffic
- 10.8 m wide ramp for single lane traffic.

15.2.5 PIT SLOPE PARAMETERS

The geotechnical pit slope parameters were provided by Golder Associates report Design Brief – Slope Design Recommendations for the PAK Lithium Deposit dated April 24, 2017. The PAK open pit was sub-divided in 4 sub-structural domains as presented on Figure 15.2 Plan Drawing Structural Domains. For all the final pit walls, the report recommends an overall slope angle of 45 and 49 degrees as provided on Figure 15.3 Section Structural Domains. This slope will be achieved with 20 m bench heights; a bench face angle of 80 degrees and 8.5 m wide catchment bench. The recommended inter-ramp angle is 51.7 and 55.3 degrees.

For the slope design analyses, please refer to the Golder Associates Design Brief. According to the report, the pit shell that was considered in this study will expose a sequence of moderate to steeply dipping weakly metamorphosed intrusive and metasedimentary rock striking NW-SE of the Archean age superior province Canadian shield bedrock. There may be some folding and mineralization plunges to the east. The testing of the rock sample indicated very strong rocks, with RQD > 80% and RMR > 80 % will be exposed.

The report further describes that there appear to be two strong joint set orientations plus random and there may be three sets plus random or lesser orientations namely a moderately southwest dipping set that parallels the regional trend, a flat set and a likely moderate to steeply dipping set perpendicular to the regional trend, possibly most prevalent on the open pit west end. The report also states given the competent rock, rock mass failure is not a concern.

15.2.6 HAUL ROAD DESIGN

The ramp and haul road were designed with an overall width of 10.8 m, allowing single lane traffic. Figure 15.5 presents a typical section of the in-pit ramp design. Industry practice indicates the running surface width to be a minimum of three (3) times the width of the largest truck for double lane. The overall width of a 40-tonne heavy-duty off-road haul truck such as the Volvo A40D or equivalent is 3.6 m which would require a running surface of 10.8 m. As such, the running surface for by pass lanes has been designed to 16.2 m width includes the allowance for berms and ditches.

By-pass lanes were designed in bench 198 and 258 with 68 m width. Both by-pass lanes located on the right side are at unsignalized intersections on one-lane roadways to allow through moving vehicles to go around stopped truck or heavy equipment.

A maximum ramp grade of 10% was used. This grade is acceptable for Volvo A40D haul trucks or their equivalent brands. Figures 15.6 and 15.7 show a cross-section and plan view for the by-pass lane.

Figure 15.5 Cross-Section Single Lane

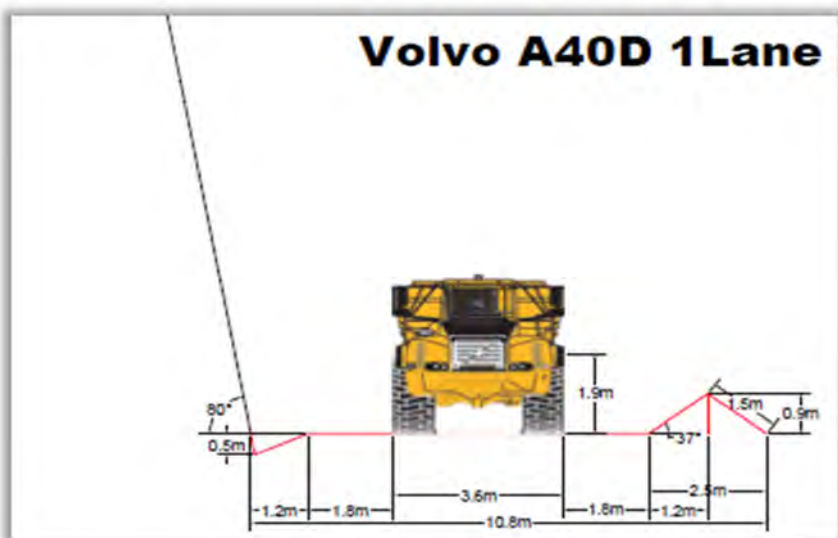


Figure 15.6 Cross-Section By-Pass Lane

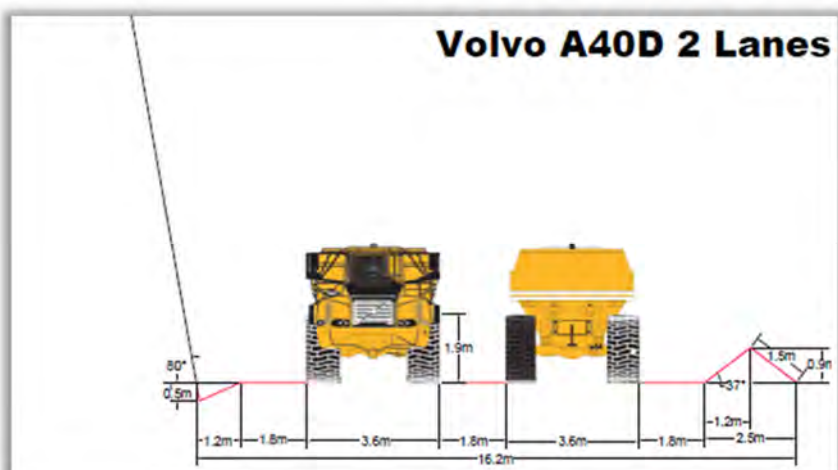
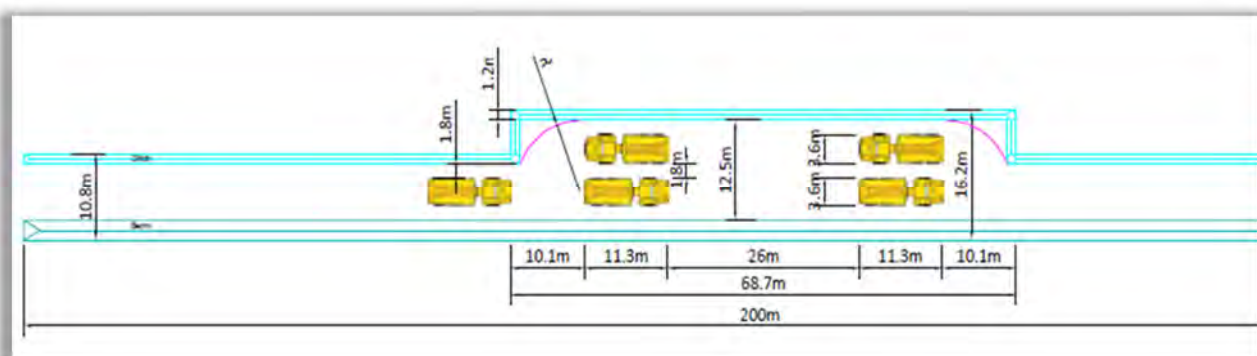


Figure 15.7 Plan of By-Pass Lane



15.2.7 MINIMUM MINING WIDTH

A minimum mining width of 15 m was considered for the open pit design allowing for the utilization of a Volvo A40D truck in all areas.

15.2.8 OPEN PIT DESIGN RESULTS

The pit that has been designed for the PAK deposit is approximately 510 m long and 312 m wide at surface with a maximum pit depth from surface of 190 m. The total surface area of the pit is roughly 221.963 thousand square metres. Overburden is minimal.

The pit ramp enters the pit on the south side at the 316 m elevation. The ramp follows the south side of the pit down to north wall where the first passing lane is located, then continues to follow a spiraling haul road until the lowest elevation 130 m. The pit entrance will be reviewed in the next level of study if the entrance can be located at the north wall.

The open pit will be mined at an average production rate of 1,118 tonnes per day to achieve target milling rate of 80,000 tpa concentrate. Figure 15.8 shows the layout of the proposed PAK open pit. Figure 15.9 shows a 3D rendering of PAK open pit.

Figure 15.8 PAK Open Pit Layout

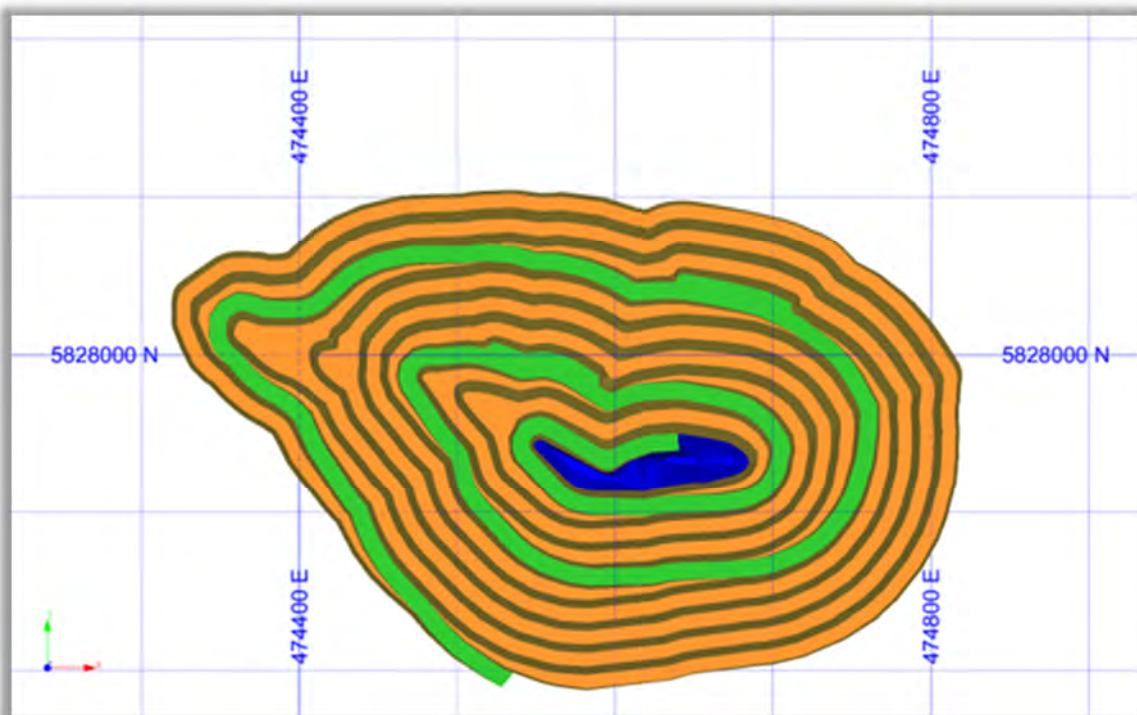
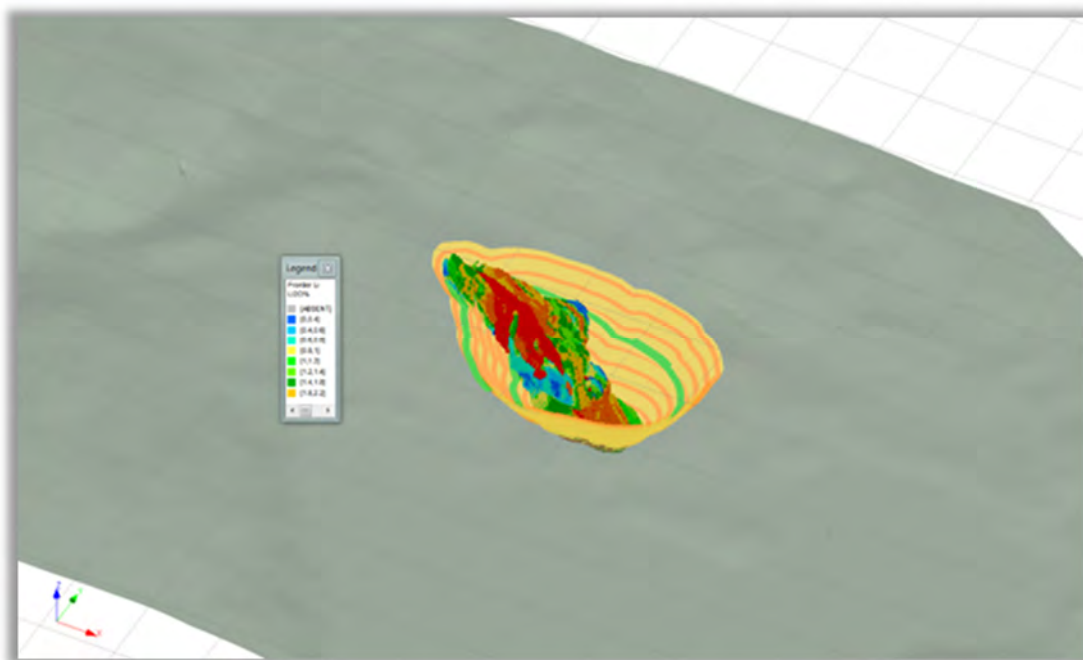


Figure 15.9 3D of PAK Open Pit Layout



This study assumes that mining will be carried out by contractors performing drill and blast. Conventional shovel loading and truck hauling equipment will be done with the owner's fleet.

The 10-m high production benches were used to design the open pit with the recommendations from Golder Associates. At the final wall, Golder suggests double-bench (20 m) on the ultimate slopes in good rock. The assumption must be confirmed as suggested in the geotechnical report moving forward.

Mining bench heights of 10 m were selected to be within the safe and efficient digging envelope for a 5 m³ bucket capacity diesel hydraulic shovel. In some instances, the CAT 390F (4.6-12 m³) loader will be used in areas where excavators are not applicable to use in the mining operations. The 10 m production mining bench height considers swell and the maximum reach of the shovel.

The Mining in each bench starts from the ramp and progresses either from the north to south with single face mining.

The ore haulage is a short 2.2-kilometre route from the pit rim to the proposed mill and waste from the PAK pit envisioned to be dumped to the waste dump as this a 2000-metre haul route.

Mining will be carried out using smaller scale mining equipment to provide the desired selectivity and to permit the use of narrower access ramps. Larger equipment may be used for stripping of waste and overburden on the top bench.

15.3 UNDERGROUND

The underground reserves were calculated using Datamine Studio 5D Planner and displayed in Table 15.5 and Figure 15.10. Stopes were designed using the block model supplied by WSP, and stope design parameters provided by Rob Whipple Engineering Inc. discussed below.

Table 15.5 Underground Reserve Tonnes and Grade

Classification	Million Tonnes	LiO ₂ (%)
Probable	1.65	1.84

15.3.1 GEOTECHNICAL PARAMETERS

A geotechnical desktop study was performed by Rob Whipple Engineering Inc. A memorandum brief (Appendix D) stated the following:

Two empirical methods: critical scaled span and Mathews modified stability chart are used in a desktop study to set preliminary underground stope dimensions for the PAK Lithium Deposit.

Data provided included an engineering geotechnical report, two MS PowerPoint® files containing diamond drill logs and an Adobe® format 3D CADD scalable model showing lithologies and planned development accesses.

From the information provided, assumptions were made:

- *in-situ stress field including magnitude and direction,*
- *no over-stress rock mass conditions are present,*
- *set a conservative Stress Reduction Factor value (SRF=2.5) for rock mass quality measurements.*

Preliminary dimensions are maximum 50 metres vertical (level-to-level) x maximum 20 metres horizontal (along strike) x maximum 25 metres (hanging wall-footwall; perpendicular to strike).

15.3.2 ECONOMIC PARAMETERS

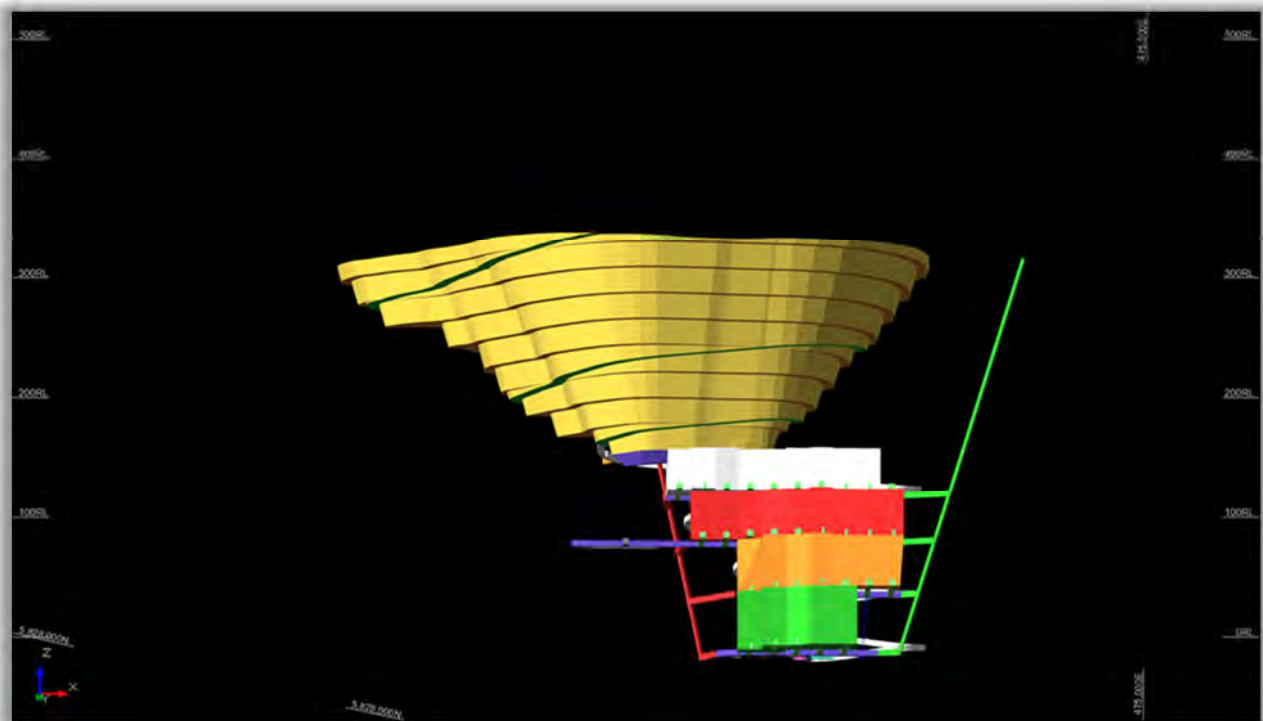
As suggested by Jon Hykawy, a sell price of \$1,250 US\$ was used along with the direct mining cost of \$84.07 to calculate the underground cut-off grade of 0.8% Li₂O.

A dilution factor of 5% was applied to all stopes. Dependent upon where the stopes were, a mining recovery factor of 70% or 85% was also applied to the stope design tonnage.

15.3.3 MINING RATES

The nominal mining rate for underground mining is 1,100 t/d.

Figure 15.10 Long Section of Underground Stope Design



16 MINING METHODS

16.1 OPEN PIT

16.1.1 MINING DESIGN

It is proposed that the PAK Lithium Project is amenable to be developed as an open pit (OP) mine followed by an underground (UG) mine. The mine plan is based on the Proven and Probable Mineral Reserves discussed in Section 15 of the report. The mining method selected for the project will be a conventional open pit, truck and shovel, drill and blast operation. Minimal vegetation, topsoil, and overburden will be stripped and stockpiled for future reclamation use. The ore and waste rock will be mined with 10 m high benches, drilled, blasted, and loaded into haul trucks with a hydraulic excavator and a loader for back-up.

The PAK Lithium Project is designed as a conventional truck-shovel operation assuming 36 nominal tonnes articulated trucks and 5 m³ shovel. Mining at the PAK open pit is planned to produce a total of 4.1 Mt of ore and 18.2 Mt of waste for a 1:4.5 overall strip ratio, for a period of 12 years (excluding 2 years of pre-production). The average Lithium grade in the PAK open pit is estimated to be 2.06 Li₂O%, containing 848,435 tonnes of concentrate of lithium. The current life-of-mine (LOM) plan focuses on achieving consistent ore production rates in the production schedule, as well as balancing grade and strip ratios.

The design parameters include a single ramp width of 10.8 m, road grade of 10%, final bench height of 20 m, targeted mining width average of 120 m, variable slope angles by sector, and a minimum mining width of 20 m (pit bottom). Table 16.1 shows the geotechnical mine design parameters.

Table 16.1 Geotechnical Mine Design Parameters

Parameter	Units	Design Sector			
		I	II	III	IV
Inter-Ramp Angle	degrees	51.7	55.3	55.3	51.7 (55.3)
Bench Face Angle	degrees	70	75	75	70 (75)
Overall Slope Angle	degrees	45	49	49	45 (49)
Bench Height	m	20	20	20	20
Road Gradient	%	10	10	10	10
Road Width - Passing Lanes	m	16.2	16.2	16.2	16.2
Road Width - One Lanes	m	10.8	10.8	10.8	10.8

HYDROGEOLOGY AND HYDROLOGY PARAMETERS

The sources of water that affect the mining operation will be surface runoff, rainfall, snowmelt and groundwater. The quantity for each of these sources of water was estimated to calculate the mine dewatering requirements.

Surface Runoff

In order to limit the surface runoff from entering the pit, a perimeter ditch will be established around the limits of the pit to capture the surface water before it enters into the mining area. Water collected in the ditch system will be directed to the settling pond that will be located on the west side of the pit, where it will be treated prior to discharge into the environment. Perimeter ditches will also be established around the waste piles and overburden stockpile to capture water runoff.

Process Inflows

Water inflow for the open pit is 730,000 m³/yr. while for UG workings, it is assumed that there will be 55,000 m³/yr. of inflow.

Groundwater was encountered in all boreholes at depths ranging from 0.3 to 7.6 m below ground surface corresponding to elevations of between 330.7 to 311.8 mASL. The water table was highest within the wetland areas and topographic lows where the depth to groundwater was generally less than 1 m; about 1.1 and 1.0 respectively. The highest groundwater elevations occur in elevated terrain in the north and northwest of the site indicating groundwater flow in a southerly and southeasterly direction largely following surface water drainage.

WASTE ROCK, OVERBURDEN, AND TAILINGS MANAGEMENT

The stripped surface organics storage area has been designed in two (2) areas. The first between the airstrip and the northeast side of the proposed open pit. The second would be in the vicinity of the mill complex. The stripped surface organics piles were designed with an overall slope of 26.6° (2H:1V) with a capacity of 0.8 Mm³, a footprint area of 128,000 m², a top elevation of 330 m and a maximum height of 26 m. The design and construction of the waste rock area (WRA), overburden area and stockpiles should ensure physical and chemical stability during and after mining activities. To achieve this, the waste areas and stockpiles are designed to account for benching, drainage, geotechnical stability, and concurrent reclamation.

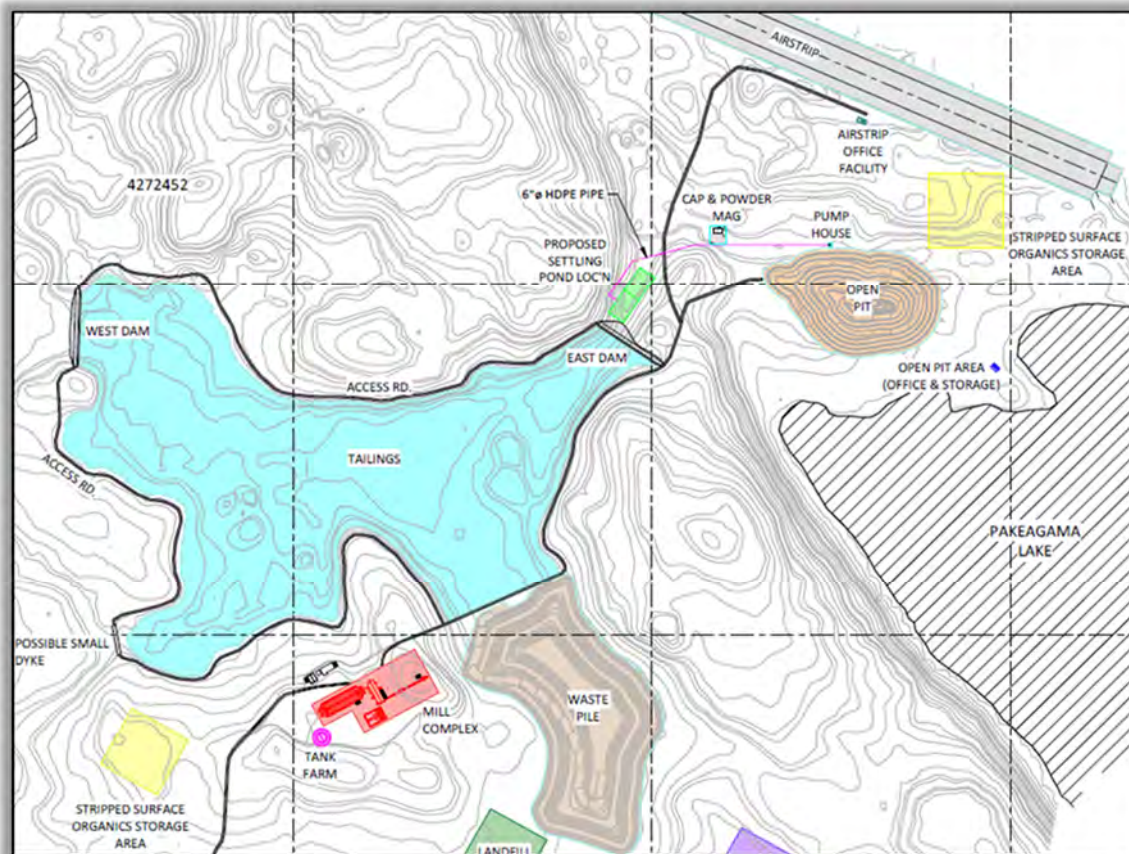
A major waste pile area has been designed and located south of the TMF. The waste rock pile has been designed with parameters that were derived from previous dump design of existing mines. The approximate total waste that can be accommodated at the WRA was calculated at 18 Mt (6.9 Mm³). Table 16.2 summarizes waste rock area design parameters.

Table 16.2 Waste Rock Area Design Parameters

Design Parameters	Values
Swell Factor	30%
Overall Slope	32° - 34°
Bench Face Angle	30°
Lift Height	30 m
Number of Lifts	3
Maximum Dump Height	90 m

The waste rock pile is 668 m from Pakeagama Lake. The waste pile and the topsoil/overburden stockpile as shown on Figure 16.1 will have a perimeter ditch around their toes to capture water runoff.

Figure 16.1 Waste Pile and Stripped Surface Organics Storage



16.1.2 MINE PLANNING

The following section discusses the mine plan that was prepared for the open pit Prefeasibility Study. The mine plan was primarily used as a basis for the mine capital and operating cost as presented in Section 21. The Open Pit mine plan was scheduled on an annual basis for the 12-year pit life. In addition to the design criteria in Section 15, some general assumptions and further design criteria were used in the mine planning and design of the PAK open pit.

GENERAL ASSUMPTIONS

- Two years of pre-production prior to plant start-up;
- Bench by bench mining;
- Waste rock is planned to be used in the construction of roads, TMF dams, and other earthwork projects during construction period;
- Conventional diesel-powered truck shovel mining method;
- The owner will purchase and operate all earth moving equipment;
- Drill and blast operations will be conducted by contractor;
- Ultimate pit limits constrained to maintain a minimum 100 m offset from Pakeagama Lake.

WORK SCHEDULE

Mining operations for the Project will be conducted 335 days per year, operating one (1), 12-hour shift. The fleet requirements and manpower were based on this work schedule. The mine will require 2 years of pre-production activities before the start of operations at the processing plant. The mine starts in Year -2 to provide waste material for the Phase 1 TMF construction dam construction, haulage and airstrip construction.

ANNUAL PRODUCTION REQUIREMENTS

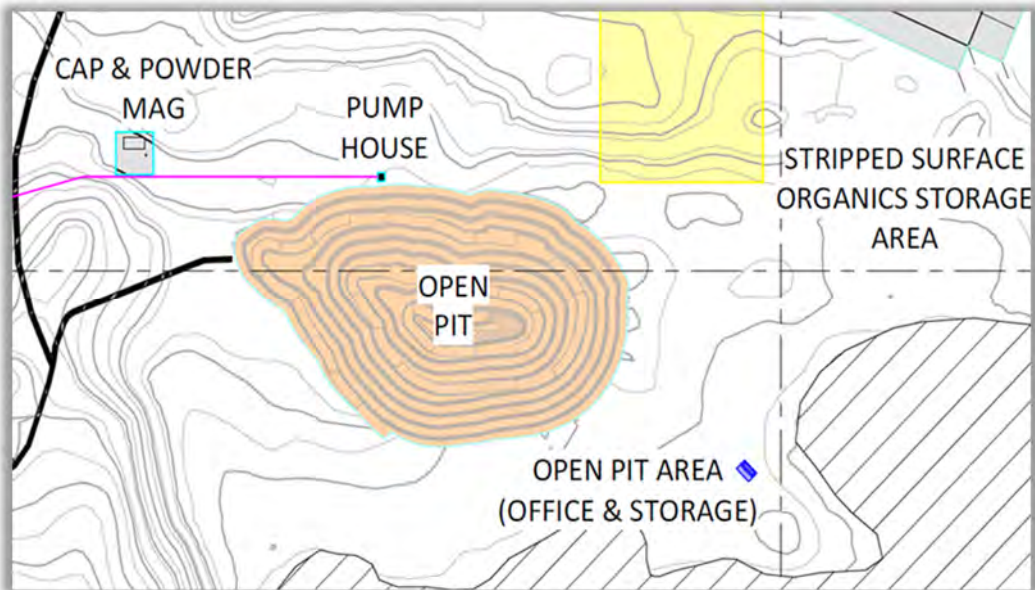
The mine plan is based on an annual production target of 80,000 tonnes of Spodumene concentrate per year.

MINING SEQUENCE

The top bench elevation is 318 mASL.

The pit access ramp will start from the south and the ore production will start from bench elevation 310. A single-lane ramp is designed to develop benches from surface down to the 150 m elevation. Refer to the PAK open pit access ramp arrangement on Figure 16.2.

Figure 16.2 PAK Open Pit Access Ramp Arrangement



Waste rock from the PAK open pit will be hauled to a waste dump facility 1.8 km away. Waste will be stored at the planned engineered waste rock facility to the south-west of the deposit which will be used for the construction of the TMF. The open pit ore is planned to be hauled directly to the mill complex, or stockpiled in case of mill repair or maintenance.

MINE PRODUCTION SCHEDULE

Table 16.3 shows the mine production schedule that was developed for the 12-year life of the open pit mine. The schedule includes a pre-production phase of two (2) years which will be required for pit development/pre-construction. During this period, 213,000 tonnes of overburden will be stripped.

The material mined will total 22 Mt during the 12-year period ranges from 2.2 Mt in the first year to an average of 2.4 Mt from Year 2 to Year 8 and average of 773,000 tonnes per year from Year 9 to Year 12. The average annual grade of Li_2O varies 2.70 % to 1.80 % during the 12-year period.

Table 16.3 Open Pit Production Schedule

Description	Units	Total	Pre-Prod		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12
Concentrate	kt	848	0	0	86	79	74	70	72	69	65	67	68	67	84	47
Run of Mine Ore	kt	4,121	0.0	-	308	325	344	354	360	380	378	390	349	340	386	207
Li₂O	%	2.06	-	-	2.7	2.5	2.2	2.2	1.9	1.9	1.8	1.8	1.8	2.0	1.9	2.1
Total Waste	kt	18,234	0.0	0	1,989	1,988	2,035	2,225	2,093	1,987	2,010	2,099	1,061	463	232	52
Overburden	kt	223	-	213	9.5	-	-	-	-	-	-	-	-	-	-	-
Waste Rock	kt	18,457	0.0	213	1,989	1,988	2,035	2,225	2,093	1,987	2,010	2,099	1,061	463	232	52
Total Material	kt	22,355	-	213	2,297	2,313	2,379	2,579	2,453	2,367	2,388	2,489	1,410	803	618	259
Strip Ratio	-	4.48	0.00	0.00	6.46	6.12	5.92	6.29	5.81	5.23	5.32	5.38	3.04	1.36	0.60	0.25

INFRASTRUCTURE

The infrastructure requirement necessary for the PAK open pit are:

- Office space;
- Maintenance truck shop;
- Explosive magazines;
- Diesel storage tanks;
- Camp facility;
- Mill complex;
- Dry facility;
- Concentrate buildings.

The electrical power would not be available during start-up and diesel generator sets will either be purchased or rented until the mine is connected to hydro grid.

OPERATIONAL ASSUMPTIONS

Due to pit service life, it is recommended that open pit operation will use the following specific model:

- Owner will supply support personnel, including technical, operational and management workforces for the open pit support;
- Owner will purchase mining equipment from the equipment list (as shown in Table 16.8);
- Contractor will conduct the drilling and blast operations including the building of emulsion plant, magazines for detonators and accessories;
- Contractor will supply services for the manufacturing, delivery and loading of explosives;
- Contractor will supply services for site preparation, lay down area, concentrate hauling, tank farm construction and other activities requiring contracting work.

EQUIPMENT FLEET

The following section discusses equipment selection and fleet requirements to carry out the mine plan for the open pit.

The mining equipment was selected to match the mine production schedule, which is based on 335 d/a, 7 d/wk, and 1 shift/d, 1- hour shifts.

HAUL TRUCKS

Based on the review of the open pit design and volume of tonnage to be mined, the equipment selected for hauling ore and waste are the 36 nominal tonnes truck.

The haul truck selected is an off-road extreme heavy-duty truck based on conventional highway truck chassis. The size of truck was selected since it matches well with the production requirements and results in a manageable fleet size. The following parameters were used to calculate the number of trucks required to carry out the mine plan.

- Mechanical Availability – 85 %;

- Utilization – 64 % (non-utilized time is accrued when the truck is not operating due to poor weather, blasting, excavator relocation and no operator available);
- Nominal Payload – 36 nominal tonnes (24 m³);
- Shift Schedule – One (1), 12-hour shift per day, seven (7) days per week, 48 weeks per year, 335 operating days per year;
- Mine scheduled and unscheduled maintenance is 408 hours/year;
- Efficiency – 90 % (54 min/hr; this represents lost time due to queuing at the shovel and dump as well as interference on the haul road); and
- Rolling Resistance – 3 %.

Haul profile on truck routes for ore and waste were measured and generated by bench for each period of the mine plan to calculate the truck requirements. The cycle times are generated using the CAT handbook and data entered using truck cycle time factors.

Table 16.4 shows the various components of a truck cycle time. The load time is calculated using a hydraulic excavator with 5.4 m³ (15-tonne) bucket as the loading unit. This size excavator which will be discussed in the following section loads ore and waste rock in a 36 nominal tonne haul truck in three to four passes.

Table 16.4 Truck Cycle Time

Ore	Distance (km)	Speed(km/h)	Time(h)	Time (mins)
Ramp loaded	1.00	17	0.06	3.53
Horizontal loaded	2.40	35	0.07	4.11
Ramp empty	1.00	28	0.04	2.14
Horizontal empty	2.40	40	0.06	3.60
Loading time			0.07	4.20
Queue loading			0.02	1.20
Queue dumping			0.08	4.80
	6.80	17.30	0.39	23.59
Waste	Distance (km)	Speed(km/h)	Time(h)	Time (mins)
Ramp loaded	1.00	17	0.06	3.88
Horizontal loaded	2.10	35	0.06	3.60
Ramp empty	1.00	28	0.04	2.36
Horizontal empty	2.10	40	0.05	3.15
Loading time			0.07	4.17
Queue loading			0.02	1.00
Queue dumping			0.08	5.00
	6.20	16.06	0.39	23.16

Haul productivities (tonnage per work hour) were calculated for each haul route using the truck payload and cycle time. Table 16.5 indicates the cycle time and productivity for the ore and waste haul routes in Year 4 as an example.

Table 16.5 Truck Productivities

Material	Cycle Times (min)						Productivity	
	Travel	Time/Pass	Load	Spot	Dump	Total	Loads/hr	t/hr
Ore	13.5	0.5	3.5	1.0	1.0	19.5	7.4	262
Waste	18.3	0.5	2.5	1.0	1.0	23.3	5.4	219

Truck hour requirements were calculated by applying the tonnages hauled to the productivity for each haul route.

A fleet of four (4) trucks is required during Year 1 to Year 8 peak years. This number decreases to three (3) in Year 9, and two (2) in Year 10 to Year 12.

EXCAVATORS

The main loading machine selected for the operations will be a hydraulic excavator (backhoe) with a 5.4 m³ bucket. To maximize loading productivity, the excavators will be placed on top of the muck pile and the haul trucks will be at the bottom of the loading face.

One (1) excavator and one (1) loader can handle the tonnages in the mine plan. The loader can be a back-up and will be required in the fleet to assist with ore blending and as a backup when the primary machine will be unavailable. Table 16.6 presents the optimal excavator and truck pass matching used in the selection of the excavator and truck for the prefeasibility study.

Table 16.6 Excavator and Truck Optimal Loader/Truck Pass Matching

Volvo Truck (36 nominal Tonnes)					
Hydraulic Excavators	min/hr		385C L	365C	345D
Loader Capacity	50	Tonnes	954-1193	750-1100	665-805
Passes			4	5	6
Wheel Loaders (back up)			988H	980H	972H
Loader Capacity		Tonnes	565-790	590-650	490-565
Passes			3 & 4	04 Jan	5

DRILLING AND BLASTING

Production drilling will be carried out with diesel powered track mounted down-the-hole (“DTH”) drills and will be provided by a Contractor. Using the following parameters; 85 % mechanical availability, 80 % utilization and a penetration rate of 0.9 m/sec (average pure penetrating rate), the QP determined that two drills would be required to complete the drilling requirements and offer flexibility to the mine plan. Table 16.7 presents the drilling and blasting parameters for production drilling that have been designed for the PFS. Pre-shear drilling or controlled blasting will be required on the pit walls to mitigate the risk of rock falls. This will be assessed once drilling and blasting starts.

Table 16.7 Open Pit Drilling and Blasting Parameters

Parameter	Units	Production
Bench Height	metre	10
Blasthole Diameter	mm	187
Burden	metre	3.0
Spacing	metre	3.5
Sub-drilling	metre	1.0
Stemming	metre	2.1
Explosives Density	kg/m	30.3
Powder Factor	kg/m ³	1.2

The blasting will be carried out with bulk emulsion and non-electric detonators. The QP evaluated the use of either ANFO or bulk emulsion and even though bulk emulsion was 10 % more costly, it was selected for the following reasons:

- Performs better under wet loading conditions;
- Produces less residual ammonia;
- Overall better fragmentation.

The bulk emulsion will be manufactured at the mine by melting down ammonia nitrate prill transported to site in 40,000 kg trailers and off loaded and stored at a designated storage site. The explosive caps and detonators as well as for the packaged explosive products will be stored in the designated magazines. These same facilities will be used for the underground mining operations. In order to carry out the blasting operation for the open pit, the mine equipment fleet includes a bulk truck and a powder truck. The mine workforce also includes two blasting crews which will work on day shift. Each crew includes a blaster, a blaster's helper and is supported by the bulk truck operator.

All of the costs associated with the purchase, storage, and loading of the explosives were included in the mine capital and operating cost estimate presented in Section 21.

The annual requirements for selected major and support equipment for this mining operation were listed by yearly period. The proposed mine equipment fleet is presented in Table 16.8 which summarizes the major equipment requirements.

SUPPORT EQUIPMENT

Support equipment such as dozer, grader, water, lube, and fuel trucks were matched with the major mining units. Support maintenance mobile equipment was also included for the mechanical and electrical servicing of the mining fleet.

A dozer has been selected for use at the waste dumps, and to maintain the mine roads and pit floor, and to clean up blasting area, etc.

A grader would be mainly used for maintaining the pit ramp and site roads. The utility backhoe would be used to break oversized rock as it will be equipped with a hydraulic hammer. It would also be responsible for ditch development and cleaning.

A water truck would provide dust control during the summer months and place sand on haul roads during winter season.

Table 16.8 identifies the equipment proposed to give the reader an appreciation for the size of each machine although the specific equipment selection and quantities will be finalized during the execution phase of the Project.

Table 16.8 Open Pit Equipment Fleet

Equipment	Model	Size	Quantity
Major Requirement			
Mass Excavator	CAT 385C L	5.4 m ³	1
Front End Loader	CAT 988K Tier 4	6.5 m ³	1
Truck	Volvo A40G	36 nominal tonnes	4
Support Equipment			
Dozer - Track	CAT D8T	8SU 11.3 yd blade, ripper	1
Grader	CAT 16M3	16 ft moldboard, ripper	1
Water Truck	745C Tractor	GF Water Tank	1
Fuel & Lube Truck	730C Tractor	GF FLT Conversion	1
Pickup Truck	Ford Heavy Duty 2017	3/4t	3
Light Plant	Magnum MTL3060	-	4
Crew Van	-	-	1
Backhoe loader	Cat 430F IT	1.31 yd bucket, 48" forks	1
Skid Loader	Cat 272C	-	1

16.1.3 OPEN PIT MINE MANPOWER REQUIREMENTS

The manpower requirements for the mine have been separated into Mine Staff, Mine Production, and Maintenance. The Mine Staff, Mine Production and Maintenance personnel will work on the day shift, 12 hr/d coverage on a two (2) week on, two (2) week off rotation. Table 16.9 is a list of the workforce requirement for the Staff Mine, and Table 16.10 shows the typical open pit mine workforce requirement during peak production.

Table 16.9 Mine Staff

Mine Staff (Open Pit)	Quantity
Site Manager	1
Pit Superintendent	1
Senior Engineer	2
Surveyor/Mining Technician	2
Geologist Technician	2
Total Mine Staff	8
Support Staff	
Purchasing/Logistics	1
Payroll	1
Accounting	1
Admin Assistant	2
Safety Training	2
Security	4
Total Support Staff	11
Total Staff Mine Operation	19

Table 16.10 Mine Production and Maintenance

Type		Manpower
Maintenance Foreman	Frontier	2
Loading	Frontier	4
Hauling	Frontier	8
Dozers/Services	Frontier	5
Drilling	Contractor	2
Blasting	Contractor	2
Maintenance	Frontier	4
Warehouse Attendant	Frontier	2
Labour	Frontier	2
Total		31

16.1.4 PIT DEWATERING

The hydrogeology and hydrology parameters presented in Section 16.2.3 mentions that there are sources of water that affect the mining operation. This is the basis for determining the pump capacity for the water in-flow.

Preliminary pit inflow estimates as per Golder were derived using Marinelli and Niccoli (1998) for the open pit to a depth of 190 m. An average quarry radius of 179 m was assumed using the proposed perimeter (as the pit outline is not circular), and 0 m saturated thickness to seepage face. Two separate groundwater recharge scenarios were used, as the groundwater recharge rates extremely affect the overall pit inflow values. One recharge rate of 5 mm/year as suggested by Singer, et al (2002) and conservative value of 10 mm/year, given the surrounding geology. Both the recharge rates yielded a Radius of Influence (ROI) of approximately 6.1 km and 4.6 km, respectively. With the proposed open pit location, it is very likely that the radius of influence from dewatering operations would intersect Pakeagama Lake.

The sum of these inflows indicates a steady state pumping requirement of around 2,000 m³/day with significant higher flows occurring during spring freshet, times of heavy precipitation, and during the initial mine development when transient inflows reflect the removal of groundwater from storage.

Dewatering will be accomplished by one high head diesel driven 4” Dry Prime Model PA4B-4045H Gorman Rupp for the calculated water inflow and will be stationed at the pit floor sump. As the mine goes deeper this pump will dewater to depths of approximately 90 m of head at the flow of 500 US gallons per minute. The pump comes with a heated priming chamber for winter pumping. A 63 m³ storage tank with suction and discharge flanges will be provided near the pump and floor sump to be loaded in a skid for mobility. The tank will be utilized as a supply tank and will be used to have the pumps draw from instead of having pumps run in series. Running pumps in series is done at many mines and is affective, however, the risk of pump failure is much greater using this method as the pressure the inline pump makes. This method is hard to manage and can cause pump premature failure. With the storage tank, it is very easy to change out and service pumps. In a series of pump, when one pump fails, the whole system fails, but with the storage tank you can disconnect and connect very easily.

Water will be pumped through high-density polyethylene (HDPE) pipe of appropriate diameter that travels directly up the north high wall, pump house and then discharges into a settling pond to allow for settlement of suspended solids to meet environmental requirements.

16.2 UNDERGROUND MINING

The mine plan is based on the Probable Mineral Reserves discussed in Section 15 of the report. The mine plan and design are based on Indicated Resource.

16.2.1 RAMP EXCAVATION

The ramp portal would be located on the north side of the pit in the wall of the bench 50 m from the pit bottom. The ramp would be excavated using typical mechanized drifting methods. The proposed ramp would be excavated on the footwall side of the mineralized zones at a size of 5.0 m H x 5.0 m W, and grade of minus 15%. The remucks would be located a maximum 300 m from the advancing face. The ramp would be supported using 1.8 m resin grouted rebar in the back and 1.2 m resin grouted rebar in the walls on a 1.5 m pattern.

16.2.2 LEVEL DEVELOPMENT

All development has been designed to be 5.0 m H and 5.0 m W, and would be developed using electric hydraulic jumbos and diesel LHD equipment. Level development would be supported using the same specifications as the ramp development. All waste development rock would be stored underground where feasible or hauled to surface for possible future backfill material. Table 16.11 summarizes the development quantities for the current mine design.

Table 16.11 Mine Development Summary

Description	Metres
Ramp	1,690
Safety Bay	108
Remuck	110
Level Access	159
Electrical Substation	38
Footwall Drift	763
Drawpoint	1,867
Laydown	58
Level Remuck	58
Refuge Station	29
Sump	31
Lube Bay	80
Wash Bay	15
Ventilation Access	313
Ventilation Raises	563
Total	5,882

16.2.3 ROCK HANDLING

Ore extracted from the stopes would be transported by LHD to a remuck on the level it is extracted from. From that point, the ore would be loaded into a 40 tonne underground haulage truck, which would haul the material to just outside of the portal in a designated dump area. From that point, a surface truck would be loaded and the material transported to the mill for processing.

16.2.4 UNDERGROUND MINE INFRASTRUCTURE

MAINTENANCE SHOP / WASH BAY

A maintenance shop used to repair broken mobile equipment and perform preventative maintenance will be located on surface. An excavation underground for tire changes and washing equipment is located on 240 Level of the mine.

REFUGE STATIONS

Portable self-contained refuge stations would be centrally located in the mine on 240 Level and 335 Level. The refuge stations are designed to withstand fire and extreme heat, and to prevent gas from entering the unit. They are equipped with potable water, a telephone line, lighting, compressed/fresh air, rations, and clay to seal any cracks in openings to further prevent gases from entering.

MATERIALS STORAGE

Designated storage areas, specifically for storing consumable mining supplies such as timber, pipe, fittings and rock bolts, will be constructed on each level. They would be designed to accommodate a piece of mobile equipment to drive in and pick up material.

LATRINES

Non-permanent toilet units would be located in appropriate active working areas and in close proximity to each refuge station. They would be of portable design and the catchment containers would be checked daily and exchanged as required. The used catchment containers would be transported to the sewage treatment area where they would be dumped and cleaned before being returned into service.

16.2.5 UNDERGROUND MINE SERVICES

HYDROGEOLOGY

As reported by Golder, the hydraulic conductivity values for bedrock were calculated based on packer testing and hydraulic response in the open hole. The hydraulic conductivity values for bedrock ranged from 4×10^{-8} m s⁻¹ to 6×10^{-4} m s⁻¹ with a median value of 7×10^{-7} m s⁻¹ and a geometric mean of 1×10^{-8} m s⁻¹. The hydraulic conductivity values decreased with depth. This decreasing conductivity is typical of crystalline bedrock of the Canadian Shield where permeability is fracture-controlled and where active groundwater flow is generally confined to shallow localized systems (e.g., *Everitt et al., 1996*). In deeper regions, rock mass hydraulic conductivity tends to decrease as fractures become less common and fracture become less interconnected.

Bedrock hydraulic conductivities from 0 m to 75 mbgs were classified as Zone 1 with an approximate k of 1×10^{-6} m s⁻¹, and values from 75 m to 190 mbgs were grouped into Zone 2 with an approximate k of 1×10^{-7} m s⁻¹. While measurements for the deep bedrock permeability are not currently available, it is reasonable to assume a further decrease below 200 m for preliminary purposes.

The calculated specific capacities at site ranged from 1.0 to 106 litres per minute per metre (L/min/m) averaging 32 L/min/m. The observed variance in specific yield is similar to the variance observed in the packer and slug testing.

The groundwater was encountered in all the boreholes at depths ranging from 0.3 to 7.6 m below ground surface corresponding to elevations of between 330.7 to 311.8 mASL. The water table was highest (relative to the ground surface) within the wetland areas and topographic lows where depth to the groundwater was generally less than 1 m; about 1.1 and 1.0 m respectively. The highest groundwater elevations occur in elevated terrain in the north and the northwest of the site indicating groundwater flow in a southerly and southeasterly direction largely following surface water drainage. Pressure measurements taken during packer testing in bedrock indicate a modest downward hydraulic gradient consistent with topography and relatively low fracture permeability.

Preliminary underground inflow estimates as per Golder were derived using the Dupuit-Thiem equation for underground workings from 190 m to 285 m depth for a cylindrical volume approximation having an effective radius of 100 m and an effective hydraulic conductivity of 1×10^{-7} m s⁻¹. Assuming the groundwater influx to the open pit has reached equilibrium before underground development begins, these assumptions yield an additional 150 m³/day of groundwater influx to the underground workings. Caution should be applied using the estimate for planning purposes as there remains considerable uncertainty regarding the hydraulic conductivity of fractured rock. While a small number of highly transmissive fractures can raise the hydraulic conductivity of a rock mass by an order of magnitude, the most permeable fractures can be grouted and a more modest margin of uncertainty (say 2) can be assumed. It was then suggested by Golder to use a total steady-state water management requirement of between 1,000 and 4,000 m³/day for underground pumping.

Based on the design criteria and summarized below:

- 166 m³/hr @ 458 m head;
- 336 m vertical distance;
- 1,900 m pipe length to surface plus additional 700 m pipe length at surface;
- 6 inches pipe diameter (friction loss calculated to be approximately 122 m).

Dewatering will be accomplished by one high head diesel driven HPXU 150 – 200I x 5 stage operating at 1,800 RPM. At the design point, the pump would require 412 HP; with a selected motor size of 500 HP. The material of construction for the pump: Casings – Cast Steel, Impellers, and Diffusers – 1.4008 Stainless Steel similar to ASTM-A-743 CA 15. The pump will have shaft packing, SKF standard roller bearings, and a balancing disc for axial thrust compensation. The HPXU 150-200I is a heavy-duty mine dewatering pump designed to handle 10% solids. All the underground levels will have sumps for water collection and be directed through pipes to the lowest sump at Level -20 where the HPXU 150-200I will be stationed.

COMPRESSED AIR

Compressed air would be required for some underground tasks such as operating pneumatic tools, operating water pumps and cleaning drillholes. As such, two permanent compressors and a backup compressor will be installed on surface near the portal. New 102 mm diameter piping will be installed in the ramp as development and drift rehabilitation progresses. Each permanent compressor will provide air at 0.71 m³/s (1,500 cfm) and 7.58 bar (110 psi) to the underground workings.

ELECTRICAL POWER

Electrical power for the underground operations will be provided by a powerline fed from the diesel generator complex near the mill.

Electrical cable would be installed in the ramps as they advance and substations would be installed where required as the power losses become too great. Junction boxes would be used to distribute the power to working areas as needed.

16.3 VENTILATION

The ventilation to support the proposed mining equipment fleet would require air volumes of approximately 175 m³ per second (370,000 cfm). The proposed underground ventilation system was designed to dilute gases that are created during mining operations. The emergency stench gas system will be installed at the main fresh air fan at the fresh air raise on surface.

The Ontario ventilation standards for an underground mine are described in Regulation 854 “Regulations for Mines and Mining Plants” as shown in Table 16.12.

Table 16.12 Ventilation Standards in Ontario for an Underground Mine

Description	Unit	Value
Ventilation air requirements per kW	m ³ /s	0.06
Ventilation air requirements per kW	cfm	127.13
Ventilation air requirements per hp	m ³ /s	0.05
Ventilation air requirements per hp	cfm	100.00

The ventilation requirement of the PAK Lithium underground operation has been estimated using the mine design layout and the fleet requirement needed for the mine development and required daily production. Table 16.13 presents a summary of the ventilation requirements.

Table 16.13 PAK Lithium Project Ventilation Requirements

Stage 3 Mobile Equipment Fleet	Unit	Qty	HP	kW	Utilization	Total HP	Total kW	m³/s	cfm
Jumbo (2 boom)	ea.	2	99	74	25%	50	37	2.21	4,693
Production Drill	ea.	2	74	55	25%	37	28	1.66	3,508
Scoop 8 yd Diesel	ea.	4	279	208	100%	1,116	832	49.93	105,806
Construction Scoop (5 yd)	ea.	1	165	123	50%	83	62	3.69	7,822
Truck 40t Diesel	ea.	3	587	438	100%	1,761	1,313	78.79	166,957
Grader (get surface/ug grader)	ea.	1	100	75	25%	25	19	1.12	2,370
Service Geology	ea.	1	128	95	25%	32	24	1.43	3,034
Mancarrier	ea.	2	150	112	25%	90	67	4.03	8,533
Mech and Elect. Carrier	ea.	2	128	95	25%	64	48	2.86	6,068
Scissor Lift	ea.	2	150	112	25%	75	56	3.36	7,111
Supervisor/Engineering Vehicle	ea.	2	128	95	25%	64	48	2.86	6,068
Kubota c/w boom & basket	ea.	1	89	66	25%	22	17	1.00	2,109
Anfo Loader	ea.	2	115	86	25%	58	43	2.57	5,451
Bolter	ea.	1	83	62	25%	21	15	0.93	1,967
		26					Ventilation Requirements	156	331,497
					Leakage			10%	33,150
								DESIGN	370,000

Note: Calculation of air volume required for the electrical equipment is based on air velocity of 0.5m/s.

The data above and a simplified underground mine design were entered into VENTSIM™ as parameters of where air is anticipated to flow in the mine and the volume required.

The overall fresh air requirements for the mine have been estimated from the mobile diesel equipment fleet requirements needed for mine development and production activities.

There will be a staged approach to providing adequate air to active mining areas. The overall mine development philosophy is to complete the mine development as quickly as possible to open all mine production zones to increase flexibility in production scheduling and reduce any risks associated with short term, unforeseen problems in individual mining zones.

16.3.1 STAGE 1

Two 150 Hp fans and a modular heating system will be set-up at the entrance of the main portal to provide approximately 76 m³ per second (160,000 cfm) of air to active development faces. Once development has reached 200 Level, two more 150 Hp auxiliary fans will be installed in the existing duct to move air to 240 Level. This will allow the development of the ramp to 240 Level as well as the access drift to the fresh and exhaust raises which will be driven to surface. The modular heating system is equipped with an underground emergency response system. A permanent escape way and second egress will be installed in the fresh air raise.

Figure 16.3 shows the Stage 1 ventilation plan.

Stage 1

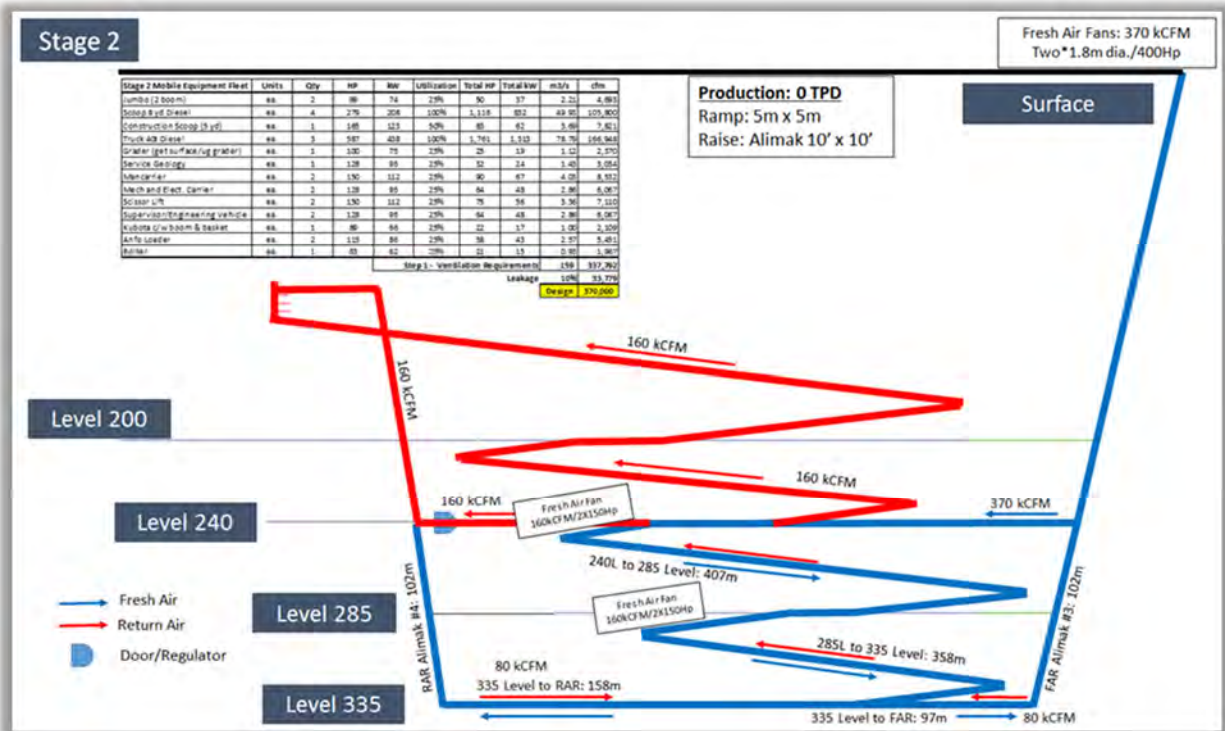
Stage 1 Mobile Equipment Fleet	Units	Qty	HP	kVA	Load Factor	Total HP	Total kVA	mVA	Watt
Compressor 1 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 2 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 3 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 4 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 5 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 6 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 7 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 8 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 9 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 10 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 11 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 12 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 13 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 14 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 15 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 16 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 17 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 18 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 19 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 20 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 21 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 22 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 23 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 24 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 25 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 26 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 27 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 28 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 29 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 30 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 31 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 32 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 33 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 34 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 35 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 36 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500
Compressor 37 (2000)	1	1	2000	1500	0.75	2000	1500	1500	1500

The main ventilation system will be commissioned to provide approximately 175 m³ per second (370,000 cfm) of fresh air to the underground workings. The main surface fresh air fan installation system will consist of two 400 hp 1.8 m diameter fans along with the mine air heaters. This system will provide the necessary air volume to start production on 240 Level and allow development of the mine down to the 335 Level fresh and exhaust raise access drifts. Both raises will be excavated to 240 Level. An escape way will be installed between 335 Level to 240 Level in the fresh air raise.

A ventilation door equipped with a regulator assembly will be installed on 240 Level so that production can start on the level and to allow air to escape from both the ramp and the exhaust air.

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Figure 16.4 Stage 2 Ventilation



16.3.3 STAGE 3

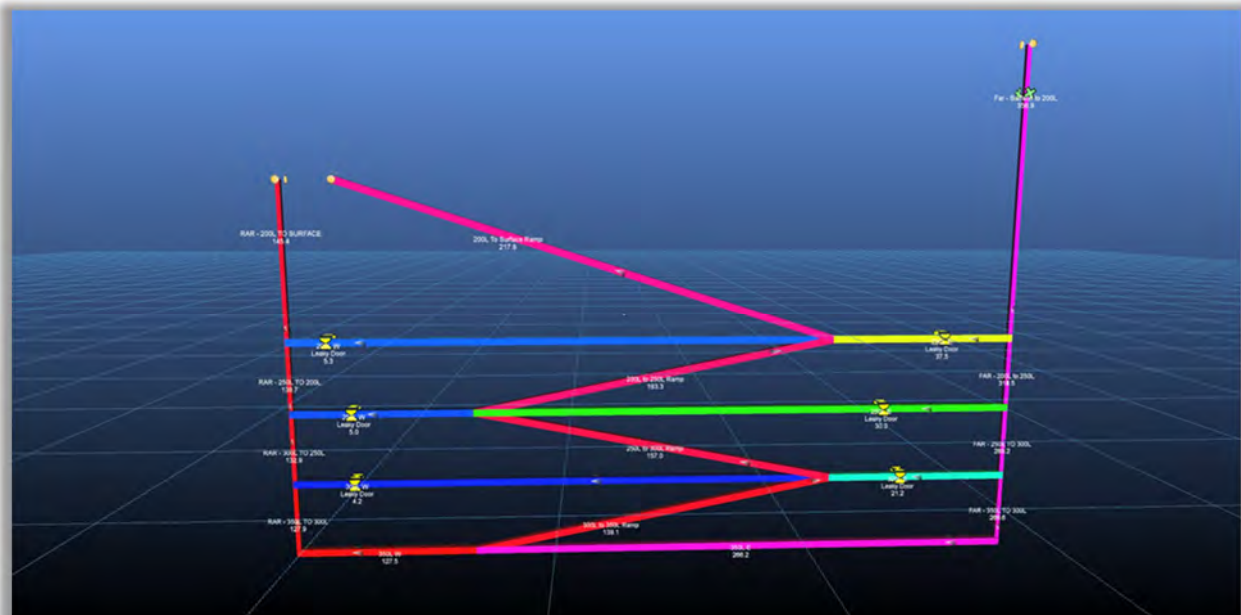
An additional set of two 450 hp 1.5 m diameter booster fans will be installed underground on 335 Level to provide enough pressure to ventilate all active mining levels.

Bulkheads, doors, and ventilation regulators will be installed on each level to control air that could escape through the exhaust raise and the ramp.

Figure 16.5 shows Stage 3 ventilation.

[illegible]

Figure 16.6 Stage 3 VENTSIM™ Model



16.3.4 MINING METHOD SELECTION

When selecting mining methods, the relevant characteristics of the PAK Lithium Project are the vertical trend, low varying width and minimal grade variance of the resource. A resource of this shape and characteristics lends itself to be mined using massive mining methods.

The underground portion of the resource will be mined using longhole mining methods. A top sill used for drilling, and a bottom sill used for mucking are required before mining of the designed stope shape can occur. The stopes will be mined from hanging wall to footwall and will be filled and cured before adjacent stopes can be mined.

OVERALL STOPE GEOMETRY

A geotechnical desktop study was performed by Rob Whipple Engineering Inc. A memorandum brief stated the following:

Two empirical methods: critical scaled span and Mathews modified stability chart are used in a desktop study to set preliminary underground stope dimensions for the PAK Lithium Deposit.

Data provided included an engineering geotechnical report, two MS PowerPoint® files containing diamond drill logs and an Adobe® format 3D CADD scalable model showing lithologies and planned development accesses.

From the information provided, assumptions were made:

- in-situ stress field including magnitude and direction,
- no over-stress rock mass conditions are present,
- set a conservative Stress Reduction Factor value (SRF=2.5) for rock mass quality measurements

Preliminary dimensions are maximum 50 m vertical (level-to-level) x maximum 20 m horizontal (along strike) x maximum 25 m (hanging wall-footwall; perpendicular to strike).

16.3.5 BACKFILL

Pastefill would be used to fill the longhole stopes. Dependent upon where the stope is, or where it lies in the mining sequence, waste rock could be mixed in with the paste if practicable. The paste plant would be located on surface and piped underground to the various headings where needed.

16.3.6 MINE EQUIPMENT

All mobile mining equipment would be provided and maintained by the contractor. The underground mining fleet required to support a nominal mining rate of 1,100 tpd is outlined in Table 16.14.

Table 16.14 Underground Equipment List

Equipment Detail	Quantity
Jumbo (2 boom)	2
Production Drill	2
Scoop 8 yd Diesel	4
Construction Scoop (5 yd)	1
Truck 40t Diesel	3
Grader (get surface/Ug grader)	1
Service Geology	1
Man carrier	2
Mech and Elect. Carrier	2
Scissor Lift	2
Supervisor/Engineering Vehicle	2
Kubota c/w boom & basket	1
Emulsion Loader	2
Bolter	1
Total	26

16.4 UNDERGROUND PERSONNEL

The mine will operate on two shifts 335 days per year. All personnel except technical staff would be employees of the selected contractor. Diamond drilling would be performed by a separate drilling contractor. Mining personnel requirements are summarized in Table 16.15. Mining operations personnel requirements are identified in Table 16.16.

Table 16.15 Mine Staff Personnel

Mine Staff (Underground)	Quantity
Site Manager	1
Pit Superintendent	1
Senior Engineer	2
Surveyor/Mining Technician	2
Geologist Technician	2
Total Mine Staff	8
Support staff	
Purchasing/Logistics	1
Payroll	1
Accounting	1
Admin Assistance	2
Safety Training	2
Security	4
Total Support Staff	11
Total Staff Mine Operation	19

Table 16.16 Mine Operations Personnel

Personnel	Personnel per Shift	Total Personnel Needed on Site
Mine General		
Warehouse Attendant	1	1
General Mine Labourer	2	2
Light Duty Mechanic	1	1
Lube Truck Driver	1	2
Production		
Production Drill Operator	2	4
Blaster	2	2
Maintenance		
Heavy duty mechanic	3	6
Welder	1	1
Electrician	1	1
Development		
Jumbo Driller	2	4
Scoop Operator	3	6
Ground Support Crew	4	8
Truck Driver (Surface and underground)	6	12
Construction Crew	3	3
Total	32	53

16.5 UNDERGROUND MINE PLAN

For the purpose of the underground plan, Year 1 of production is in Year 12 of the overall production.

The QP prepared the LOM production schedule in EPS®. Refer to Table 16.17; its purpose is to define the sequencing of each mining area, respecting the dependencies among them, and to schedule the tonnage and grade mined for the life-of-mine.

A nominal production rate of 1,100 tpd would be expected from underground.

Table 16.17 Overall Production Schedule

Mine Year	Ore Mined (tonnes)	Grade (% Li ₂ O)	Concentrate Produced (tonnes)
12	160,000	2.11	33,661
13	372,095	1.92	70,022
14	370,795	1.92	70,007
15	371,887	1.48	51,273
16	375,400	1.92	70,671
Total	1,650,178		295,635

16.5.1 MINE LATERAL DEVELOPMENT SCHEDULE

Development designs and rates were entered into EPS®. Predecessors and successors were used to ensure that development was completed in a sequential manner. A maximum of 11 m/d will be excavated utilizing 2 development crews. Table 16.18 shows development schedule for the LOM.

Table 16.18 Development Schedule

Mine Year	Development Metres
11	3,762
12	1,419
Total	5,181

17 RECOVERY METHODS

17.1 FLOWSHEET DEVELOPMENT

Section 13.0 of this report provides a summary of the metallurgical test work to date. A series of locked-cycle tests were performed at the XPS Consulting and Test Work Facility located in Falconbridge, ON. The results of which were used to derive the preliminary Process Flowsheet and mass balance of the facility. The Process design provides design parameters for the production and storage of a Concentrator facility on site. Provision for the storage of all process inputs as well as Process Concentrate output as necessitated to operate on a year-round basis with only road access available on a seasonal winter ice road basis. Metallurgical testing has shown recovery to be fairly constant and predictable. Changes in the flowsheet were completed up to the 12th iteration of the locked-cycle test (FRON-12) were primarily related to stabilization of the circuit as well as improvements in the removal of contaminants and improvement in concentrate grade as stated by the guiding technical specification for the concentrate. The preliminary circuit configuration has been built on the learnings from test work and configured to mitigate risk associated with the process.

General processing plant descriptions are provided in this section, which were based primarily on locked-cycle (FRON-12) work. This resulted in the development of a viable flowsheet for the production of technical and chemical grade spodumene concentrates and served as the basis for both the mill design model and Capital Cost estimate. Subsequently, information from the resultant processing plant model as well as vendor budget pricing contribute to the overall Capital and Operating cost estimates presented in Section 21.0.

The technical concentrate is expected to contain a grade of 7.15% Li₂O, representing 73.7% of the lithium in mill feed in 39.5% of the mass. The chemical concentrate had a grade of 7.14% Li₂O, representing 7.6% of the lithium in mill feed in 4.1% of the mass. The technical and chemical concentrates met their respective specifications for contaminant elements, with the exception of iron and tantalum, which were not removed in the process demonstration exercise due to restricted availability of mass. Subsequent testing on larger samples showed substantial upgradeability of tantalum (and reduction of contaminant levels) by means of Knelson gravity separation, as well as reduction of iron by means of WHIMS separation to acceptable limits.

Combined lithium recovery in the milling circuit to saleable products was $(73.7\% + 7.6\%) = 81.3\%$. The feed to flotation (FRON-12) had been DMS-upgraded, with the FRON-12 blend representing 92.8% of the lithium in ore. Thus, the adjusted recoveries (basis = ore) become:

Technical grade (73.7* 0.928)	=	68.4%
Chemical grade (7.6* 0.928)	=	7.0%
Combined Products (81.3* 0.928)	=	75.4%

17.2 PROCESS DESIGN CRITERIA

All throughput and mass balance calculations used as the basis of design were based on the average production mill feed of 45 tph of ore. Thirty-one percent (31%) of mill feed is expected to be rejected as a result of the DMS process, thereby reducing the comminution and flotation throughput down to 30.8 tph on a design basis. Simplified flowsheets are presented on Figures 17.1 to 17.5, and the overall Process Design Basis is summarized in Table 17.1.

The concentrator will operate on a 24-hour per day basis, 7 days per week, and 335 days per year which equates to a planned availability of 92%.

Figure 17.1 Simplified Overall Process Design

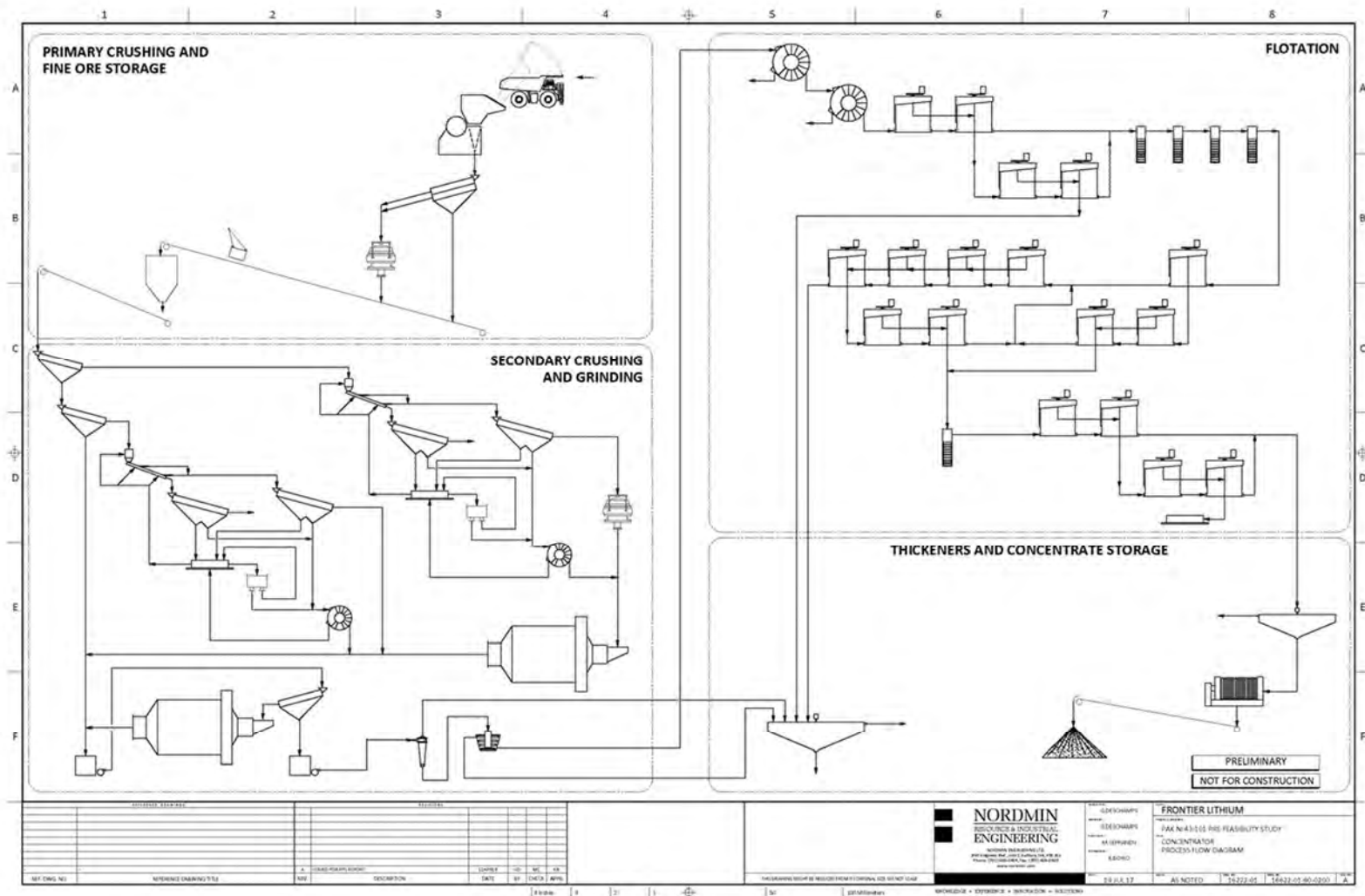


Figure 17.2 Crushing and Fine Ore Storage

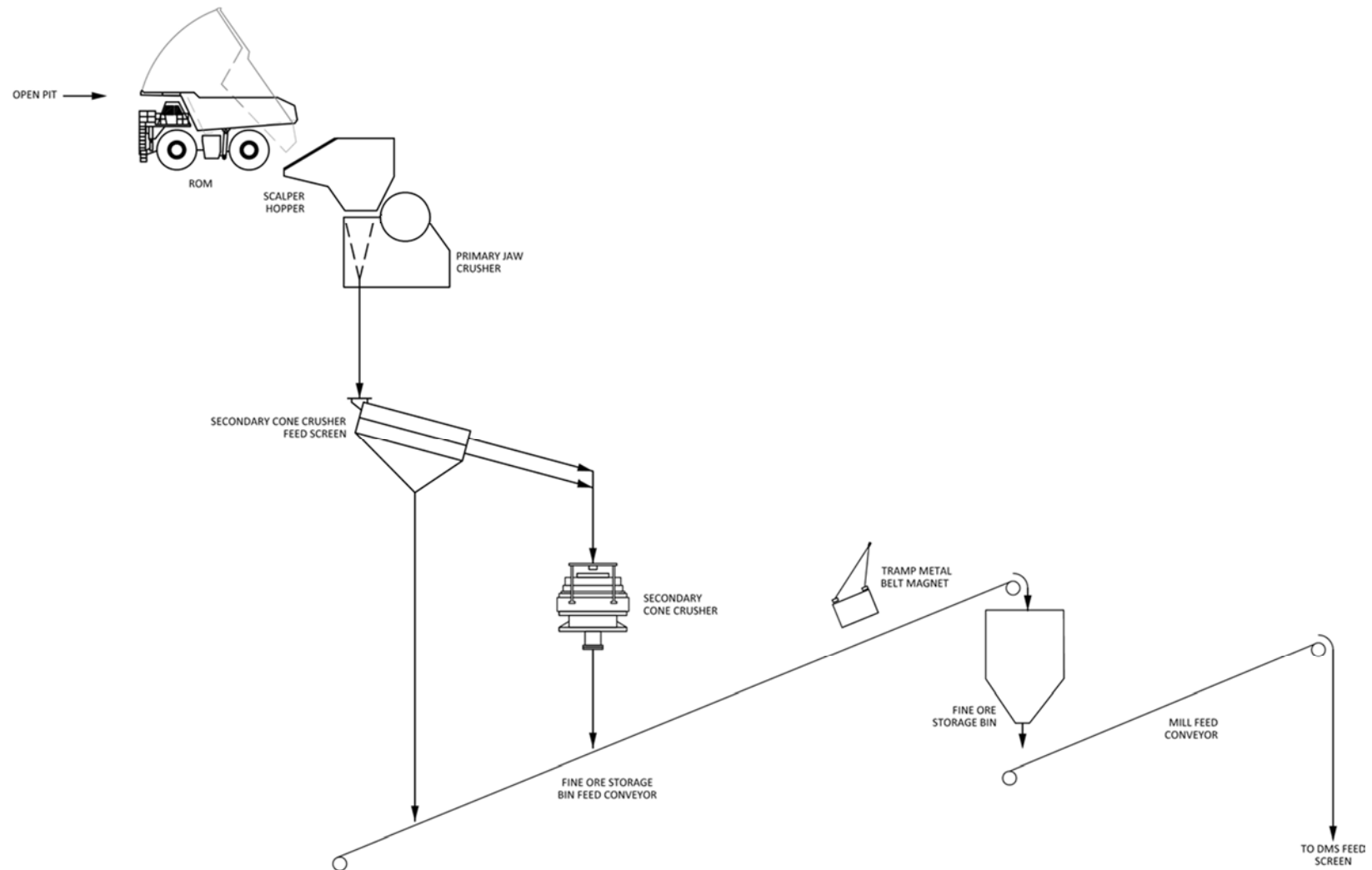


Figure 17.3 DMS and Grinding

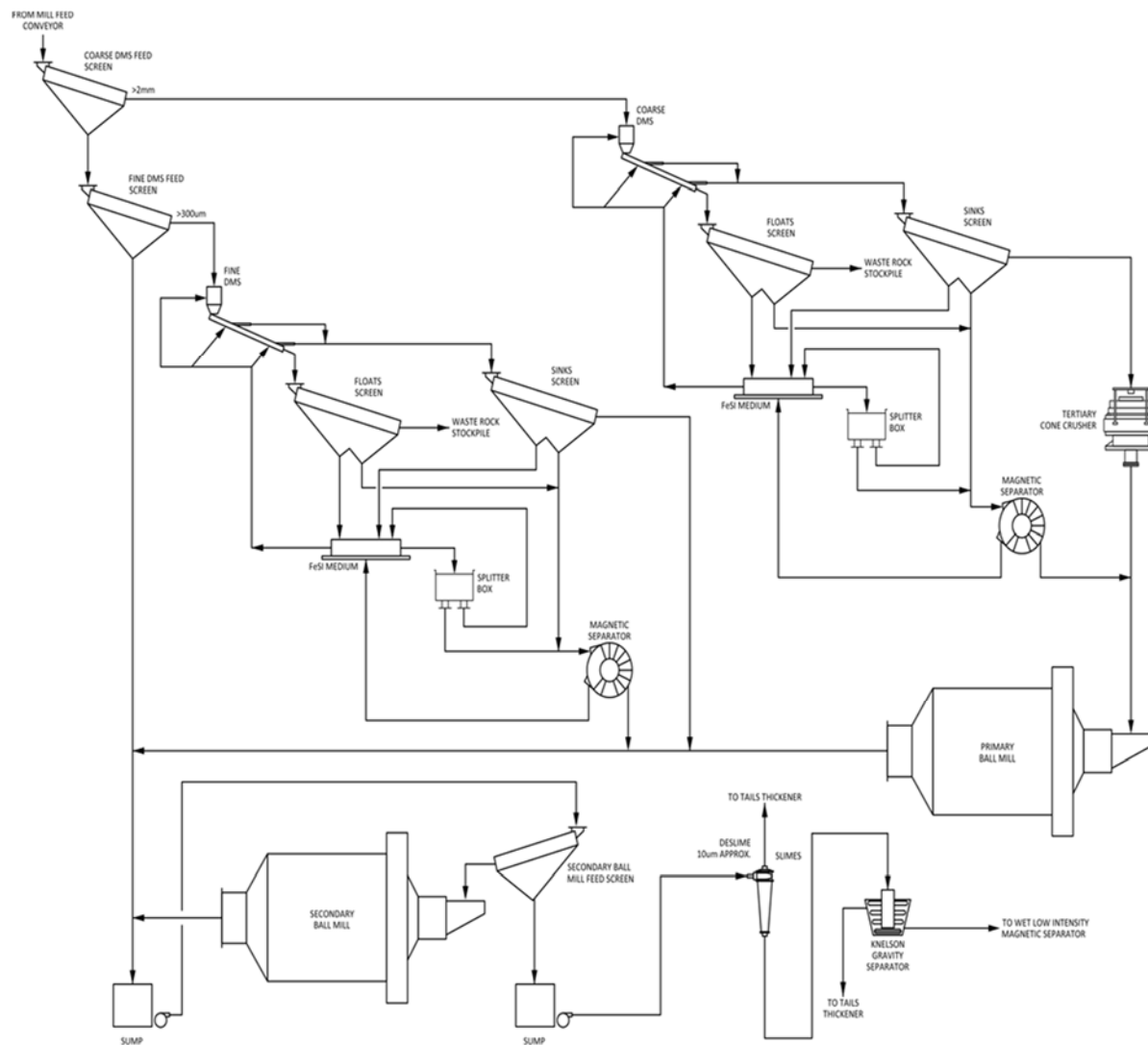
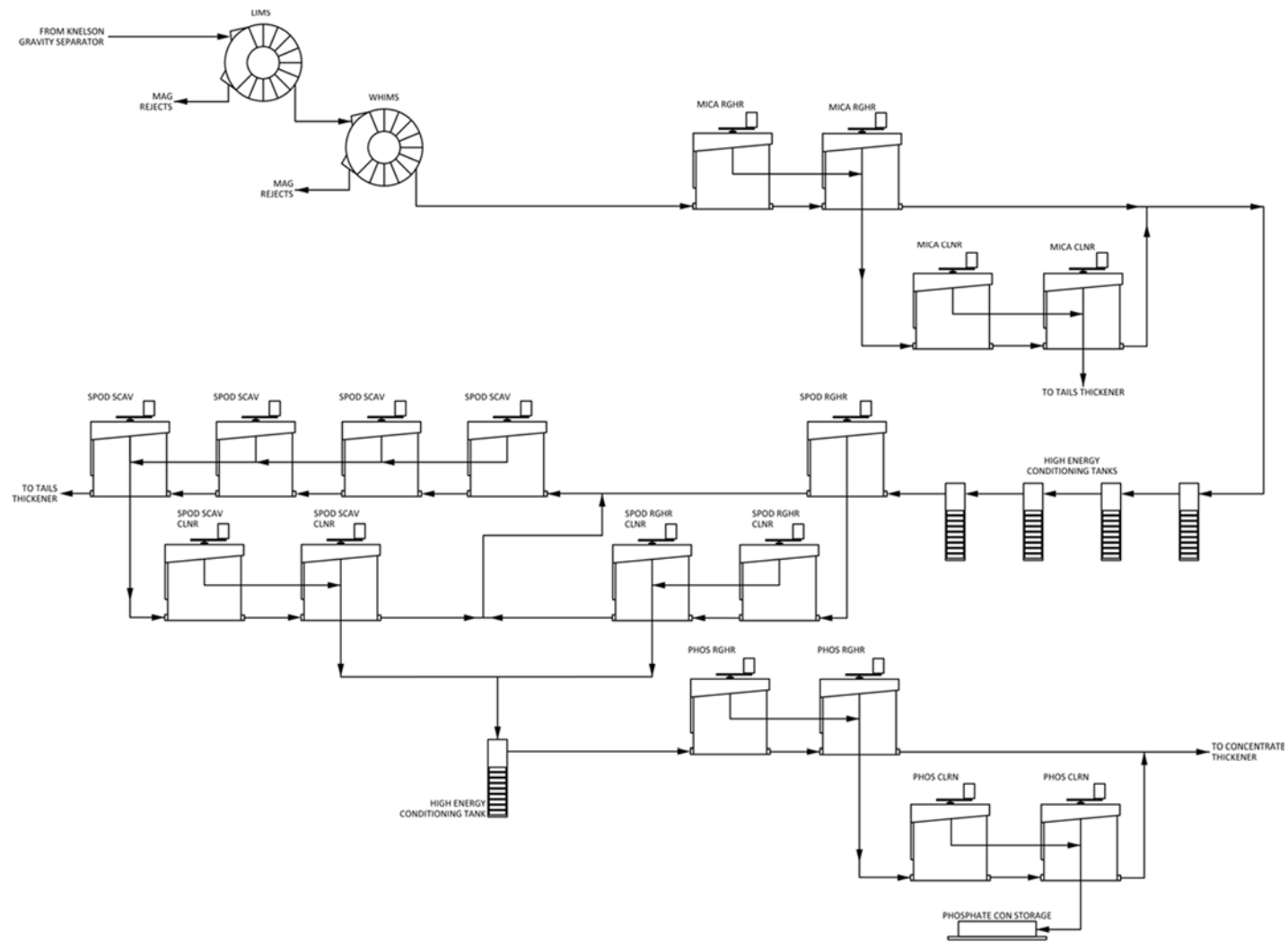


Figure 17.4 Flotation



The diagram illustrates the material flow in a phosphate processing plant. On the left, five input streams are listed: 'FROM PHOSPHATE FLOTATION TAILS', 'FROM MICA CLNR FLOTATION CONC', 'FROM SPOD SCAV FLOTATION TAILS', 'FROM DESLIME CYCLONE OVERFLOW', and 'FROM KNELSON GRAVITY CONCENTRATOR TAILS'. These streams feed into a 'TAILINGS THICKENER'. The thickener has two outputs: 'TO TAILINGS POND' (bottom) and 'TO PROCESS WATER TANK' (right). A line from the top of the thickener goes to the right and then down to a 'CONCENTRATE THICKENER'. The 'CONCENTRATE THICKENER' also has two outputs: 'TO PROCESS WATER TANK' (right) and a line that goes down to a 'CONCENTRATE FILTER'. The filter's output goes to a 'CONCENTRATE TRANSFER CONVEYOR', which then feeds into a 'CONCENTRATE STOCKPILE'.

Table 17.1 Process Design Basis

Unit Operation	Stream	Mass%	Li2O Grade	Li2O Dist	Dry tph	Solids SG	Solids m3/h	Water m3/h	Total tph	Volume m3/h	Pulp SG	%Solids
Fresh feed (ore)	Fresh feed (ore)				45.0	2.75	16.4	0.9	45.9	17.3	n/a	98
DMS Screens	Wash Water				n/a	n/a	n/a	5.0	5.0	5.0	1.00	0
	DMS >2000um solids				33.8	2.75	12.3	1.0	34.8	13.3	n/a	97
	DMS <2000um pulp				11.3	2.75	4.1	4.9	16.1	8.9	1.80	70
	Wash water				n/a	n/a	n/a	2.0	1.0	2.0	1.00	0
	DMS >300um solids				6.8	2.75	2.5	0.8	7.5	3.2	n/a	90
	DMS fines (<300um) pulp				4.5	2.75	1.6	6.1	9.6	7.7	1.24	47
DMS Separation	No balance has been constructed around the DMS. Assumes that washed solids come back at the same moisture that they entered											
	DMS >2000um Light Fraction				11.8	2.65	4.5	0.4	12.2	4.8	n/a	97
	DMS >2000um Heavy Fraction				21.9	2.81	7.8	0.7	22.6	8.5	n/a	97
	DMS >300um Light Fraction				2.4	2.65	0.9	0.3	2.6	1.2	n/a	90
	DMS >300um Heavy Fraction				4.4	2.81	1.6	0.5	4.9	2.1	n/a	90
Primary Ball Mill	DMS >2000um Heavy Fraction				21.9	2.81	7.8	0.7	22.6	8.5	n/a	97
	Grinding Water				n/a	n/a	n/a	8.7	8.7	8.7	1.00	0
	Primary BM Discharge				21.9	2.81	7.8	9.4	31.3	17.2	1.82	70
Secondary Ball Mill	BM Sump				61.7	2.80	22.0	29.2	89.9	51.2	1.75	69
	recirc load: 100											
	Screen Oversize				30.8	2.80	11.0	3.4	34.3	14.4	n/a	90
	Grinding water				n/a	n/a	n/a	9.8	9.8	9.8	1.00	0
	Ball Mill Discharge				30.8	2.80	11.0	13.2	44.0	24.2	1.82	70
	Screen Undersize Sump				30.8	2.80	11.0	25.8	55.6	36.8	1.51	55
Desliming	Dilution water (sump)				n/a	n/a	n/a	66.7	66.7	66.7	1.00	0
	Cyclone Feed	100	3.9	100.0	30.8	2.80	11.0	92.5	123.3	103.5	1.19	25
	Cyclone Overflow (Slimes)	4	2.7	2.8	1.2	2.80	0.4	68.3	69.5	68.7	1.01	2
	Cyclone Underflow	96	4.0	97.2	29.6	2.80	10.6	24.2	53.8	34.8	1.55	55
Flotation	Dilution Water				n/a	n/a	n/a	30.7	30.7	30.7	1.00	0
	Mica Float Feed	96	4.0	97.2	29.6	2.80	10.6	55.0	84.5	65.5	1.29	35
	Mica Rghr Con				2.0	2.80	0.7	3.7	5.7	4.4	1.29	35
	Mica Rghr Tails				27.6	2.80	9.9	51.2	78.8	61.1	1.29	35
	Mica Clnr Con	3	2.2	1.8	1.0	2.80	0.4	1.9	2.9	2.2	1.29	35
	Mica Clnr Tails				1.0	2.80	0.4	1.9	2.9	2.2	1.29	35
	Spod Rghr1 Feed	93	4.0	95.4	28.6	2.80	10.2	53.1	81.7	63.3	1.29	35
	Spod Rghr1 Con	23	6.9	40.0	7.0	3.00	2.3	12.9	19.9	15.3	1.30	35
	Spod Rghr1 Tails	70	3.1	55.4	21.6	2.74	7.9	40.2	61.8	48.1	1.29	35
	Spod Rghr2 Con	25	7.1	45.0	7.6	3.00	2.5	14.2	21.8	16.7	1.30	35
	Spod Rghr2 Tails	45	0.8	10.4	14.0	2.62	5.4	26.0	40.0	31.4	1.28	35
	Phosphate Con	3	6.6	5.0	0.9	3.00	0.3	1.7	2.6	2.0	1.30	35
	Phosphate Tails	20	6.9	35.0	6.1	3.00	2.0	11.3	17.3	13.3	1.30	35
Tails Thickener	Thickener Feed				17.1	2.66	6.5	97.8	115.0	104.3	1.10	15
	Thickener Underflow				17.1	2.66	6.5	8.4	25.6	14.9	1.72	67
	Thickener Overflow				0	0	0	89.4	89.4	89.4	1.00	0
Concentrate Dewater	Total Concentrate	65		80.0	13.7	3.0	4.6	25.4	39.1	30.0	1.30	35
	Thickener Underflow	65		80.0	13.7	3.0	4.6	5.6	19.3	10.1	1.90	71
	Thickener Overflow				0	0	0	19.8	19.8	19.8	1.00	0

Feed	45.0
DMS Reject	14.2
Con	13.7
Tails	17.1

Water Inputs	123.8
Return Water	109.2
Water Outputs	14.7

17.3 PRIMARY AND SECONDARY CRUSHING

17.3.1 PURPOSE

The Crushing circuit is designed to reduce ROM ore with a moisture content of maximum 5% and a F80 of 300 mm to feed the mill concentrator at a P80 of 13 mm.

17.3.2 DESCRIPTION

ROM ore is transported by truck from the open pit and dumped into a hopper prior to the Primary Crusher, where it is reduced to a P80 size of 150 mm. The ROM ore top size will be controlled by blast fragmentation to below 400 mm minus, thereby avoiding the use of a grizzly section prior to the primary. A 89 5x 660 mm feed opening crusher has been selected to handle maximum lump size, which is lightly loaded at closed-side setting of 100 mm. The Primary Crusher is a 75 hp jaw-type, with a minimum operating capacity of 125 tph. A 12-hour operating day for the crusher is assumed.

From the Primary Crusher, crushed ore drops onto a double-deck screen which classifies undersize to bypass the Secondary Crusher. Deck sizes for the double-deck screen have been selected at 25 mm and 15 mm respectively. The double-deck screen is 1.5 m wide and 4.8 m long, and is in open configuration in order to lower the machine load of the Secondary Crusher. The Secondary Crusher is a 120 hp cone type, with a predicted operating capacity of 71 tph at a closed side setting of 25 mm. Both undersize from the double-deck screen and product of the Secondary Crusher will report to load-out conveyor that carries the ore through a heated gallery to the Fine Ore Storage bin located prior to the concentrator building.

A belt magnet is located on the load-out conveyor to remove tramp ferrous material entrained in the ore before it leaves the crusher building complex. A belt weigh scale on the load-out conveyor tracks the production rate of the crushing plant.

A baghouse collects dust at the ore transfer points within the Primary Crusher Building, which once collected, will report to the tail end of the load-out conveyor. A sump pit is provided to collect wash-up residue, and is designed to be emptied periodically by vacuum truck.

17.4 FINE ORE STORAGE

17.4.1 PURPOSE

The Fine Ore Storage bin is designed to provide storage of concentrator feed ore prior to the concentrator, and capacitance between the crushing circuit and concentrator in order to allow for day shift ore handling only to feed the crusher complex which operates on a continuous basis.

17.4.2 DESCRIPTION

Ore discharged from the Primary and Secondary Crusher circuit is fed to the Fine Ore Storage bin via the crusher circuit load-out conveyor. The Fine Ore Bin is 6.2 m diameter x 7.2 m high, which corresponds to a design capacity of 600 tons.

Ore discharged from the Primary and Secondary Crusher circuit is fed to the Fine Ore Storage bin via the crusher circuit load-out conveyor. The Fine Ore Bin is 6.2 m diameter x 7.2 m high, which corresponds to a design capacity of 600 tons.

17.5 DENSE MEDIA SEPARATION

17.5.1 PURPOSE

The Dense Media Separation (DMS) circuit has been incorporated at the front end of the concentrator facility as a method to remove barren material from SQUI resulting in a reduction of the comminution energy prior to flotation, and an upgraded mill feed.

17.5.2 DESCRIPTION

A two-stage DMS (Coarse and Fine) has been carried based on test work and pro-forma calculations which set the DMS Plant design parameters to:

Coarse:

DMS plant feed rate (Max):	up to 40 tph
DMS plant nominal feed rate:	34 tph
DMS plant nominal feed size range:	-13 + 2.0 mm
DMS maximum feed particle size:	38 mm
DMS separator d50 cut-point density:	2.7 to 3.1 SG
DM separator:	two-stage 300 mm Condor
Medium:	ferrosilicon 270D (milled)
Medium consumption (estimated):	200-300 g/t DMS feed

The selected coarse modular system includes for a two-stage, 300 mm diameter separator, and includes one 1.8 m x 3.6 m drain/rinse screen with 1.0 mm aperture panels, as well as a dense media recovery system. The wet drum magnetic separator will be 0.9 m diameter x 1.2 m wide.

Fine:

DMS plant feed rate (Max):	up to 15 tph
DMS plant nominal feed rate:	7 tph
DMS plant nominal feed size range:	-2 + 5.0 mm
DMS maximum feed particle size:	25 mm
DMS separator d50 cut-point density:	2.7 to 3.1 SG
DM separator:	two-stage 250 mm Condor
Medium:	ferrosilicon 270D (milled)
Medium consumption (estimated):	300-400 g/t DMS feed

The selected fine modular system includes for a two-stage, 250 mm diameter separator, and includes one 1.2 m x 3.6 m drain/rinse screen with 0.5 mm aperture panels, as well as a dense media recovery system. The wet drum magnetic separator will be 0.9 m diameter x 1.2 m wide.

The Coarse DMS feed screen rejects (>2 mm) report to the Coarse DMS Separator. Sinks from the separator report to the tertiary crusher, to be reduced to a F80 of 2 mm prior to Primary Grinding. Floats from the Coarse DMS proceed to the integral Floats Screen and subsequent magnetic separation prior to reporting to the DMS tailings stockpile.

The Coarse DMS feed screen accepts (undersize) report to the Fine DMS feed screen. The Fine DMS feed screen rejects (>300 µm) report to the Fine DMS Separator. Sinks from the separator report to the Primary Ball Mill discharge stream after magnetic separation. Floats from the Fine DMS proceed to the integral Floats Screen, then magnetic separation prior to reporting to the DMS tailings stockpile.

Further testing will be required at the next stage of study to confirm; however, it is estimated that the combined DMS plant will require 0.3 tonnes of ferrosilicon per day to maintain proper level of dense media within the circuit.

17.6 GRINDING

17.6.1 PURPOSE

The Grinding Circuit is designed to produce feed slurry fine enough for effective Flotation. The Primary and Secondary Ball mills work in concert to particle size of P80 = 200 µm for feed to a cyclopak unit prior to Mica Flotation. Design product size was set to a P80 = 150 µm as a conservative measure.

17.6.2 DESCRIPTION

As previously mentioned, the Primary Ball Mill is in open-circuit with the discharge of the Tertiary Crusher. The Tertiary crusher is a 120 hp cone type, with a predicted operating capacity of 22 tph at a closed side setting of 4 mm.

A Primary and Secondary Ball Mill comminution circuit has been carried based on test work and pro-forma calculations which set the grinding parameters to:

Feed material:	Lithium Ore
Specific gravity:	2.75
Abrasion index:	1.08 g
Primary Ball Mill	
Capacity:	22 dry TPH
Ball mill work index:	14.7 kWh/T
Feed size:	F80 = 2 mm
Product size:	P80 = 0.3 mm
Secondary Ball Mill	
Capacity:	31 dry TPH
Ball mill work index:	17.7 kWh/T
Feed size	F80 = 0.3 mm
Product size:	P80 = 150 microns

The Primary Ball Mill is a 2.2 m diameter x 3.0 m long unit with a 200 hp installed motor and variable frequency drive. The discharge of the Primary mill reports to the Secondary Ball Mill pumpbox. In order to minimize working capital, both the Primary and Secondary mills will have identical installed motors. However, length of the Secondary mill had to be longer to meet product requirements.

The Secondary Ball Mill is in closed configuration with a double deck feed screen, a 1.8 m x 3.6 m unit which is of similar construction as the Coarse DMS feed screen. The Secondary Ball mill is a 2.2 m diameter x 3.5 m long mill with a 200 hp installed motor with a variable frequency drive.

Product of the Secondary Ball mill will be pumped to a de-sliming cyclone cluster consisting of ten (10) 50 mm diameter cyclones. Cyclones overflows are classified slimes (<10 μ) and report to the tailings thickener. The underflow will feed a Knelson Gravity separator prior to reporting to a Low Intensity Magnetic Separator (LIMS) and Wet High Intensity Magnetic Separator (WHIMS) prior to further the first stage of (Mica) flotation.

Placement of the LIMS and WHIMS within the overall circuit will be confirmed at the next stage of study, which will involve pilot plant testing to predict the most efficient arrangement. In practice, there is pragmatic evidence that the LIMS and WHIMS placement would be after pH depression prior to the Mica Flotation circuit. It is also anticipated that further de-sliming using an additional cyclone cluster prior to the next stage of flotation may be of benefit.

17.7 MICA FLOTATION CIRCUIT

17.7.1 PURPOSE

The Mica Flotation Circuit is designed to remove undesired Mica from the spodumene ore and therefore increase final Li₂O concentration destined for flotation plant feed.

17.7.2 DESCRIPTION

The Mica Flotation circuit consists of two 8.5m³ Rougher mechanical cells in series, equipped with 11 kW agitators. Feed will report to the Roughers at a grind P80 of 200 μ , reduced to a pH of 3.5 using sulphuric acid. Additional reagents introduced at the Rougher stage are Flotigam EDA and Oleylamine. Rougher float products will report to two 1.4 m³ Cleaner mechanical cells in series, equipped with 3.7 kW agitators.

Attrition scrubbing is required to clean the mineral surfaces will produce more slimes prior the next stage of flotation. The combined Mica Rougher and Cleaner tails will continue to feed forward to a series of four 8 m³ conditioning tanks equipped with 11 kW agitators.

Mica Rougher float product will report to the Mica Cleaner cells. The float product from the Cleaner cells will constitute the Mica concentrate which will be pumped to the tailings thickener for disposal.

17.8 SPODUMENE FLOTATION CIRCUIT

17.8.1 PURPOSE

The Spodumene Flotation Circuit is designed to produce high concentration spodumene concentrate.

17.8.2 DESCRIPTION

The Spodumene flotation circuit consists of a single 8.5m³ Rougher mechanical cell, equipped with a 11 kW agitator. Feed to the Rougher will be increased to a target pH of 8.5 using NaOH. Additional reagents introduced at the Rougher stage are Flotigam FS/2 and Oleic acid as a collector. Rougher float products will report to two 1.4 m³ Rougher Cleaner mechanical cells in series, equipped with 3.7 kW agitators. The Rougher tails will continue to feed forward to a series of four 8.5 m³ Scavenger tanks equipped with 11 kW agitators. Float products from the Rougher Scavengers will report to a Scavenger Cleaner circuit consisting of two 1.4 m³ mechanical cells in series, also equipped with 3.7 kW agitators.

Both Rougher Cleaner and Scavenger Cleaner float products will report to the conditioning stage prior to the final stage of flotation – Phosphate flotation. Rougher Scavenger tails will be pumped to the tailings thickener for disposal.

17.9 PHOSPHATE FLOTATION CIRCUIT

17.9.1 PURPOSE

The Phosphate Flotation Circuit is designed to remove phosphate from the spodumene concentrate to produce the high-grade (technical) spodumene as well as a phosphate concentrate.

17.9.2 DESCRIPTION

The Phosphate flotation circuit consists of a two 1.4 m³ Rougher mechanical cell, equipped with a 3.7 kW agitator. Feed to the Rougher will be maintained to a target pH of 8.5 using NaOH. Additional reagents introduced at the Rougher stage are WW82 Dextrine prior to reverse flotation of phosphates from spodumene. The Rougher tails will continue to feed forward to the spodumene concentrate thickener circuit. Rougher float products will report to two 1.4 m³ Phosphate Cleaner mechanical cells in series, equipped with 3.7 kW agitators. Float products from the Phosphate Cleaner will be dewatered and handled as a separate chemical grade concentrate.

17.10 CONCENTRATE THICKENING, DEWATERING, AND STORAGE

17.10.1 PURPOSE

The Spodumene Concentrate Thickening and Dewatering circuit is designed to dewater and filter a combined concentrate feed, in preparation for storage on site.

17.10.2 DESCRIPTION

Final Concentrate from the Phosphate Rougher and Cleaner tails are fed to a 7 m diameter high-rate Concentrate Thickener, where the feed slurry at 8% w/w is mixed with flocculant (30g/T) and thickened to a target solids concentration of 67% w/w.

Thickened concentrate is pumped to a Pressure Concentrate Filter, where the solids content is further increased to a target of 90% solids w/w.

Discharge from the Pressure Filter is conveyed in an enclosed stockpile for bulk storage prior to being transported off site for further refining. The Bulk storage facility is sized to stage 60,000 T of concentrate and is of dimension 37 m wide x 151 m long (5,522 m²).

Thickener overflow and filter filtrate is collected and recycled back to the process.

17.11 REAGENTS / PROCESS WATER

Reagents will be stored dry, when possible, onsite prior to being prepared and stored in a separate area adjacent to the Concentrator facility for distribution to the process. Reagents will be prepared using a dedicated process water unique to flotation zones (Mica, Spodumene, and Phosphate) in order to avoid cross-contamination and other unfavorable effects. Make-up to process water systems will be accomplished by reclaim of supernatant liquid from the tailings pond as well as direct make-up from the adjacent lake. Table 17.2 summarizes the reagent consumption.

Table 17.2 Required Reagents

S.No.#	Reagent	Usage	
		kg/day	kg/yr
1	Flotigam EDA	120	40200
2	Flotigam 10022	60	20100
3	MIBC	120	40200
4	Flotisor 10060	252	84420
5	Combined Oleic Acid + S ₂	588	205800
6	H ₂ SO ₄	240	84000
7	NaOH (Quadra quote)	165	55275
8	Dextrine WW82	60	20100
9	Ferrosilicon (DMS media)	300	100500

17.12 ASSAY AND METALLURGICAL LABORATORY

The assay and metallurgical laboratory facilities will include all necessary equipment to filter, dry and pulverize mine and concentrator samples to prepare them for assay; to perform all digestions and analytical procedures required for tracking concentrator feed head grades (using mine samples); and to perform all digestions and analytical procedures required for tracking the day-to-day metallurgical performance of the concentrator facility (using grinding and flotation composite samples collected within the mill). Table 17.3 summarizes the ore mass recovery. Table 17.4 and 17.5 summarizes the mill labour count.

Analytical instruments required to provide all routine assays for the mine, concentrator, and environmental department will include:

Water Supply

Four separate water supply systems will be provided to support the operations for the concentrator – three process water supply systems, and one TMF reclaim water supply system.

Process Water Supply System

Process water will be supplied to a process/fire water storage tank from the water treatment plant located adjacent to the concentrator building.

Process water will primarily be used for:

- Fire water for emergency use
- Cooling water for mill lubrication systems
- Gland water for the slurry pumps
- Concentrate filter wash water
- Reagent make-down

The process/fire water tank will be equipped with a standpipe for process water suctions, which will ensure that the tank is always holding at least a 2 hours supply of fire water.

There will be one potable water supply system for the entire mill complex, located adjacent to the concentrator. Potable water will be treated (chlorination, filtration, colour removal), stored and distributed to the various buildings on site, with each building having its own pressurized reservoir tank for distribution within each building.

TMF Reclaim Water Supply System

Reclaim water will be supplied to the Reclaim Water Storage Tank adjacent to the concentrator. Barge-mounted pumps at the TMF will pump the reclaimed water directly to the storage tank. The overflow solution from the concentrate thickener will also be reused by pumping it to the reclaim storage tank.

Reclaim water will be used for:

- DMS
- Primary ball mill circuit dilution
- Secondary grinding mill circuit dilution

Table 17.3 Ore Mass Recovery

	Unit	Values	Formula
Ore Mass	tonnes	100	-
Li₂O	%	2.0	-
Diluent	tonnes	25	$((\text{tonnes} \times \text{grade}) / 2) - \text{ore mass}$
Usize Grade	%	1.91	$(\text{Usize grade} \times \text{LiO}_2 \%) / \text{LiO}_2 \text{ Grade}$
Usize Mass	tonnes	10.00	$\text{Ore Mass} \times 10$
Osize Mass	tonnes	90.00	$\text{Ore Mass} - \text{Usize}$
Osize Grade	%	2.01	$(\text{Ore Mass} \times \text{Li}_2\text{O} \% - \text{Usize Mass} \times \text{Usize}) / \text{Osize Mass}$
Sinks Grade	%	4.33	Constant
Sinks Mass	tonnes	35.21	$((\text{Osize Mass} \times (\text{Osize Grade} - \text{Floats Grade})) / (\text{Sink Grade} - \text{Floats Grade}))$
Floats Mass	tonnes	54.79	$\text{Osize Mass} - \text{Sinks Mass}$
Floats Grade	%	0.52	DMS Balance Floats %
Mill Mass	tonnes	45.21	$\text{Usize Mass} + \text{Sink Mass}$

(table continues on next page)

	Unit	Values	Formula
Mill Grade	%	3.79	$((\text{Usized Grade} \times \text{Usized Mass} + \text{Sinks Grade})) \times \text{sinks Mass} / \text{Mill Mass}$
R% Mill	%	85.81	$(\text{Ore Mass} \times \text{Mill Grade} \times \text{Mill Mass}) / \text{Li}_2\text{O Grade} \times \text{Ore Mass}$
Discard Grade	%	2.92	$(\text{Mill Grade} \times 13.5) / 17.5$
Discard Mass	tonnes	7.91	$(\text{Mill slimes/Mica/Fe Removal}) \times \text{Mill Mass}$
Feed Mass	tonnes	37.29	$\text{Mill Mass} - \text{Discard Mass}$
Feed Grade	%	3.97	$((\text{Mill Mass} - \text{Mill Grade}) - (\text{Discard Grade} - \text{Discard Mass})) / \text{Feed Mass}$
Tails Grade	%	0.70	-
Cons Grade	%	7.11	-
Cons Mass	tonnes	19.03	$(\text{Feed Mass} \times (\text{Feed Grade} - \text{Tails Grade})) / (\text{Cons Grade} - \text{Tails Grade})$

Table 17.4 Mill Operations

Manpower	Per Shift	Total	Comment
Lead Operator	1	4	Vacation relief by Field Operator 1.
Field Operator	1	4	Responsible for field sampling / assisting operator.
Field Operator	2	2	Responsible for utility functions and assisting maintenance, not backfilled for vacation.
Crusher/Loader Operator	2	8	These positions would be utility on night shift to clean plant and perform Field Op 2 duties after crushing is done for the day.
Metallurgist	1	2	-
Assayer	1	2	-
Clerk	1	2	-
Total	9	24	

Table 17.5 Mill Maintenance

Manpower	Per Shift	Total	Comment
Mech. Working Foreman	1	2	Vacation relief performed by E/C Working Foreman
E/C Working Foreman	1	2	-
Millwright	2	4	Vacation quota (1) off at a time.
Tour Electrician	1	3	Total of 3 with vacation relief. Responsible for off-shift (night call-ins)
Garage (Diesel) Mechanics/Welders	2	4	Report to Mech. Working Foreman and assist with mill maintenance.
Total	7	15	

Detailed designs of the mill complex can be found in Appendix E.

18 PROJECT INFRASTRUCTURE

The mine, mill processing plant and major infrastructures will be located at the PAK mine site approximately 175 km north of Red Lake are described in Sections 18.1 to 18.2.11. The Project infrastructure is designed to support the operation of a 1,118 tpd open pit mine and processing plant, operating on a 12 hour per day, 7 days per week basis. The infrastructure will be maintained and will support a 1100 tpd underground after the open pit has been mined out. It has been developed for the most economical operation at this production rate and will require further expansion and development for any increases in throughput. The overall site layout showing location of the mining pit, processing plant and waste management is provided on Figure 18.1.

18.1 SUMMARY

The infrastructure required for the PAK Lithium Project will include:

- Mill complex;
- Site development and access;
- Overall water management plan;
- A tailings management facility (TMF);
- Preliminary TMF design;
- Electrical site reticulation and generated power;
- Warehouse, offices, facilities and other services;
- Temporary and permanent camp complex;
- Airstrip;
- Underground infrastructure.

The proposed layout of the PAK Lithium Project site is shown on Figure 18.1 and the 3D mill plant site layout on Figure 18.2. The mill plant site layout is presented on Figure 18.3.

Figure 18.1 PAK Lithium Project Site

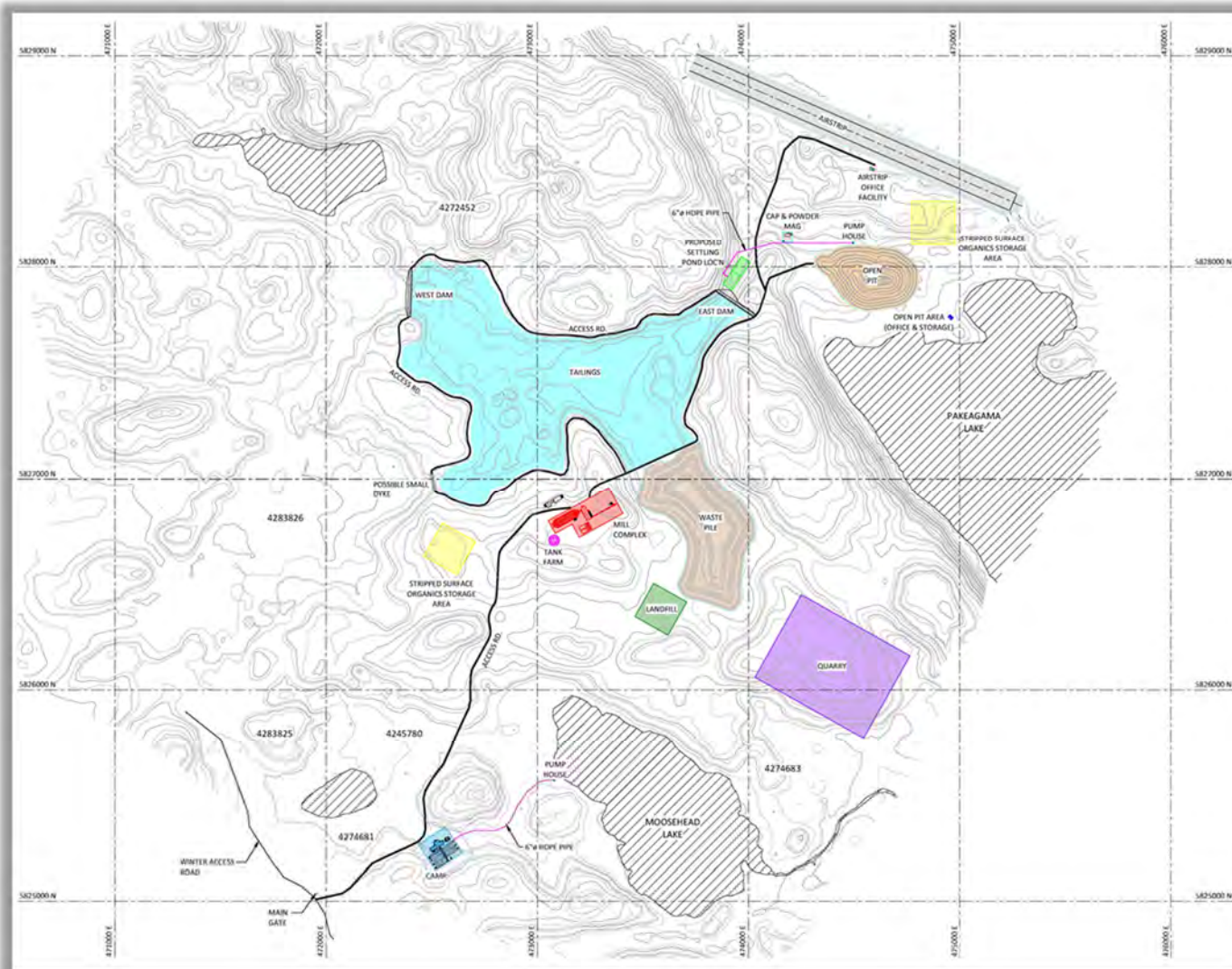


Figure 18.2 3D Mill Complex Layout

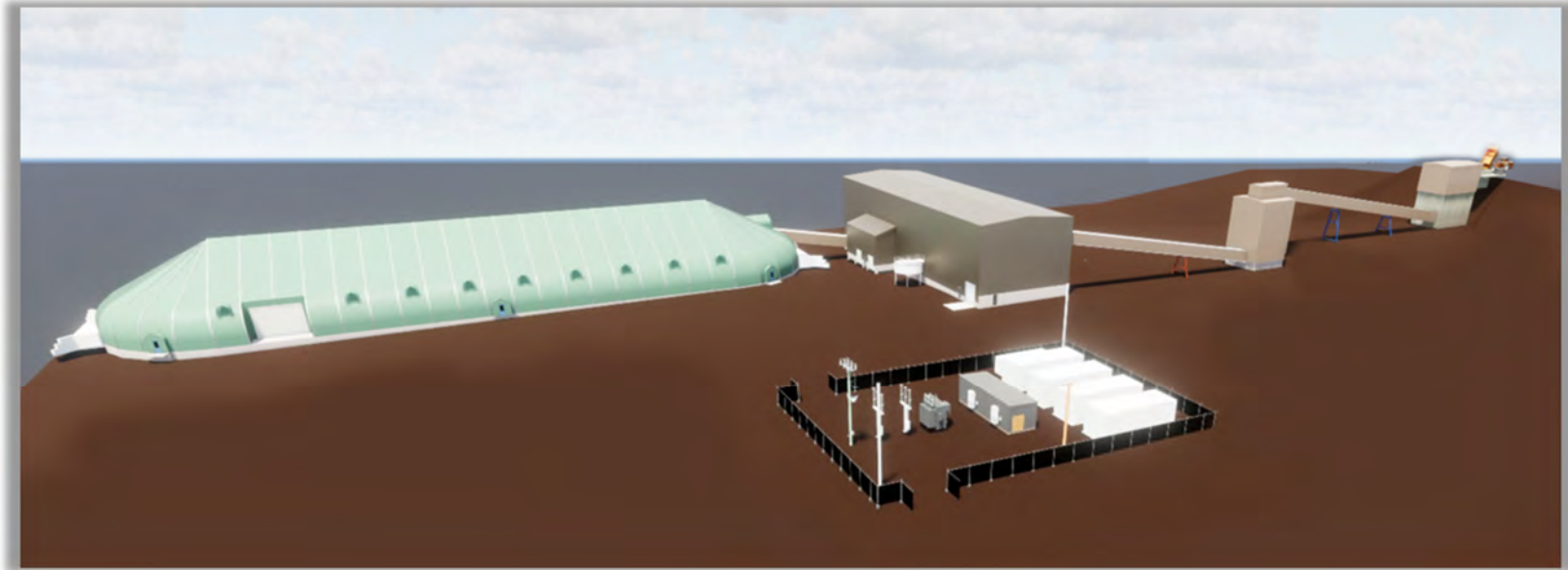
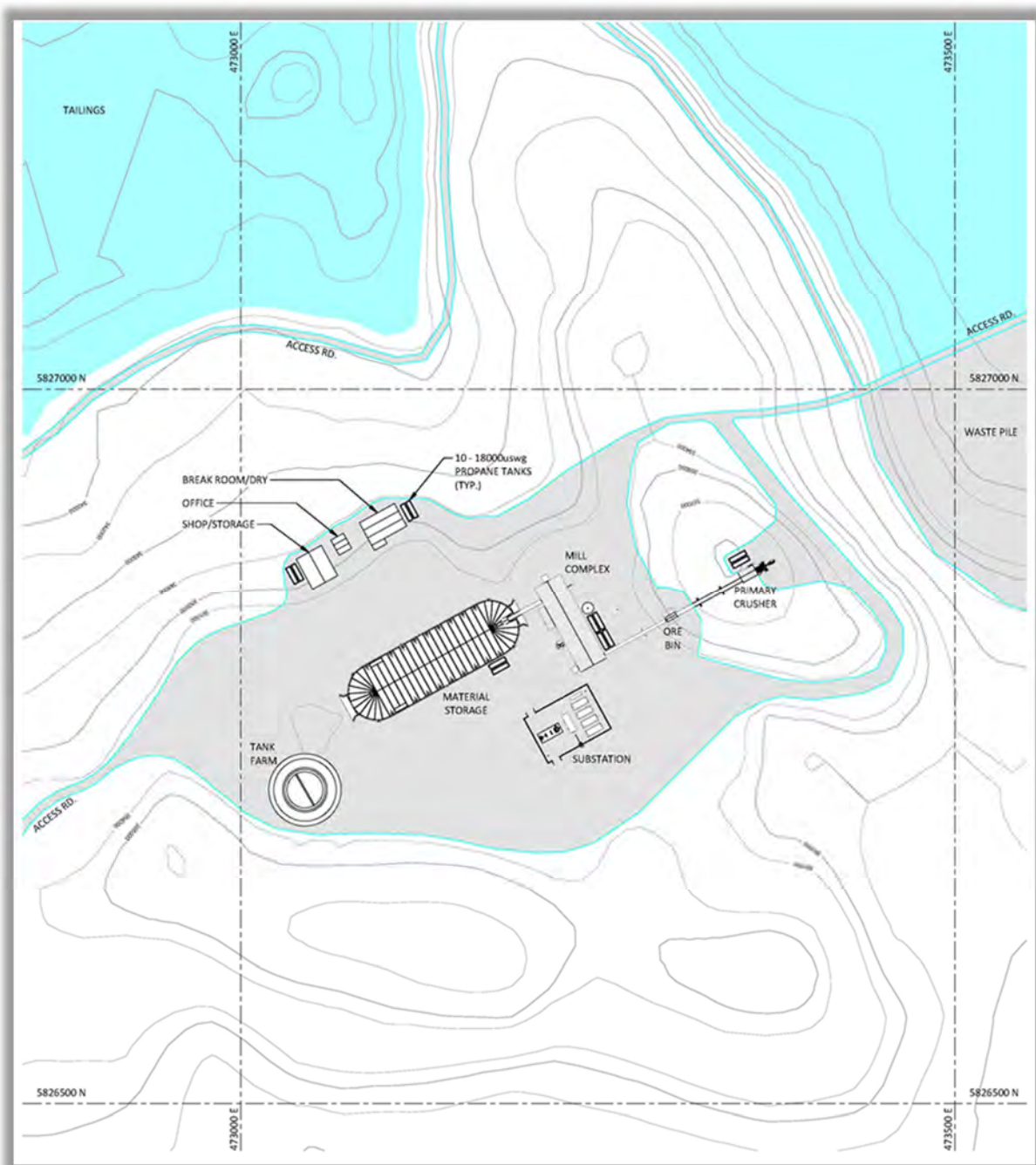


Figure 18.3 Mill Complex Layout



18.2 PAK GENERAL SITE PLAN

A Site Layout scale plan has been produced for the Project: Drawing No. 1662201-01-10-1001 to a scale of 1:10,000 represents the overall area where the mining project is to be constructed. The drawing shows the haul road, open pit, tailings management facility (TMF), processing plant, generator complex with tank farm, including the camp, office, maintenance shop, with related services for waste muck piles, water treatment, landfill and airport strip.

18.2.1 MILL COMPLEX

The mill complex site is located 200 m from the tailings facility and will contain most of the offices, warehouse, maintenance, process plant, and safety office/first aide. The only office away from the mill complex will be the open pit area (office, lunch room and washrooms).

The layout of mill facilities has been optimized to take advantage of topography, and to reduce the earthworks. A major decision was done from the previous location was for the foresight for future TMF expansion. This also enabled moving the primary crusher onto higher ground, allowing its base to be founded on bedrock to simplify foundation requirements. The mill complex will cover an area of approximately 117,719 m². The complex will include the primary crusher, ore storage bin, DMS, grinding, flotation, concentrate storage, E-House, fuel and propane storage, warehouse, office and dry.

MILL CONTROLS

All elements of the mill, from the primary crusher through to tailings management, will be monitored and controlled from the mill control room. The control system will be industry proven programmable logic controllers (PLCs) and human machine interfaces (HMIs). A camera system will provide visual monitoring for critical equipment and process transfer points. The rack room adjacent to the control room will house the control system hardware including the networking equipment, virtual machine servers, PLC CPU and camera servers.

Industrial communication protocols such as Ethernet IP, HART for intelligent instruments etc. will be utilized to the greatest extent possible and Ethernet based remote PLC I/O (RIO) cabinets will be strategically placed in the mill to minimize field cabling requirements.

Supervisory staff will have access to the operating graphics remotely for review of plant operation and key performance indicators. Overall plant performance and process data will be historically archived and will be accessible for trending and reporting (shift reports, etc.).

18.2.2 SITE DEVELOPMENT AND ACCESS

The main access to the camp/mill complex from the winter access road intersection will be a 2.6 km, two-lane gravel road starting with a main gate to be manned 24/7.

The segment of the Ontario Winter Road currently provides access to the Frontier PAK Project Site begins north of Red Lake from Nungesser Road and extends northerly for 148.5 km. The winter road is presently maintained during the winter months to serve the remote First Nation Communities of North Spirit Lake, Deer Lake and Sandy Lake, resource users (outfitters, commercial bait fishing and fur trapping), government agencies (MNR, MOECC, etc.), resident and non-resident fishing and hunting, and the public. The segment of the winter road traverses crown land and the community of North Spirit Lake. The existing length of the winter road is 148.5 km of which 135 km is constructed over land and 13.5 km is currently constructed over ice.

There are 15 water crossing locations identified by Frontier Lithium as areas to consider improvements. The winter road is required to be improved in order to support two-way traffic and to be utilized to transport materials, supplies, and concentrate.

The haul roads are planned to be constructed on site for transporting ore and waste from the open pit to their designated destinations. Mine haul road and service roads are planned to be constructed to accommodate 36 nominal tonne trucks carrying ore from the pit to the crusher, and waste to the waste rock pile and to the TMF. The waste haul road will connect with the aggregate pit and will also serve as the access to the contractor aggregate primary crusher. An access road is being planned from the main haul road to the proposed airstrip located north of the open pit.

18.2.3 OVERALL WATER MANAGEMENT PLAN

Fresh water to the permanent camp and mill complex site will be supplied by a 0.6 km long pipeline from the Moosehead Lake. The line will be 6-inch diameter HDPE pipe, installed overland, heat traced and insulated; it will also be used for additional water for initial fill of the tailings management facility.

Surface runoff from the open pit and plant site will be collected in a storm water / mine water settling pond located at the east dam downstream, in a natural low area to enable a gravity feed and to minimize earthworks. This pond will also receive in the future the underground mine water and drainage. The pond will be lined with a 60 mil HDPE liner, and will be equipped with a subdrain system to anticipate groundwater in this area. The pond water will be pumped to the process plant as required, with an option to discharge water to Whitemoon Lake 7 km distance and both lines will be 6-inch diameter HDPE pipes.

In general, utilities at the plant site will be buried for vehicular access, while outside the process plant area they will run at grade on gravel pads, with culvert / casing protection at road crossings as required.

Yard utilities comprise potable water, sanitary sewage, and fire main, complete with yard hydrants and building connections. Due to the presence of bedrock, these lines will have a relatively shallow bury for mechanical protection and will be heat traced and insulated for frost protection.

Spill containment systems will be provided for the fuel storage facility and the oil-filled transformers in the electrical substation.

Aggregate required for site development can be obtained from the mine site Aggregate Pit.

A water management plan has been developed and includes the following elements:

- The mine's facilities are planned to be designed to minimize the effects on the environment that need to be mitigated to the maximum extent practicable.
- Natural runoff is planned to be away from, and around, areas disturbed by the mining and processing activities.
- Detention storage is planned to be provided for runoff from disturbed areas to allow suspended particles to settle out. The water will then be discharged under a permit, recycled to the process plant, or pumped to the TMF for re-use. Compliant water may also be used for dust control and progressive reclamation.
- Waters that contain, or potentially contain, elevated dissolved metals when precipitation meets mined materials are planned to be collected in water quality control ponds and recycled for reuse in the process plant.
- Sufficient water storage is planned to be provided in the TMF and water quality control ponds to prevent discharges during extreme wet periods.

- Recycling of all mine waters is planned to be maximized, thereby minimizing the need for make-up from surface and/or groundwater.
- Provide treatment of stored waters requiring discharge to meet applicable discharge and receiving water standards, as necessary.

To assess the overall water management plan for the PAK site, hydrological and water quality models were constructed by Golder to estimate the effluent water quality under fully developed operations. The approach for the prediction of effluent quality used a mass-balance mixing model that consists of several site-specific components: both natural components (e.g., precipitation, watershed runoff) and project-site components (e.g., contact water from waste rock or tailings storage areas), that are linked together to form a series of mixing points based on the flow logic within the site. Each mixing point has two or more sources of mass load that are combined to determine a “mixed” or combined water quality. The water balance logic is used to configure the model linkages, including the direction of mass movement along the flow paths and defining the location of mass mixing points.

The following sections describe the assumptions, model construction, and results of the water balance and water quality modeling.

As discussed by Golder, waste rock and tailings will be placed in subaerial storage which will result in exposure of these materials to atmospheric conditions. The exposed material surfaces, the fine-grained portions, are susceptible to weathering processes that can lead to the mobilization of constituents through oxidation and dissolution reactions. Water that infiltrates into the waste rock pile and/or runoff that flows along the surface of the tailings pile can interact (come into contact) with material (e.g., waste rock and tailings) surfaces; this water is referred to as “contact” water. Brief descriptions of these site components, and how these components are expected to influence site water quality, are presented below.

WASTE ROCK PILE

Waste rock will be stored in an area adjacent to the TMF. Contact water, generated from water-rock interactions, will contain soluble constituents (i.e., major ions, metals and nitrogen species) from mineral weathering by-products and from residual explosives from blasting, which can persist in the waste rock and are water soluble and provide a source of ammonia and nitrate.

Waste from one of the process streams, referred to as the Dense Media Separation or “DMS” stream, will report to the waste rock area.

The contact water from the waste rock area will report to the TMF.

TMF

Tailings are produced as part of ore processing and will be stored in the TMF. Contact water, generated from interaction of runoff water with the tailings, will contain soluble constituents from by-products of tailings oxidation and process water.

The contact water from the tailings area will report to the Settling Pond.

OPEN PIT

The excavation of mine rock and the development of the open pit will result in the rock face of the pit walls being exposed to atmospheric conditions. The blasting of the rock typically results in a “damaged zone” of rock that consists of shallow fractures that extend into the bedrock from the face of the pit wall. The surfaces of the fractures in the damaged zone are also exposed to atmospheric conditions. Contact water, generated from water-rock interactions (i.e., from direct precipitation, groundwater inflow and runoff from the open pit catchment area) at the pit wall surface, will contain constituents of the exposed rock and explosive residues. Pit-wall contact water and contact water generated from dewatering of the underground workings, which can similarly transport soluble constituents from the underground rock surfaces, will report to the pit sump and affect the quality of the sump water.

SETTLING POND

The water quality in the Settling Pond will consist of contact water from the TMF and open pit, together with natural runoff from the catchment areas.

Excess water in the Settling Pond will be discharged to the environment in accordance with federal and provincial regulatory/permitting requirements and effluent discharge restrictions (i.e., effluent concentration limits). The surface water receiver of the effluent will need to have an appropriate assimilative capacity to allow for rapid mixing of the effluent, such that Provincial Water Quality Objectives are achieved downstream of the outfall. If the effluent has concentrations greater than the effluent concentration limits, and/or the surface water receiver does not have the necessary assimilative capacity, the effluent will need to be treated prior to discharge to the environment.

The preliminary average annual water balance is provided in Table 18.1. At this level of study, the water balance did not consider onsite water management (e.g., storage) or water retained in the pores of the tailings, leading to conservative outflows. A more detailed water balance will be required at the next level of study

Table 18.1 Annual Average Water Balance

Location	Volume (m ³ /year)
TMF Watershed Runoff	401,600
TMF Beach Runoff	131,600
Waste Rock Pile Watershed Runoff	201,900
Waste Rock Pile Runoff	59,200
Mill Input (Tailings residual water)	119,800
Total TMF Inflow	914,100
Total TMF Outflow to Settling Pond	914,100
Open Pit Dewatering	730,100
Open Pit Watershed	251,800
Open Pit Direct Precipitation	14,800
Underground Dewatering	54,800
Settling Pond Watershed Runoff	30,900
Settling Pond Direct Precipitation	2,600
Total Settling Pond Inflow	1,999,100
Settling Pond Outflow to Receiving Waters	1,999,100

The mine water balance and calculated water inflows consider contributions from waste rock runoff, milling and tailings deposition, underground and open pit operations, and watershed runoff. As per Golder, the excess mine-influenced water not re-used on the site will be collected in a settling pond downstream of the TMF. The projected monthly average flow rates were calculated for the settling pond outflow and are shown on Figure 18.4. The peak flow rate occurs in April and is approximately three times larger than the average flow rate calculated over the entire year. The design flow rate selected for the water treatment cost estimate was the average annual flow. This selection assumes that sufficient storage will be available in the TMF, Settling Pond and potentially in other mine areas, to equalize the flow. The design flow basis is summarized in Table 18.2 and compared to the annual total average flow rate and peak month flow rate in Table 18.1.

Figure 18.4 Monthly Flow Rates from the Settling Pond

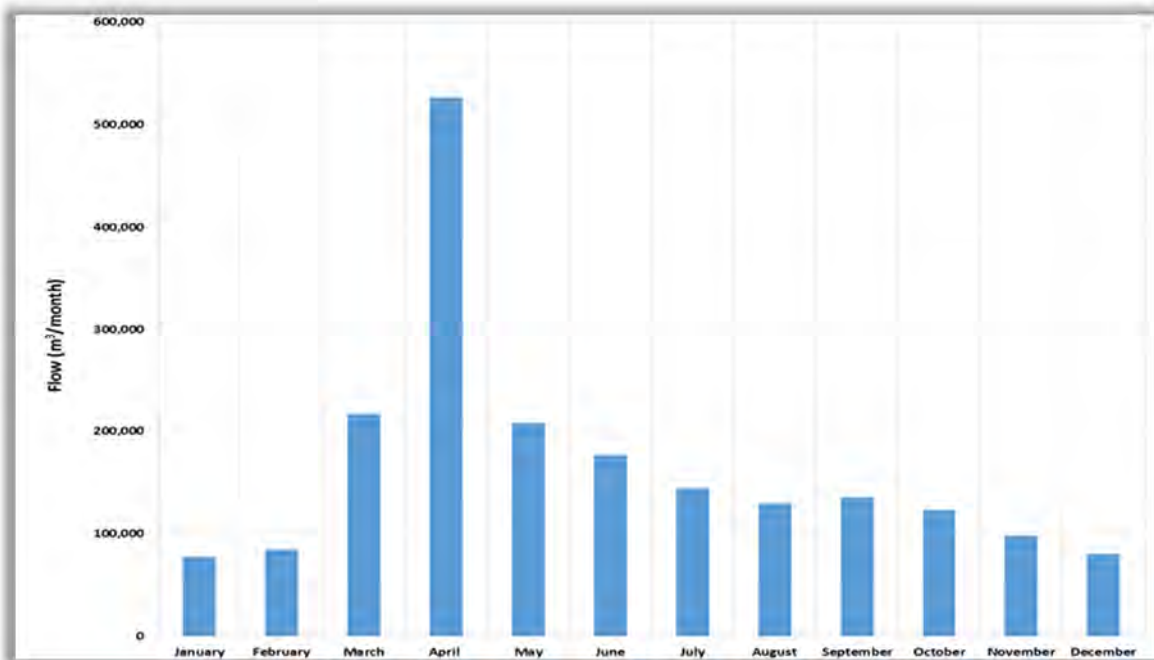


Table 18.2 Design Flow Rates

Parameter	Unit	Flow Rate
Average monthly flow (Settling Pond overflow)	m³/month	166,588
Daily flow for peak month (April)	m³/day	17,546
Average daily flow (design flow basis for cost estimate)	m³/day	5,553

18.2.4 TAILINGS MANAGEMENT FACILITY

TAILINGS DEWATERING OPTION DEVELOPMENT

Golder's basis of the prefeasibility design study was undertaken to evaluate different levels of dewatering (slurry, thickened, tailings, paste and filter cake). A dewatering design basis was developed to document the study input parameters, as presented in Table 18.1.

Table 18.3 Basis of Design

Mine Information		Value	Units
Ore Reserve		4.3 M	tonne
Life of Mine		16	years
Ore SG		2.73	
Waste SG		2.64	
Operating Weeks Per year		48	wk/yr
Scheduled Days Per Week		7	days/wk
Days Per Year		335	days/yr
Mining Hours Per day		12	h/day
Mill Production			
Operating Weeks Per year		48	wk/yr
Scheduled Days Per Week		7	days/wk
Days Per Year		335	days/yr
Average Mill Operating		24	hrs/day
Plant Availability		92	%
Nominal Feed Rate		1,000	tonne/day
Nominal Feed Rate		41.7	tonne/hr
Design Annual Production	Ore	335,000	tonne/yr
	Conc	80,000	tonne/yr
	DMS	147,000	tonne/yr
	Tailings	127,500	tonne/yr
Tailings Production			
Density (SG)		2.73	
Estimated		381	tonne/yr
Annual		127,500	tonne/yr
Design Rate		15.9	tonne/hr
Equipment Design Factor		1.15	
Mass Flow Rate		18.2	tonne/hr
Option:1 Conventional Slurry Disposal			
Discharge Solids from Mill		51.6	wt. %
Design Volume Flow Rate		20.7	m ³ /h
Pipe Length to East Dam		1650	m
Pipe Length to West Dam		2750	m
Water Volume to Pump Fr TMF to Polishing Pond			
Average Flow rate		104	m ³ /h
Peak Flow rates During Snow Melt		457	m ³ /h
Pump Distances TMF to Polishing Pond		-	-
Length of Barge to Shore		75	m
Length of Pipeline to Land		1,000	m

(table continues on next page)

Mine Information		Value	Units
Option:2 Filter Cake			
Filter Rate Feed		20.7	m ³ /h
Mill Tailings Slurry Solids Content		51.6	wt. %
Flocculant Type		AN 905 VHM	-
Flocculant Dosage		60	g/tonne
Horizontal Belt Filter		TBD	masl
Cake Moisture		18	wt. %
Average Wet Cake Production		22.2	tonne/hr
Bulk Density Wet Cake		1.6	tonne/m ³
Trucking Distances			
Shortest Distance Mill to Dry Stack Facility		225	m
Longest Distance Mill to Dry Stack Facility		2000	m
Average Distances Mill to Dry Stack Facility		800	m

DEWATERING

Conventional Slurry Disposal

Golder provided two options for slurry disposal. The option chosen was Conventional Slurry Disposal for this PFS. The slurry coming out of the mill would be sent to a thickener. The thickener underflow would be pumped to an agitated slurry tank before tailings are pumped to the TMF from the mill where the solids would be allowed to settle. The tailings will be discharged around the perimeter of the TMF, allowing the supernatant to accumulate within the containment structure. It has been assumed that a floating barge will be required to draw down the water level. The water would be discharged to the Settling Pond. The design resulted to an average tonne per year of dry tailings of 127,500 at a density of 1.49 (52 wt. % solids) with a flow rate of 21 m³/hr. The average water flow rate of the supernatant to the Settling Pond is 104 m³/hr at peak flow rate of 457 m³/hr.

Based on the above parameters, Golder's tailings pipeline design comprises two 75 mm (3") diameter pipelines; one going to the east end of the TMF and one going to the west end of the TMF. The line running to the east will be approximately 1,650 m in the length. The line running to the west will be approximately 2,750 m in lengths but both pipeline do not include the final spigot arrangements. Two pipeline types will be made of carbon steel and final section of the line will be HDPE. The east and west pipes will have corresponding pump capacity and horsepower to handle the flow. There is the option to switch between lines.

The floating barge is required to draw down the TMF water level and will be equipped with two 50 hp pumps (one on standby). The pipeline will comprise of DR21 with a 200 mm (8") diameter with pipe length of 75 m of floating line. An estimated pipe line of 1,000 m will be required to be installed along the access road to the Settling Pond. Two pipe lines are required, one will be spare.

18.2.5 PRELIMINARY TMF DESIGN

The TMF designs have been completed by Golder. There are two methods of tailings management completed namely conventional slurry tailings deposition and the dry stacking of filtered tailings.

CONVENTIONAL SLURRY DEPOSITION

The TMF location for conventional slurry tailings deposition was chosen to make the most practical use of the existing topography of the item to contain tailings and the supernatant pond. To maximize the area, two containment dams would be constructed. The two dams as per Golder (the East Dam and West Dam) were located to utilize the most favourable foundation soil conditions as well as the natural topography.

The East Dam was located at the eastern end of the valley, near the location of MW17-14 due to the narrow width of the valley resulting to the reduction of construction costs as well as the favourable foundation soil conditions at this location. The West Dam was planned to be located at the western end of the valley, near location of MW17-04. The dam will use the two hills in the natural topography to reduce construction costs.

Slurry Deposition Methodology

There will be two areas where slurry deposition will occur by subaerial deposition from a single point spigot discharge at various points spaced around the perimeter of the TMF. The tailings will be pumped through two HDPE pipelines; one 1,650 m line directed towards the east end of the TMF and the one with the length of 2,750 m towards the wet end of the TMF. The spigots will branch off from each of the main deposition lines at each discharge point and the slurry will naturally fan out and the solids will drop out of suspension as the velocity of the slurry decreases. The formation of a tailings beach which slopes away from each discharge point as the coarser fraction of the tailings will settle out of the closer deposition point, while fines of the tailings is carried further from the deposition point by the supernatant.

The slope of the tailings beach is dependent on the gradation characteristics of the tailings, the velocity of the slurry discharging from the spigot, and the density of the tailings slurry (percentage solids). As per Golder, the laboratory test is not reliable and will require further tests in larger scale to obtain an accurate beach slope design.

Preliminary Slurry Deposition Plan

Golder prepared a preliminary deposition plan for the slurry deposition and is planned to occur from various disposition points spaced around the TMF. The maximum elevation for each point was constrained to 334.8 masl to maintain the freeboard requirement.

Deposition will begin in Deposition Point 1 off the crest of the East Dam to establish a tailings beach against the upstream slope of the dam and push the supernatant pond away from the upstream slope of the dam. This will provide an estimated storage capacity of 216,000 m³ and will be filled in Year 4. The disposition point will be moved to Point 2 near the West Dam with the estimated storage capacity of 78,000 m³ and estimated to be filled in Year 5.

Once the storage volume at Deposition 2 is finished, the deposition areas will be Point 3, Point 4 and Point 5. Deposition Point 3 located at the south of the East Dam is estimated to provide storage capacity of 178,000 m³ and to be filled in Year 8. As soon as Point 3 is exhausted, the deposition will be moved to Point 4 and afterward Point 5 each having storage capacity of 74,100 m³ and 200,000 m³ respectively which will provide storage until Year 12. Point 4 is located southeast of the West Dam while the Point 5 area is further southeast of Point 4.

18.2.6 PRELIMINARY DAM DESIGN

Golder completed preliminary designs for the East Dam and the West Dam located west and east of the delineated tailings area. The tailings area (Figure 18.5) is proposed to be located north of the mill processing proposed site as well as the waste fill area. The west and east dam cross sections are presented in Figures 18.6 and 18.7 respectively.

The dam rockfill will be primarily sourced from the open pit development. ROM mine rock will be hauled to the dam and end-dumped and compacted. In the subsequent years of operations, the dams will be raised with rockfill with upstream slopes provided with transition and filter layers only to allow seepage to filter through the dam to the reclaim pond constructed downstream of the TMF.

Sufficient borrow material sources and quantities have been identified through the initial construction period for all dams on site as well as subsequent TMF dam raises. The dams are expected to have a downstream slope of 2H:1V to facilitate closure rehabilitation and ensure long-term stability.

Figure 18.5 Tailings Design Layout

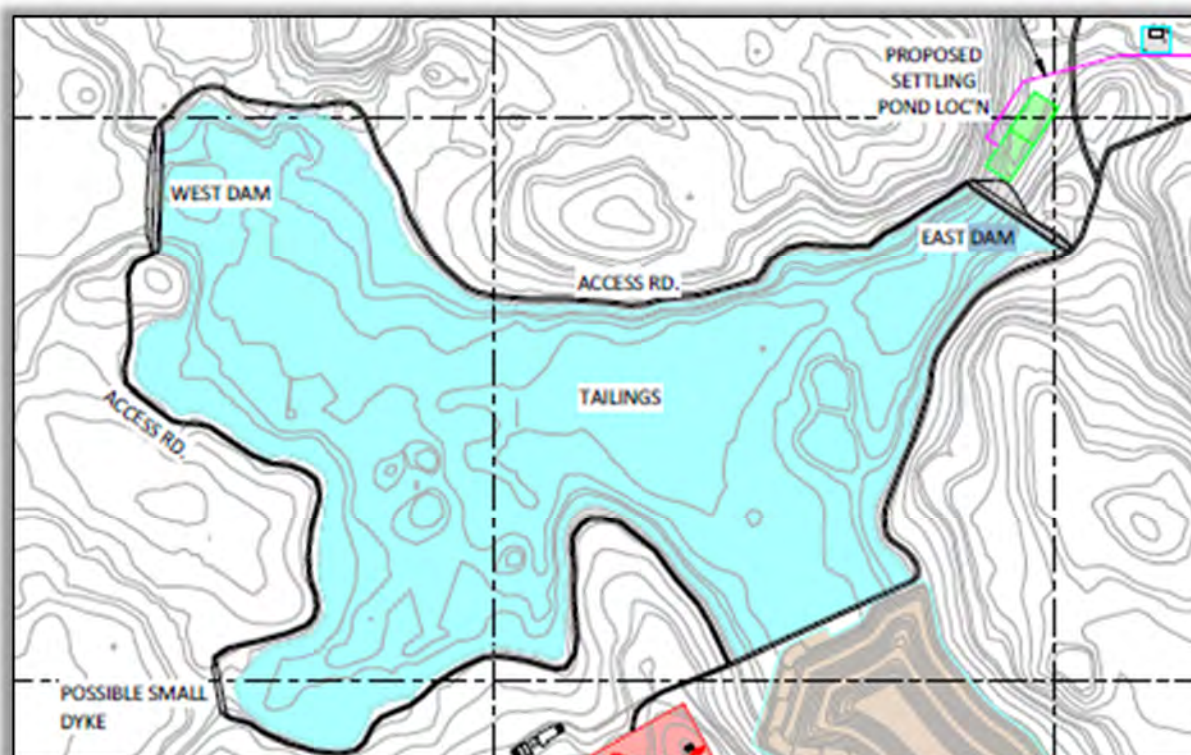


Figure 18.6 East Dam Cross-Section

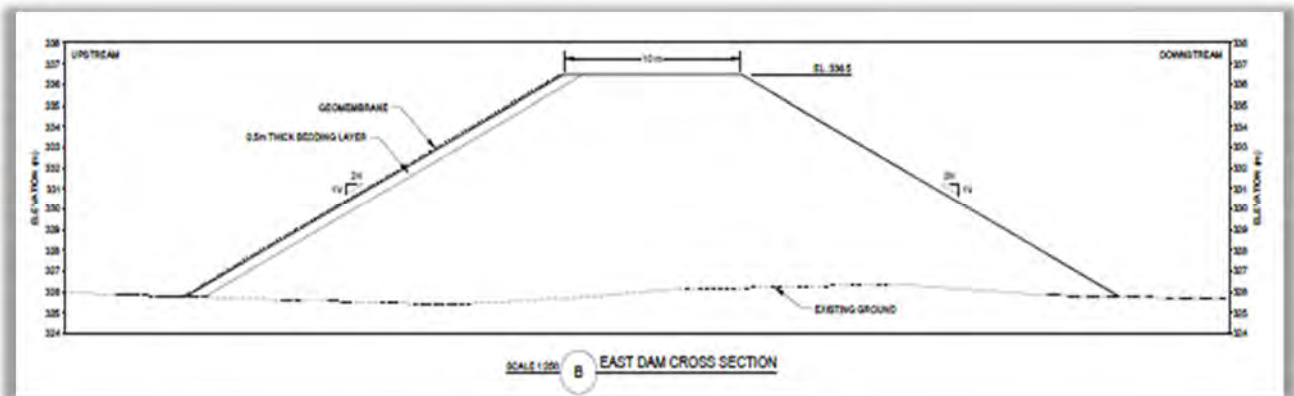
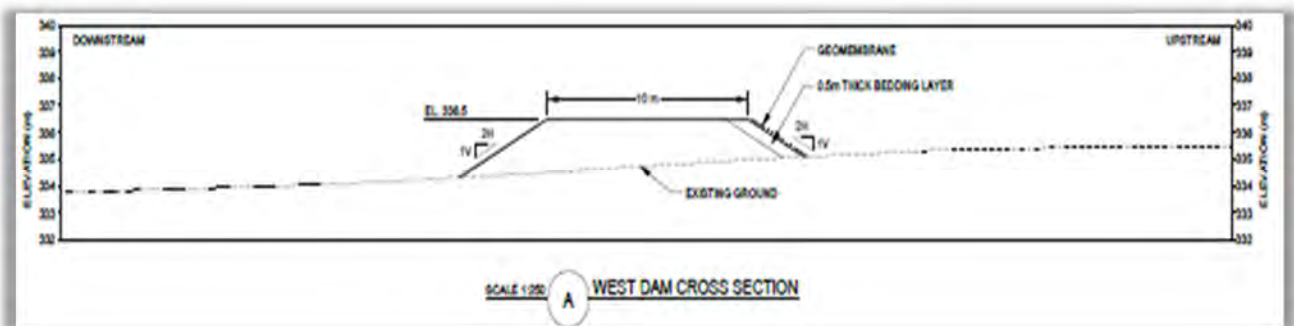


Figure 18.7 West Dam Cross-Section



EAST DAM

Based on the Golder's Prefeasibility study report on the TMF, the East Dam would be constructed to provide containment for deposited slurry tailings and storm runoff at the east end of the TMF. The East Dam will be constructed to a crest elevation of 337.2 masl. The East Dam would be constructed of approximately 20,400 m³ of waste rock fill screened to a maximum particle size (D_{max}) of 600 mm. The upstream and downstream slopes will be constructed at three horizontal to one vertical (3H:1V). The crest of the dam will be constructed to a width of 10 m.

Hydraulic containment would be provided by installing approximately 6,500 m² of bituminous geomembrane (BGM) on the upstream face of the East Dam. The BGM would also extend 50 m horizontally into the TMF from the interior toe of the East Dam to lengthen the seepage path below the dam. A 1.5 m thick layer of screened granular material (6,500 m³) would be placed above the BGM at the base of the TMF to reduce the risk of the BGM floating during the initial filling of the TMF from Deposition Point 1.

A 2.0m thick bedding layer will be provided below the BGM on the upstream face to protect the BGM from the angular waste rock fill of the dam core. This bedding layer will consist of approximately 4,350 m³ of waste rock material crushed to a D_{max} of 40 mm. Depending on the particle size gradation of the waste rock fill, the bedding layer may require a graded granular filter below it to prevent migration of the bedding layer particles into the waste rock fill.

A foundation filter will be required to prevent fines in the foundation soil from being piped upwards into the waste rock shell. The foundation filter would be 1.0 m thick and would extend 20 m from the BGM anchor trench near the upstream toe of the dam. The foundation filter would be constructed of a free-draining granular material sized to filter the dam foundation material. The volume of the foundation filter is included in the total waste rock fill volume provided above.

A seepage collection ditch will be excavated at the downstream toe of the dam to collect seepage from the toe. The seepage collection ditch will have a depth of 0.5 m, a base width of 1.0 m, and 3H:1V slopes. The seepage collection ditch will be graded to drain to a sump, where the seepage will be collected and pumped to the Settling Pond.

WEST DAM

Golder's design of the west dam is required to meet the freeboard tailings requirement and it is not expected that tailings will be deposited against it as the Golder report.

As per Golder, the West Dam will be constructed to a crest elevation of 337.2 masl. The upstream and downstream slopes will be constructed at 3H:1V. The crest of the West Dam will be constructed to a width of 10.0 m. A total of 18,000 m³ of waste rock fill, with a D_{max} of 600 mm, will be required to construct the West Dam. A total of 3.5 m depth of peat stripping has been assumed below the footprint of the West Dam.

Hydraulic containment will be provided by installing approximately 7,500 m² of BGM on the upstream slope and to 20 m out from the upstream toe. A 1.5 m thick layer of screened granular material (5,500 m³) will be placed above the BGM at the base of the TMF to reduce the risk of the BGM floating during periods where surface runoff has raised the pond level into the freeboard zone of the TMF.

A 2 m thick bedding layer will be provided below the BGM on the upstream face to protect the BGM from the angular waste rock fill of the dam core. This bedding layer will consist of approximately 5,700 m³ of waste rock material crushed to a D_{max} of 40 mm. Depending on the particle size gradation of the waste rock fill, the bedding layer may require a graded granular filter below it to prevent migration of the bedding layer particles into the waste rock fill.

A foundation filter will be required to prevent fines in the foundation soil from piping upwards into the waste rock shell. The foundation filter will be 1.0 m thick and will extend 7 m from the BGM anchor trench near the upstream toe of the dam. The foundation filter would be constructed of a free-draining granular material sized to filter the foundation material. The volume of the foundation filter is included in the total waste rock fill volume provided above.

A seepage collection ditch will be excavated at the downstream toe of the dam to collect seepage from the toe. The seepage collection ditch will have a depth of 0.5 m, a base width of 1.0 m, and 3H:1V slopes. The seepage collection ditch will be graded to drain to a sump, where the seepage will be collected and pumped to the Settling Pond.

18.2.7 STOCKPILES

A waste rock area (WRA) will be constructed southwest of the open pit to store mine rock from the open pit excavation. The rock piles will be built in 30 m lifts with 10 m benches to provide an overall safe slope of 34 degrees. The inter-bench slopes will be at the angle of repose of the rock. In its ultimate configuration, the WRA will store 28.7 Mt of waste rock with its final crest elevation at approximately an elevation of 420 m.

Collection ditches and contact water collection ponds/sumps will be built at topographical low points around the WRA perimeter to collect runoff and seepage, which will then be pumped to the settling pond.

A topsoil and overburden stockpile will be established to contain stripped materials from all excavations for the project development. Sedimentation ponds will be built to settle out solids before release to the environment. A perimeter ditch will be constructed at the toe of the topsoil and overburden to keep the material intact.

The stockpiled/reclamation materials will be utilized for rehabilitation applications upon open pit closure.

18.2.8 ELECTRICAL SITE RETICULATION AND DIESEL POWER GENERATION

ELECTRICAL LOAD

The predicted electrical demand load is approximately 3.5 MW during open pit mining operations, increasing to approximately 4.5 MW once mining underground.

This estimated load is based on the current mill process-mechanical load, mill utility load, tailings management facility load, camp and auxiliary building load, open pit and underground mine load, ancillary loads, and an allowance for future nominal growth / changes of auxiliary loads over time.

POWER GENERATION

Diesel power generation is to be used as the primary power source for the mine. There is potential to source power from the Ontario IESO Controlled grid through the proposed Wataynikaneyap transmission system, which will route close to site, and is expected to be completed in 2023.

The intent is to install four 1350 kW, 4160V diesel generators, initially three will operate continuously with one in standby. Once underground mining begins all four operate, and as necessary load will be reduced to maintain production when one generator is unavailable / scheduled for maintenance. The generators will be installed in a substation near the mill.

MAIN SUBSTATION

The main substation will include the following equipment:

- Four 1350 KW, 4160V diesel generators and zig zag grounding transformer;
- A substation E-house (modularized, assembled and tested off site) complete with 2000A power distribution center, protective relaying, generator synchronization and load shedding equipment;
- Provision for a future capacitor bank;
- Provision for a future dead-end structure, main incoming circuit switchers and power transformer for a power feed from the Wataynikaneyap transmission system.

The power distribution centre will distribute power to the site. Power to the mill substation will route through underground trenches, while power to the remote gate house, camp, ancillary buildings, airport, open pit and underground mine will route through six kilometers of 5 kV O/H line. The mill substation will be equipped with pad mounted step-down transformers, while power to remote loads will be stepped-down with pole mounted transformers.

MILL SUBSTATION

The mill substation will include two 4160/600V 1.5 MVA outdoor oil filled step-down transformers with secondary 600V 2000A power distribution centers feeding motor control centers to provide utilization voltages for mill process and utility equipment.

The power distribution centre and motor control centers will be housed in a E-house (modularized, assembled and tested off site) and will provide power to:

- Crushing, conveying loads;
- Grinding area, including DMS and ball mills;
- Floatation area;
- Reagents, thickening and filter areas;
- Tailings, reclaim water, fresh water and ancillary services.

Plant equipment utilization voltages are provided in Table 18.4.

Table 18.4 Power Utilization Voltages

Plant Equipment	Voltages
All motors / VFDs including ball mills	600 volt three-phase
Small drives below 0.5 HP	120 V one-phase
Electrical heaters over 2 kW	600 V three-phase
Electrical heaters up to 1.8 kW	120 V one-phase
Lighting – LED	120 V one-phase
Small power & instrumentation	120 V one-phase
Heat tracing	240 V one-phase
Welding receptacles	600 V three-phase

SITE-WIDE COMMUNICATIONS

The mine site will employ a site-wide communications system based on a single mode fibre optic backbone. VOIP telephones, intranet/internet access, and control system network connectivity will be integrated into this fiber backbone so that these systems can be accessible anywhere on site. Broadband internet access will be purchased from a satellite internet service provider. The corporate network (intranet) will be isolated from the control system network via a firewalled DMZ (de-militarized zone) network.

18.2.9 WAREHOUSE, OFFICES, FACILITIES, AND SERVICES

Warehouse, offices, facilities, and services will include the following:

- Gate house;
- Four-bay heavy and light vehicle truck shop;
- Truck wash and lube;
- Emergency vehicle and first-aid centre;
- Warehouse/cold storage;

- Assay laboratory;
- Administration office;
- Mine dry;
- Fuel storage and dispensing;
- Process water system;
- Potable water system;
- Sanitary system;
- Water treatment;
- Fire protection;
- Waste management and disposal;
- Auxiliary equipment fleet;
- Emulsion plant and storage areas;
- Sea container;
- Generator set housing;
- Network of site access roads.

18.2.10 TEMPORARY AND PERMANENT CAMP

A temporary camp is planned to be rented for a 132-person workforce. This building will be modular construction with a kitchen and cafeteria seating 150 people, as well as laundry services, recreational rooms and mine dry. After two years of pre-production, a permanent complex (operational mine camp) will be purchased for the life of mine. The camp layout is presented on Figure 18.8. The permanent camp would consist of three 44-person dormitory (230'-3" x 27'-9") and one 4-person skidded propane dormitory (60' x 11"), kitchen, recreation complex, laundry unit and 15,000 gallon water and sewage tanks with pump house and lifting station.

The camp was selected as the most practical location away from noise and dust from mill, open pit and equipment as well as the air strip and the area is near the lake for fresh water supply.

The all-weather airstrip will be located north of the open pit and is capable of landing aircraft up to Beech 1900 and De Havilland Dash 8, having a width of 150 m and length of approximately 1,655 m. It is planned to be constructed with run-of-quarry rock topped with a crush layer for durability. Dust suppression will be managed through the use of water trucks or environmentally safe chemical dust suppressants as required. Future expansion of the airstrip is not anticipated. The aircraft availability is well-matched to the size of operations planned, with an average of 100 travelers in/outbound per rotation on multiple days and flights.

2018 PAK PREFEASIBILITY STUDY – 2020 SPARK RESOURCE ESTIMATION
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FRONTIER LITHIUM INC.

18.2.12 UNDERGROUND INFRASTRUCTURE

After the open pit mine is completed, the following underground infrastructure will be constructed on surface near the portal at El. 196, portal structure, fresh air and exhaust ventilation fans with heating system/propane tanks, lay down area for supplies, ore stockpile, compressed air, a substation for underground power, and a paste fill plant for backfilling.

VENTILATION

The main ventilation system will be commissioned to provide approximately 175 m³ per second (370,000 cfm) of fresh air to the underground workings. The main surface fresh air fan installation system will consist of two 400 hp 1.8 m diameter fans along with the mine air heaters.

COMPRESSED AIR

A compressed air system will be provided near the portal with a mobile Sullaire air compressor with a 120 gal horizontal tank with skirt and electric auto drain with strainer. The compressed air rated capacity is 185 cfm with a Caterpillar (iT4) C2.2 engine.

UNDERGROUND GENERATOR SET

The predicted electrical demand load is approximately 3.5 MW during open pit mining operations, increasing to approximately 4.5 MW once mining underground. The intent is to install four 1350 kW, 4160V diesel generators, initially three will operate continuously with one in standby. Once underground mining begins all four operate, and as necessary load will be reduced to maintain production when one generator is unavailable / scheduled for maintenance.

PASTE FILL PLANT

The information provided by Outotec (Canada) Ltd. will give some preliminary guidance on backfill for the Frontier PAK Lithium project. This guidance is very high level and takes into account that underground mining (and therefore backfill) is not expected to occur within the first 12 years of mining. This delay in underground mining significantly reduces the impact of future CAPEX on NPV.

The following statements were extracted from an email sent by Outotec (Canada) Ltd. to the QP sent on February 14, 2018:

- Processing of ore will produce approximately 40% DMS waste product, 35% Tailings and 25% Concentrates with a total hourly ore processing rate of approximately 35 tonnes. There is insufficient tailings being produced to fulfill the backfilling needs of the mine without adding additional material. Also, there is no data provided which shows the composition or size of the tailings.
- It is assumed based on conversations, that the tailings fraction will be ground similar to gold tailings (fine), but other lithium projects have produced relatively coarse tailings in the past. Based on this assumption, paste backfill would be the preferred backfill option due to the grind of the tailings. Since there is insufficient volume of tailings to meet the needs of the mine, DMS would be added to the paste as an aggregate (much like concrete) to produce a Paste Aggregate Fill (PAF).

- The simplest, most economical, plant design would use the live tailings and DMS streams with little storage. The production rate of the PAF would match the production rate of these materials at roughly 25 tph. The tailings would be dewatered using a thickener and filter, then combined with the DMS material in a mixer with the binder. This PAF mixture would be distributed underground via a 3-inch pipe system. Due to the relatively low PAF production rate, plant utilization would be high at roughly 80%, but this should allow sufficient time for breakdowns and maintenance.
- Due to the northern climate, stockpiling or excavated material are not considered for potential backfill material. They are possible, but would require additional analysis before these could be considered.

The Capital cost provided by Outotec (Canada) Ltd was included in the capital cost estimate in Section 21. The cost includes all the dewatering, mixing and conveying equipment to the site and the initial portion of the distribution system (but no PAF pump cost was estimated, gravity flow only). Although this CAPEX probably seems high for a plant that does 25 tph, it is skewed higher to account for the remote site, retrofit factor, short construction season, and uncertainty.

19 MARKET STUDIES AND CONTRACTS

Stormcrow has completed an analysis (Appendix F) of likely chemical- and technical-grade spodumene concentrate pricing, through to 2028. Our analysis suggests that such concentrate prices are likely to remain robust, and that, in spite of varying prices for lithium chemicals, prices of concentrate should remain strong compared to historical levels as margin is transferred from the converters in China, that process spodumene into lithium chemicals, to the producers of the feedstock. This is a pattern that we have seen repeated in basic commodities such as iron ore through to critical materials such as rare earths.

Stormcrow believes that the appropriate pricing levels for 6.6% chemical-grade and 7.2% technical-grade concentrates are as shown in Table 19.1.

Table 19.1 Lithium Concentrate Pricing (Forecasts)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	Average	QP
6.6% Chemical-Grade (US\$/t)	\$1,181	\$891	\$732	\$656	\$685	\$740	\$965	\$1,004	\$987	\$1,008	\$885	\$750
7.2% Technical-Grade (US\$/t)	\$2,250	\$1,365	\$1,423	\$1,137	\$1,225	\$1,385	\$1,780	\$1,509	\$1,414	\$1,443	\$1,493	\$1,250

Source: Stormcrow

As part of the QP's cash-flow and revenue evaluation, conservative prices of 750 US\$/t for chemical-grade concentrate and 1,250 US\$/t for technical-grade concentrate.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACTS

Blue Heron Solutions for Environmental Management Inc. (Blue Heron), along with Golder Associates (Golder) were contracted by Frontier Lithium to initiate the environmental baseline studies beginning in Q3 of 2016. The baseline studies were designed and implemented to support requirements for future project permitting for Advanced Exploration and Production (mining/milling) purposes.

The environmental baseline studies that have been initiated to support permitting requirements for a Lithium Mine and Mill north of Red Lake, Ontario include:

- Hydrology and water quality;
- Hydrogeology;
- Geochemistry;
- Terrestrial Biology;
- Aquatic Biology;
- Archaeology.

The baseline studies will collect environmental information about the current site and areas surrounding the site that could potentially be affected by mining/milling activities. The baseline studies give an indication of conditions prior to any development. In addition, they can be used as a basis for the predictions of potential environmental impacts and appropriate mitigation can be incorporated into the project plan to minimize those impacts. Should the project plan or project footprint change, the baseline studies may have to be adjusted or expanded to incorporate the areas affected.

The following work was initiated in the 2016 – 2017 season.

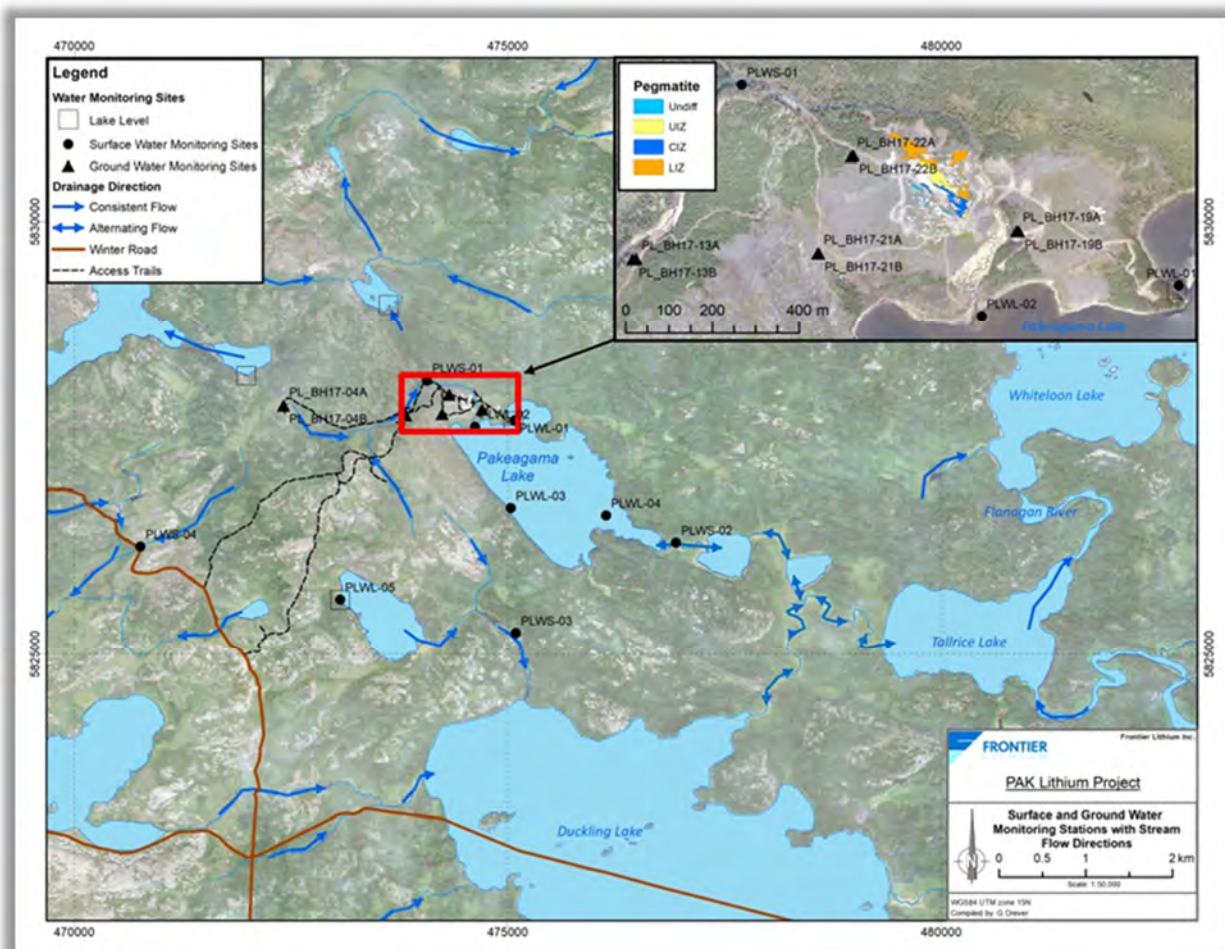
20.1 HYDROLOGY AND WATER QUALITY

The collection of hydrology and surface water quality baseline data is important to establish existing water quality and flow conditions in and around the project site, to determine potential sources of contaminants, to compare water quality during and following operations, and to support future permitting initiatives.

Surface water samples are collected from stations established upstream and downstream of the proposed project footprint. A meteorological station has been set up on site to support the baseline work.

In Q3 of 2016, five lake and four stream monitoring sites were established and a sampling campaign was initiated and scheduled. Figure 20.1 shows the locations of the monitoring sites. The sites may be revised as data is reviewed and site plans are modified. Flow monitoring will be conducted at four of the monitoring stations defined as streams (PKWS).

Figure 20.1 Surface and Ground Water Sampling Locations



Water quality monitoring parameters are listed in Table 20.1. This parameter list may be revised as data are collected and reviewed.

Table 20.1 Surface Water Quality Parameters

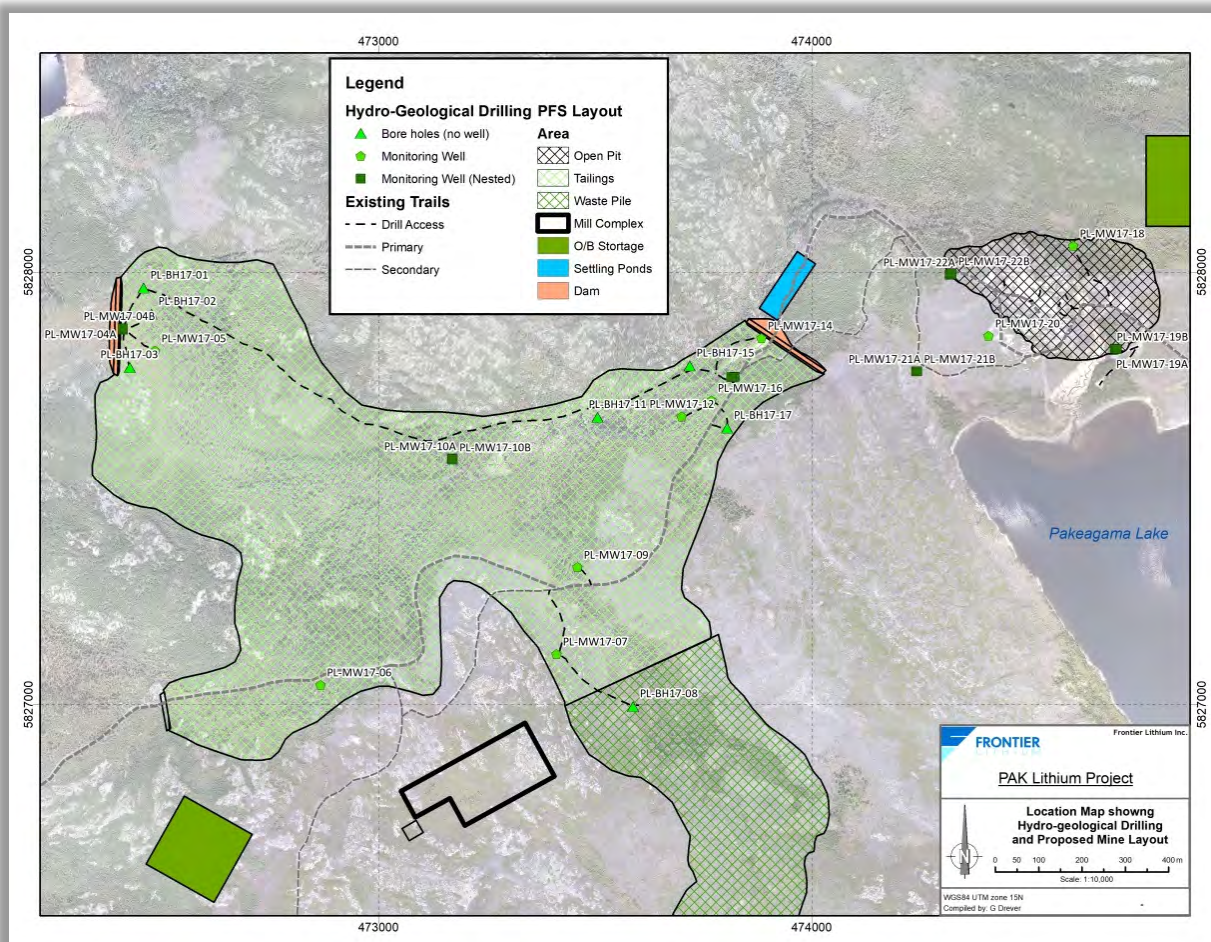
	Field	Temperature, pH, Conductivity, Dissolved Oxygen
General Parameters	Lab	pH, conductivity, Acidity, Alkalinity, conductivity, Ammonia (NH ₃), Ammonium (NH ₄ ⁺), Chemical Oxygen Demand (COD), Chloride (Cl), Conductivity, Dissolved Organic Carbon (DOC), Fluorine (F), Hardness, Nitrate (NO ₃ ⁻), Nitrate + Nitrite, Nitrite (NO ₂ ⁻), Sulphate (SO ₄), Total ammonia (NH ₃ +NH ₄ ⁺), Total Dissolved Solids (TDS), Total Organic Carbon (TOC), Total Suspended Solids (TSS)
Metals (total)	Lab	Aluminum (Al), Dissolved Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Phosphorus (P), Potassium (K), Selenium (Se), Silicon (Si), Silver (Ag), Sodium (Na), Strontium (Sr), Sulphur (S), Thallium (Tl), Tin (Sn), Titanium (Ti), Tungsten (W), Uranium (U), Vanadium (V), Yttrium (Y), Zinc (Zn)

20.2 HYDROGEOLOGY

A baseline hydrogeological investigation is required in order to establish existing groundwater conditions (flow and quality) in the vicinity of the project site, as well as to satisfy the requirements of groundwater monitoring for the Closure Plan submission [Ontario Regulation (O.Reg.) 240/00, as amended by O.Reg.229/11, under Part VII of the Ontario Mining Act] and the Permit to Take Water (PTTW) through the Ministry of Environment and Climate Change (MOECC). Hydrogeological monitoring is undertaken prior to and during mine development to assess the potential for migration of contaminants as a result of activities at the project site.

Monitoring wells were drilled, installed and developed in February of 2017 as per proposed mine site layout and field conditions. A total of 22 boreholes (PL-BH17-1 to PL-BH17-22) were advanced at the site (Figure 20.2). Five of the boreholes were advanced in the western TMF dam location (PL-BH17-1 to PL-BH17-5), six were completed throughout the proposed TMF (PL-BH17-6 to PL BH17 11), seven were advanced in the east TMF dam and settling ponds locations (PL-BH17-12 to PL BH17 17 and PL-BH17-21), and four were completed in the proposed open pit location (PL-BH17-18, PL BH17 19, PL BH17 20 and PL-BH17-22). The sampled boreholes were advanced using an exploration drill rig outfitted with HQ rods, HW casing and a split-spoon sampler, supplied and operated by Chenier Drilling Inc. of Val Caron, Ontario. Soil samples were obtained, where possible, at intervals of depths of about 0.76 m to 1.52 m using a 5 cm outer diameter split-spoon sampler in accordance with Standard Penetration Test (SPT) procedures. Monitoring Wells were installed at 13 of the 22 borehole locations and were constructed using 5 cm diameter polyvinyl chloride (PVC) pipe with a 1.5 m screen inserted into the chosen stratigraphic zone beneath the water table. Where sufficient overburden was present, Monitoring Wells were installed within 2 horizons at each location, generally with one screen in the overburden and one in the shallow bedrock.

Figure 20.2 Hydrogeology Drill and Monitoring Locations



Following the installation, the monitoring wells were developed by purging approximately three well volumes. Once the water levels reached a static elevation, a rising and/or falling head test was conducted to determine the hydraulic conductivities (K) in the screened stratigraphic zone.

Of these 13 Monitoring Well locations, five nested wells were established for regular groundwater quality monitoring, with a Deep (A) and Shallow (B) screened interval at each well nest.

The collection of hydrogeological and groundwater quality baseline data collection will continue to be conducted and will include the following:

- Installation of automated water level data loggers in groundwater monitoring wells;
- Twice annual water quality sampling and water level measurements at groundwater monitoring wells (spring, late summer). Water quality monitoring parameters are listed in Table 20.2.

Table 20.2 Surface Water Quality Parameters

	Field	Temperature, pH, Conductivity, Dissolved Oxygen
General Parameters	Lab	pH, conductivity, Acidity, Alkalinity, conductivity, Ammonia (NH ₃), Ammonium (NH ₄ ⁺), Chemical Oxygen Demand (COD), Chloride (Cl), Conductivity, Dissolved Organic Carbon (DOC), Fluorine (F), Hardness, Nitrate (NO ₃ ⁻), Nitrate + Nitrite, Nitrite (NO ₂ ⁻), Sulphate (SO ₄), Total ammonia (NH ₃ +NH ₄ ⁺), Total Dissolved Solids (TDS), Total Organic Carbon (TOC), Total Suspended Solids (TSS)
Metals (dissolved)	lab	Aluminum (Al), Dissolved Aluminum (Al), Antimony (Sb), Arsenic (As), Barium (Ba), Beryllium (Be), Bismuth (Bi), Boron (B), Cadmium (Cd), Calcium (Ca), Chromium (Cr), Cobalt (Co), Copper (Cu), Iron (Fe), Lead (Pb), Lithium (Li), Magnesium (Mg), Manganese (Mn), Mercury (Hg), Molybdenum (Mo), Nickel (Ni), Phosphorus (P), Potassium (K), Selenium (Se), Silicon (Si), Silver (Ag), Sodium (Na), Strontium (Sr), Sulphur (S), Thallium (Tl), Tin (Sn), Titanium (Ti), Tungsten (W), Uranium (U), Vanadium (V), Yttrium (Y), Zinc (Zn)

20.3 GEOCHEMISTRY

A baseline geochemistry program is required to assess the risk of Acid Rock Drainage / Metal Leaching (ARD/ML) from future mined rock and tailings at the project site. In Ontario, the Mining Act under Ontario Regulation 240/00 stipulates that ARD/ML assessment programs must follow the general methodologies outlined in the Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (*MEND, 2009*). This ensures that there is a level of conformity with current industry best practices in assessing the risk of ARD/ML at any mine site in the Province of Ontario.

Frontier Lithium initiated ARD/ML assessment work in 2015. Blue Heron Environmental reviewed the data to identify gaps, additional samples were collected from existing core and site samples for various types of testing during 2016 and 2017. Samples have been submitted for kinetic testing (laboratory and field bins).

A geochemistry program, including ore, waste rock and tailings management plans, will be incorporated into operations should the project proceed.

20.4 TERRESTRIAL BIOLOGY

Terrestrial biology baseline studies focus on terrestrial plant communities and wildlife species presence or absence, with an emphasis on identifying habitat with potential to support rare, threatened or endangered species at the project site or within 120 m of the project site. The terrestrial biology baseline study methods will follow the requirements specified by the Ontario Ministry of Natural Resources and Forestry.

The terrestrial biology baseline program was initiated in 2017. Components of the terrestrial studies include:

- Desktop review;
- Species at risk screening;
- Breeding bird survey;
- Marsh bird and amphibian survey;
- Whip-poor-will surveys;
- Bat Acoustic wildlife survey;

- Habitat Assessment and Snag Counts (use existing ELC data);
- Data Analysis and Reporting.

20.5 AQUATIC BIOLOGY

The Federal Fisheries Act (1985, as amended) definition of fish habitat encompasses not only lakes, rivers, streams (permanent, intermittent and ephemeral), but also the quality of water and the total surroundings in which plants and other life forms interact to make fish life possible. Mine development and discharges have the potential to impact fish habitat, and hence establishing pre-mining aquatic biology baseline conditions is necessary.

The aquatic biology baseline program was initiated in 2017. Components of the aquatic studies include:

- Desktop review;
- Habitat assessment;
- Fish community assessment;
- Benthic community/sediment assessment;
- Data Analysis and Reporting.

20.6 ARCHAEOLOGICAL ASSESSMENT

An archaeological assessment is required in order to identify any areas of cultural significance that may potentially be affected by mine development activities. Archaeological studies are typically carried out using a staged approach. The objectives of the Stage I archaeological assessment are to gather information about the project location's geography, history, current land conditions, as well as any previous archaeological research and listed archaeological sites on, or within the vicinity of the Project site. This assessment will provide a detailed evaluation of the archaeological potential for the local area.

The planned Stage 1 Archaeological Assessment will include the following tasks:

- Review of relevant historic and environmental literature pertaining to the study area;
- Review of the Ontario Archaeological Sites Database (OASD) from the MTCS;
- Review of historic maps of the study area;
- Determination of archaeological potential based on key criteria.

The Stage 1 assessment will determine if further action is required (e.g. Stage 2 or Stage 3 assessment).

20.7 AIR QUALITY AND NOISE

Baseline Air Quality and Noise studies are not proposed at this time, due to the remote location of the project and anticipated permitting requirements. Should an Environmental Assessment be triggered by planned activities or should an interested party (First Nation community or government body) require air and noise baseline studies, a work plan will be developed to address those requirements at that time.

20.8 ABORIGINAL ENGAGEMENT, SOCIAL OR COMMUNITY IMPACTS

Frontier Lithium has taken on an active role in communicating and consulting with the communities of North Spirit Lake First Nation, Deer Lake First Nation and Sandy Lake First Nation since the onset of their presence in conducting exploration activities at the PAK Lithium Project.

Frontier Lithium has signed exploration agreement with all three communities. The agreements are designed to recognize and respect the Aboriginal and Treaty rights and interests of the Community with their constitutional and other legal rights. Frontier and all three signatory communities desire to maintain open and friendly, cooperative, ongoing communications with positive working relationships.

These agreements also state that the parties agree that it is their common objective to assist community members to benefit from business opportunities associated with Exploration Activities undertaken by Frontier Lithium and that assuming the Prefeasibility Study is positive, the Parties commit to make best efforts to develop a Collaboration Agreement.

The Company will continue to conduct mineral exploration with the support of the Communities.

Consultation with First Nations will be a requirement for all environmental permits and approvals in all phases of the project.

20.9 FUTURE SITE MONITORING AND MANAGEMENT

It is fully expected that part(s) of the baseline monitoring programs will continue or be modified and eventually transition into operations and post closure requirements as define by regulations, conditions in permits/approvals, agreements with stakeholders and good management practices. All sampling and monitoring programs will be aligned with the project description and the activities during the different phases of the project.

20.10 PROJECT ENVIRONMENTAL PERMITTING

Environmental permitting requirements for the PAK Lithium Project will be based on the project description and activities planned at the site. Table 20.3 includes the preliminary list of permits/approvals that will most likely apply to the Advanced Exploration and Production phases of the project.

The permitting requirements will have to be re-evaluated when the project description is completed by the QP.

Table 20.3 Environmental Permitting Summary

Approval / Permit / Licence	Triggering Activity	Government Level	Legislative Authority
Exploration Plan	Early Exploration Activities	Provincial	Mining Act
Exploration Permit	Early Exploration Activities	Provincial	Mining Act
Closure Plan - First Nation Consultation Plan	Closure Plan	Provincial	Mining Act
Closure Plan	Advanced Exploration	Provincial	Mining Act
Closure Plan	Mine Production	Provincial	Mining Act
Aggregate Licence	Aggregate for site/roads	Provincial	Aggregate Resources Act
Forest Resource Licence (Cutting Permit)	Cutting trees on Crown Land	Provincial	Crown Forest Sustainability Act
Work Permit	Building construction or other work on Crown Land	Provincial	Public Lands Act
Licence to Collect Fish for Scientific Purposes	Aquatic Baseline Study	Provincial	Fish and Wildlife Conservation Act
Surface Rights Only Lease	Long term use of crown land (up to 50 years)	Provincial	Public Lands Act
Work Permit - Location Approval and Plans and Specifications Approval	Construction of any water retaining/ tailings retaining dams/dikes/diversion ditches	Provincial	Public Lands Act/Lakes and Rivers Improvement Act
Environmental Compliance Approval – Air & Noise	use, operate, construct, any plant, structure, equipment, apparatus	Provincial	Environmental Protection Act
Environmental Compliance Approval – Industrial Sewage Works	Water Treatment/Tailings	Provincial	Ontario Water Resources Act
Environmental Compliance Approval – Waste Disposal and Management	Waste Management System Operation (Landfill)	Provincial	Environmental Protection Act
Permit to Take Water	Taking of any water in excess of 50,000 lpd	Provincial	Ontario Water Resources Act
Fire Permit	Burning during fire season	Provincial	Forest Fires Prevention Act
Permit to Construct or Demolish	Septic system construction <10,000 lpd	Provincial	Health Unit
License	Explosives, magazine for mining activities	Provincial	Explosives Act

20.11 MINE CLOSURE

Should the project proceed to advanced exploration or production, a Closure Plan will be required. A closure plan must be developed and acknowledged by the ministry before advanced exploration or production can begin, and, after “approval”, if any material change is made on site.

A closure plan outlines how the affected land will be rehabilitated to approximate pre-development conditions, meet the requirements of the “Mine Rehabilitation Code” and the costs associated with doing so. Costs affiliated with post-closure monitoring are required to be included.

To ensure that the rehabilitation work outlined in a closure plan is successfully performed, a financial guarantee (“financial assurance”) equal to the estimated cost of the rehabilitation work must be held in trust by the Ministry. Financial assurance must be included with the submission of a closure plan.

21 CAPITAL AND OPERATING COSTS

The PAK mine site project scope covered in this study is based on the construction of a green field facility having a nominal daily processing capacity of 1,118 tpd for open pit and 1,100 tpd for underground. The Capital and Operating cost estimates related to the mine, processing plant, and site infrastructure have been developed by the QP. Engineering quantities related to the water and environmental management were provided by Golder Associates, including the associated costs.

The QP developed the Indirect costs estimation and consolidated cost information from all sources. Owner's costs were provided by Frontier Lithium. An open pit contractor has provided costs for drill and blast. Other costs have been included in areas such as site preparation, environmental permitting, genset power, temporary facilities, site services, air transportation, room and board, and Owner's project team and services. The capital and operating costs are reported in 2018 Canadian Dollars ("C\$").

The Capital cost estimate consists of the Direct Capital costs for the mine, the mill processing site, the Indirect costs for the mill engineering, and project construction management services. Each of the estimates will have a contingency added which is (10 %). A "Working Capital", equal to three (3) months of the operating costs, has been included.

This estimate was prepared in accordance with the American Association of Cost Engineers (AACE) Class 4 Estimate with an expected accuracy of -15% to +20%.

21.1 CAPITAL COSTS

21.1.1 MAJOR ASSUMPTIONS

Estimation is based on the project obtaining all relevant permits in a timely manner to meet the Project schedule.

For earthworks, the following were assumed:

- All construction material for backfill will be available from gravel pit and other sources located within a radius of five (5) kms;
- Waste rock material from open pit pre-stripping/gravel pit is suitable for use in road construction;
- Site preparation, mass earthworks including airstrip and haulage road construction is to be performed by a contractor;
- Soil conditions will not require special foundation designs such as grouting and piling;
- Availability of clay and construction materials for the TMF and the dams.

21.1.2 MAJOR EXCLUSIONS

The following items were not included in this capital cost estimate:

- Provision for inflation, escalation, currency fluctuations and interests incurred during construction;
- Project financing costs;
- Changes to design criteria;
- Schedule delays caused by the following:
 - Changes in scope of work
 - Permitting delays

- Undefined geotechnical or environmental conditions
- Unidentified or adverse subsurface soil conditions
- Other external influences.
- Disposal of hazardous materials;
- Salvage Value;
- Sunk Costs;
- Owners reserve;
- Costs of income benefit agreements with First Nations communities;
- Additional exploration monies;
- Cost of Feasibility Study.

21.1.3 CAPITAL COST

The pre-production initial Capital cost for the base case scope of work is \$147.3M. The pre-production capital cost is split into Direct costs (\$127.8m) and Indirect costs (\$19.5M). All pre-production capital costs include a 10% contingency as presented in Table 21.1.

Table 21.1 Capital Expenditures

Area	Description		Cost (\$)
Direct Costs			
	Site Infrastructure		
	Winter Road Upgrade (Split FL/Government)		1,451,364
	Environmental, Permitting & Baseline Studies		1,951,950
	Site Preparation (Includes TMF and Settling Ponds)		22,906,361
	Buildings		2,280,948
	Camp Rental/Catering		5,189,720
	Mill Processing Plant		56,219,844
	Power (Gen Set)		2,350,000
	Surface Substation & Distribution Lines		3,790,006
	Pit Dewatering		231,500
	Compressed Air		20,477
	Tank Farm, Fuel Bay and Systems		5,816,000
	Water Treatment & Waste Management		9,788,965
	IT and Communication		432,000
	Open Pit		1,500,000
	Mobile Equipment		10,737,505
	Concentrate Storage/Loading		2,184,678
	Air Transport (Pre -Construction)		978,161
	Total Direct Costs		127,829,479
Indirect Costs			
	Engineering (Mill)	5%	3,408,793
	PCM Service	4%	3,259,048
	Contingency	10%	12,782,948
	Total Indirect Costs		19,450,789
	Total Capital Expenditure		147,280,267

Provision for sustaining capital and working capital is \$37.1M and are summarized in Table 21.2.

A closure cost provision is included in the open pit and underground operating cost per tonne.

Table 21.2 Sustaining and Working Capital

	Cost (\$)
Working Capital	10,146,977
Sustaining Capital	
Open Pit	
Buildings	1,717,500
Power (Gen Set)	750,000
Underground	
Capital Development	15,583,872
Water Management	325,936
Backfilling	5,000,000
Compressed Air	
Ventilation	2,995,775
UG Substation & Distribution	600,000
Total Working & Sustaining Capital	37,120,060

21.1.4 SCOPE AND STRUCTURE OF CAPITAL COST ESTIMATE

Capital cost for surface facilities includes labour, materials, equipment as well as associated Indirect and management costs for the construction and installation of structures. The Capital cost includes contractor and engineering support to commission the process plant to ensure all systems are operational.

21.1.5 BASIS OF ESTIMATE FOR DIRECT CAPITAL COST

WINTER ROAD UPGRADE

There are two phases for the winter road upgrade. The first phase involves bringing the compacted snow road construction and maintenance to existing provincial specifications. The existing corridor should be cleared to a minimum width of 15 meters requiring the clearing of 88 hectares of land over 148 km. To date, remaining clearing required is 99 km with remaining cost of \$148,000 to be funded by the government. The cost currently funded road will include widening the corridor to facilitate a wider platform and increase sight distances. The second phase is establishing an ice-capped snow road and implementation of structure-design, construction and maintenance. The construction and maintenance of the ice-capped snow road will involve grading, compaction, clearing and watering of snow with the total estimated cost of \$2.9M. With the length of winter road at 148 km, fifteen (15) water crossing locations have been identified for improvement via construction of structures. For the purpose of the PFS, 50% of the total cost has been carried despite it being a public road, servicing various northern communities.

OVERALL SITE PREPARATION

The site work involved various activities namely:

- Tree clearing and grubbing;
- Soil excavation;
- Rock excavation;
- Earth and rock embankment;

- Haul place and compacting crushed rock;
- Culvert crossings;
- Surface trenches and ditches;
- Stripping of organics.

The QP delineated the treed areas using Google earth as well created the rock exposures and created a map in Vulcan where different infrastructure is envisioned to be built. The areas for the trees were measured and was used to calculate the total area for tree clearing and grubbing. The volume for excavating foundation areas for the infrastructures were derived and a depth of excavation was estimated at 0.3m.

A summary of the site preparation and request for quote was submitted to a contractor who then provided a unit price for each of the site preparation activities. The Capital cost for overall site preparation submitted by the contractor totalled \$22.9M. A separate cost for the construction of the TMF was provided by Golder amounting to \$1.5M.

MILL PROCESSING PLANT

The mill processing plant was designed by the QP, thus the cost estimate provided by mechanical and process engineers includes the equipment, power requirements, and material quantities. The piping requirements are based on the historical equipment factored allowances that were applied for the process piping. The electrical estimate was established using a combination of budgetary quotations and recent in-house data for supply and installation. The mill processing plant is a major cost item amounting to \$56.2M. Details of the major processing costs are presented in Table 21.3.

Table 21.3 Mill Processing Capital Cost

Mill Capital	Cost (\$)
General	27,863,369
Primary Crushing	2,299,750
DMS	2,104,903
Grinding	3,036,696
Flotation	4,243,493
Concentrate	1,532,875
Tailings	466,438
Concentrate Storage	3,883,490
Cabling	419,637
E-House	2,667,503
Instrumentation	577,754
Heat Trace	5,046
Reagent Storage Bldg.	3,000,000
Construction Indirect	4,118,891
Total Mill Capital	56,219,844

MINING

The scope for developing the cost for mining includes the purchase of initial mining fleet for the open pit, maintenance, and the mine support equipment.

Estimates for mining equipment were based either on the mining fleet equipment schedules and the equipment pricing provided by vendors for supply, delivery, assembly, and testing or from historical data. Costs for the equipment does not include the pre-production stripping and haul road/air strip construction by a contractor. The equipment list is provided in Table 21.4 and the total equipment Capital cost is projected at \$10.7M.

Table 21.4 Equipment Capital List

Equipment	Machine Class	Model	Units	Total
Mass Excavator	4 m ³	CAT374 FL	1	1,051,690
Front End Loader	9 yd rock bucket 4.6-12 m ³	CAT 390 F	1	806,076
Truck	40 tonnes	Volvo A40G	4	3,705,200
Dozer - Track	8SU 11.3 yd blade, ripper	CAT D8T	1	1,091,170
Grader	16 ft moldboard, ripper	CAT 16M3	1	1,389,464
Water Truck	GF Water Tank conversion	745C Tractor	1	1,202,476
Fuel & Lube Truck	GF FLT Conversion	730C Tractor	1	991,197
Pickup Truck	3/4t	Ford Heavy Duty 2017	2	79,698
Light Plant	Magnum MTL3060	Generac model MLT3060	4	67,180
Rubber tired Backhoe loader	1.31 yd bucket, 48" forks	Cat 430F IT	1	192,930
Crew Van	-	-	1	35,000
Skid Loader	-	Cat 272C	1	125,424
Total				\$10,737,505

TANK FARM, FUEL BAY, AND SYSTEMS

Diesel power generation is to be used as the main primary source for the mine, thus a tank farm is the most practical solution for the fuel storage. The estimated capital cost to construct the tank farm with fueling bay and systems is \$5.8M which includes:

- Civil;
- Structural;
- Equipment;
- Piping; and
- Electrical and instrumentation.

The single storage tank will accommodate 7M litres of diesel fuel which will mostly be used for power generation. A small portion of the fuel will be utilized for mobile equipment for both open pit and underground. For initial pre-construction start up, fuel tanks will be rented until the construction of the permanent storage tank is completed within the first year.

WATER TREATMENT AND WASTE MANAGEMENT

The water treatment and waste management in the Capital cost estimate includes the cost for developing a landfill site and associated infrastructure. The unit costs used in the estimate were taken from previously constructed landfill areas. The camp wastewater equipment estimate was provided by Filter Boxx with the capacity of 233L/person/day. The water treatment plant capital expenditure was provided by Golder that comprises of equipment and installation for a six (6) inch poly pipe water pipe line discharge to Flanagan River. The estimated water treatment and waste management totalled \$9.8M.

21.1.6 BASIS OF ESTIMATE FOR INDIRECT COSTS

ENGINEERING (MILL)

The allowance for Engineering (Mill) costs is 5% of Direct costs.

PROCUREMENT AND CONSTRUCTION MANAGEMENT

The allowance for PCM costs is 4% of the Direct costs. A construction Indirect cost of 7% was applied within the total mill capital expenditure equivalent to \$4.1M.

SUSTAINING CAPITAL EXPENDITURES

A provision of \$27M which covers sustaining capital includes:

- Underground mine development including water management;
- Backfilling;
- Compressed air;
- Ventilation;
- Underground substation and distribution.

The Capital expenditure for the underground mine is considered as sustaining Capital because it is considered an operating mine.

21.2 OPERATING COSTS

This section provides information on the estimated operating costs of the PAK Lithium Project and covers open pit, underground, processing plant, tailings, mine services, concentrate hauling, G & A and royalty.

The total Operating costs are based on a few LOM parameters as listed below:

- Total open pit ore mined tonnes 4.12M;
- Total underground mined tonnes 1.65M;
- Processed ore 5.77M.

The total Operating costs over the LOM are estimated to be \$662M as shown in Table 21.5. Mining and processing cost represents 37% and 16% of this total cost respectively.

Table 21.5 Total Operating Costs over Life of Project

Cost Area	Total (\$)	Percent of Total
Mining operating	248,219,020	37%
Processing	103,928,152	16%
Tailings	6,699,730	1%
Mine Services	139,689,928	21%
Concentrate Hauling	138,454,428	21%
G&A	6,965,327	1%
Royalty	18,218,472	3%
Total	662,175,057	100%

The Operating cost estimates exclude any allowances for contingencies.

21.2.1 NSR / ROYALTY

The annual royalty payment was based on a 1.5% of the total revenue less the sum of total of the Operating costs.

21.2.2 MINING OPERATING COST ESTIMATE

The average mining costs over the LOM are estimated to average \$43/t of the processed mill feed (Table 21.6). Operating costs include both open pit and underground. The open pit cost will fund both ore and waste mining with the following field activities such as drill and blast, road maintenance, loading and hauling overhead and indirect as well as closure costs. The underground operating costs will include ore mining, overhead and indirect, ore haulage, back filling, draw points, and ore development. We have also included Table 21.7, comparing Direct mining cost and processing costs for the LOM.

Table 21.6 Average Mining Operating Costs

Cost Area	Total (\$)	\$/t of Processed Mill Feed
Open Pit Ore	16,878,700	3
Open Pit Waste	73,926,191	13
UG Ore Mining	71,485,100	12
OH & Indirects	23,302,454	4
Ore Haulage	19,034,262	3
Backfilling	28,848,030	5
Draw Points	7,834,241	1
Ore Development	5,660,956	1
Total		43

Table 21.7 Summary of Direct Costs

Operating Costs	\$/tonne processed
Direct Open Pit Mining Cost	4.06
Direct Underground Mining Cost	84.07
Direct Processing Cost	18.01

Mining quantities were derived from first principles and mine planning to achieve the planned production rates. Mining excavation estimates were based on geological studies, mine models, drawings and sketches. The unit cost per tonne were provided by the drill and blast contractor. The road maintenance, loading and hauling were the actual 2016 budget cost per tonne from a mining operation with similar production rates. The QP developed the cost estimate for manpower/labour with rates used from an open pit and underground mine operation in Ontario.

21.2.3 PLANT PROCESSING AND TAILING OPERATING COSTS

The process and tailings operating costs over the LOM are estimated to average \$18.5/t of the mill processed mill feed (Table 21.8). The process Operating cost estimates were developed from first principles and vendor quotations and benchmarked against other historical data for similar process plants. The tailings Operating cost were provided by Golder.

Table 21.8 Average Processing and Tailings Operating Costs

Cost Area	\$/t of Processed Mill Feed
Processing Operating Cost	
General and Administration	3
Mill Operations	4
Reagents	7
Consumables Consumption	1
Spare Parts and Miscellaneous	1
General Services Costs	1
Tailings Operating Cost	
Pumping & Pipeline	1
Barge & Pipeline	0.5
Total	18.5

The budgetary quotes were compiled from vendors active in Ontario market to provide reagent pricing in Canadian dollars. The QP developed the mill manpower requirement for general administration and mill operations. Additional cost for consumables, spare parts and general services cost were included. The tailings Operational cost provided by Golder included the provision for pumping, barge and pipeline costs.

21.2.4 MINE SERVICES

The average mine services costs over the LOM are estimated to average \$48/t of processed mill feed (Table 21.9). The mine services costs include dewatering for open pit and underground, compressed air, fuel for generator sets, propane, internet & communication, camp catering, hauling concentrate, water treatment and concentrate storage.

Table 21.9 Average Mine Services Operating Costs

Cost Area	Total (\$)	\$/t of Processed Mill Feed
Dewatering (Open Pit & UG)	3,727,505	1
Compressed air	2,875,740	0.5
Fuel (Gen set)	61,494,213	11
Propane	9,826,800	2
Internet/Communication	3,193,920	1
Camp Catering	18,843,750	2.5
Concentrate Haul	125,010,476	22
Water Treatment	39,728,000	6
Concentrate Storage	13,443,952	2
Total	278,144,357	48

The budgetary quotes were compiled from vendors active in Ontario to provide pumping equipment and piping quotes, compressed air equipment, fuel cost for gen set, propane from Superior (primary propane supplier). Internet/communication cost estimate was provided by the QP from previous projects. The camp and catering contract is based on 138 total employees on site at a rate of \$75/day. For concentrate hauling, cost estimates were based on budget proposal obtained from transporters. The water treatment plant operation expense was provided by Golder and the concentrate operational expense covers the handling fees and lot rental at the Port of Thunder Bay provided by the Port of Thunder Management.

21.2.5 SITE GENERAL AND ADMINISTRATION

The average site general and administration costs for air transport travel over the LOM are estimated to average \$1/t of processed mill feed and the quotes provided different by air transport groups in Ontario.

22 ECONOMIC ANALYSIS

The QP has prepared its evaluation and assessment of the PAK Lithium Project based on a discounted cash flow model, from which the Net Present Value (NPV), Internal Rate of Return (IRR), payback, and other measures of the project pre-feasibility are determined. The economic assessments are generally accepted as a process of identifying, calculating and comparing the costs and benefits of mining projects to evaluate its merit, after consideration of the initial capital investment and operating expenses.

The main objective of this report is to determine the pre-feasibility of the proposed open pit, underground and processing of the material at a milling facility to exploit the PAK Lithium Project. For this analysis, the cash flow arising from the base case of the project has been forecasted, allowing for the calculation of the NPV and IRR. The sensitivity of this NPV to changes in the base case assumptions are then made and examined.

22.1 FORWARD-LOOKING INFORMATION

This technical report contains forward-looking information regarding the results of the economic analysis that is subject to known and unknown risks, uncertainties and other factors that may cause the following actual results to differ materially from those presented. The actual results may be affected by the following:

- Unexpected variations in quantity of mineralised material, grade or recovery rates, or the presence of deleterious elements that would affect the process plant or waste disposal;
- Unexpected geotechnical and hydrogeological conditions from what was assumed in the mine designs, including water management and site preparation work;
- Differences in the timing and amount of estimated future spodumene concentrate production, costs of future concentrate production, sustaining capital requirements, future operating costs, assumed currency exchange rate, requirements for additional capital, unexpected failure of plant, equipment or processes not operating as anticipated; and,
- Unexpected social risks, higher closure costs and unanticipated closure requirements.

Forward-looking statements in this Report include, but are not limited to, statements with respect to the future prices of technical and chemical spodumene concentrate, the estimation of Mineral Resources, the estimated mine production and spodumene concentrate recovered, the estimated capital and operating costs, and the estimated cash flows generated from the planned mine production.

22.2 ASSUMPTIONS

22.2.1 ECONOMIC ASSUMPTIONS

The main economic assumptions used in the base case are presented in Table 22.1. The price forecasts for the technical and chemical grade were based on projections from the market study presented in Section 19. The sensitivity analysis examines a range of prices 30% above and below these base case prices.

Table 22.1 Economic Assumptions

Item	Unit	Base Case Value
Technical Grade SC7.2 Li₂O	US\$/tonne	1,250
Chemical Grade SC6.6 Li₂O	US\$/tonne	750
Exchange Rate	CAN\$=US\$	1.25
Nominal Discount Rate	% per year	8
Discount Rate Variants	% per year	12 and 15

An exchange rate of 0.75 US\$ per CAN\$ was used to convert the US\$ market price projections into Canadian currency. The sensitivity of the base case financial results to variations in the exchange rate was examined. Those cost components which include U.S. content originally converted to Canadian currency using the base case exchange rate were adjusted accordingly.

In calculating the NPV of the cash flow forecast of the project, a base case discount factor must be used which represents the average cost of capital imposed on the project by the capital markets. The cash flow projections used for the project have been prepared based on the assumption that the project proceeds on an all-equity basis; therefore, the discount factor would include the market cost of equity plus the project risk factor.

22.2.2 ROYALTY

The only royalty on the project is a 1.5% NSR to an individual as part of prior arrangement for the PAK Lithium Project. This Royalty has been considered in the economic calculation of the project.

The cash flow analysis incorporates an annual payment based on 1.5% bought out with a lump sum payment of 1 M of the net value of the revenue less operating expenses.

22.2.3 TECHNICAL ASSUMPTIONS

The main technical assumptions used in the base case are given in Table 22.2.

Table 22.2 Technical Assumptions

Item	Unit	Base Case Value
Open Pit Resource Mined	M tonnes	4,121,115
Open Pit Average Mill Head Grade	% LiO ₂	2.06
Open Pit Design Mining Rate	k tonnes/year	374,647
Underground Resource Mined	M tonnes	1,650,178
Underground Average Mill Head Grade	% LiO ₂	1.63
Underground Design Mining Rate	k tonnes/year	330,036
Mine Life	years	16
Process Recovery	%	78.5
Concentrate Grade	% LiO ₂	7.2
Total Concentrate Production	k tonnes	1,259,496
Loss of Concentrate During Transport	%	2
Total Technical Grade Production	k tonnes	1,144
Total Chemical Grade Production	k tonnes	0.115
Average Mining Costs	(\$/tonne concentrate)	197
Average Processing Costs	(\$/tonne concentrate)	83
Average Tailings Costs	(\$/tonne concentrate)	5
Average Mine Services Costs	(\$/tonne concentrate)	89
Average Concentrate Hauling Costs	(\$/tonne concentrate)	132
Average General and Administration Mine Site Costs	(\$/tonne concentrate)	6
Royalty	(\$/tonne concentrate)	14

22.3 BASIS OF ANALYSIS

The financial analysis was based on:

- The Mineral Resource disclosed in Section 14, defined as Mineral Reserve as included in the mine plan presented in Section 15;
- The mine planning and schedule described in Section 16;
- Mill feed treated in the process plant described in Section 17;
- Support from the projected infrastructure requirements outlined in Section 18;
- Marketing assumptions;
- Capital and operating cost estimates detailed in Section 21.

22.4 TAXATION

The following are the taxes applied to the PAK Lithium Project.

Canadian Corporate Income Tax Rates Applicable to Mining (CCH, for December 31, 2013 year-end). Net federal tax rate on resource income is 15%, while the provincial income tax applied is 10%. The mining tax exemptions for new mines allows no tax for profit under \$0.5 M/year; no tax for the first \$10 M or first 3 years (10 years for remote area), whichever comes first. The special features applicable to mining taxation is no mining taxes are payable in the first 3 years of production on profits below \$10,000,000; the period is extended to 10 years for mines in remote locations; 5% tax rate for mines in remote locations.

22.5 FINANCIAL MODEL AND RESULTS

A summary of the base case results is given in Table 22.3.

Table 22.3 Project Cost Economic Evaluation Summary

Item	Unit	Value
Total Technical Grade Revenue	\$ M	1,752.0
Total Chemical Grade Revenue	\$ M	106.0
Total Operating Costs	\$ M	662.0
Initial Capital Costs (excludes Working Capital & Closure Cost)	\$ M	147.0
Sustaining Capital Costs	\$ M	27.0
Total Before-tax Cash Flow	\$ M	1,012
Before-tax NPV @ 8 %	\$ M	447.0
Before-tax NPV @ 12 %	\$ M	308.0
Before-tax NPV @ 15 %	\$ M	235.0
Before-tax IRR	%	46.4
Before-tax Payback Period	Years	3.0
Total After-tax Cash Flow	\$ M	699.0
After-tax NPV @ 8 %	\$ M	301.0
After-tax NPV @ 12 %	\$ M	202.0
After-tax NPV @ 15 %	\$ M	151.0
After-tax IRR	%	38.2

The cash flow statement for the base case is given in Table 22.4.

Table 22.4 Cash Flow Statement

Year	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Annual Mining (Kt)			2,297	2,313	2,379	2,579	2,453	2,367	2,388	2,489	1,410	803	619	419	372	371	372	375	24,007
Waste (Open Pit) (Kt)			1,989	1,988	2,035	2,225	2,093	1,987	2,010	2,099	1,061	463	232	52					18,236
Ore Processed (Kt)			308	325	344	354	360	380	378	390	349	340	386	367	372	371	372	375	5,771
Pit Stripping Ratio			6.5	6.1	5.9	6.3	5.8	5.2	5.3	5.4	3.0	1.4	0.6	0.1					
Technical Grade (%LiO ₂)			2.72	2.40	2.13	1.99	2.01	1.84	1.76	1.77	1.96	1.97	2.15	2.20	1.92	1.92	1.48	1.92	2.00
Chemical Grade (%LiO ₂)			6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Technical Grade Concentrate Production			86,476	79,466	73,645	70,107	72,160	68,678	65,035	67,470	67,804	66,600	83,566	81,088	70,022	70,007	51,273	70,671	1,144,070
Less Handling Losses			1,730	1,589	1,473	1,402	1,443	1,374	1,301	1,349	1,356	1,332	1,671	1,622	1,400	1,400	1,025	1,413	22,881
Chemical Grade Concentrate Production			6,151	6,509	6,878	7,088	7,204	7,602	7,551	7,792	6,989	6,794	7,730	7,335	7,442	7,416	7,438	7,508	115,426
Less Handling Losses			123	130	138	142	144	152	151	156	140	136	155	147	149	148	149	150	2,309
Technical Grade Concentrate Processed			84,746	77,876	72,172	68,705	70,717	67,304	63,735	66,121	66,448	65,268	81,895	79,467	68,622	68,607	50,248	69,258	1,121,188
Chemical Grade Concentrate Processed			6,028	6,379	6,741	6,946	7,060	7,450	7,400	7,636	6,849	6,658	7,575	7,189	7,293	7,268	7,289	7,358	113,117
Technical Grade Revenue (000 \$)			132,458	121,721	112,805	107,386	110,530	105,197	99,617	103,347	103,859	102,014	128,001	124,206	107,256	107,232	78,538	108,250	1,752,417
Chemical Grade Revenue (000 \$)			5,654	5,983	6,323	6,515	6,622	6,988	6,941	7,162	6,425	6,245	7,106	6,743	6,841	6,817	6,837	6,902	106,104
Total Revenue (000 \$)			138,112	127,704	119,128	113,901	117,152	112,185	106,558	110,509	110,283	108,259	135,107	130,949	114,096	114,049	85,375	115,152	1,858,521
Royalty Payments (000 \$)			1,544	1,391	1,261	1,172	1,224	1,153	1,074	1,120	1,195	1,207	1,537	1,280	846	848	465	901	18,218
Open Pit Mine Costs (000 \$)			9,473	9,541	9,811	10,638	10,120	9,766	9,850	10,265	5,823	3,321	2,564	882					92,054
Underground Mine Cost (000 \$)													2,982	20,366	34,266	34,157	32,833	31,562	156,165
Processing (000 \$)			5,538	5,861	6,193	6,382	6,487	6,845	6,799	7,015	6,293	6,117	6,960	6,805	6,701	6,677	6,697	6,760	103,928
Tailings (000 \$)			319	356	391	412	417	451	453	467	408	395	438	413	438	436	465	441	6,700
G & A Mine Site Costs (000 \$)			1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,742	1,329	1,329	1,329	1,329	1,329	1,329	25,809
General Services (000 \$)			8,070	8,070	8,070	8,070	8,084	8,070	8,070	8,070	8,070	8,084	8,070	6,410	6,410	6,410	6,410	6,410	120,846
Concentrate Transport & Storage (000 \$)			10,034	9,374	8,833	8,502	8,717	8,411	8,045	8,310	8,264	8,125	9,902	9,617	8,529	8,525	6,668	8,600	138,454
Total Operating Cost (000 \$)			36,720	36,335	36,301	36,918	36,791	36,438	36,033	36,990	31,795	28,992	34,195	46,901	58,518	58,381	54,866	56,002	662,175
EBITDA (000 \$)			101,392	91,369	82,827	76,983	80,362	75,746	70,526	73,520	78,488	79,267	100,913	84,048	55,579	55,668	30,509	59,149	1,196,346
Capital Expenditure (000 \$)																			
Infrastructure	22,979	22,090																	45,069
Mill Processing Plant	28,110	28,110																	56,220
General Services	7,702	8,100																	15,803
Mobile Equipment	5,369	5,369																	10,738
Engineering (Mill)	1,688	1,721																	3,409
PCM Service	1,617	1,643																	3,259
Contingency	6,416	6,367																	12,783
Total (000 \$)	73,881	73,400																	147,280
Working Capital (000 \$)			10,180																10,180
Sustaining Capital (000 \$)			2,468									7,711	9,784	7,010					26,973
Total Capital Expenditure (000 \$)	73,881	73,400	12,647									7,711	9,784	7,010					184,433
Pre-Tax Cashflow	-73,881	-73,400	88,745	91,369	82,827	76,983	80,362	75,746	70,526	73,520	78,488	71,556	91,128	77,038	55,579	55,668	30,509	59,149	1,011,913
Pre-Tax Cumulative Cashflow	-73,881	-147,280	-58,535	32,834	115,660	192,644	273,005	348,752	419,278	492,797	571,286	642,842	733,970	811,008	866,586	922,255	952,764	1,011,913	
Federal Corporate Income Tax				13,705	12,424	11,547	12,054	11,362	10,579	11,028	11,773	10,733	13,669	11,556	8,337	8,350	4,576	8,872	180,567
Provincial Corporate Income Tax				9,137	8,283	7,698	8,036	7,575	7,053	7,352	7,849	7,156	9,113	7,704	5,558	5,567	3,051	5,915	107,045
Mining Tax						3,849	4,018	3,787	3,526	3,676	3,924	3,578	4,556	3,852	2,779	2,783	1,525	2,957	44,813
Total Corporate Income and Mining Taxes				22,842	20,707	23,095	24,109	22,724	21,158	22,056	23,547	21,467	27,338	23,111	16,674	16,701	9,153	17,745	312,425
After-Tax Cashflow	-73,881	-73,400	88,745	68,527	62,120	53,888	56,253	53,022	49,368	51,464	54,942	50,089	63,790	53,927	38,905	38,968	21,356	41,405	699,488
After-Tax Cumulative Cashflow	-73,881	-147,280	-58,535	-9,992	72,111	126,000	182,253	235,275	284,644	336,107	391,049	441,138	504,928	558,855	597,760	636,728	658,084	699,488	

The project cost economic evaluation summary and cash flow statement indicate that the total pre-production (initial) capital costs were evaluated at \$147.3M. The sustaining capital requirement was evaluated at \$27M, which includes the pre-production underground mine development, equipment, and support mine services. A closure cost provision is included in the open pit and underground operating cost per tonne.

The cash flow statement shows a capital cost breakdown by area and provides an estimated capital spending schedule over the 2-year pre-production period for the Project. Working capital requirements were estimated at three (3) months of total annual operating costs. Since operating costs vary annually over the LOM, additional amounts of working capital may be injected or withdrawn as required.

The total revenue derived from the sale of the two (2) products from the processing plant was estimated at \$1,859M (\$1,752M for technical grade and \$106M for chemical grade), or on average, \$322/tonne milled. The total operating costs were estimated at \$662M, or on average, \$114.74/tonne milled.

The financial results indicate a before-tax NPV of \$447M at a discount rate of 8.0 %. The before-tax IRR is 46.4 % and the positive cash flow starts on the 3rd year.

The after-tax NPV is \$301M at a discount rate of 8.0 %. The after-tax IRR is 38.2 %.

22.6 SENSITIVITY ANALYSIS

The risks in projects can be identified in both economic and non-economics terms. The PAK key economics were assessed by running cash flow sensitivities against the following:

- The lithium products price and exchange rate;
- Li_2O grade;
- Operating cost;
- Capital cost.

Within the economic analysis and feasibility stages of the mine design process there is often uncertainty with the input parameters of an economic model. Spider graph sensitivity analysis measures the impact on project economics as a result of changing one or more of the parameters within the given range (*Marshall, 1999*). Analyzing these impacts can help a mining company determine, which model inputs result in the greatest change in the project economics (*Law, 2014*). This sensitivity technique is possibly the most widely used analysis in determining the economic stability of a project (*Pannell, 1997*).

To perform a spider graph analysis, an economic model must first be in place. Outlined below are the steps involved in performing a spider graph analysis:

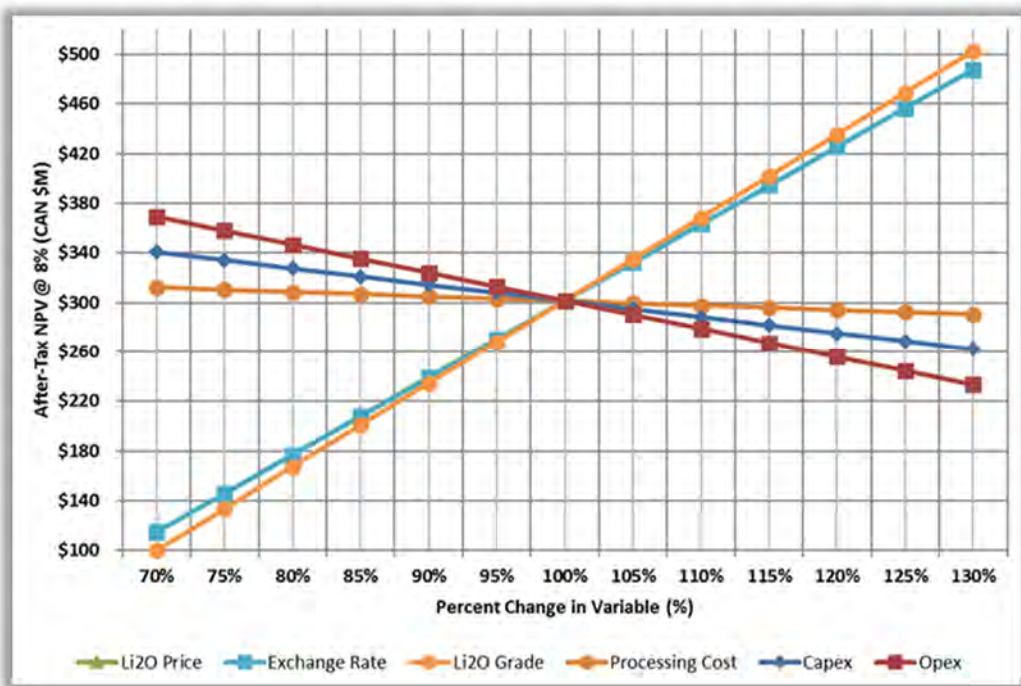
- Determine which economic performance characteristics are to be evaluated (typically: NPV and/or IRR).
- Determine which model input parameters have the greatest impact on the economic model (typically: Metal Price, CAPEX, OPEX, Grade, Recovery, Discount Rate).
- Determine which model input parameters have the greatest impact on the economic model.
- Determine the possible range in deviation/error from the assumed value for each parameter (typically: $\pm 20\%$).
- Determine new economic performance characteristic as a result of changes to given input.
- Determined values of performance characteristics can now be plotted.

The QP selected a base discount rate of 8%. While project revenues are directly proportional to the lithium concentrate price, grade and the project capital costs are unaffected to these factors.

A range of sensitivities were performed on key input variables of the economic evaluation to determine the impact that each of these variables has on the NPV. The following factors were adjusted to between 80% and 120% of its base input value. The results of the sensitivities are displayed in Figure 22.1.

- 1 Commodity prices;
- 2 Foreign exchange (US\$/CAN\$);
- 3 Mill head grade;
- 4 Processing costs;
- 5 Capital costs;
- 6 Operating costs.

Figure 22.1 Sensitivity Chart - Post-Tax NPV @ 8%



Analysis of the NPV sensitivities reveals that the PAK Lithium Project economics are most responsive to market factors beyond the control of the operations; namely, commodity prices and foreign exchange rates. The remaining factors can, to some extent, be controlled by operations and have a varying effect on NPV. In order of decreasing impact, these factors are:

- 1 Head grade;
- 2 Operating Costs;
- 3 Capital Costs.

Improved head grade positively impacts revenue and, hence NPV. Though it was not explicitly modeled, increasing the production rate (mill throughput) would result in a similar positive impact on NPV.

23 ADJACENT PROPERTIES

There are no immediately adjacent properties to the Property.

Favourable Lake Gold Corp, a private company, has 73 claim units approximately 16 km north along the ice road from the Property. These claims are under option to Golden Share Mining Corporation. There has been no recent reported work on these claim units. These claims are targeting gold exploration.

Rockex Limited hold 337 claim units approximately 28 km southeast of the Property, on the south shore of North Spirit Lake. There are no public records of any recent work by Rockex on this Project. These claims are targeting nickel-PGE exploration.

24 OTHER RELEVANT DATA AND INFORMATION

The QPs are not aware of any other relevant data.

To the best of the authors' knowledge, there is no other relevant data, additional information or explanation necessary to make the Report understandable and not misleading.

25 INTERPRETATION AND CONCLUSIONS

25.1 PAK

The mineral resource at the PAK Lithium Property contains a measured mineral resource of 1.25 Mt for 28,678 tonnes of contained Li₂O, an indicated mineral resource of 7.25 Mt for 122,465 tonnes of contained Li₂O, and an inferred mineral resource of 1.9 Mt for 38,439 tonnes of contained Li₂O as shown in Table 25.1.

Table 25.1 Mineral Resource Statement for PAK Lithium Project

Cut-off	Resource Category	Commodity	Geologic Zone	Tonnes (t)	Li ₂ O (%)	Ta ₂ O ₅ (ppm)	Cs ₂ O (%)	Rb ₂ O (%)	Contained Li ₂ O (t)
0.4% Li ₂ Oeq	Measured	Lithium	Upper Intermediate Zone (UIZ)	324,720	3.95	60	0.03	0.12	12,830
		Lithium	Lower Intermediate Zone (LIZ)	920,330	1.72	104	0.03	0.29	15,848
		Lithium	Total Lithium Zone	1,245,050	2.3	93	0.03	0.24	28,678
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	1,245,050	2.3	93	0.03	0.24	28,678
0.4% Li ₂ Oeq	Indicated	Lithium	Upper Intermediate Zone (UIZ)	333,200	3.23	70	0.04	0.2	10,776
		Lithium	Lower Intermediate Zone (LIZ)	5,909,500	1.89	102	0.04	0.31	111,690
		Lithium	Total Lithium Zone	6,242,700	1.96	100	0.04	0.3	122,465
		Tantalum / Rubidium	Central Intermediate Zone (CIZ)	1,011,300	0.8	117	0.08	0.58	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	7,254,000	1.69	102	0.04	0.34	122,465
0.4% Li ₂ Oeq	Measured +Indicated	Lithium	Upper Intermediate Zone (UIZ)	657,920	3.59	65	0.03	0.16	23,605
		Lithium	Lower Intermediate Zone (LIZ)	6,829,830	1.87	102	0.04	0.3	127,538
		Lithium	Total Lithium Zone	7,487,750	2.02	99	0.04	0.29	151,143
		Tantalum / Rubidium	Central Intermediate Zone (CIZ)	1,011,300	0.8	117	0.08	0.58	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	8,499,050	1.78	101	0.04	0.33	151,143
0.4% Li ₂ Oeq	Inferred	Lithium	Upper Intermediate Zone (UIZ)	13,000	3.56	44	0.03	0.12	463
		Lithium	Lower Intermediate Zone (LIZ)	1,819,000	2.09	95	0.02	0.29	37,982
		Lithium	Total Lithium Zone	1,832,000	2.1	95	0.02	0.28	38,439
		Tantalum /Rubidium	Central Intermediate Zone (CIZ)	85,000	1.16	151	0.08	0.49	n/a
		Lithium / Tantalum / Rubidium	Bulk Pegmatite	1,917,000	2.01	97	0.02	0.29	38,439
		Grand Total	Bulk Pegmatite	10,416,050	1.82	100	0.04	0.32	189,582

Notes:

- 1 For the sole purpose of this resource estimation, Li₂O equivalent was determined based on lithium and tantalum grades, prices (\$400 per tonne of 6% spodumene concentrate and \$150 per kg of 30% tantalite concentrate) and their respective recovery ratio (78.5% recovery for lithium and a 50% recovery for tantalum from bulk pegmatite). No credit was included for rubidium, cesium or any of the other elements contained for the purpose of this estimate.

- 2 *Li₂O content in the CIZ is predominantly associated with lithian micas and without metallurgical testing not deemed recoverable, therefore, not included in the Li₂O contained and subsequently the Li₂O equivalent calculation for the purpose of this report.*
- 3 *The UIZ and LIZ are technical/ceramic-grade lithium zones (high-grade lithium with low inherent iron (0.1% Fe₂O₃ from whole rock analysis). The iron content of spodumene contained within the LIZ increases as the contact with iron-rich metasedimentary country rocks are approached, but it has been noted that a concentration below 0.1% wt.% Fe₂O₃ is maintained to within about 1 m of the pegmatite-metasediment contact.*
- 4 *Calculation is based on 6,307 m of drilling in 32 holes with an average depth of 160 m to a maximum depth of 360 m vertical in the deposit, 294 m of production drilling for 68 blast holes for the 300 tonne UIZ bulk sample in 2015, and 32 channels covering 216 m at surface.*
- 5 *Mineral Resources are not Mineral Reserves having no demonstrated economic viability. Results are presented undiluted and in situ.*
- 6 *Measured, Indicated and Inferred Resources were evaluated from drillhole and channel sample results using a block model approach (krig interpolation) with SurpacTM software.*
- 7 *Calculations used metric units (metres, tonnes and ppm). Results were rounded to reflect their estimated nature. Tonnes are rounded to reflect the accuracy of the estimation. Grades reported in percent were rounded to two decimals while grades reported in part per million (ppm) were rounded to the closest integer.*

The PFS includes both open pit and underground mining operations. Underground mine access will be via a portal, which is located 3 benches up from the bottom of the current pit design. A fresh air raise (also used as a second means of egress) would be excavated at one end of the underground workings, and the air would be exhausted to surface via the ramp and another raise at the opposite end of the underground workings. Extraction of the underground ore will be done using longhole open stoping mining methods.

Table 25.2 summarizes the estimated operating costs developed for the PFS.

Table 25.2 Operating Costs

Operating Costs	\$/tonne processed
Direct Open Pit Mining Cost	4.06
Direct Underground Mining Cost	84.07
Direct Processing Cost	18.01

Financial analysis yields positive economic returns for the project with a pre-production capital investment of \$147.3 million and \$36.6 million of sustaining Capital investment. Table 25.3 shows the capital requirements for the PAK Lithium Project.

Table 25.3 Capital Requirements

Capital Requirements	\$ Million
Site prep/ infrastructure	45.6
Mill processing	59.3
Power distribution	6.4
Open pit equipment	12.9
Water treatment and waste management	9.5
Contingency	13.5
Total Pre-Production Capital Cost	147.3
Total Sustaining Capital Cost	36.6

Based on the results of the PFS (Table 25.4), the following conclusions can be made:

- 1 The PAK Lithium Project has significant potential to provide positive and robust returns.
- 2 Additional exploration and expansion of the current resource, including the potential conversion of Inferred resources to Measured and Indicated.

Table 25.4 PFS Highlights

Project Economics	
Pre-Tax	
NPV (8% Discount Rate)	\$448 M
Internal Rate of Return	46.5%
Cumulative Cash Flow	\$1,013 M
Post-Tax	
NPV (8% Discount Rate)	\$301 M
Internal Rate of Return	38.3%
Cumulative Cash Flow	\$700 M

25.2 SPARK

The conclusions for the geology and resource for Spark are summarized below.

- The Property is currently held 100% by Frontier.
- The geology and mineralization is analogous to a highly evolved, granitic, rare-element lithium-cesium-tantalum bearing (LCT), complex-type – Spodumene or Petalite Subtype pegmatite similar to the Tanco Deposit in Manitoba.
- There is a good understanding of the regional and local geology to support the interpretation of the mineralized zones.
- Mineralization is currently defined in one domain: LIZ, an internal zone with significant lithium, tantalum and rubidium.
- Drilling and sampling procedures, sample preparation, and assay protocols conducted by Frontier are generally conducted in accordance with accepted practices and meet current standards.
- Verification of the downhole surveys, assays, core, and drillhole logs indicates the data supplied by Frontier is reliable.
- The 2018 and 2019 channel sampling, diamond drill programs was supported by a proper QA/QC program.
- The mineral models have been constructed in conformance to industry standard practices.
- The geological understanding is sufficient to support the resource estimation.
- The specific gravity value used to determine the tonnage was derived from 321 samples collected from all rock types.
- The pit constrained mineral resource estimate for the Spark Pegmatite deposit, at a 0.65% Li₂O cut off, is 3.2 Mt at 1.59% Li₂O, 123 ppm Ta₂O₅, 0.015% Cs₂O, and 0.256% Rb₂O in an Indicated Resource. An additional 12.2 Mt at 1.36 % Li₂O, 107 ppm Ta₂O₅, 0.02% Cs₂O, and 0.228% Rb₂O in an Inferred Resource.

- The resource remains un-tested along strike in both directions as well as down dip.

25.3 OTHER RISKS

The PFS demonstrates that the PAK Lithium Project has the potential to be technically and economically viable. The PAK Lithium Project is technically uncomplicated because of the near surface nature of the deposit and relatively simple ramp access to the underground mine. There are risks that have been identified within the recommendations.

The main risks to project success would be:

- One of the greater concern areas identified in the recommendations are environmental. With recent changes in environmental regulations, further baseline work is recommended.
- Pilot plant testing should be performed to confirm flowsheet and lock cycle testing results.
- First Nations agreements.
- The potential for excessive groundwater inflows that are not anticipated.
- Unforeseen increase of diesel fuel costs.
- Availability of skilled labour during the construction phase.

26 RECOMMENDATIONS

The results of this PFS demonstrates that the PAK Lithium Project has the potential to be technically and economically viable as a producer of premium technical grade Lithium concentrate with by-product of chemical grade concentrate.

Two separate exploration programs are proposed. The successful completion of Phase 1 will have an impact on how Phase 2 is conducted.

26.1 PHASE 1

Phase 1 is designed to enhance the project leading towards a feasibility study. The budget of \$1.4 million is estimated to be required to complete the Phase 1 program. A summary of the recommendation is listed below. Table 26.1 summarizes the Phase 1 budget.

Table 26.1 Phase 1 Budget Summary

Task	Estimated Cost (CAN\$) Phase 1
Geology & Exploration	800,000
Mining	10,000
Geotech and Hydrogeology	-
Environmental, Permitting and Community Relations	250,000
Electrical Supply	-
Processing	300,000
Engineering and Feasibility	40,000
Total	\$1,400,000

26.1.1 GEOLOGY

- Consider Advanced Exploration by processing a bulk sample centred on the high-grade Upper Intermediate Zone of the PAK deposit with a test pilot plant on site.
- Continue drilling mineralized zone at Spark to increase confidence of the mineral resource.
- Characterize the mineral zonation's at Spark to determine mineralogical and geochemical similarities and potential contrasts to the PAK deposit

26.1.2 MINING

- Define optimum size and area required to complete a test mining scenario to evaluate the economics for mining in an area without hydro power and all-season roads.

26.1.3 ENVIRONMENTAL, PERMITTING AND COMMUNITY RELATIONS ADVANCED EXPLORATION

- Complete a Project Description for the project for permitting purposes.
- Continue the baseline study program and enlarge to encompass the Spark pegmatite area.

- Continue to engage local First Nations communities.
- Develop detailed closure plan and associated costs.

26.1.4 PROCESSING

- Explore options to minimize initial capital costs by using a phased approach to the mill construction.
- Explore options to further reduce impurities in the technical grade Lithium concentrates.
- Commence a study of the Spark pegmatite including Fe₂O₃ content in spodumene and developing a flowsheet for processing based on the PAK processing flowsheet.

26.2 PHASE 2

Phase 2 is designed to collect the data required to complete a feasibility study.

The budget for Phase 2 is estimated to be \$3 million. A summary of the recommendation is listed below. Table 26.2 summarizes the Phase 2 budget.

Table 26.2 Phase 2 Budget

Task	Estimated Cost (CAN\$) Phase 2
Geology & Exploration	500,000
Mining	50,000
Geotech and Hydrogeology	800,000
Environmental, Permitting and Community Relations	-
Electrical Supply	150,000
Processing	70,000
Engineering and Feasibility	1,500,000
Total	\$3,070,000

26.2.1 GEOLOGY

- Continue with the current surface drilling programs at PAK targeting areas where additional mineralization is expected within, below and adjacent to the Lithium mineralization considered in this study.
- Update the geological and mineral resource model to incorporate new understanding from exploration drilling.

26.2.2 MINING

- Enlarge pit design to get as close as geotechnically possible to Pakeagama Lake.
- Study the viability of using battery operated equipment underground.
- Refine and optimize the production stope designs.
- Complete detailed surface and underground geological mapping to refine stratigraphy, structural setting and characterize mineralization.

26.2.3 GEOTECHNICAL AND HYDROGEOLOGY

- Address the gaps in the geotechnical coverage caused by the expansion of the proposed open pit shell with the interpretation and new geotechnical drilling. This includes the eastern and western extents of the pit walls as well as the pit bottom.
- Develop a water management plan by simply collecting surface water/overburden/shallow top of the bedrock runoff and seepage in sumps on the pit floor may be sub-optimal.
- Update the geologic model with the emphasis on identifying potential major structures.
- Conduct geotechnical studies on the waste rock and stripped surface organics pile designs to determine overall dump height and slope angle maximum bench lifts and safe face slope angles.

26.2.4 ELECTRICAL SUPPLY

- Explore options to source hydro power from local or neighbouring sources.
- Consider the timing and explore option to source grid power from the Wataynikaneyap Power Project.

26.2.5 PROCESSING

- Investigate the possibility of blending Spark with the PAK deposit for processing.
- Perform cost-benefit analysis of reducing output of technical grade and subsequent increase of chemical grade output.
- Complete proof of concept development work to produce Lithium compounds (carbonate and hydroxide) for thorough evaluation of chemical grade concentrate alternatives.

26.2.6 FEASIBILITY STUDY

- Update the project engineering to a feasibility level design, using the project pre-feasibility study as a base and the information gathered during Phase 1 and Phase 2 programs.

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28 CERTIFICATES OF QUALIFIED PERSONS

TODD MCCRACKEN, P.GEO.

I, Todd McCracken, P. Geo., of Sudbury, Ontario do hereby certify:

- I am a Manager with WSP Canada Inc. with a business address at 93 Cedar Street, Suite 300, Sudbury, Ontario P3E 1A7.
- This certificate applies to the technical report titled “2018 PAK Prefeasibility Study – 2020 Spark Resource Estimation, Northwestern Ontario, Canada” (the “Technical Report”), with an issue date of March 19, 2020.
- I am a graduate of the University of Waterloo, with a Bachelor of Science (Honours) in Applied Earth Science in 1992.
- I am a member of the Association of Professional Geoscientists of Ontario and License 0631. My relevant experience includes 28 years of experience in exploration and operations, including resource estimation of spodumene pegmatite deposits.
- I have read the definition of “Qualified Person” as set out in National Instrument 43-101 *Standards of Disclosure for Mineral Properties* (“the Instrument”) and certify that by reason of my education, affiliation with a professional association (as defined in the Instrument), and past relevant work experience, I fulfill the requirements to be a “Qualified Person” for the purposes of the Instrument.
- I have visited the site on October 1 and 2, 2013, and again July 14 and 15, 2015. In addition, I visited the core farm located at 2736 Belisle Drive in Val Caron, Ontario several times.
- I am responsible for Sections 1 to 12, 14, 23 to 27 of the Technical Report.
- I am independent of Frontier Lithium Inc. as defined by Section 1.5 of the Instrument.
- I have prior involvement with the PAK Project that is the subject of the Technical Report. I authored a previous technical report on the PAK Project titled “NI 43-101 Technical Report Preliminary Feasibility Study for the PAK Lithium Project, Red Lake Mining District, Ontario, Canada”, dated April 16, 2018.
- I have read the Instrument, and the Technical Report has been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and stamped this 19th day of March 2020 at Sudbury, Ontario.

*Original signed and stamped by
Todd McCracken, P.Geo.*

Todd McCracken, P.Geo.
Manager - Mining
WSP Canada Inc.

JOHNNY CANOSA, P.ENG.

I, Johnny Canosa P.Eng. of Surrey, British Columbia do hereby certify:

- I am a Senior Mining Engineer.
- This certificate applies to the technical report titled “*2018 PAK Prefeasibility Study – 2020 Spark Resource Estimation, Northwestern Ontario, Canada*” (the “Technical Report”), with an issue date of March 19, 2020.
- I am a graduate of Bachelor of Science in Mining Engineering from Saint Louis University, Baguio City, Philippines. I am a member in good standing of the Association of Professional Engineers of Ontario (licence #100509964) and the Association of Professional and Geoscientist of Alberta ((licence #93946).
- My relevant experience includes more than 20 years of experience in mine engineering, mine planning and mining operation, including mine optimization, projects, open pit planning and scheduling, and mining consultancy. I am a “Qualified Person” for purposes of National Instrument 43-101 (the “Instrument”).
- My most recent personal inspection of the Property was September 21, 2016.
- I am responsible for Sections 15 (15.1-15.2), 16 (16.1), 18, 20, 21 and 22 of the Technical Report.
- I am not independent of Frontier Lithium as defined by Section 1.5 of the Instrument.
- I have prior involvement with the PAK Project that is the subject of the Technical Report. I authored a previous technical report on the PAK Project titled “NI 43-101 Technical Report Preliminary Feasibility Study for the PAK Lithium Project, Red Lake Mining District, Ontario, Canada”, dated April 16, 2018.
- I have worked as a Senior Mining Engineer for Nordmin Engineering Ltd since September 2016 until May 2019 mainly on the Preliminary Feasibility Study for the PAK Lithium Project and prior to that, I had worked as a Senior Mine Engineer for Primero Mining Corporation from June 1, 2014 to 2016. I had also worked with various companies such as Teck Coal, Golder Associates, Cameco Corporation, and Shell here in Canada and oversees with Benguet Corporation in Philippines and Zambia Consolidated Copper Mines in Luanshya, Zambia, Africa.
- I have read the Instrument and the sections of the Technical Report that I am responsible for have been prepared in compliance with the Instrument.
- As of the date of this certificate, to the best of my knowledge, information and belief, the sections of the Technical Report that I am responsible for contain all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and stamped this 19th day of March 2020 at Surrey, British Columbia.

*Original signed and stamped by
Johnny Canosa, P.Eng.*

Johnny Canosa, P.Eng.
Senior Mining Engineer

ROY LEVESQUE, P.ENG.

I, Roy Levesque, P.Eng., residing at 44 Tawny Port Drive, Sudbury, Ontario, P3E 0A8, do hereby certify:

- I am a Senior Mining Engineer with 20 years of industry experience.
- This certificate applies to the technical report titled “2018 PAK Prefeasibility Study – 2020 Spark Resource Estimation, Northwestern Ontario, Canada” (the “Technical Report”), with an issue date of March 19, 2020.
- I am a graduate of Laurentian University in Sudbury, Ontario, Canada.
- I am a Professional Engineer in good standing with the Association of Professional Engineers of Ontario (registration number – 100072522).
- My experience is as follows:
 - Senior Mining Engineer – JDS Energy and Mining – since 2019
 - Senior Mining Engineer – Nordmin Engineering – since 2016-2019
 - President – Norite Mining Consulting Inc. – 2014-2016
 - Managing Senior Mining Engineer – SNC Lavalin – 2012-2013
 - Mining Staff Manager – Tetra Tech – 2011-2012
 - Senior Mining Engineer – Stantec Consulting – 2010-2011
 - Senior Mine Engineer – FNX Mining Company – 2008-2010
 - Senior Mine Engineer – SRK Consulting – 2006-2008
 - Mining Consultant – AST Mining Canada – 2003-2006
- I have read the definition of “Qualified Person” in National Instrument 43-101 – Standards of Disclosure for Mineral Projects (“NI 43-101”) and according to NI 43-101 I am a qualified person owing to my education, experience and registration with professional associations.
- I have visited the PAK Lithium Project September 21, 2016.
- I am independent as defined by Chapter 5, Section 1.5 of NI 43-101.
- I have prior involvement with the PAK Project that is the subject of the Technical Report. I authored a previous technical report on the PAK Project titled “NI 43-101 Technical Report Preliminary Feasibility Study for the PAK Lithium Project, Red Lake Mining District, Ontario, Canada”, dated April 16, 2018.
- I am responsible for Sections 15.3, 16.2 – 16.5, and 19 of the Technical Report.
- I have read NI 43-101 and confirm that the sections of this report for which I am an author or co-author have been prepared in compliance with NI 43-101.
- As of the effective date of this report, to the best of my knowledge, information and belief, the sections of this report for which I am an author or co-author contain all scientific and technical information that is required to be disclosed so as to make the technical report not misleading.

Signed and stamped this 19th day of March 2020 at Sudbury, Ontario.

*Original signed and stamped by
Roy Levesque, P.Eng.*

Roy Levesque, P.Eng.
Senior Mining Engineer
JDS Mining and Energy

KURT BOYKO, P.ENG.

I, Kurt Boyko, P. Eng., residing at 15 MacGregor St., Rosslyn, ON do hereby certify that:

- I am a Senior Professional Engineer and Director of Nordmin Engineering Ltd. with a business address at 2565 Kingsway Unit 2, Sudbury, Ontario, P3B 2G1.
- This certificate applies to the technical report titled “*2018 PAK Prefeasibility Study – 2020 Spark Resource Estimation, Northwestern Ontario, Canada*” (the “Technical Report”), with an issue date of March 19, 2020.
- I am a graduate of Lakehead University, with a Bachelor of Engineering (Mechanical) Degree in 1994.
- I am currently a member in good standing of the Association of Professional Engineers of Ontario (90418484) and The Association of Professional Engineers and Geoscientists of Saskatchewan (15109).
- I have practiced my profession continuously since graduation.
- My relevant experience includes 26 years of Engineering design, construction and management in the Industrial and Mining Fields. I have authored several published papers, and am a member of the Canadian Institute of Mining, Metallurgy and Petroleum. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
- I am responsible for authoring Section 17, and contributing to Section 21 - specifically related to the Capital Cost estimate of the Processing Facilities.
- I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
- I have prior involvement with the PAK Project that is the subject of the Technical Report. I authored a previous technical report on the PAK Project titled “NI 43-101 Technical Report Preliminary Feasibility Study for the PAK Lithium Project, Red Lake Mining District, Ontario, Canada”, dated April 16, 2018.
- I have read National Instrument 43-101 and Form 43-101F1 and the Report has been prepared in compliance therewith.
- As of the date of this certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and stamped this 19th day of March 2020 at Sudbury, Ontario.

*Original signed and stamped by
Kurt Boyko, P.Eng.*

Kurt Boyko, P.Eng.
Senior Professional Engineer and Director
Nordmin Engineering Ltd.

STEVEN W. WILSON, P.ENG.

I, Steven W Wilson, P. Eng., residing at 5 Hopperton Drive, Toronto, ON, do hereby certify that:

- I am a professional Process Engineer with Wil-Solve Consulting Services.
- This certificate applies to the technical report titled “*2018 PAK Prefeasibility Study – 2020 Spark Resource Estimation, Northwestern Ontario, Canada*” (the “Technical Report”), with an issue date of March 19, 2020.
- I am a graduate of the University of Toronto with a BSc (1987) and MSc (1990), and the University of Nottingham with a PhD (2002).
- I am currently a member in good standing of the Association of Professional Engineers of Ontario. (registration number – 90321035).
- I have practiced my profession continuously since 1990.
- My summarized career experience is as follows:
 - Process Engineer through to Superintendent Metallurgy, Inco Ltd 1990-2004
 - Chief Metallurgist, Placer Dome 2004-2006
 - Manager, Technology Transfer, Teck Resources 2006-2010
 - Global VP Metallurgy, Sr VP Mineral Services, SGS 2010-2017
 - Principal, Wil-Solve Consulting Services 2017-present
- I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education, affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfill the requirements to be a qualified person for the purposes of NI 43-101.
- I am responsible for authoring Section 13 of the Technical Report.
- I am independent of the issuer applying all of the tests in Section 1.5 of NI 43-101.
- I have prior involvement with the PAK Project that is the subject of the Technical Report. I authored a previous technical report on the PAK Project titled “NI 43-101 Technical Report Preliminary Feasibility Study for the PAK Lithium Project, Red Lake Mining District, Ontario, Canada”, dated April 16, 2018.
- I have read National Instrument 43-101 and Form 43-101F1 and the Report has been prepared in compliance therewith.
- As of the date of this certificate, to the best of my knowledge, information, and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signed and stamped this 19th day of March 2020 at Sudbury, Ontario.

*Original signed and stamped by
Steven W. Wilson, P.Eng.*

Steven W. Wilson, P.Eng.
Process Engineer
Wil-Solve Consulting Services

APPENDIX

A

PROJECT
LOCATION MAP /
LAND TENURE

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	109669	Mining Lease	100%	2.5% J.Brady	242.2	22-Feb-17	22-Feb-38		
Deer Lake	100101	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$189	\$400
Deer Lake	101000	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	102018	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	102019	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	102031	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$8,523	\$400
Deer Lake	102112	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$9,406	\$400
Deer Lake	102113	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	102148	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	113828	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$42	\$400
Deer Lake	115736	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	115765	Mining Claim	100%		6.8	10-Apr-18	21-Feb-21	\$75	\$200
Deer Lake	115766	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$166	\$400
Deer Lake	115767	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$1,380	\$400
Deer Lake	116468	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,000	\$400
Deer Lake	116469	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,486	\$400
Deer Lake	116470	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	116498	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	120427	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	120471	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	120472	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	123027	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	125575	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	125576	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	125577	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$13	\$400
Deer Lake	125578	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$113	\$400
Deer Lake	126222	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer Lake	126876	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$39	\$400
Deer Lake	129021	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	132648	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	142071	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
Deer Lake	142072	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	142073	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$123	\$400
Deer Lake	142110	Mining Claim	100%		5.6	10-Apr-18	21-Feb-21	\$0	\$200
Deer Lake	149255	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$41	\$400
Deer Lake	149256	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,441	\$400
Deer Lake	151738	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	154798	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,442	\$400
Deer Lake	154799	Mining Claim	100%		6.3	10-Apr-18	25-Sep-20	\$496	\$200
Deer Lake	154800	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$1,113	\$400
Deer Lake	154801	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	154889	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$41	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	154898	Mining Claim	100%		8.6	10-Apr-18	25-Sep-20	\$0	\$200
Deer Lake	156174	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$19	\$400
Deer Lake	158797	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	158821	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	158822	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	158823	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$111	\$400
Deer Lake	159573	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	159589	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	165598	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	167632	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	168106	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$590	\$400
Deer Lake	170843	Mining Claim	100%		5.3	10-Apr-18	25-Sep-20	\$494	\$200
Deer Lake	171445	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$302	\$400
Deer Lake	171446	Mining Claim	100%		19.6	10-Apr-18	11-Mar-21	\$1,398	\$400
Deer Lake	172100	Mining Claim	100%		7.9	10-Apr-18	25-Sep-20	\$0	\$200
Deer Lake	177635	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	178439	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	194142	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$3,200	\$400
Deer Lake	194178	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	194837	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	194868	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	197364	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,441	\$400
Deer Lake	200164	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
Deer Lake	200702	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	200836	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	204105	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	204106	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	204121	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	205395	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	208194	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	208226	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$1,238	\$400
Deer Lake	208227	Mining Claim	100%		16.9	10-Apr-18	21-Feb-21	\$319	\$200
Deer Lake	208228	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$628	\$400
Deer Lake	208896	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer Lake	212205	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	212229	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	212810	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$2,306	\$400
Deer Lake	212811	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	212838	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	213503	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	213553	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	214966	Mining Claim	100%		15.8	10-Apr-18	21-Feb-21	\$1,347	\$200

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	216319	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	217493	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$290	\$400
Deer Lake	217494	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$166	\$400
Deer Lake	217495	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$42	\$400
Deer Lake	217496	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	220240	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	220281	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$3,251	\$400
Deer Lake	221608	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,421	\$400
Deer Lake	224219	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	224220	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	224854	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	225551	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	227011	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	227024	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$5,238	\$400
Deer Lake	227607	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	228239	Mining Claim	100%		7.3	10-Apr-18	25-Sep-20	\$0	\$200
Deer Lake	228871	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$2,255	\$400
Deer Lake	229589	Mining Claim	100%		3.7	10-Apr-18	21-Feb-21	\$0	\$200
Deer Lake	231010	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	231011	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$21,226	\$400
Deer Lake	231012	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	231013	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$328	\$400
Deer Lake	231014	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,189	\$400
Deer Lake	231015	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,275	\$400
Deer Lake	232307	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	232308	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	232973	Mining Claim	100%		15.7	10-Apr-18	21-Feb-21	\$316	\$200
Deer Lake	234349	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	257580	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,400	\$400
Deer Lake	260153	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	260178	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	260266	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	260823	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	266727	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	266728	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	266793	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	266794	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer Lake	268175	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	268176	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	268198	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$3,767	\$400
Deer Lake	268306	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	268942	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	268943	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	268963	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	268999	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	271396	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	271397	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$42	\$400
Deer Lake	272222	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	274148	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$42	\$400
Deer Lake	274211	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,401	\$400
Deer Lake	275412	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer Lake	280329	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$2,064	\$400
Deer Lake	280358	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	280360	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	281006	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	281575	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	286285	Mining Claim	100%		9.6	10-Apr-18	25-Sep-21	\$16	\$200
Deer Lake	286286	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$2,103	\$400
Deer Lake	286815	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$1,722	\$400
Deer Lake	286816	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$166	\$400
Deer Lake	286817	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$525	\$400
Deer Lake	286818	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$1,973	\$400
Deer Lake	288182	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$42	\$400
Deer Lake	297536	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	297537	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,400	\$400
Deer Lake	297557	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$8,709	\$400
Deer Lake	297558	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$4,081	\$400
Deer Lake	297633	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$6,733	\$400
Deer Lake	298308	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	298324	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	299015	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	300711	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$4,442	\$400
Deer Lake	302618	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$1,008	\$400
Deer Lake	302658	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$216	\$400
Deer Lake	302659	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$3,768	\$400
Deer Lake	310649	Mining Claim	100%		7.1	10-Apr-18	25-Sep-20	\$498	\$200
Deer Lake	310688	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
Deer Lake	310689	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer Lake	310725	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$2,624	\$400
Deer Lake	310726	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	312012	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$166	\$400
Deer Lake	312013	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$2	\$400
Deer Lake	312787	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	312788	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	314658	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$12,007	\$400
Deer Lake	314733	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	314734	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	314735	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	314775	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	322879	Mining Claim	100%		19.6	10-Apr-18	10-Jun-20	\$1,486	\$400
Deer Lake	323434	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$81	\$400
Deer Lake	323458	Mining Claim	100%		6.2	10-Apr-18	21-Feb-21	\$0	\$200
Deer Lake	323459	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer Lake	326830	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	326863	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	328163	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	339938	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	339939	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$3,449	\$400
Deer Lake	339956	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	339957	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	339997	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	339998	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer Lake	532951	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532952	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532953	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,441	\$400
Deer Lake	532954	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,400	\$400
Deer Lake	532955	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,442	\$400
Deer Lake	532956	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,441	\$400
Deer Lake	532957	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532958	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532959	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532960	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532961	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,424	\$400
Deer Lake	532962	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532963	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532964	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532965	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532966	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532967	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532968	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532969	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532970	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532971	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532972	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,441	\$400
Deer Lake	532973	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532974	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	532975	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532976	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,403	\$400
Deer Lake	532977	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$42	\$400
Deer Lake	532978	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532979	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532980	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532981	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532982	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,409	\$400
Deer Lake	532983	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532984	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,438	\$400
Deer Lake	532985	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$4,415	\$400
Deer Lake	532986	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532987	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532988	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532989	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532990	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532991	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532992	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532993	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532994	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532995	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532996	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532997	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532998	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	532999	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533000	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533001	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533002	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533003	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533004	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533005	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533006	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533007	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533008	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533009	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533010	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533011	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533012	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533013	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533014	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533015	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533016	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	533017	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533018	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533019	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533020	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533021	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533022	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533023	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533024	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533025	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533026	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533027	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533028	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533029	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533030	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533031	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533032	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533033	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533034	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533035	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533036	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533037	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533038	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533039	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533040	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533041	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533042	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533043	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533044	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533045	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533046	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533047	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533048	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533049	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533050	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533051	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533052	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533053	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533054	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533055	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533056	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533057	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533058	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	533059	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533060	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533061	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533062	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533063	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533064	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533065	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533066	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533067	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533068	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533069	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533070	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533071	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533072	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533073	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533074	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533075	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533076	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533077	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533078	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533079	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533080	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533081	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533082	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533083	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533084	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533085	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533086	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533087	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533088	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533089	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533090	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533091	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533092	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533093	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533094	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533095	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533096	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533097	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533098	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533099	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533100	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	533101	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533102	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533103	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533104	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533105	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533106	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533107	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533108	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533109	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533110	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533111	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533113	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533114	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533115	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533116	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533117	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533118	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533119	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533120	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533121	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533122	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533123	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533124	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533125	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533126	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533127	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533128	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533129	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533132	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533133	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533134	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533135	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533136	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533137	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533138	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533139	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533140	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533159	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533179	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533182	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533183	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	533184	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	533185	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Deer Lake	100280	Mining Claim	100%	2.5% K.Smith/M.Desmeules	4.1	10-Apr-18	12-Aug-20	\$0	\$200
Deer Lake	107054	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$10	\$400
Deer Lake	115088	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$525	\$400
Deer Lake	127587	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$1,063	\$400
Deer Lake	127588	Mining Claim	100%	2.5% K.Smith/M.Desmeules	14.0	10-Apr-18	12-Aug-20	\$996	\$200
Deer Lake	127589	Mining Claim	100%	2.5% K.Smith/M.Desmeules	4.1	10-Apr-18	12-Aug-20	\$7	\$200
Deer Lake	139995	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$1,936	\$400
Deer Lake	144776	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$4,620	\$400
Deer Lake	146719	Mining Claim	100%	2.5% K.Smith/M.Desmeules	15.9	10-Apr-18	12-Aug-20	\$0	\$200
Deer Lake	154542	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer Lake	156879	Mining Claim	100%	2.5% K.Smith/M.Desmeules	7.9	10-Apr-18	12-Aug-20	\$590	\$200
Deer Lake	162890	Mining Claim	100%	2.5% K.Smith/M.Desmeules	2.8	10-Apr-18	12-Aug-20	\$0	\$200
Deer Lake	192026	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$548	\$400
Deer Lake	193336	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer Lake	193337	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$62	\$400
Deer Lake	202696	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$2,580	\$400
Deer Lake	210764	Mining Claim	100%	2.5% K.Smith/M.Desmeules	3.8	10-Apr-18	12-Aug-20	\$8	\$200
Deer Lake	210765	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$42	\$400
Deer Lake	222323	Mining Claim	100%	2.5% K.Smith/M.Desmeules	3.9	10-Apr-18	12-Aug-20	\$8	\$200
Deer Lake	229259	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$21	\$400
Deer Lake	229578	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$649	\$400
Deer Lake	229579	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$1,555	\$400
Deer Lake	230554	Mining Claim	100%	2.5% K.Smith/M.Desmeules	16.0	10-Apr-18	12-Aug-20	\$0	\$200
Deer Lake	230555	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer Lake	258269	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$60	\$400
Deer Lake	258270	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$6	\$400
Deer Lake	276777	Mining Claim	100%	2.5% K.Smith/M.Desmeules	6.1	10-Apr-18	12-Aug-20	\$1,085	\$200
Deer Lake	276778	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$512	\$400
Deer Lake	278576	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer Lake	278577	Mining Claim	100%	2.5% K.Smith/M.Desmeules	3.7	10-Apr-18	12-Aug-20	\$4,362	\$200
Deer Lake	288867	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.1	10-Apr-18	12-Aug-20	\$165	\$200
Deer Lake	288868	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$1,615	\$400
Deer Lake	309437	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer Lake	309438	Mining Claim	100%	2.5% K.Smith/M.Desmeules	3.9	10-Apr-18	12-Aug-20	\$4,261	\$200
Deer Lake	313373	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$1,445	\$400
Deer Lake	313374	Mining Claim	100%	2.5% K.Smith/M.Desmeules	12.9	10-Apr-18	12-Aug-20	\$866	\$200
Deer Lake	313375	Mining Claim	100%	2.5% K.Smith/M.Desmeules	13.5	10-Apr-18	12-Aug-20	\$1,119	\$200
Deer Lake	313376	Mining Claim	100%	2.5% K.Smith/M.Desmeules	4.0	10-Apr-18	12-Aug-20	\$8	\$200
Deer Lake	325237	Mining Claim	100%	2.5% K.Smith/M.Desmeules	1.9	10-Apr-18	12-Aug-20	\$0	\$200
Deer Lake	325238	Mining Claim	100%	2.5% K.Smith/M.Desmeules	2.4	10-Apr-18	12-Aug-20	\$1	\$200
Deer Lake	325239	Mining Claim	100%	2.5% K.Smith/M.Desmeules	1.0	10-Apr-18	12-Aug-20	\$262	\$200

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Deer Lake	325431	Mining Claim	100%	2.5% K.Smith/M.Desmeules	5.8	10-Apr-18	12-Aug-20	\$12	\$200
Deer Lake	336212	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$951	\$400
Deer - North Spirit Lake	100296	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer - North Spirit Lake	100298	Mining Claim	100%		16.7	10-Apr-18	21-Feb-21	\$0	\$200
Deer - North Spirit Lake	100606	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
Deer - North Spirit Lake	101683	Mining Claim	100%		15.7	10-Apr-18	21-Feb-21	\$1,042	\$200
Deer - North Spirit Lake	115774	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer - North Spirit Lake	116174	Mining Claim	100%		15.9	10-Apr-18	21-Feb-21	\$4,160	\$200
Deer - North Spirit Lake	123720	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer - North Spirit Lake	127613	Mining Claim	100%		3.6	10-Apr-18	21-Feb-21	\$0	\$200
Deer - North Spirit Lake	144798	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer - North Spirit Lake	154897	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$4,200	\$400
Deer - North Spirit Lake	156898	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer - North Spirit Lake	158938	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer - North Spirit Lake	160250	Mining Claim	100%		15.6	10-Apr-18	21-Feb-21	\$0	\$200
Deer - North Spirit Lake	177767	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer - North Spirit Lake	179111	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
Deer - North Spirit Lake	195523	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$85	\$400
Deer - North Spirit Lake	200835	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
Deer - North Spirit Lake	208895	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
Deer - North Spirit Lake	220961	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer - North Spirit Lake	222337	Mining Claim	100%		3.8	10-Apr-18	21-Feb-21	\$0	\$200
Deer - North Spirit Lake	227614	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$4,400	\$400
Deer - North Spirit Lake	231640	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer - North Spirit Lake	269614	Mining Claim	100%		15.5	10-Apr-18	21-Feb-21	\$1	\$200
Deer - North Spirit Lake	288885	Mining Claim	100%		3.9	10-Apr-18	21-Feb-21	\$0	\$200
Deer - North Spirit Lake	310731	Mining Claim	100%		8.4	10-Apr-18	19-Mar-21	\$4,360	\$200
Deer - North Spirit Lake	314759	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
Deer - North Spirit Lake	154540	Mining Claim	100%	2.5% K.Smith/M.Desmeules	11.8	10-Apr-18	12-Aug-20	\$6,654	\$200
Deer - North Spirit Lake	154541	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$4,332	\$400
Deer - North Spirit Lake	221291	Mining Claim	100%	2.5% K.Smith/M.Desmeules	15.5	10-Apr-18	12-Aug-20	\$0	\$200
Deer - North Spirit Lake	221292	Mining Claim	100%	2.5% K.Smith/M.Desmeules	15.7	10-Apr-18	12-Aug-20	\$0	\$200
Deer - North Spirit Lake	241426	Mining Claim	100%	2.5% K.Smith/M.Desmeules	11.2	10-Apr-18	12-Aug-20	\$4,360	\$200
Deer - North Spirit Lake	308080	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer - North Spirit Lake	308081	Mining Claim	100%	2.5% K.Smith/M.Desmeules	19.6	10-Apr-18	12-Aug-20	\$0	\$400
Deer - North Spirit Lake	315461	Mining Claim	100%	2.5% K.Smith/M.Desmeules	16.0	10-Apr-18	12-Aug-20	\$0	\$200
Deer - North Spirit Lake	315462	Mining Claim	100%	2.5% K.Smith/M.Desmeules	2.9	10-Apr-18	12-Aug-20	\$0	\$200
North Spirit Lake	100150	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	100151	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$4,400	\$400
North Spirit Lake	100272	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	100297	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	101372	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	101373	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	101572	Mining Claim	100%		4.4	10-Apr-18	19-Mar-21	\$0	\$200
North Spirit Lake	101831	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	101832	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	101853	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$118	\$400
North Spirit Lake	102572	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	102573	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	115078	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	115772	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$0	\$400
North Spirit Lake	115773	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	115775	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	116046	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	116047	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	116343	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	116497	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	116499	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	116687	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	117145	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	117146	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	117175	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	120470	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	121729	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	122335	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
North Spirit Lake	123022	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	124440	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	125616	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	125617	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	127570	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	128325	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	129653	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	142118	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	142119	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$200	\$400
North Spirit Lake	143495	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	143496	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$200	\$400
North Spirit Lake	152940	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	156867	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	156868	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	157586	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$200	\$400
North Spirit Lake	157587	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	157588	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	158834	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	158937	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	161615	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	162880	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	163617	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$200	\$400
North Spirit Lake	163636	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	164843	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	164924	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	165629	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	165630	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	167547	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	169559	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	178965	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	179698	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	179699	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	180454	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	180455	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	182354	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	196920	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	198240	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	202187	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	202188	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	202718	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	202719	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	203403	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$18	\$400
North Spirit Lake	203404	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	203429	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	204131	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	204935	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	204936	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	208747	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	208748	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	208749	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	208750	Mining Claim	100%		7.8	10-Apr-18	19-Mar-21	\$4,360	\$200
North Spirit Lake	211493	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	212238	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	212239	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	212240	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	214791	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	214908	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
North Spirit Lake	215043	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	215044	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	215045	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	215046	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	215750	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	216311	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	216312	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	217741	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	220318	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	222309	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	222335	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	222336	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
North Spirit Lake	223543	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	224246	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	227613	Mining Claim	100%		19.6	10-Apr-18	25-Sep-20	\$108	\$400
North Spirit Lake	230306	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	231641	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	233555	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	234344	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	258258	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	258259	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	259478	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	259506	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	259507	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$118	\$400
North Spirit Lake	260186	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	260187	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	260809	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	264968	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	264969	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	266837	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	266838	Mining Claim	100%		7.2	10-Apr-18	19-Mar-21	\$4,360	\$200
North Spirit Lake	268205	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	268998	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	269615	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$2,015	\$400
North Spirit Lake	270218	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	270219	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	270220	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	270927	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	270989	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	272221	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	274770	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	274771	Mining Claim	100%		9.7	10-Apr-18	19-Mar-21	\$0	\$200
North Spirit Lake	276766	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	276790	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	276791	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	277511	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	277512	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	277513	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	279035	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	279569	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	280359	Mining Claim	100%		19.6	10-Apr-18	10-Jan-21	\$0	\$400
North Spirit Lake	281574	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	283610	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	285006	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	288859	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	288886	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	295617	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	295643	Mining Claim	100%		4.1	10-Apr-18	19-Mar-21	\$0	\$200
North Spirit Lake	297568	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	310730	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$4,400	\$400
North Spirit Lake	313366	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	313367	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	314094	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	314109	Mining Claim	100%		19.6	10-Apr-18	19-Mar-21	\$0	\$400
North Spirit Lake	314665	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	321043	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	321044	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	325417	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	325418	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	325450	Mining Claim	100%		19.6	10-Apr-18	21-Feb-21	\$0	\$400
North Spirit Lake	326132	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	326133	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	326134	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	326870	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	328162	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	330195	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	330196	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	341968	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	341969	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	342028	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	343959	Mining Claim	100%		19.6	10-Apr-18	22-Feb-21	\$0	\$400
North Spirit Lake	532153	Mining Claim	100%	1.0% J. Salo	294.5	02-Oct-18	02-Oct-20	\$0	\$6,000
North Spirit Lake	532916	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532917	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532918	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532919	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532920	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532921	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	532922	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532923	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532924	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532925	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532926	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532927	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532928	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532929	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532930	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532931	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532932	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532933	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532934	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532935	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532936	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532937	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532938	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532939	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532940	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532941	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532942	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532943	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532944	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532945	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532946	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532947	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532948	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532949	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	532950	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	533276	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	533277	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	533278	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	533279	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
North Spirit Lake	538663	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538664	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538665	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538666	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538667	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538668	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538669	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538670	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538671	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	538672	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538673	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538674	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538675	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538676	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538677	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538678	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538679	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538680	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538681	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538682	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538683	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538684	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538685	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538686	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538687	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538688	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538689	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538690	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538691	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538692	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538693	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538694	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538695	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538696	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538697	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538698	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538699	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538700	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538701	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538702	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538703	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538704	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538705	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538706	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538707	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538708	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538709	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538710	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538711	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538713	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538714	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	538715	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538716	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538717	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538718	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538719	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538720	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538721	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538722	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538723	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538724	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538725	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538726	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538727	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538728	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538729	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538730	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538731	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538732	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538733	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538734	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538735	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538736	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538737	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538738	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538739	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538740	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538741	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538742	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538743	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538744	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538745	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538746	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538747	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538748	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538749	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538750	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538751	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538752	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538753	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538754	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538755	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538756	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	538757	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538758	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538759	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538760	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538761	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538762	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538763	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538764	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538765	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538766	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538767	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538768	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538769	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538770	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538771	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538772	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538773	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538774	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538775	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538776	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538777	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538778	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538779	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538780	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538781	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538782	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538783	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538784	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538785	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538786	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538787	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538788	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538789	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538790	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538791	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538792	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538793	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538794	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538795	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538796	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538797	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538798	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	538799	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538800	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538801	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538807	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538808	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538809	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538810	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538811	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538812	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538813	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538814	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538815	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538816	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538817	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538818	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538819	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538820	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538821	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538822	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538823	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538824	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538825	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538826	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538827	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538828	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538829	Mining Claim	100%		19.6	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538830	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538831	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538832	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538833	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538834	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538835	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538836	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538837	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538838	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538839	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538840	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538841	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538842	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538843	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538844	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538845	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	538846	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538847	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538848	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538849	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538850	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538851	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538852	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538853	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538854	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538855	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538856	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538862	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538863	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538864	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538865	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538866	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538867	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538868	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538869	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538870	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538871	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538872	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538873	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538874	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538875	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538876	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538877	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538878	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538879	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538880	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538881	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538882	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538883	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538884	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538885	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538886	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538887	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538888	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538889	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538890	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538891	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400
North Spirit Lake	538892	Mining Claim	100%		19.7	09-Jan-19	09-Jan-21	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
North Spirit Lake	172535	Mining Claim	100%	2.5% K.Smith/M.Desmeules	15.3	10-Apr-18	12-Aug-20	\$0	\$200
North Spirit Lake	287851	Mining Claim	100%	2.5% K.Smith/M.Desmeules	9.9	10-Apr-18	12-Aug-20	\$0	\$200
North Spirit Lake	325236	Mining Claim	100%	2.5% K.Smith/M.Desmeules	12.4	10-Apr-18	12-Aug-20	\$4,843	\$200
Sandy Lake	530288	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530289	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530290	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530291	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530292	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530293	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530294	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530295	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530296	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530297	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530298	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530299	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530300	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530301	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530302	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530303	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530304	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530305	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530306	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	530307	Mining Claim	100%		19.6	28-Aug-18	28-Aug-20	\$0	\$400
Sandy Lake	533141	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533142	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533143	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533144	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533146	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533147	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533148	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533149	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533152	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533154	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533155	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533156	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533157	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533158	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533162	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533164	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533165	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533166	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533167	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533168	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533169	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533170	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533171	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533172	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533173	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533174	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533176	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533177	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533178	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533180	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533181	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533186	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533187	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533188	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533189	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533190	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533191	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533192	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533194	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533195	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533196	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533197	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533198	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533199	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533200	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533201	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533202	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533203	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533204	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533205	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533206	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533207	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533208	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533209	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533210	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533211	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533212	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533213	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533214	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533215	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533216	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533217	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533218	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533219	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533220	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533221	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533222	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533223	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533224	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533225	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533226	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533227	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533228	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533229	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533230	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533231	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533232	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533233	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533234	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533235	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533236	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533237	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533238	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533239	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533240	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533241	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533242	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533243	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533244	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533245	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533246	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533247	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533248	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533249	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533250	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533251	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533252	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533253	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533254	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533255	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533256	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533257	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533258	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533259	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533260	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533261	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533262	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533263	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533264	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533265	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533266	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533267	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533268	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533269	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533270	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533271	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533272	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533273	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533274	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533275	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake	533289	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533290	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533291	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533292	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533293	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533294	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533295	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533296	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533297	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533298	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533299	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533300	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533301	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533302	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533303	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533304	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533305	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533306	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533307	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533308	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533309	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533310	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533311	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533312	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533313	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533314	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533315	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533316	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533317	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533318	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533319	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533320	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533321	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533322	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533323	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533324	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533325	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533326	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533327	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533328	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533329	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533330	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533331	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533332	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533333	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533334	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533335	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533336	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533337	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533338	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533339	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533340	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533341	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533342	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533343	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533344	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533345	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533346	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533347	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533348	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533349	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533350	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533351	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533352	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533353	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533354	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533355	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533356	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533357	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533358	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533359	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533360	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533361	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533362	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533363	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533364	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533365	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533366	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533367	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533368	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533369	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533370	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533371	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533372	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533373	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533374	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533375	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533376	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533377	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533378	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533379	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533380	Mining Claim	100%		19.6	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533381	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533382	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533383	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533384	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533385	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533386	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533387	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533388	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533389	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533390	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533391	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533392	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533393	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533394	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533395	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533396	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533397	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533398	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533399	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533400	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533401	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533402	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533403	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533404	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533405	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533406	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533407	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533408	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533409	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533410	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533411	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533412	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533413	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533414	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533415	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533416	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533417	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533418	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533419	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533420	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533421	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533422	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533423	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533424	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533425	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533426	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533427	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533428	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533429	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533430	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533431	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533432	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533433	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533434	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533435	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533436	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533437	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533438	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533439	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	533440	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533441	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533442	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533443	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533444	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533445	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533446	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533447	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533448	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533449	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533450	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533451	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533452	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533453	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533454	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533455	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533456	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	533457	Mining Claim	100%		19.5	16-Oct-18	16-Oct-20	\$0	\$400
Sandy Lake	536079	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536080	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536081	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536082	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536083	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536084	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536085	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536086	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536087	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536088	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536089	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536090	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536091	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536092	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536093	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536094	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536095	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536096	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536097	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536098	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536099	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536100	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536101	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536102	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	536103	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536104	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536105	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536106	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536107	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536108	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536109	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536110	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536111	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536112	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536113	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536114	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536115	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536116	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536117	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536118	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536119	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536120	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536121	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536122	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536123	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536130	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536131	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536132	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536133	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536134	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536135	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536136	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536137	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536138	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536139	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536140	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536141	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536142	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536143	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536144	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536145	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536146	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536147	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536148	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536149	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536150	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	536151	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536152	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536153	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536154	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536155	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536156	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536157	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536158	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536159	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536160	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536161	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536162	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536163	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536164	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536165	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536166	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536167	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536168	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536169	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536170	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536171	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536172	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536173	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536174	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536175	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536176	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536177	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536178	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536179	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536180	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536181	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536182	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536183	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536184	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536185	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536186	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536187	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536188	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536189	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536190	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536191	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536192	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	536193	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536194	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536195	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536196	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536197	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536198	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536199	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536200	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536201	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536202	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536203	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536204	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536205	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536206	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536207	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536208	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536209	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536210	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536211	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536212	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536213	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536214	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536215	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536216	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536217	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536218	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536219	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	536220	Mining Claim	100%		19.5	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake; Deer Lake	533112	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533130	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533131	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533145	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533150	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533151	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533153	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533160	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533161	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533163	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533175	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	533193	Mining Claim	100%		19.6	15-Oct-18	15-Oct-20	\$0	\$400
Sandy Lake; Deer Lake	536124	Mining Claim	100%		19.6	10-Dec-18	10-Dec-20	\$0	\$400
Sandy Lake	529505	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400

Table 1: PAK Lithium Project Disposition Status

Land Use region	Tenure Number	Tenure Type	Frontier Owner-ship	Royalty	Area (ha)	Date Issued	Next due Date	Reserve	Work Required
Sandy Lake	529506	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529507	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529508	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529509	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529510	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529511	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529512	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529513	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529514	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529515	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529516	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529517	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529518	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529519	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529520	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529521	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529522	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529523	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529524	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529525	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529526	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529527	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529528	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529529	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529530	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529531	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529532	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529533	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529534	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529535	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529536	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529537	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529538	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	529539	Mining Claim	100%	1.5% NSR G.Smith	19.5	26-Aug-18	26-Aug-20	\$0	\$400
Sandy Lake	522222	Mining Claim	100%	0.5% NSR S.Woolhead	58.6	27-May-18	27-May-21	\$0	\$1,200
Sandy Lake	531510	Mining Claim	100%	0.5% NSR S.Woolhead	117.2	15-Sep-18	15-Sep-20	\$0	\$2,400
1380					27068.5			\$413,992	\$548,600

APPENDIX

B

SRM CONTROL
CHARTS

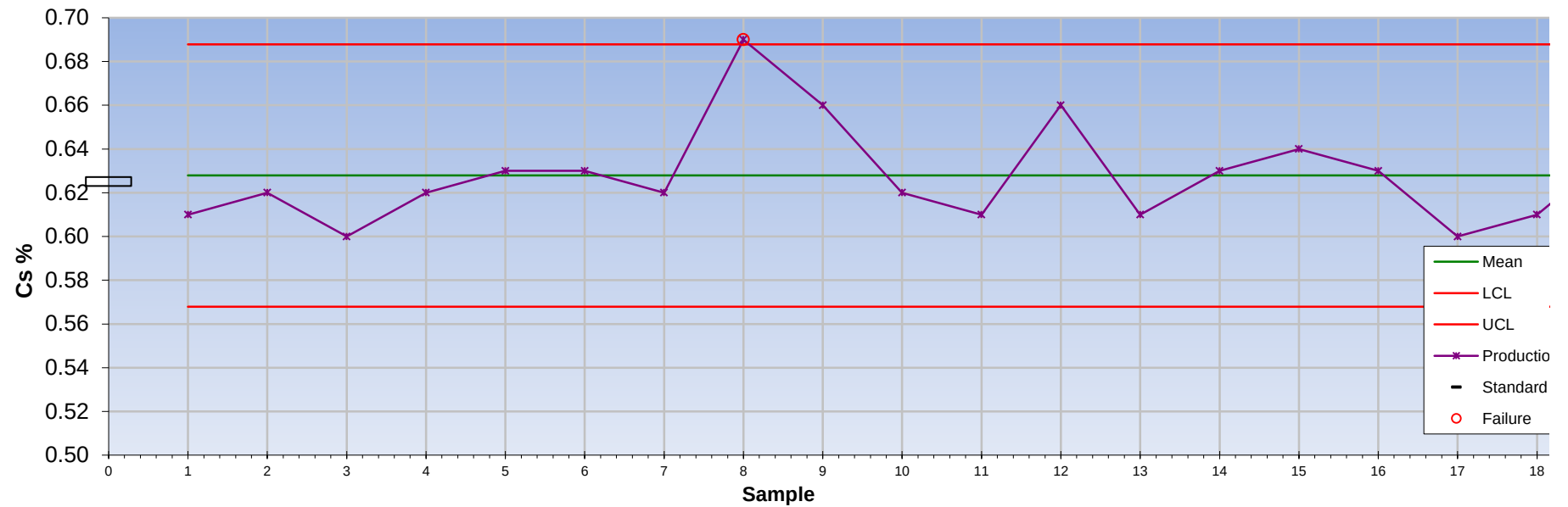
APPENDIX

B-1 2015

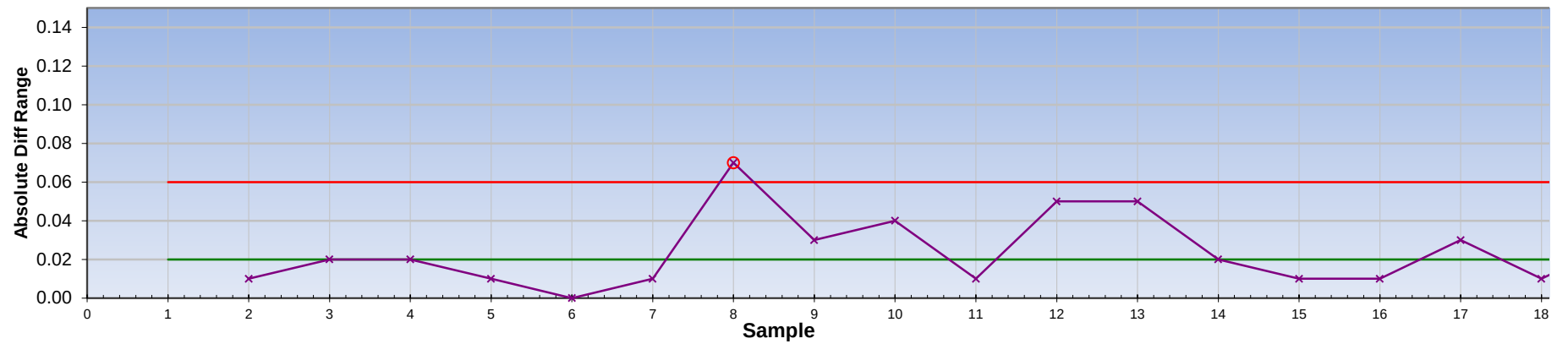
Cs CONTROL CHART

Process Performance Chart

LRC-1



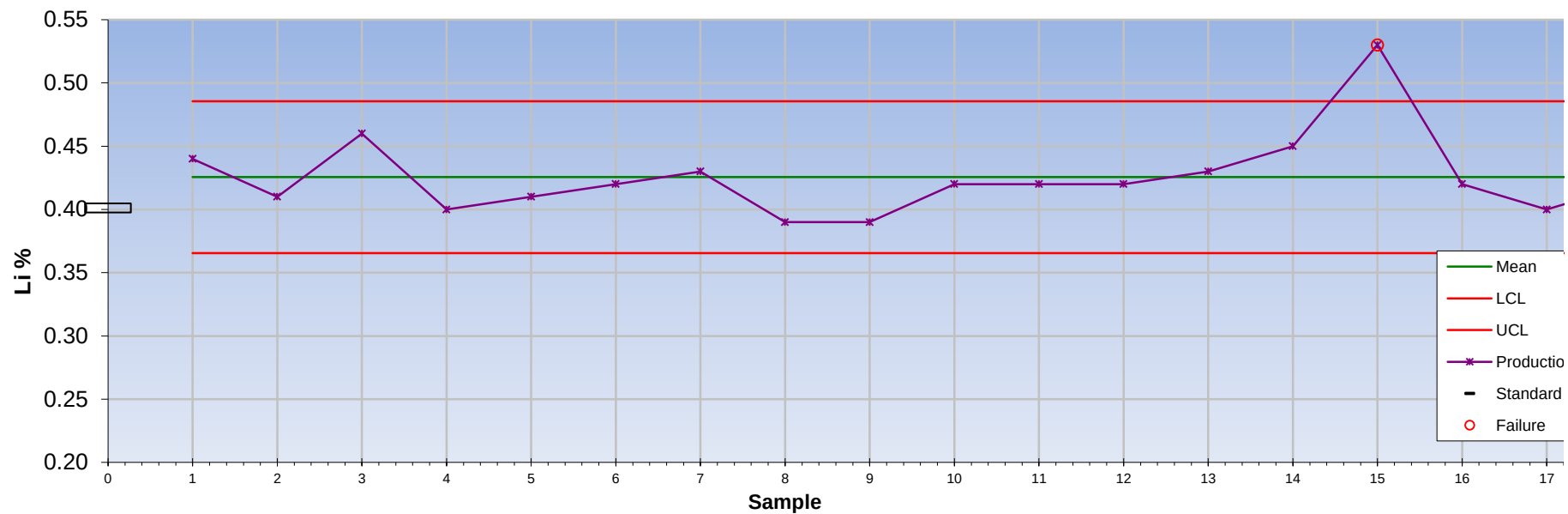
Moving Range Chart



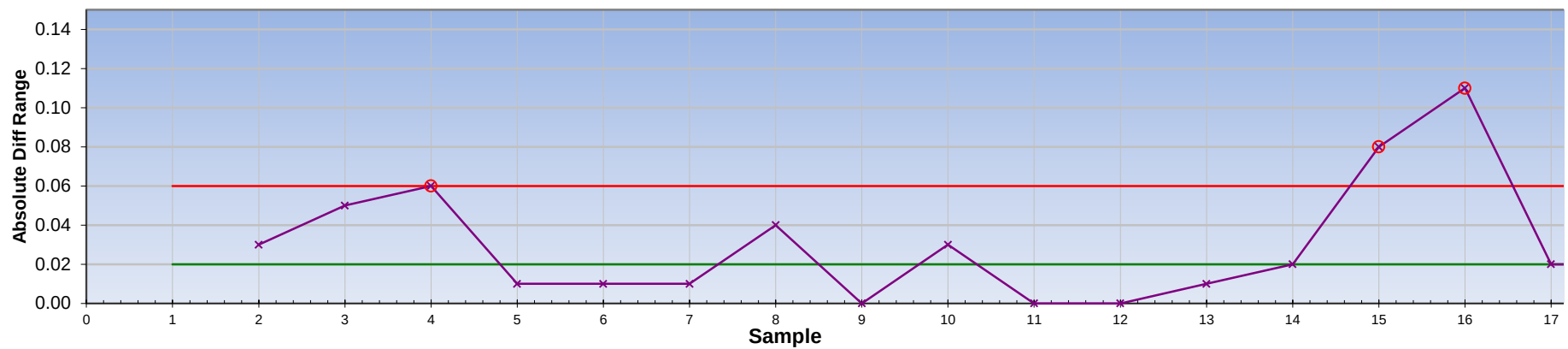
Li CONTROL CHART

Process Performance Chart

LRC-1



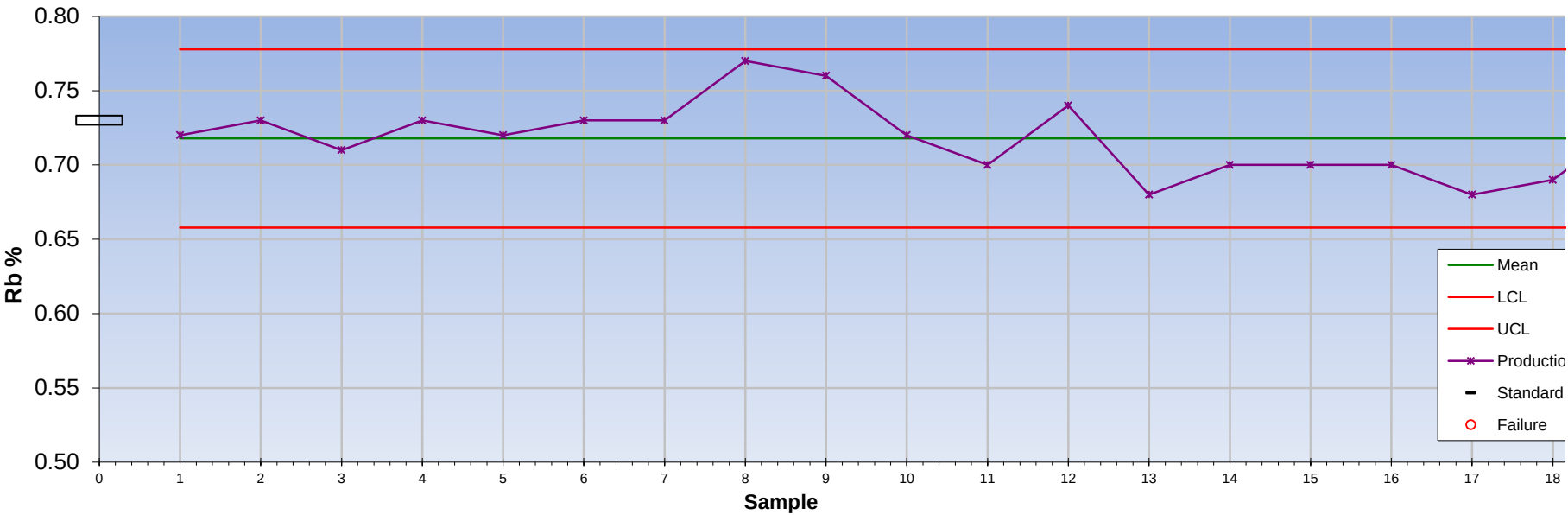
Moving Range Chart



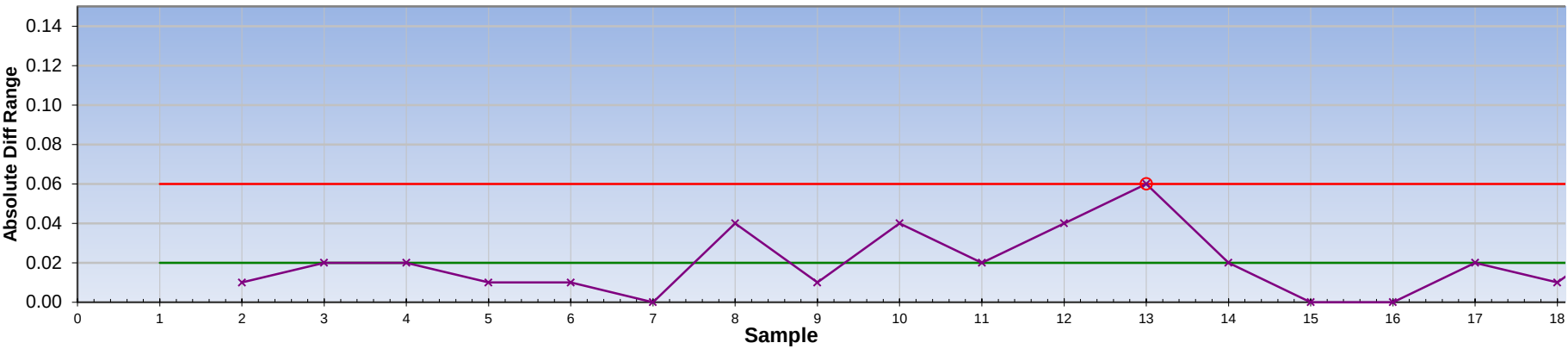
Rb CONTROL CHART

Process Performance Chart

LRC-1



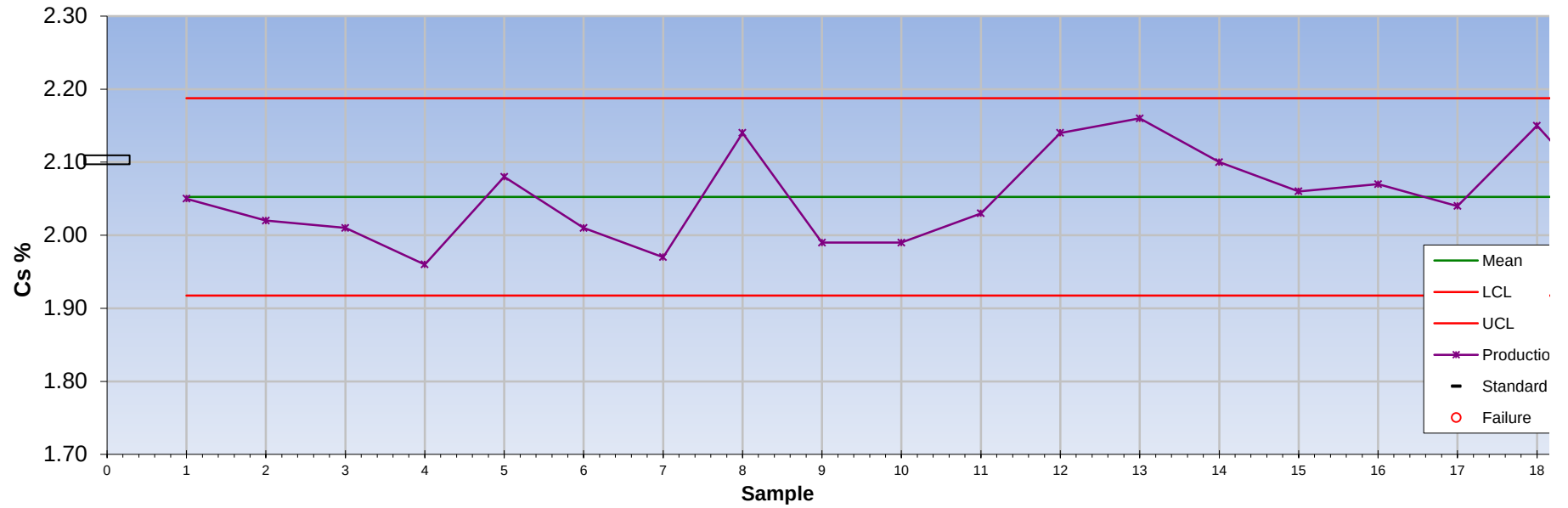
Moving Range Chart



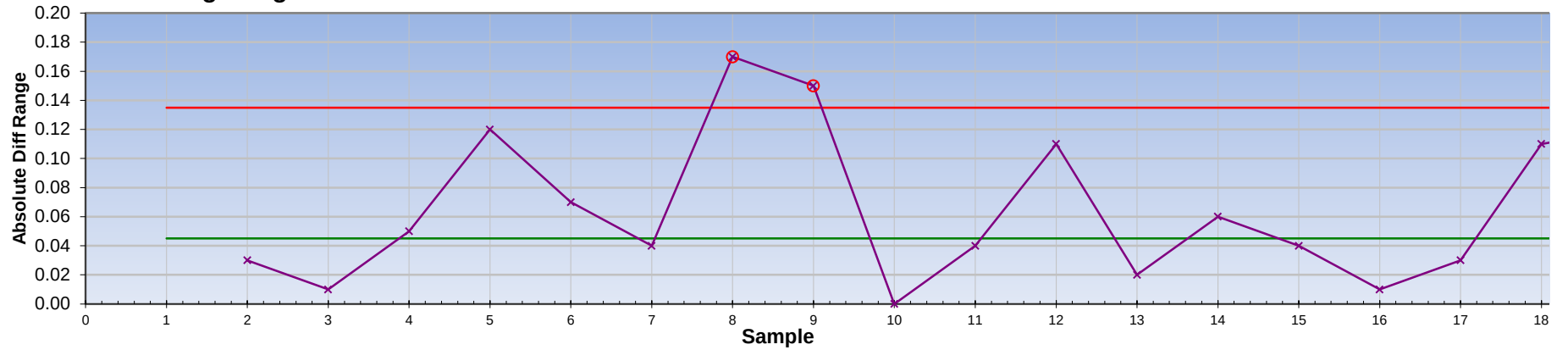
Cs CONTROL CHART

Process Performance Chart

LRC-2



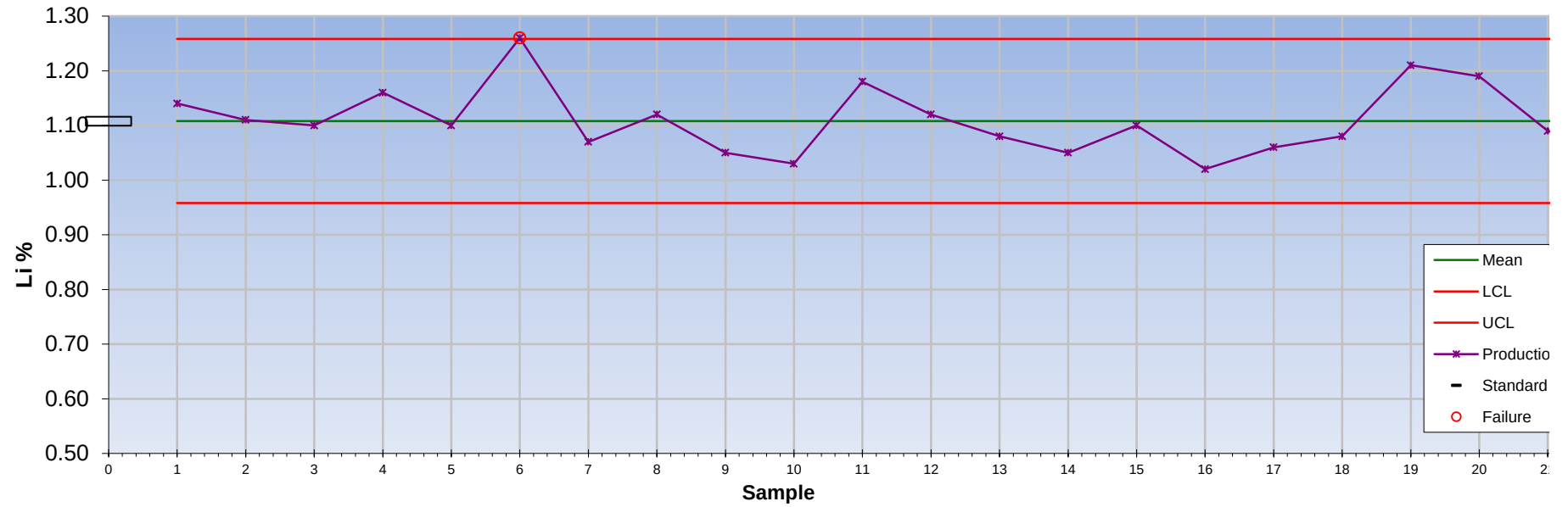
Moving Range Chart



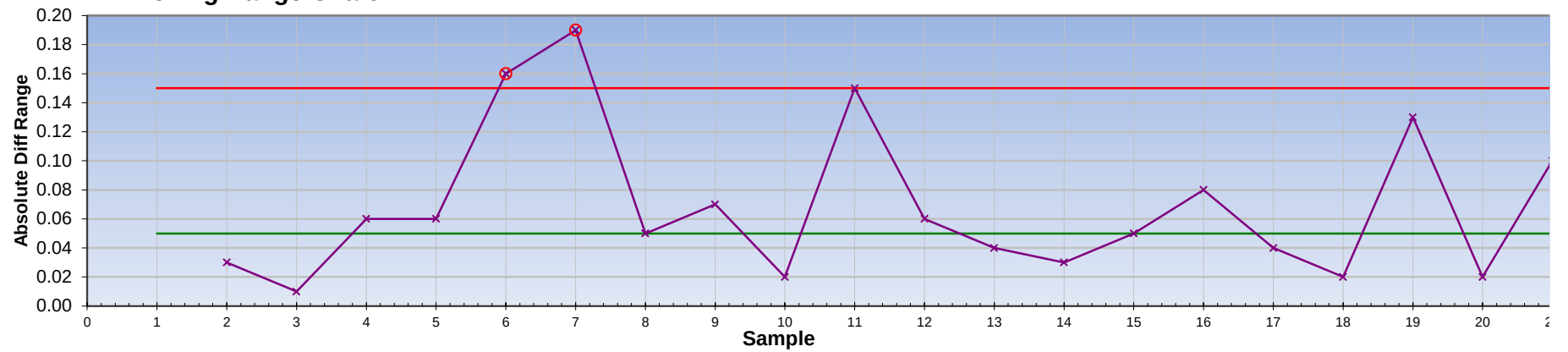
Li CONTROL CHART

Process Performance Chart

LRC-2



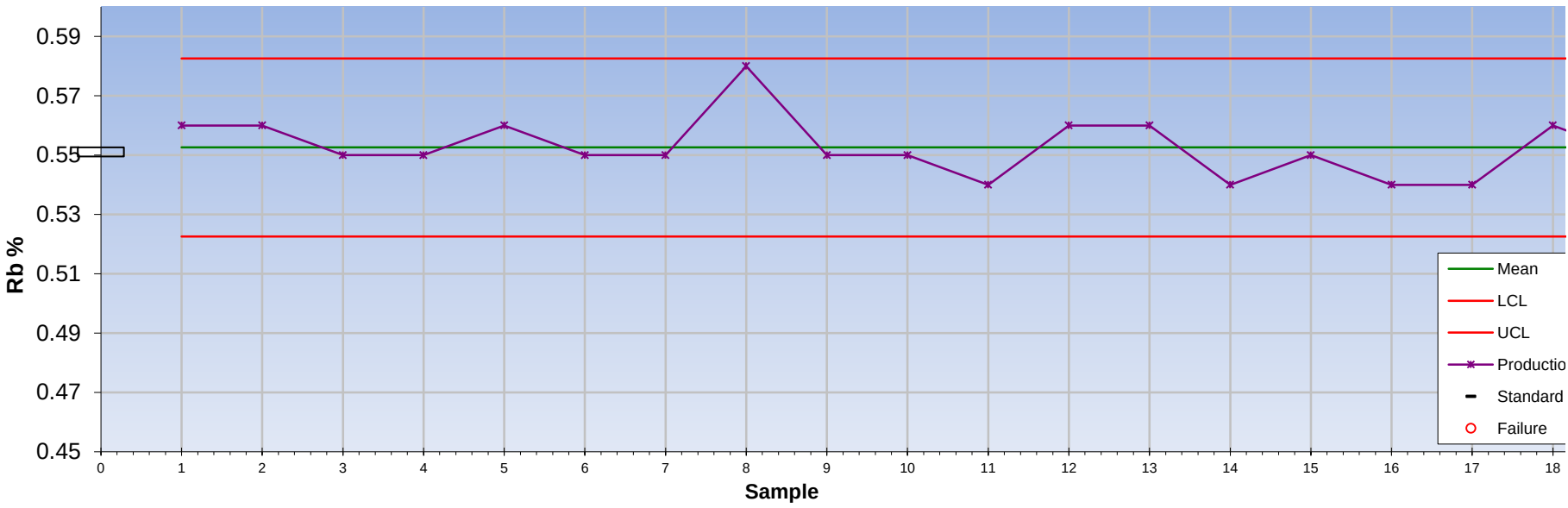
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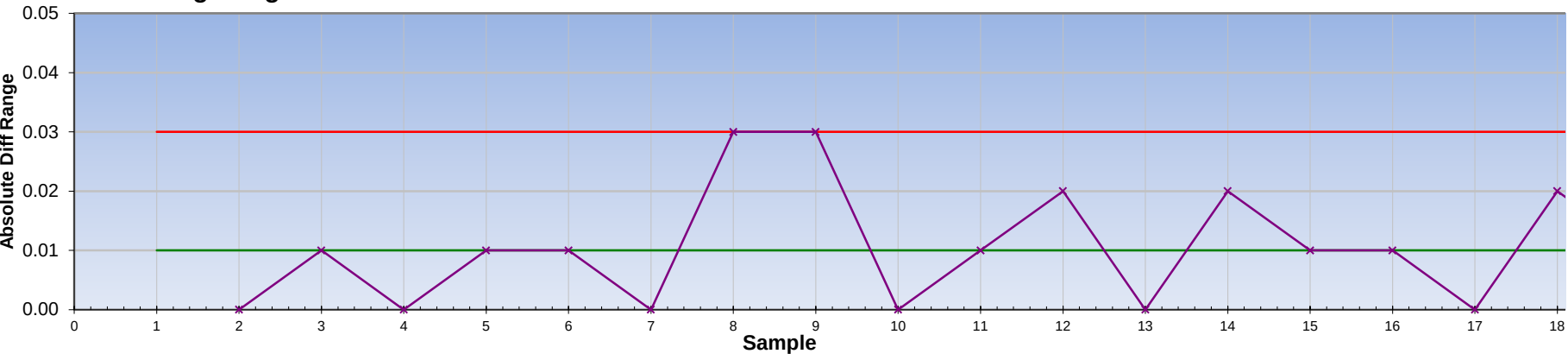
Rb CONTROL CHART

Process Performance Chart

LRC-2



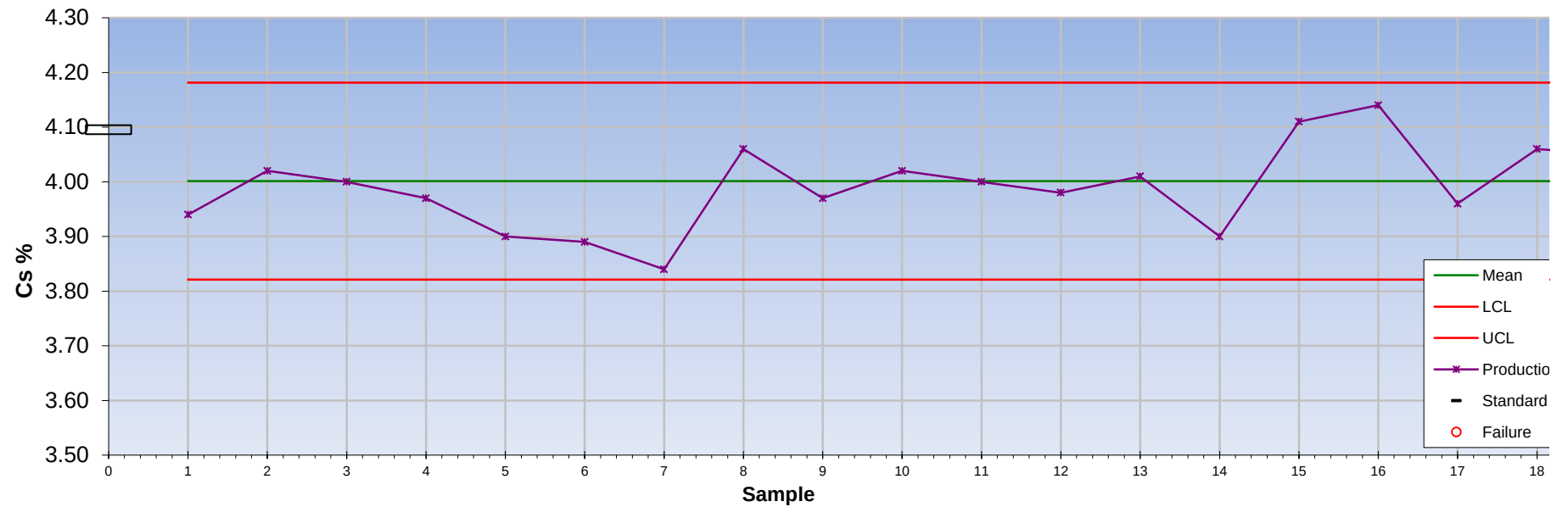
Moving Range Chart



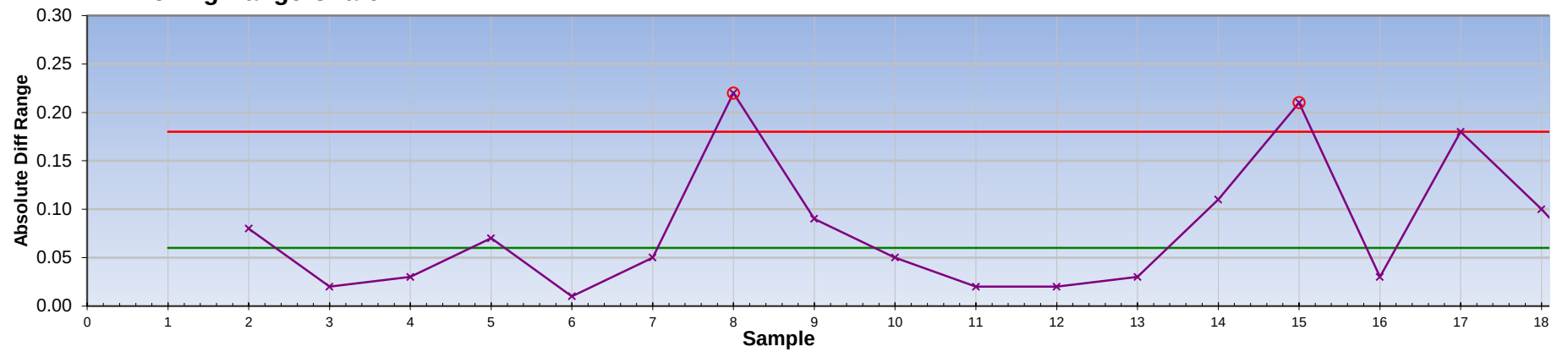
Cs CONTROL CHART

Process Performance Chart

LRC-3



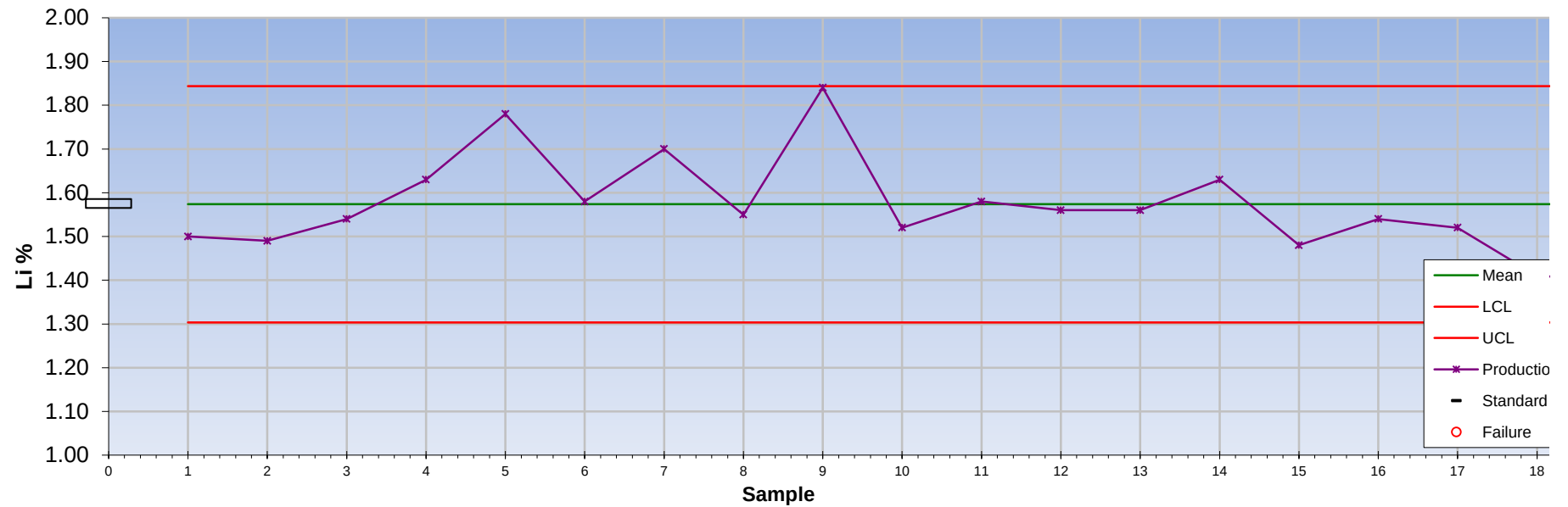
Moving Range Chart



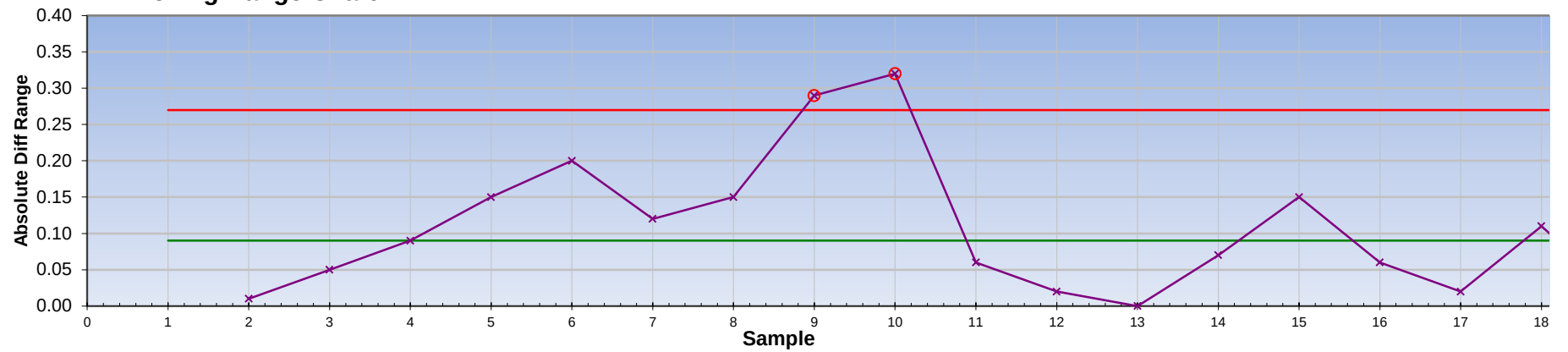
Li CONTROL CHART

Process Performance Chart

LRC-3



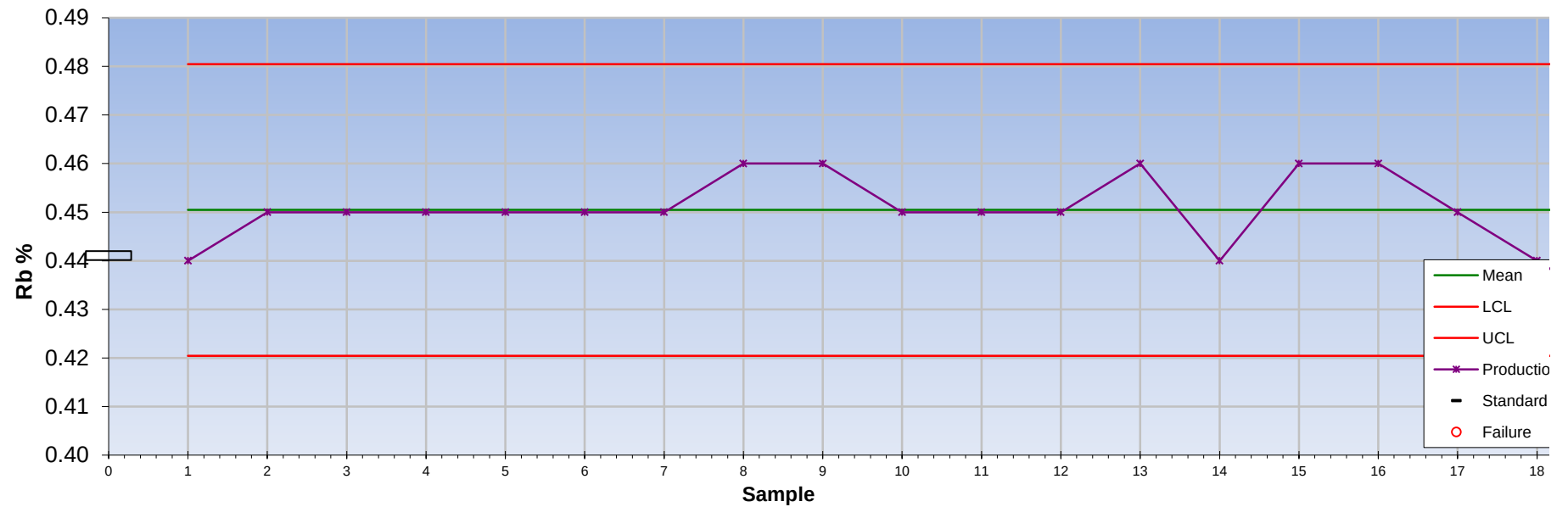
Moving Range Chart



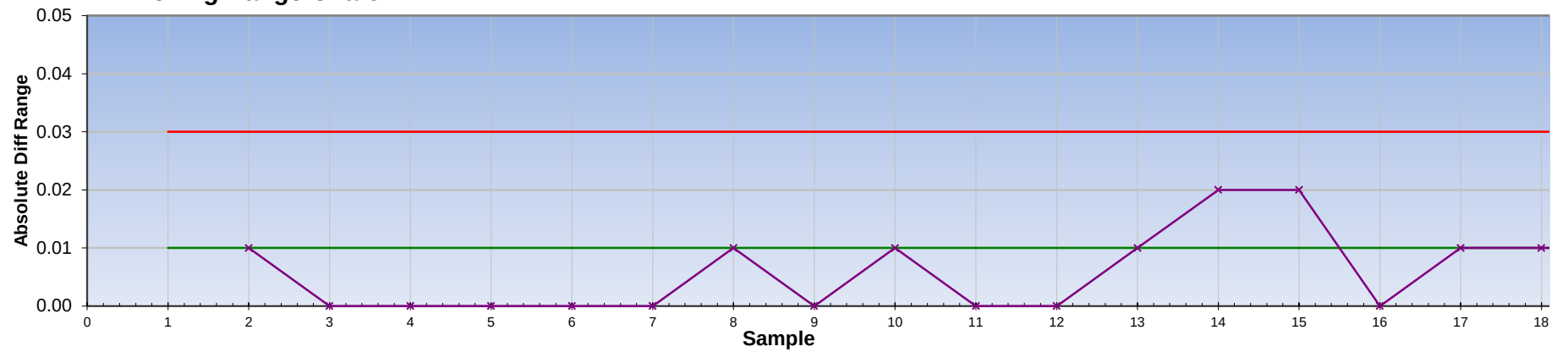
Rb CONTROL CHART

Process Performance Chart

LRC-3



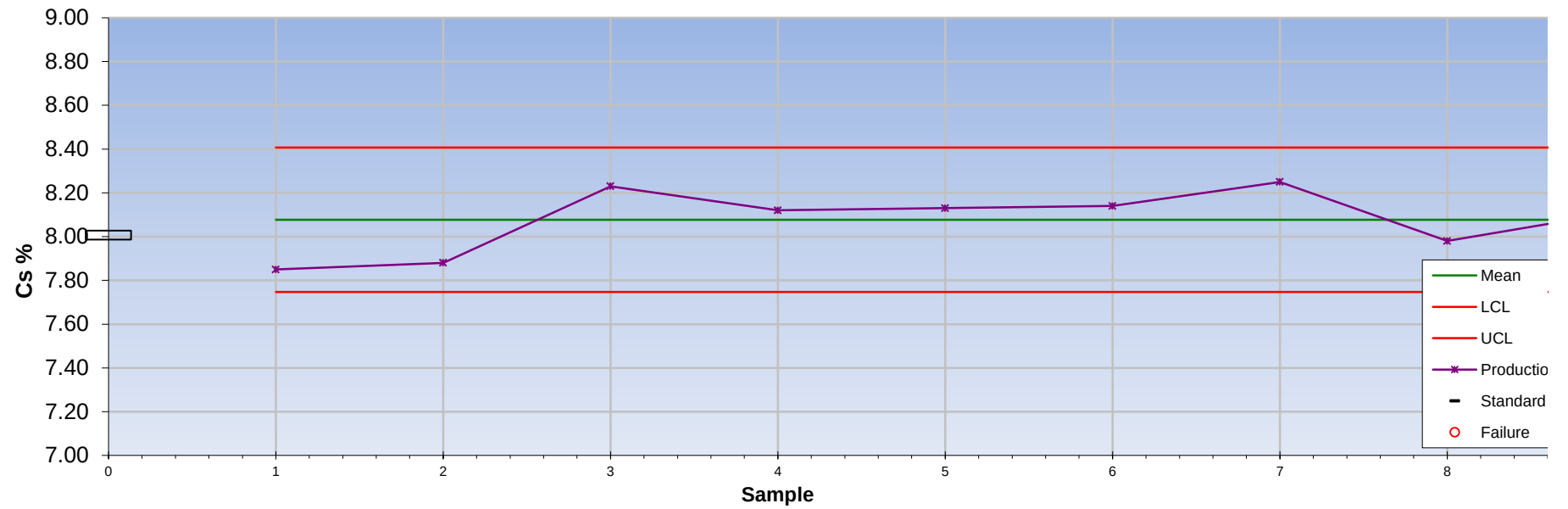
Moving Range Chart



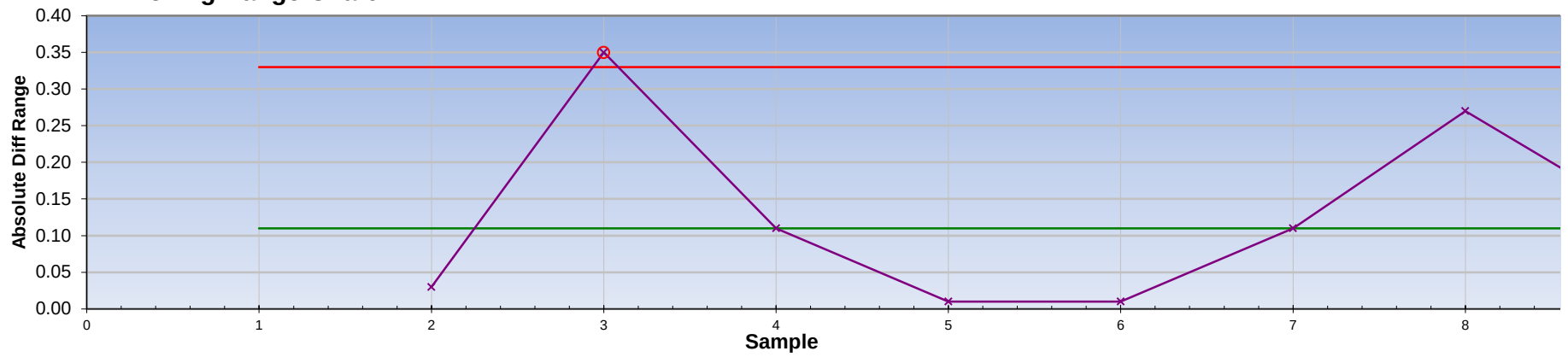
Cs CONTROL CHART

Process Performance Chart

LRC-4



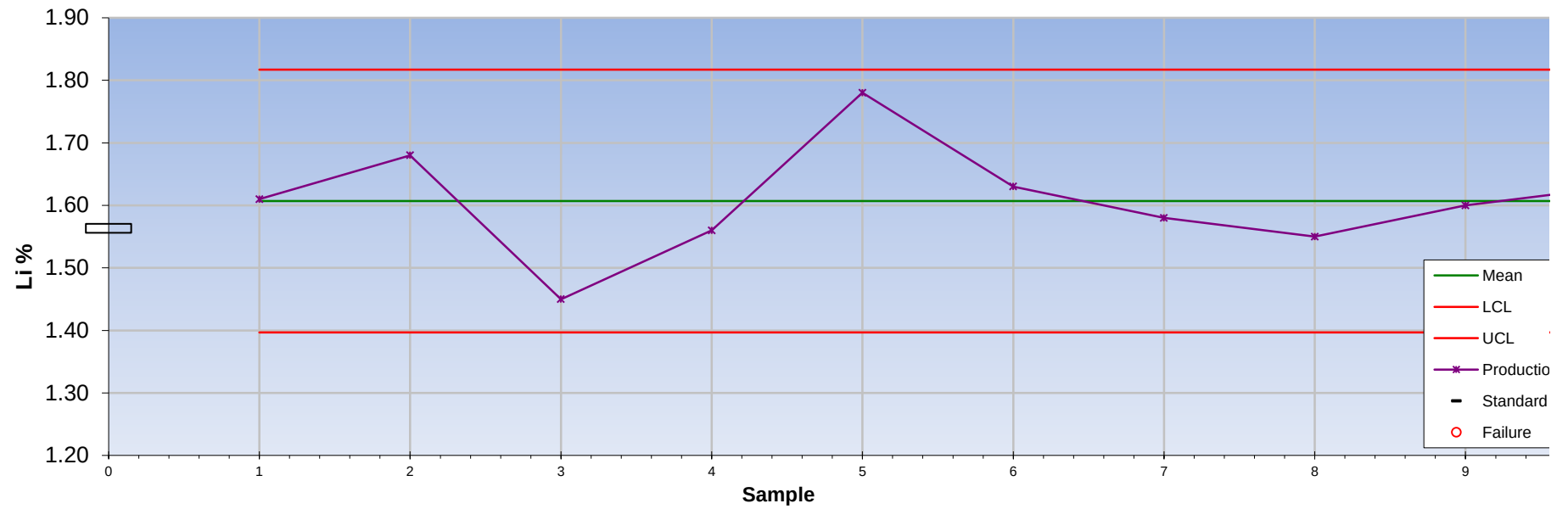
Moving Range Chart



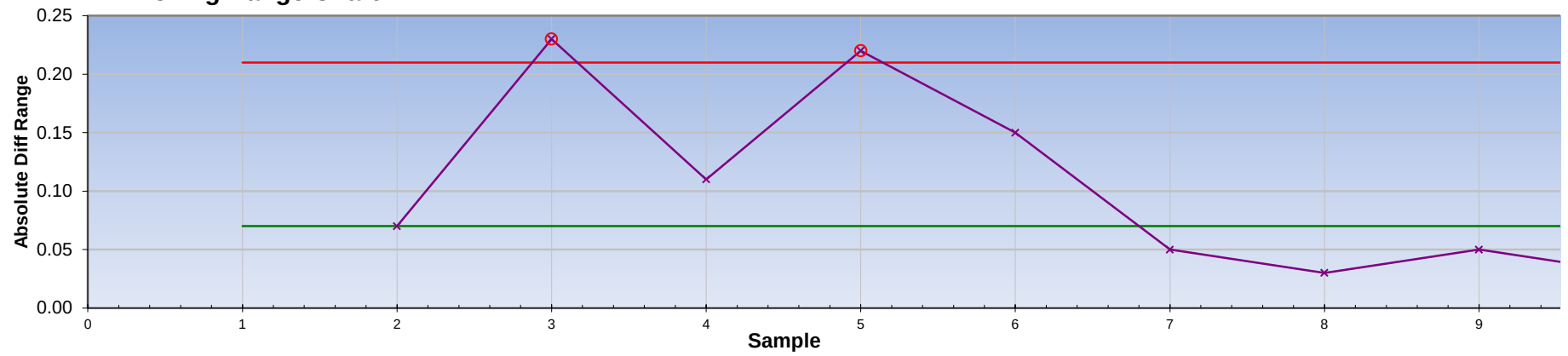
Li CONTROL CHART

Process Performance Chart

LRC-4



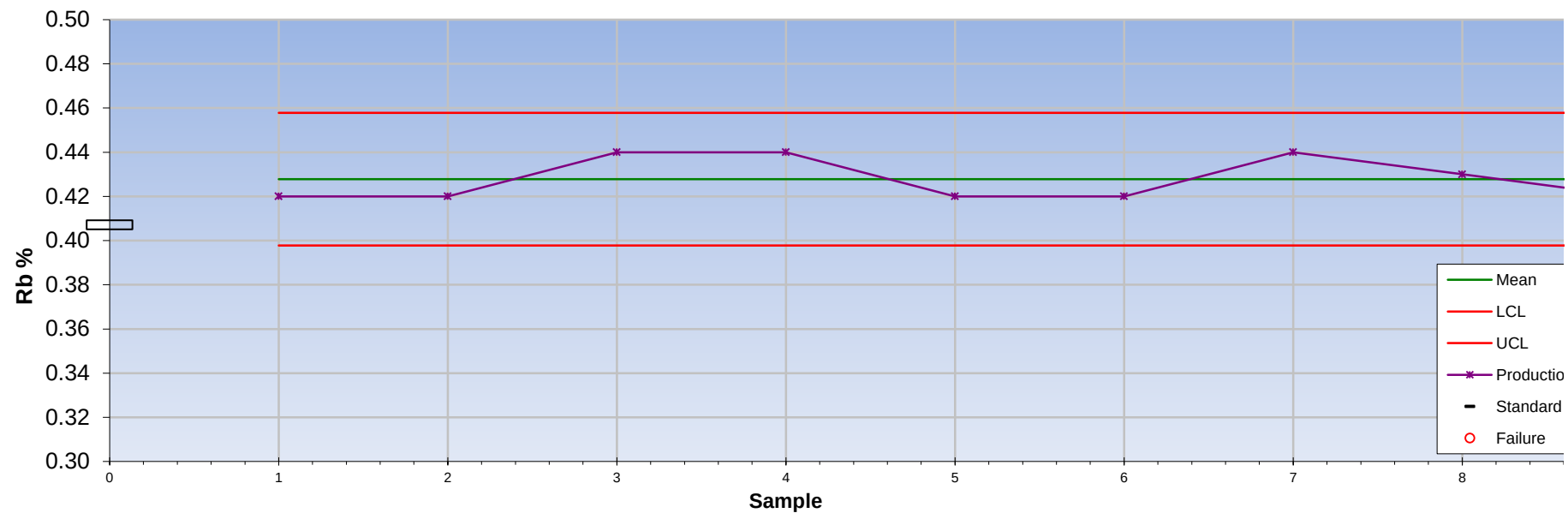
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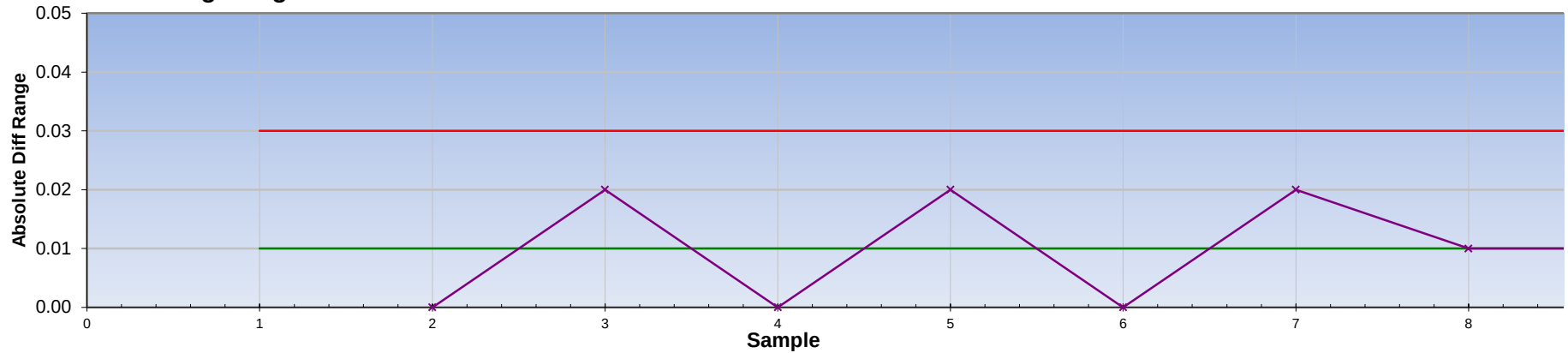
Rb CONTROL CHART

Process Performance Chart

LRC-4



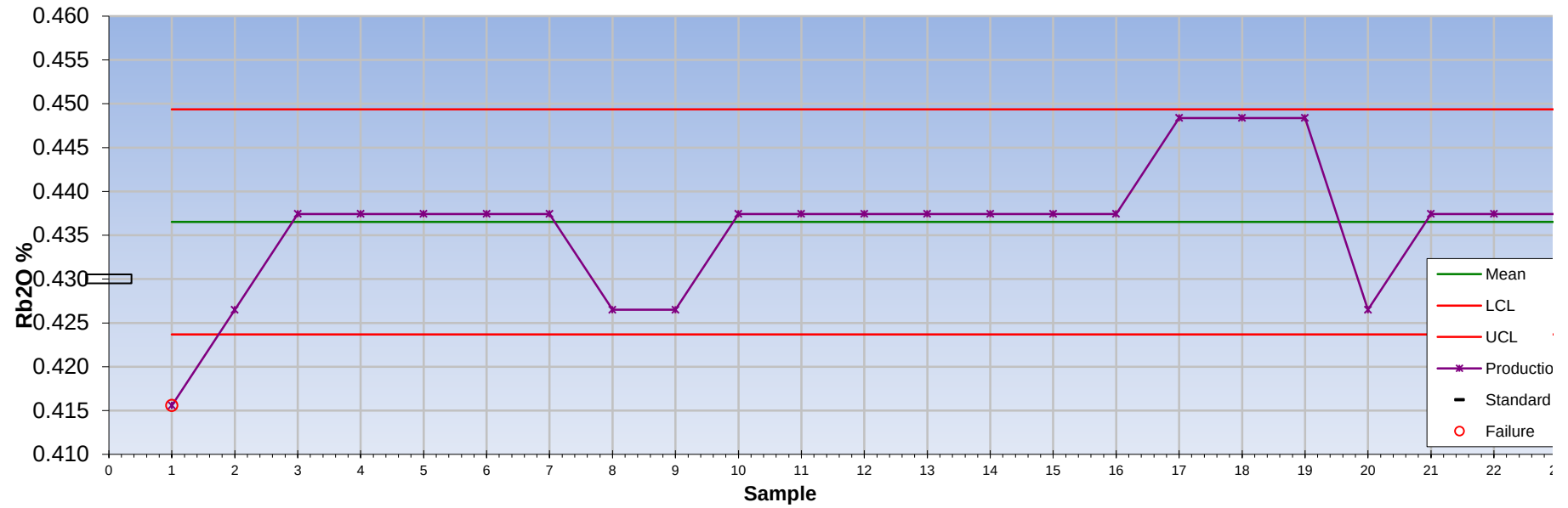
Moving Range Chart



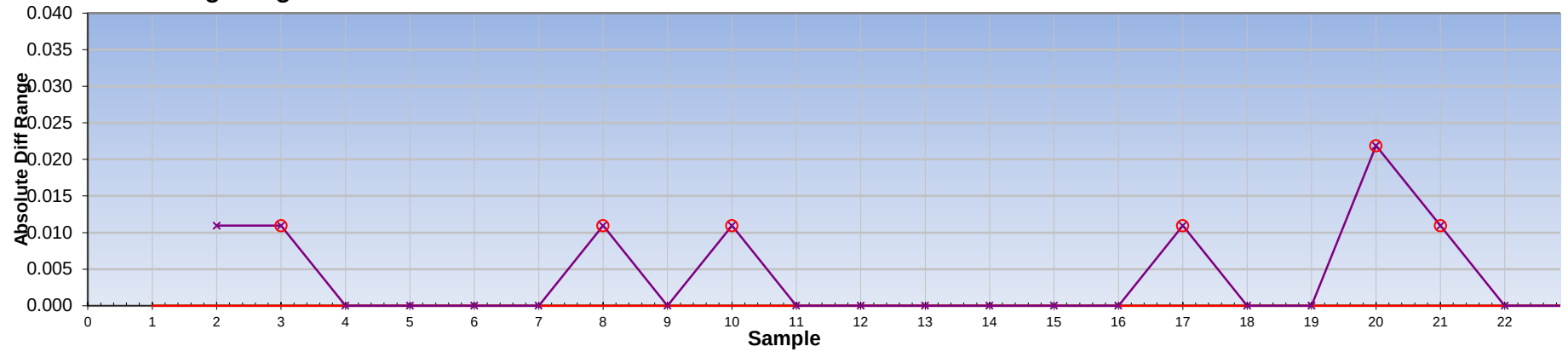
Rb2O CONTROL CHART

Process Performance Chart

PLTA-01



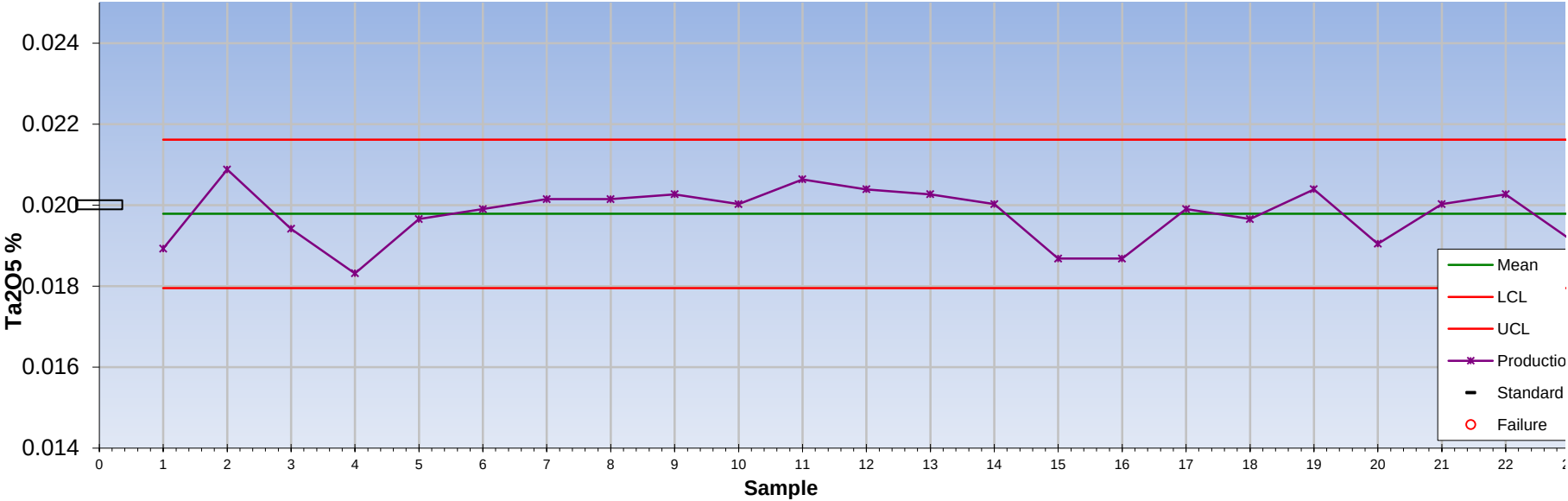
Moving Range Chart



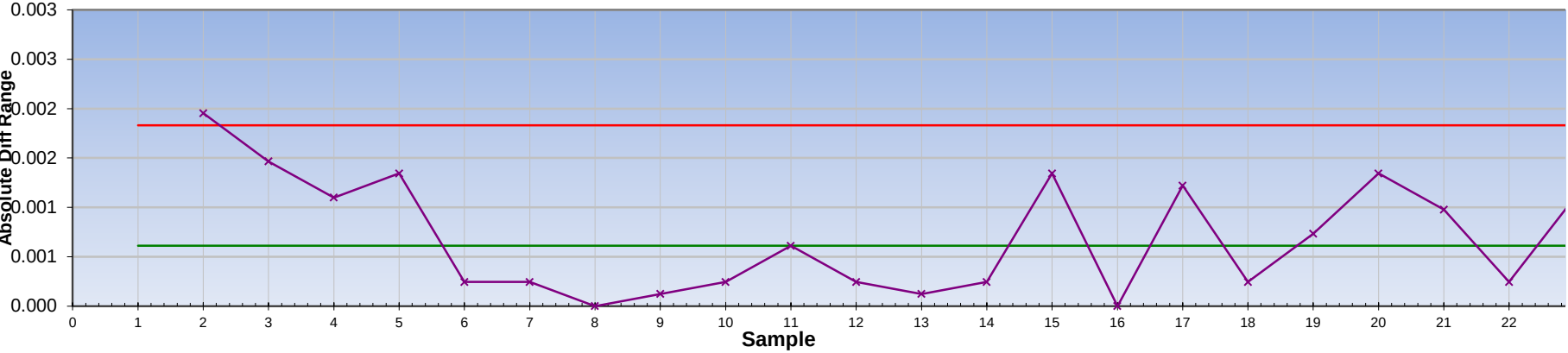
Ta2O5 CONTROL CHART

Process Performance Chart

PLTA-01



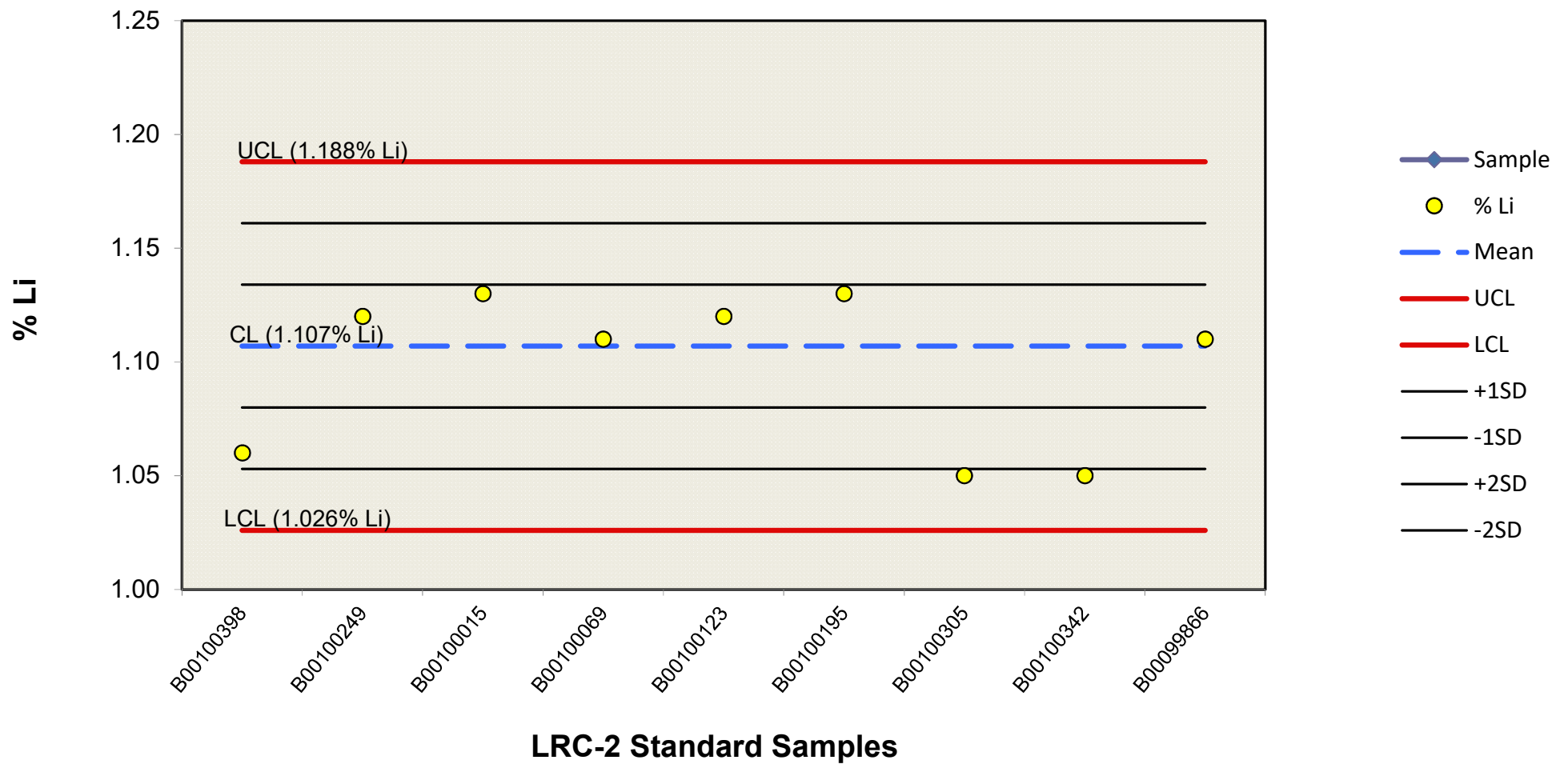
Moving Range Chart



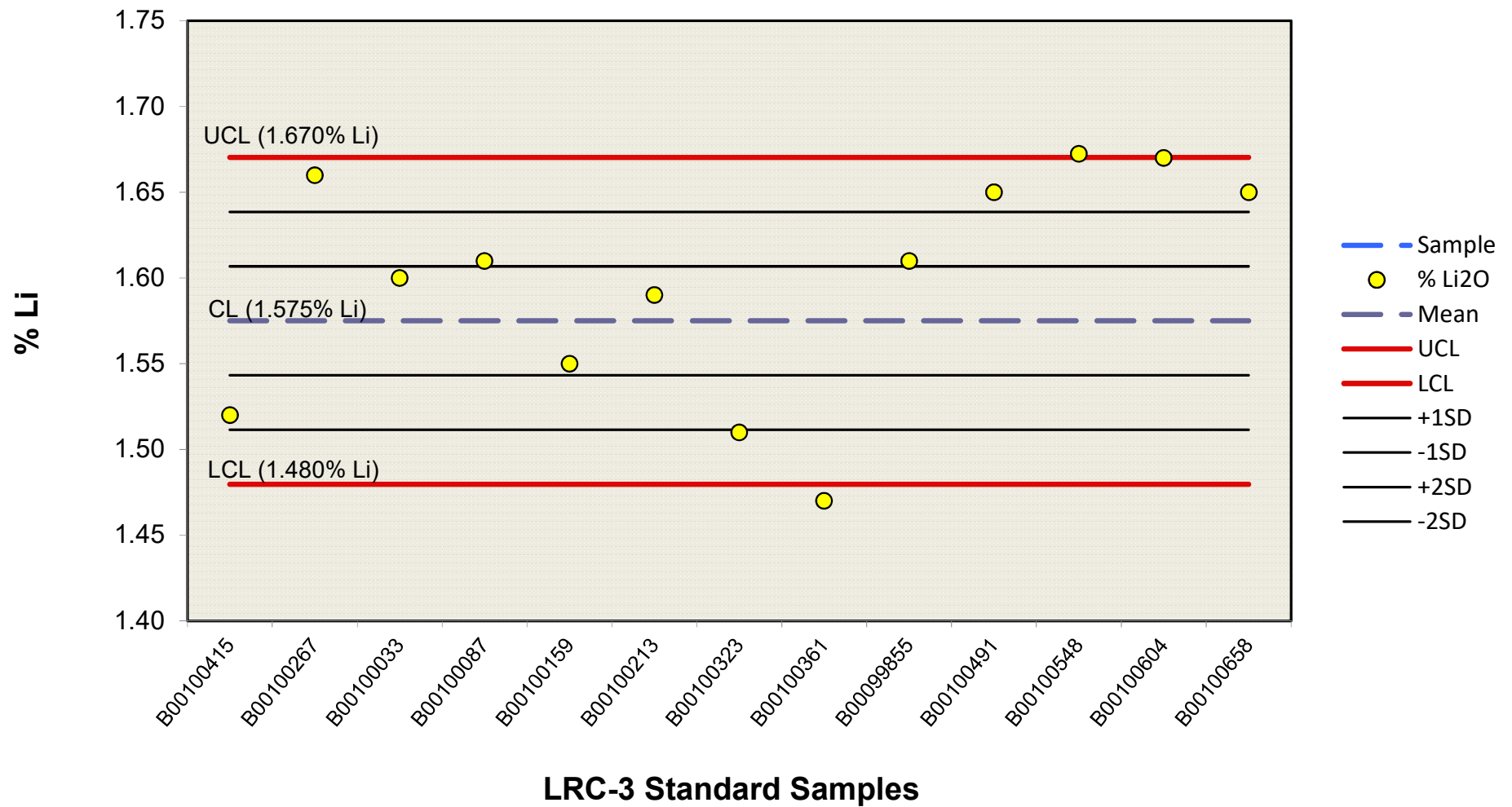
APPENDIX

B-2 *2018*

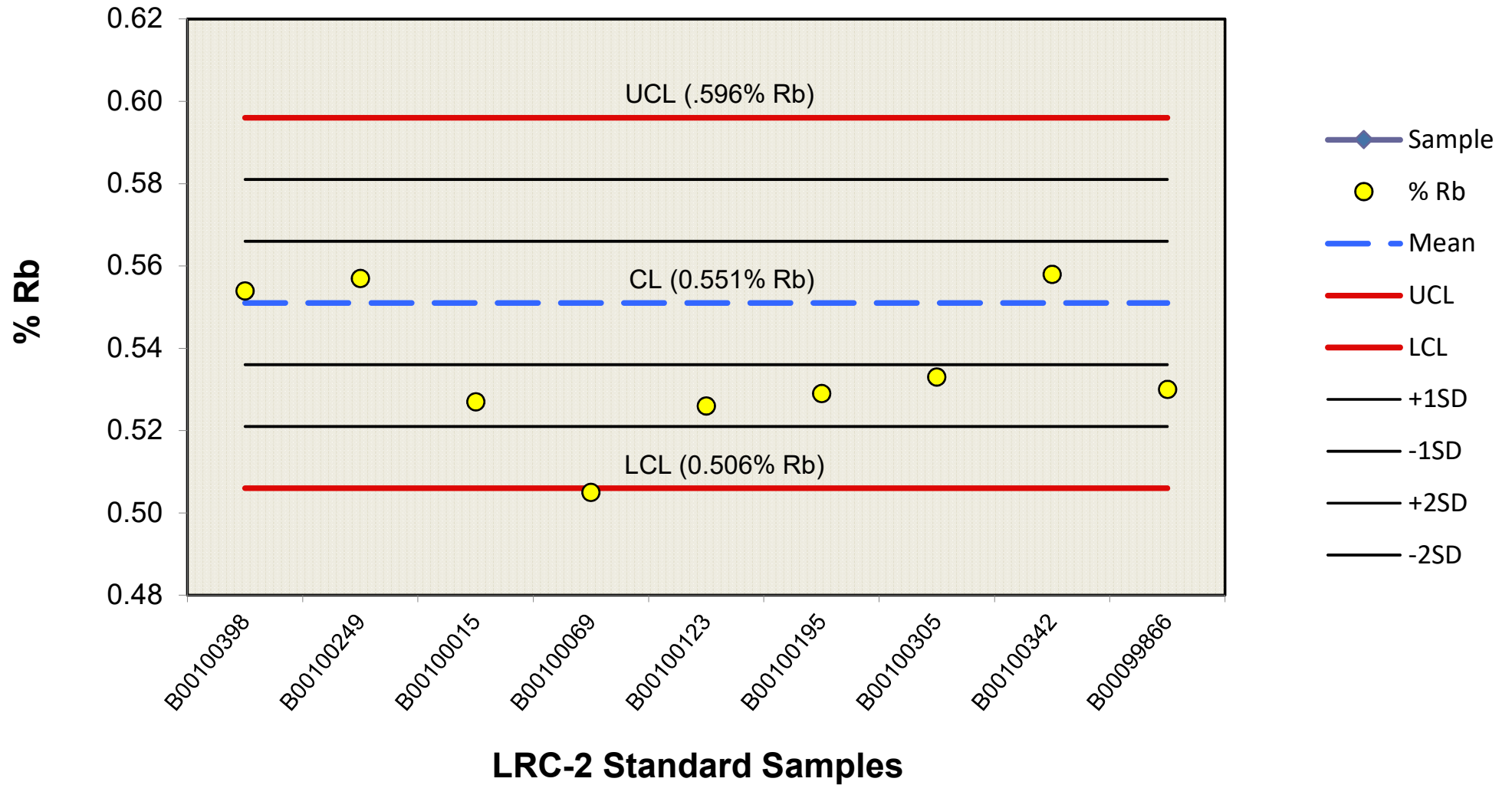
XbarS Control Chart for LRC-2 Standard (Li)



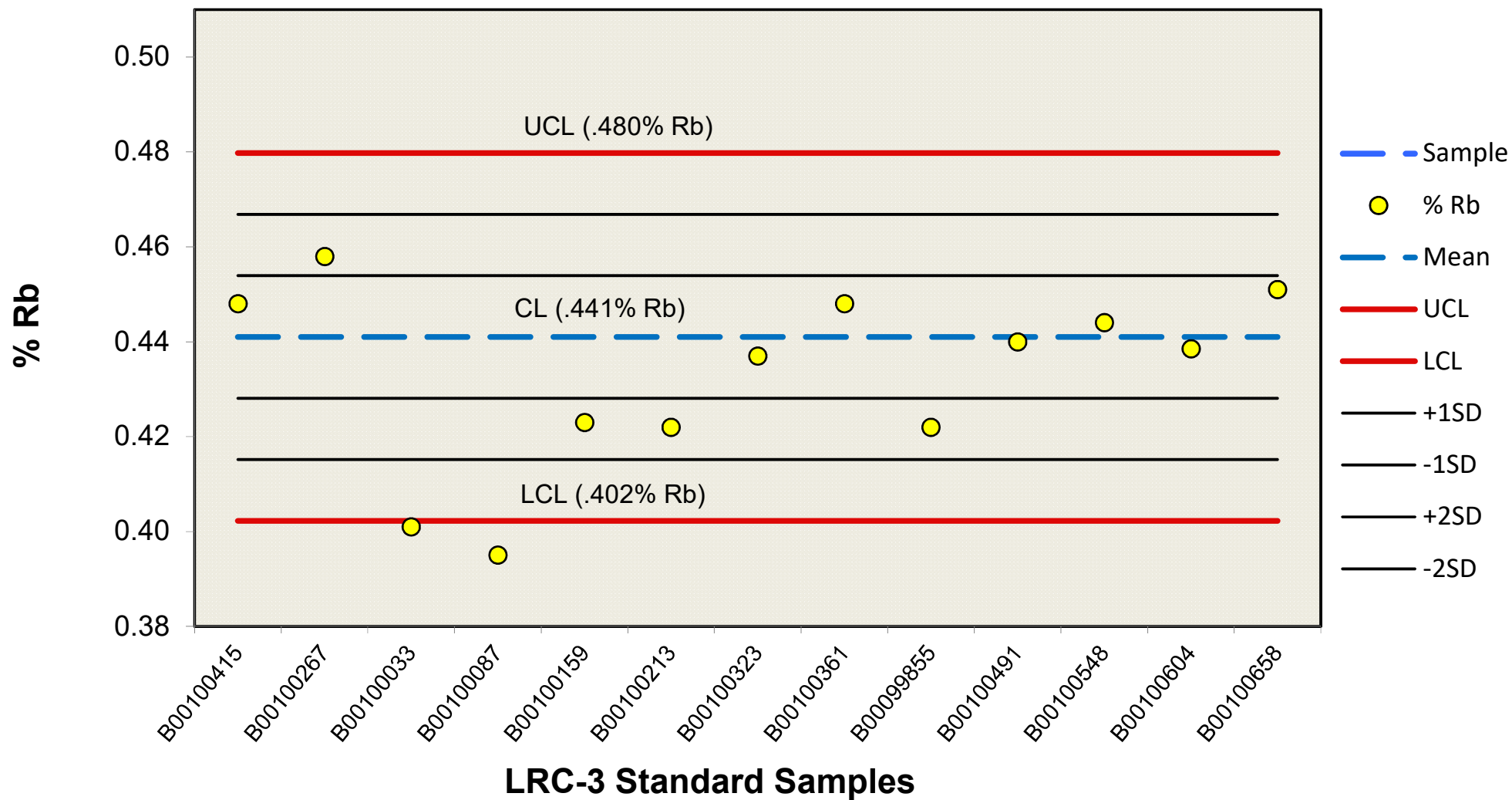
XbarS Control Chart for LRC-3 Standard (Li)



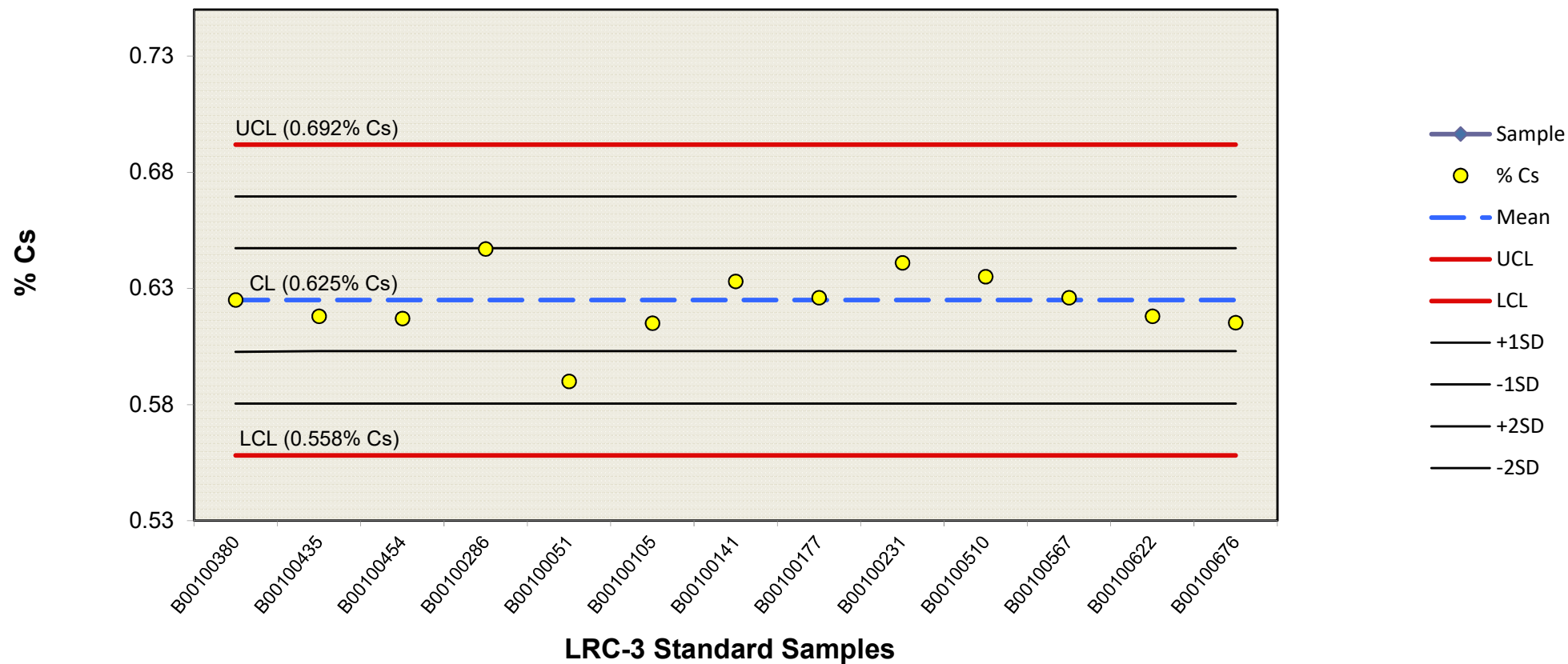
XbarS Control Chart for LRC-2 Standard (Rb)



XbarS Control Chart for LRC-3 Standard (Rb)



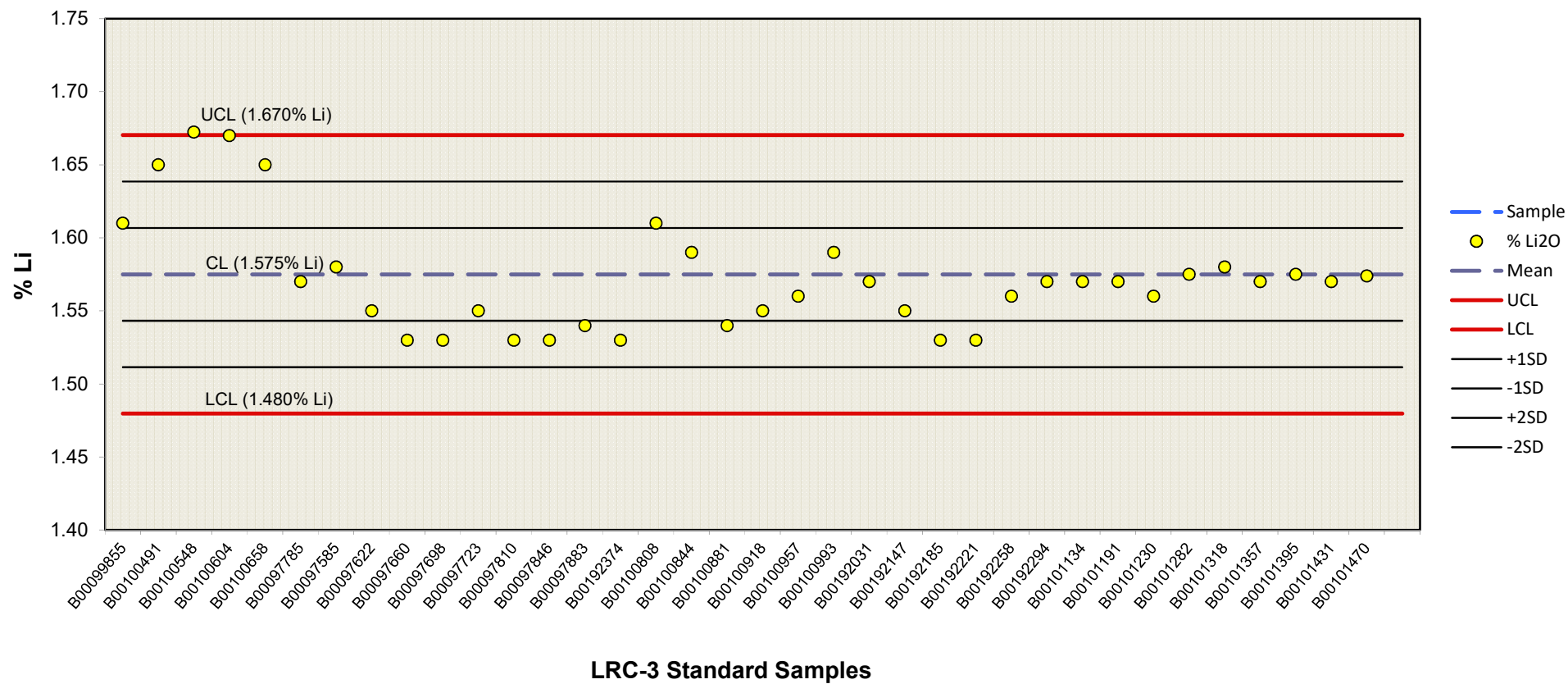
XbarS Control Chart for LRC-3 Standard (Cs)



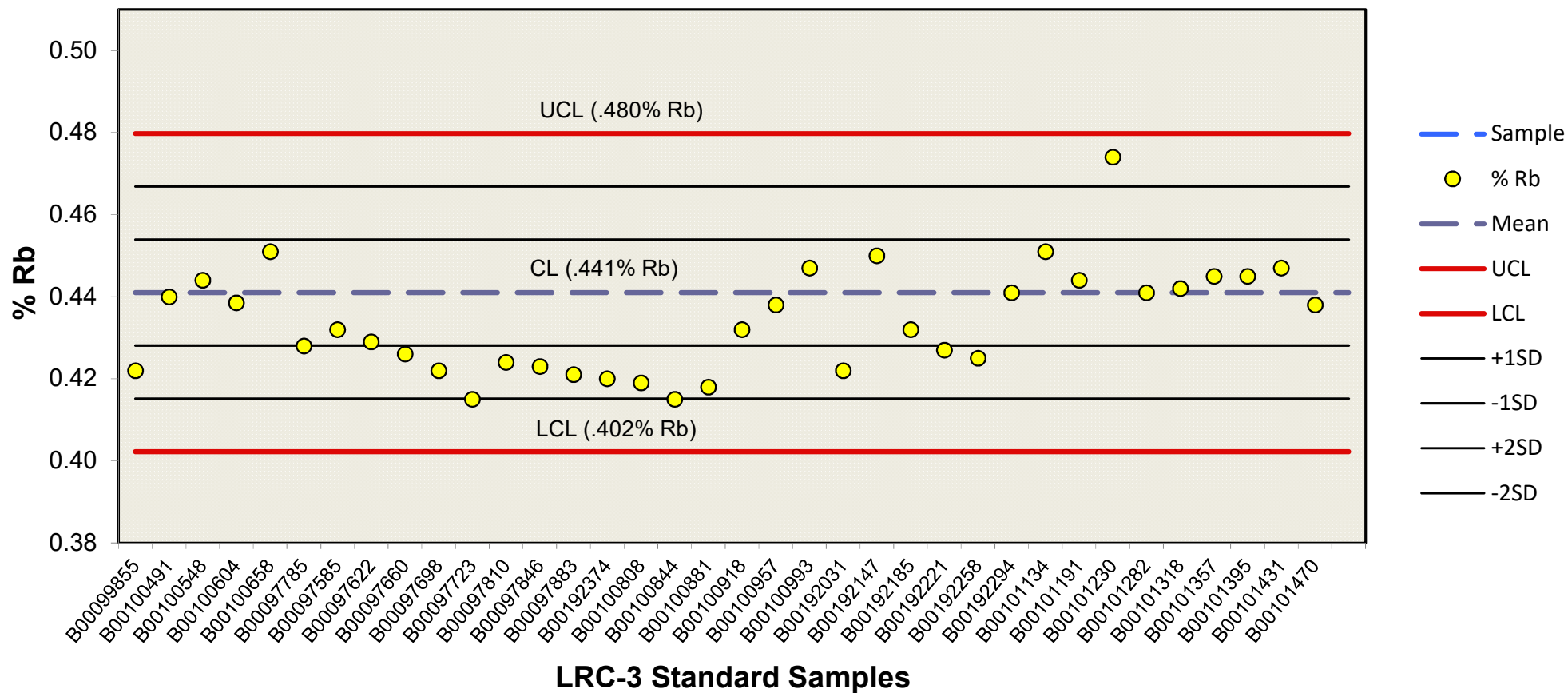
APPENDIX

B-3 *2019*

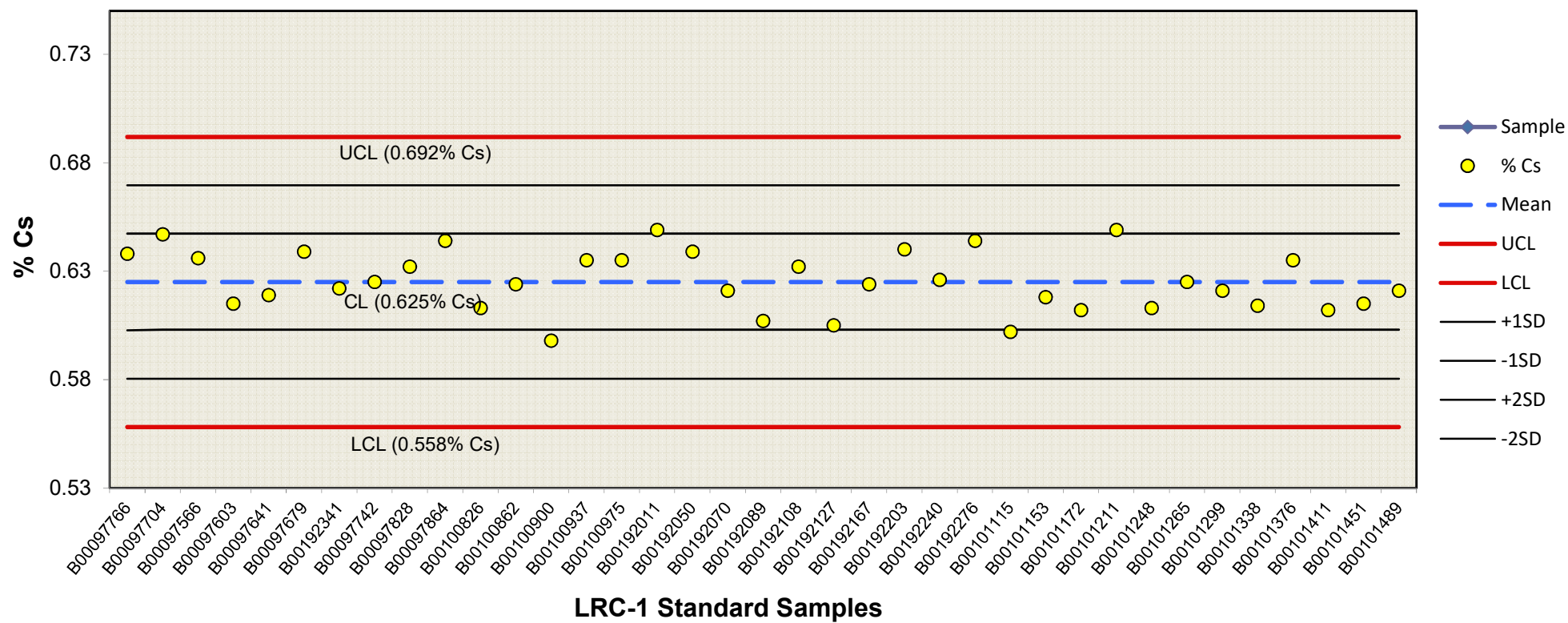
XbarS Control Chart for LRC-3 Standard (Li)



XbarS Control Chart for LRC-3 Standard (Rb)



XbarS Control Chart for LRC-1 Standard (Cs)

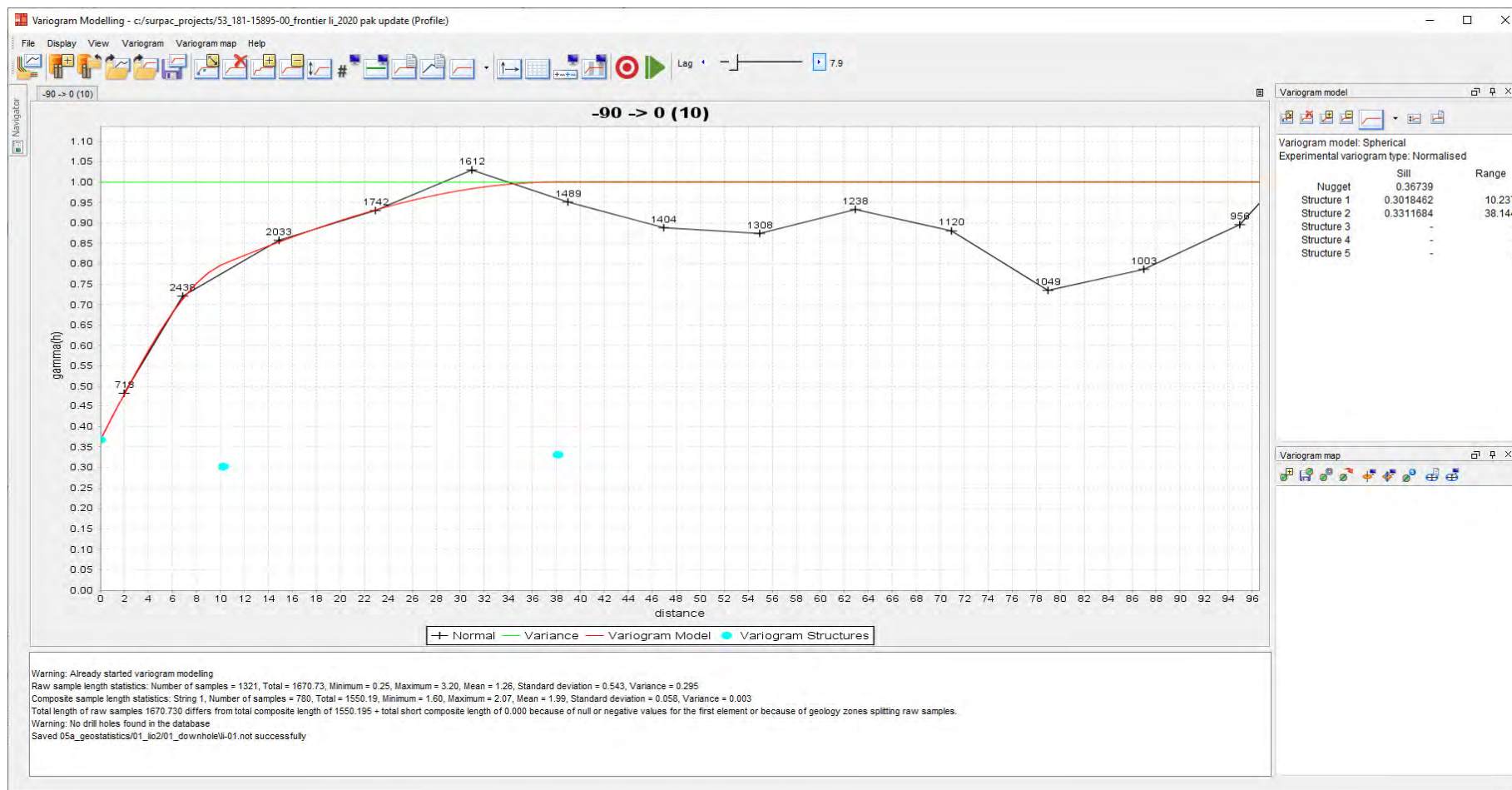


APPENDIX

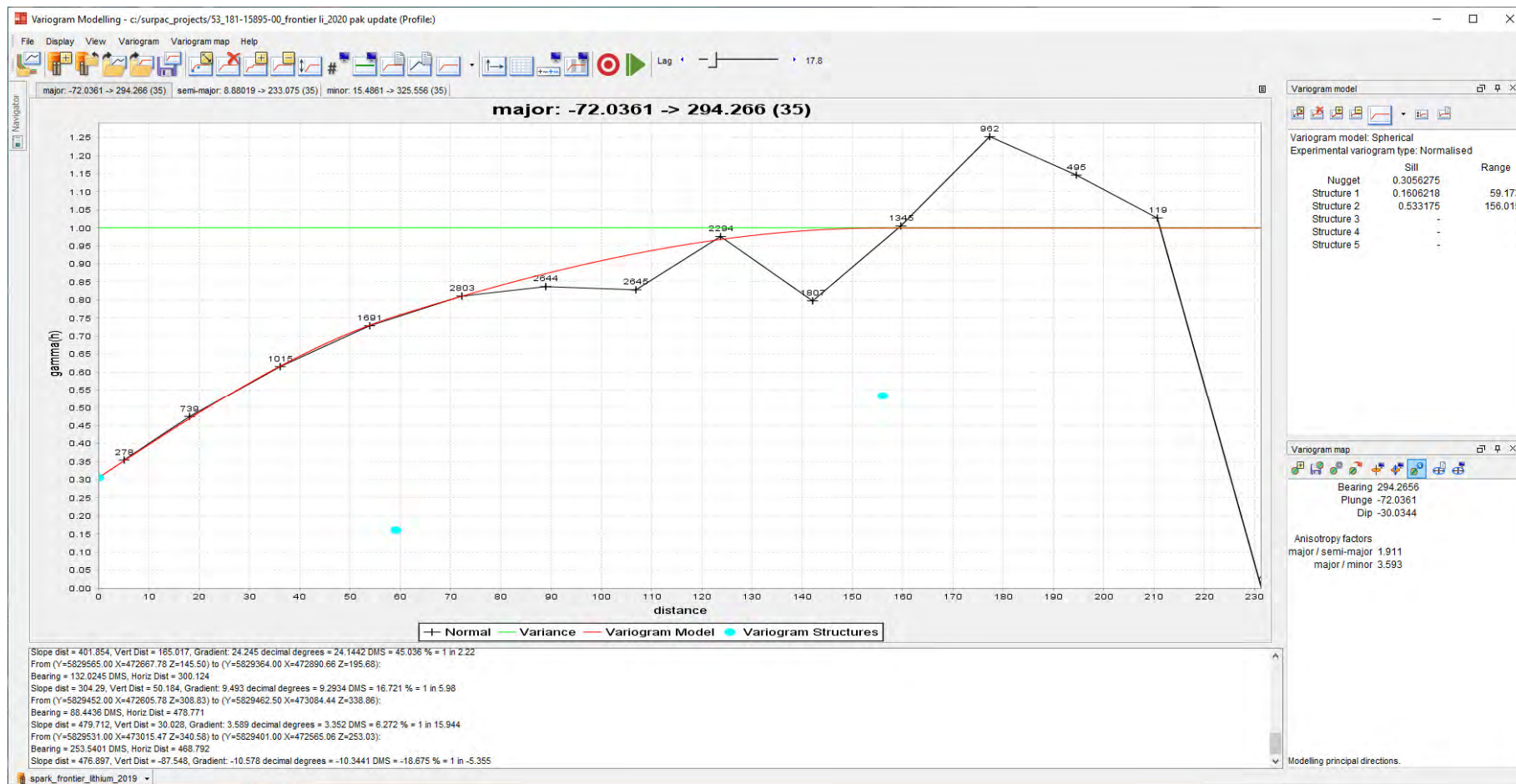
C VARIOGRAM MODELS

A large, white, stylized geometric shape, resembling a thick 'V' or a folded corner, is positioned in the bottom-left corner of the page. It has a light blue shadow on the right side, giving it a 3D effect.

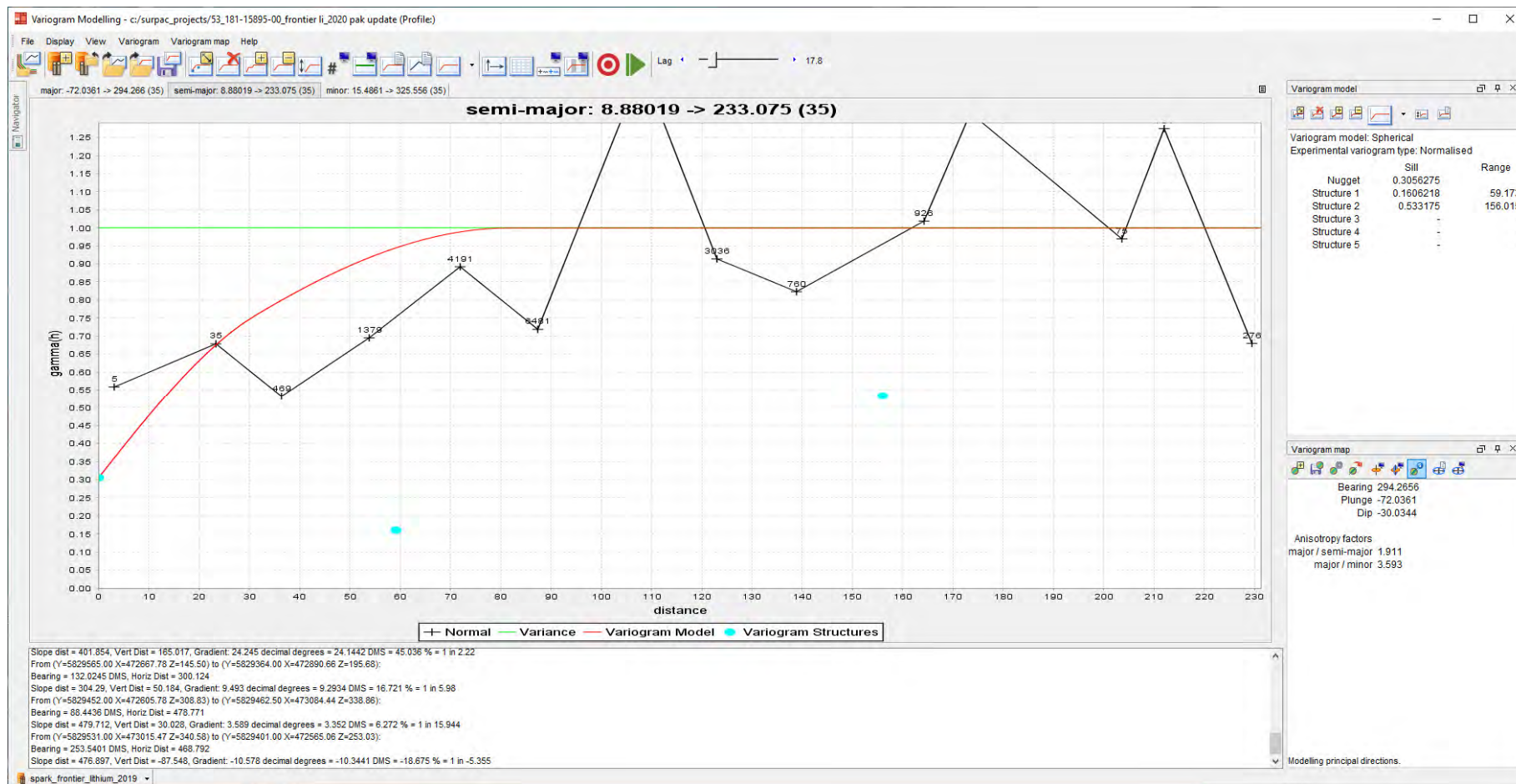
LiO₂ Downhole Variogram



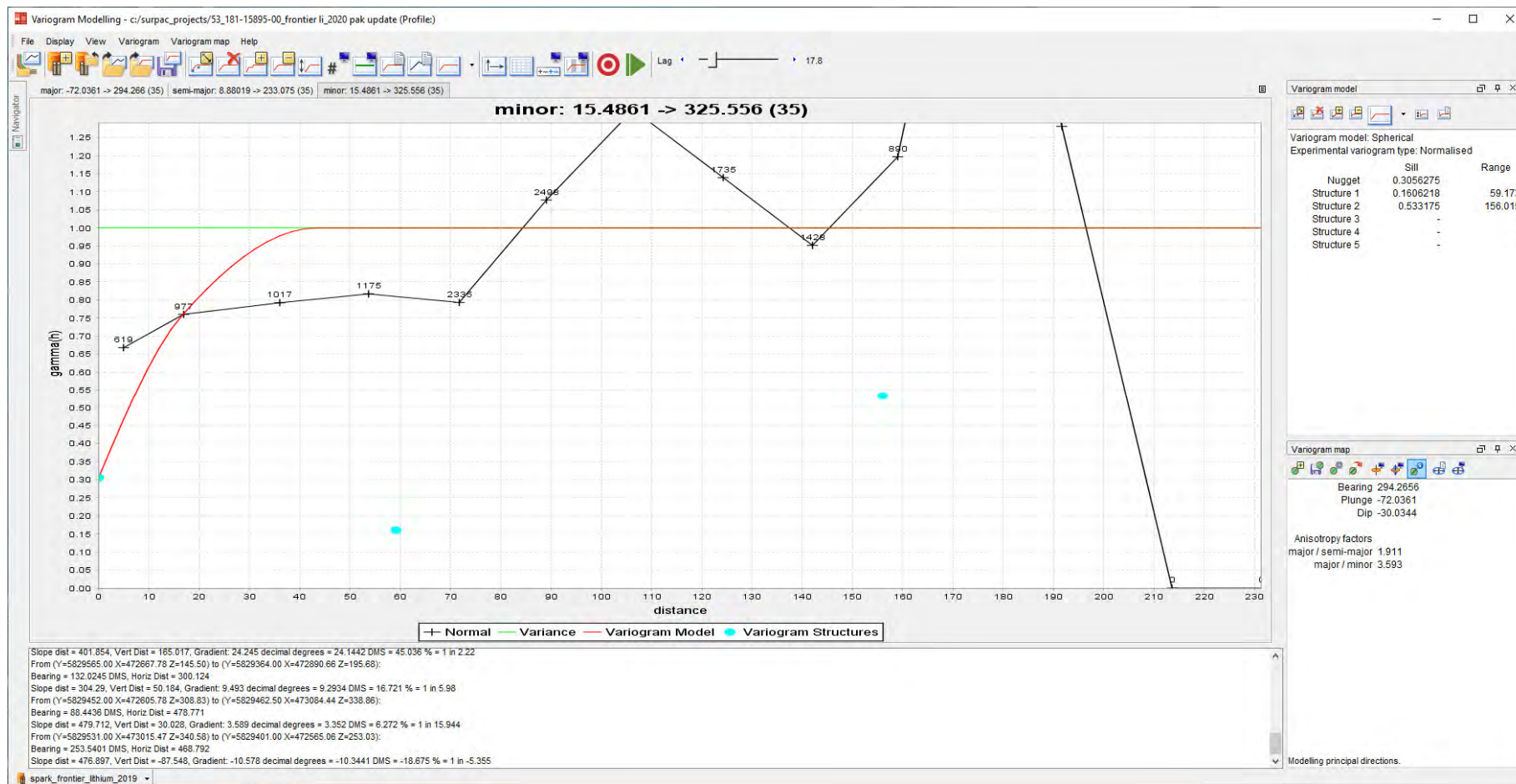
LiO₂ Major Axis Variogram



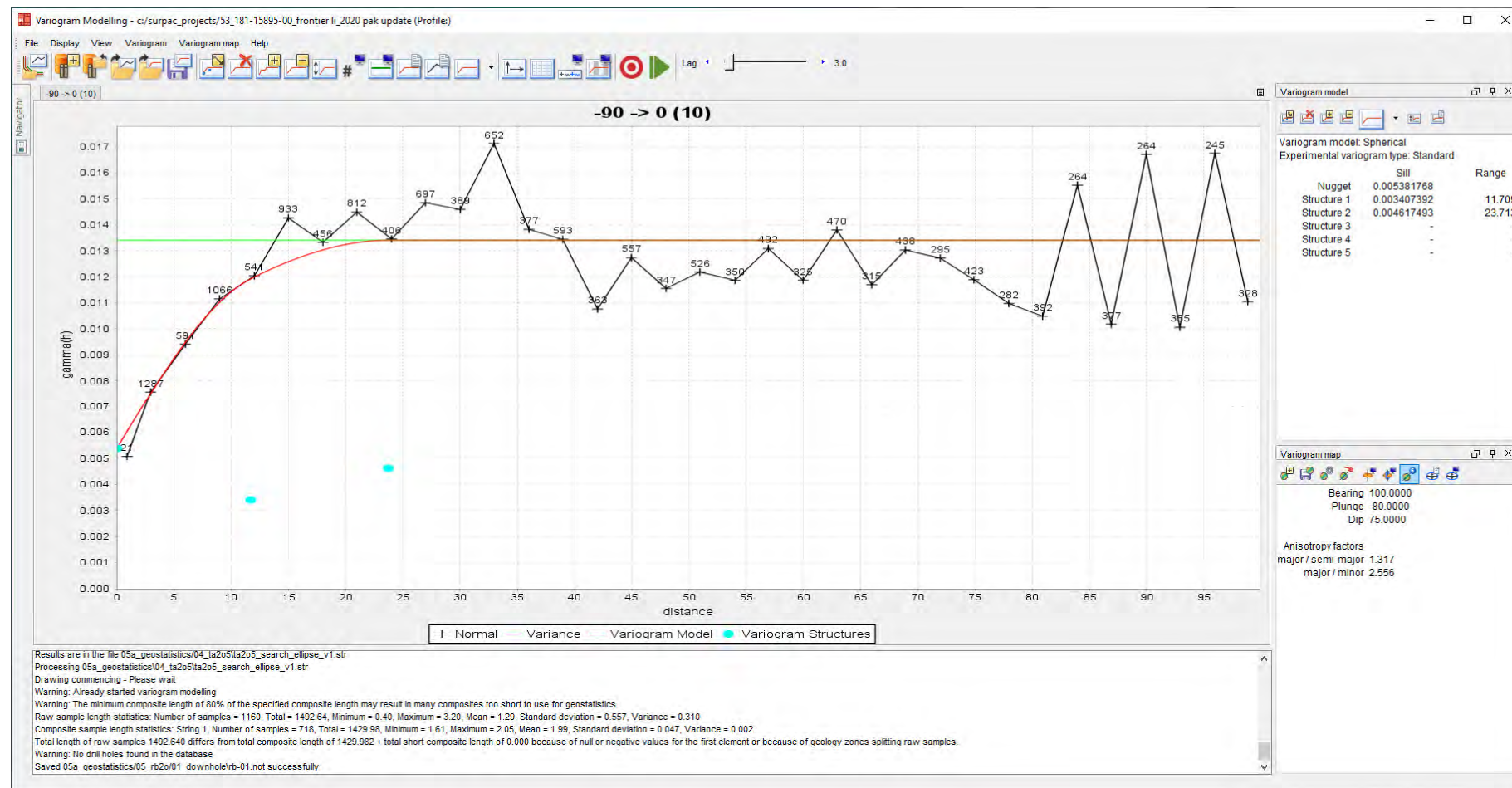
LiO₂ Semi-Major Axis Variogram



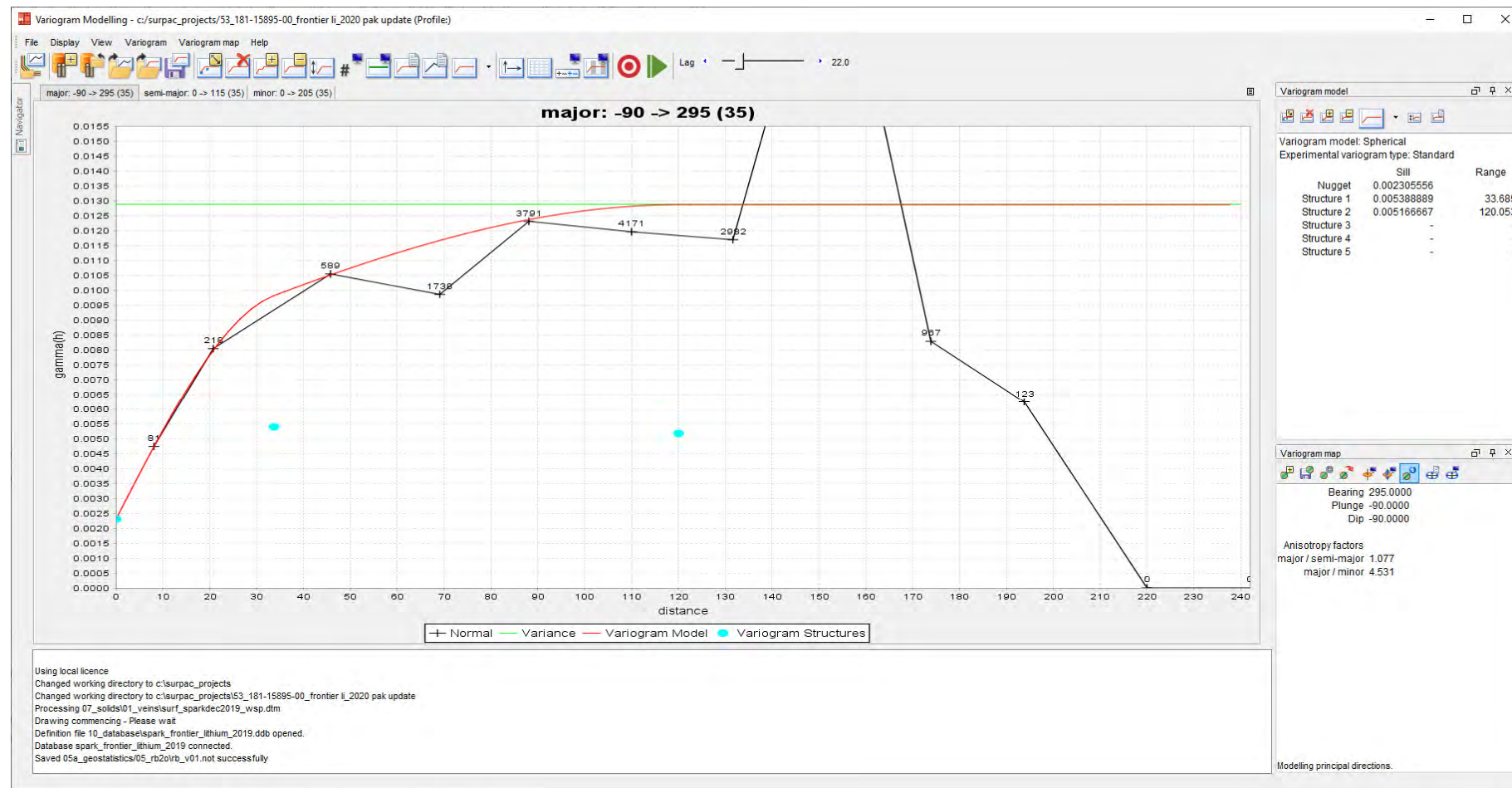
LiO₂ Minor Axis Variogram



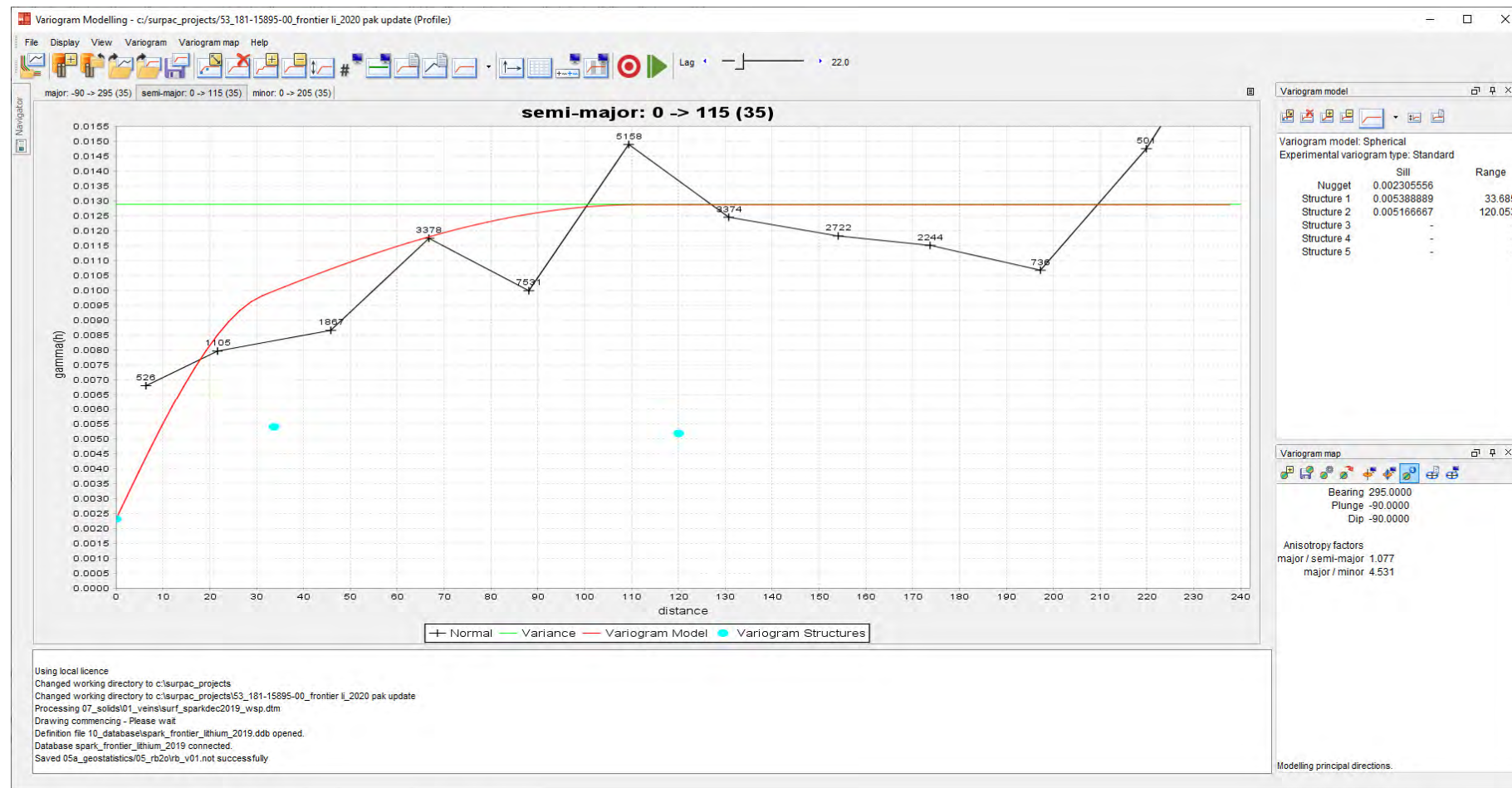
Rb₂O Downhole Variogram



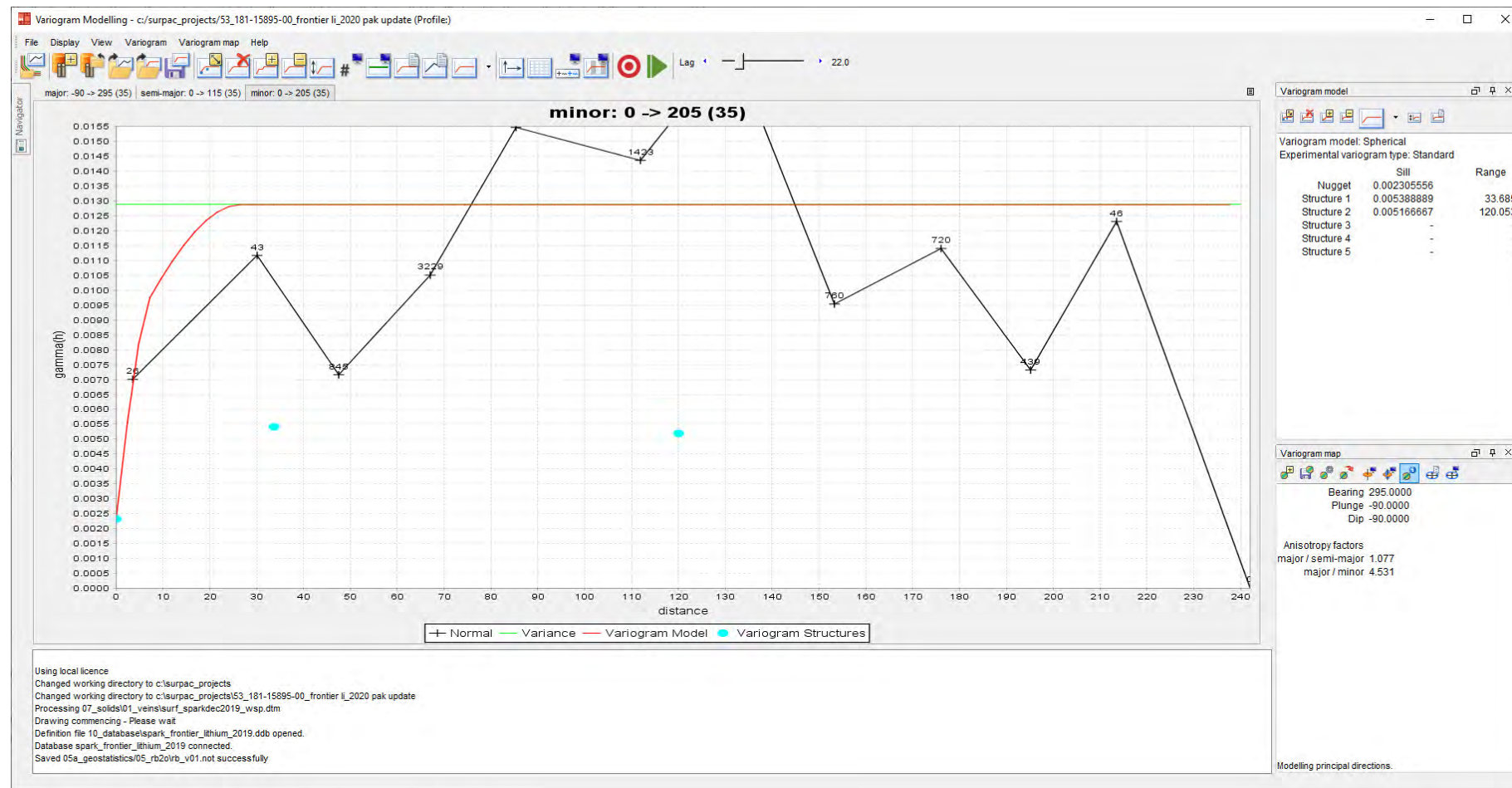
Rb₂O Major Axis Variogram



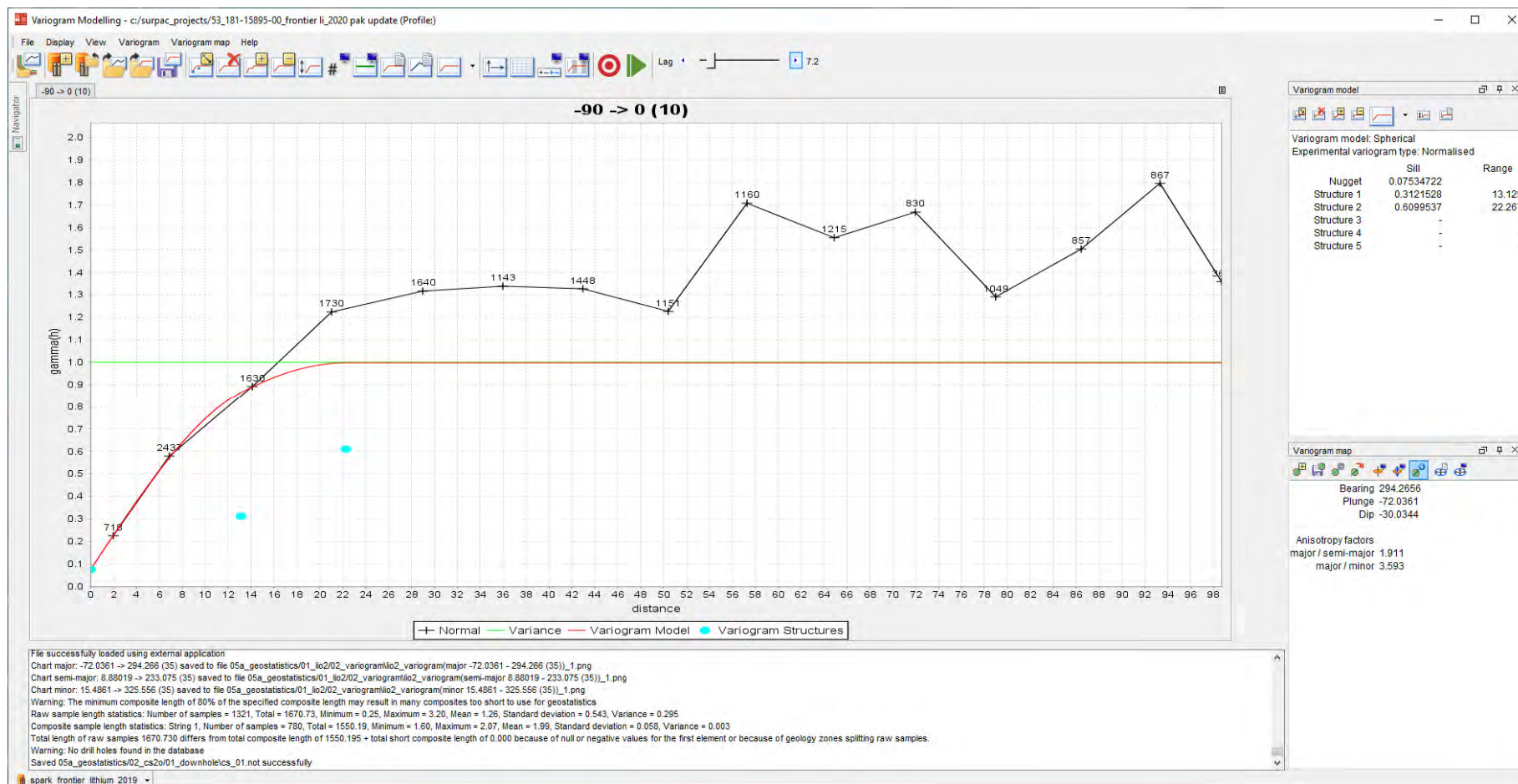
Rb₂O Semi-Major Axis Variogram



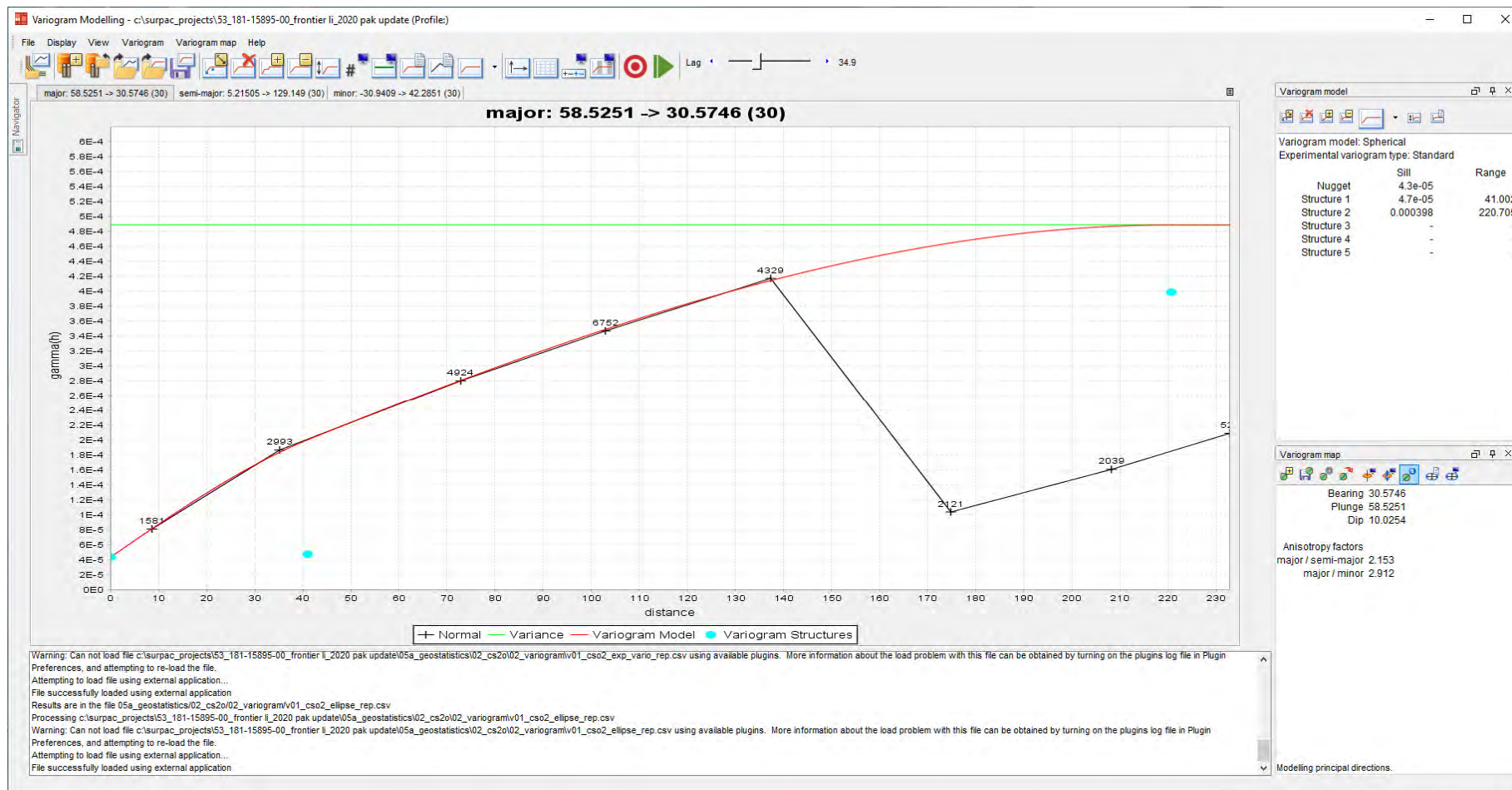
Rb₂O Minor Axis Variogram



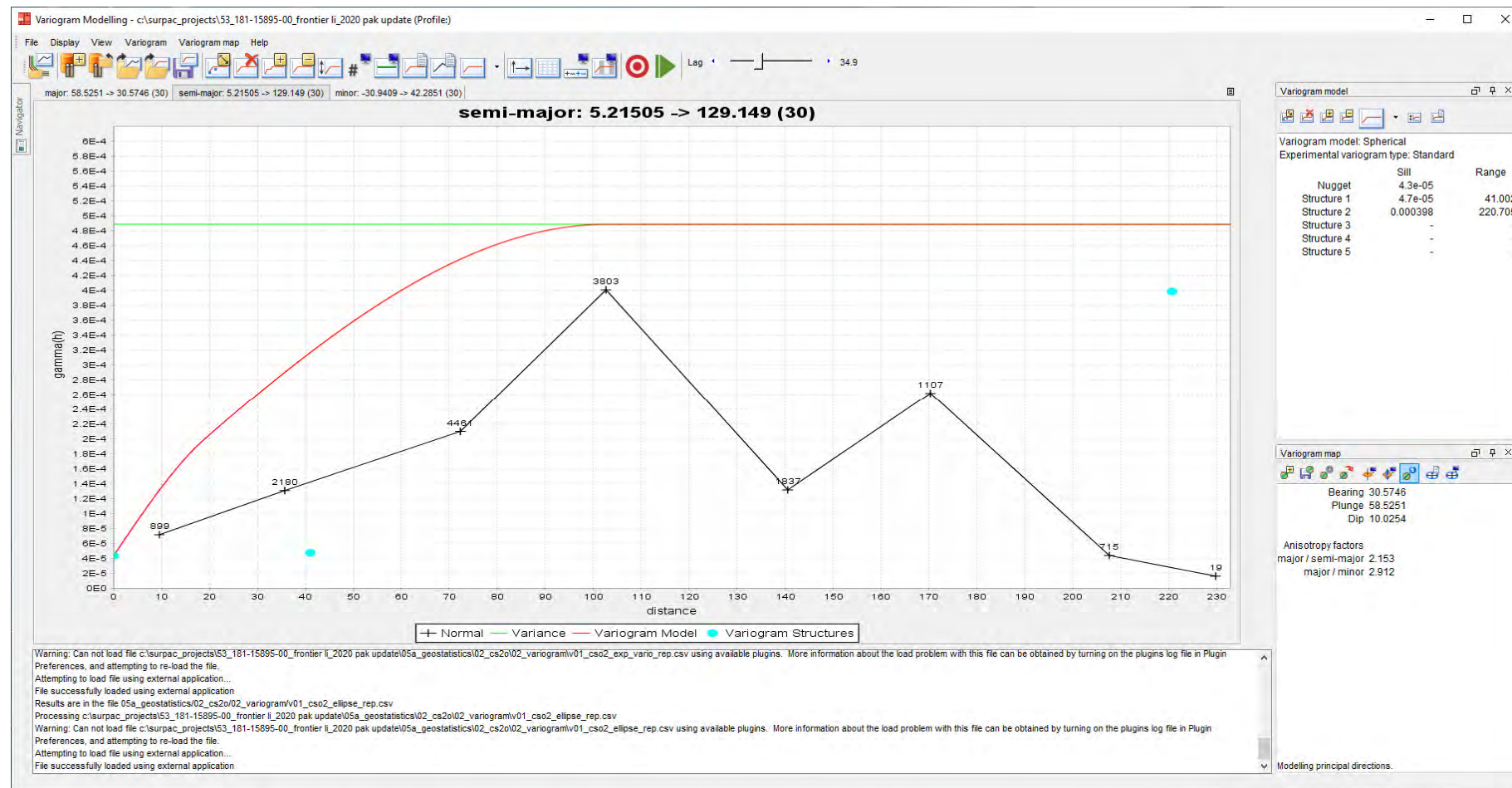
Cs₂O Downhole Variogram



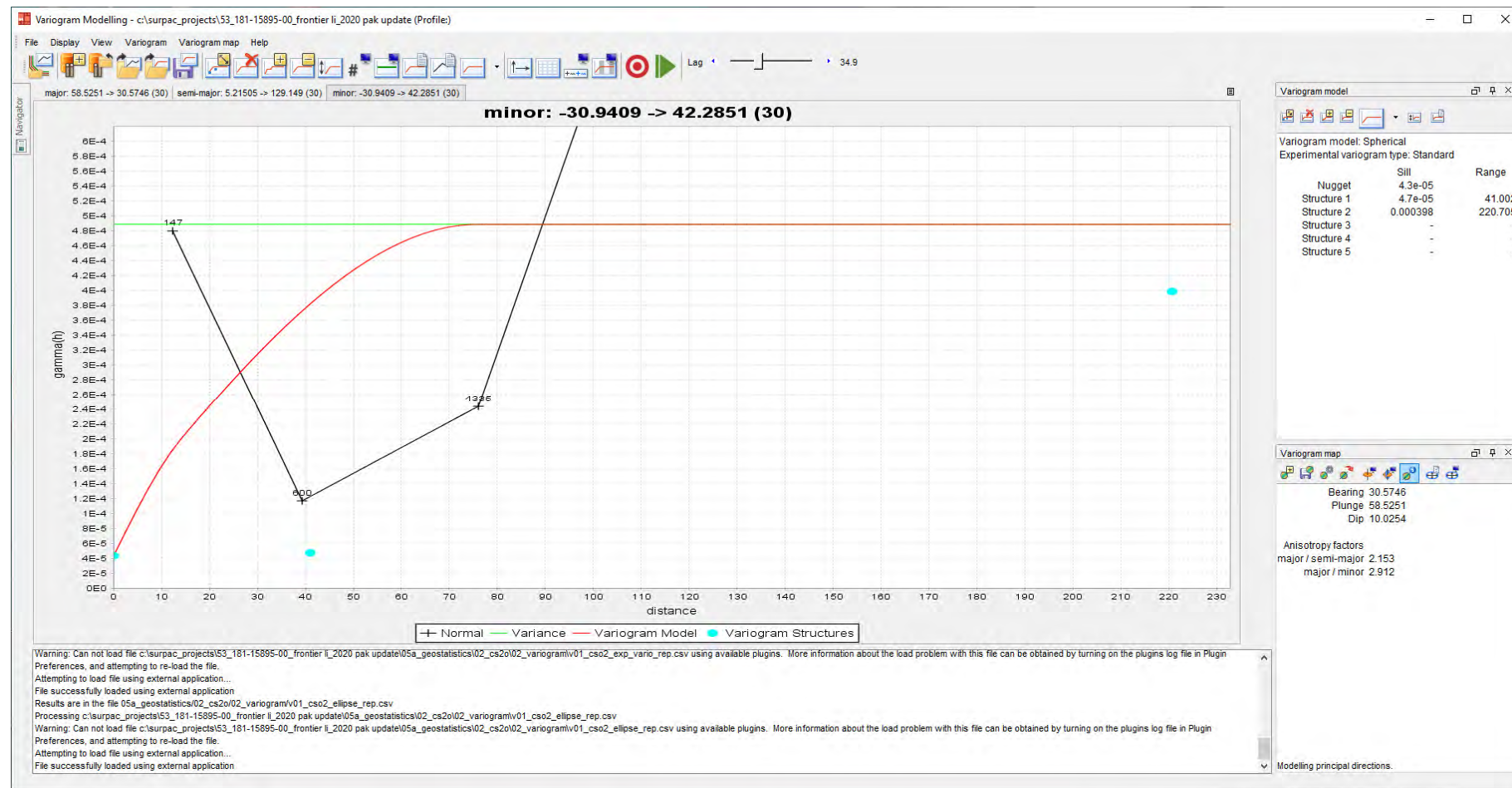
Cs₂O Major Axis Variogram



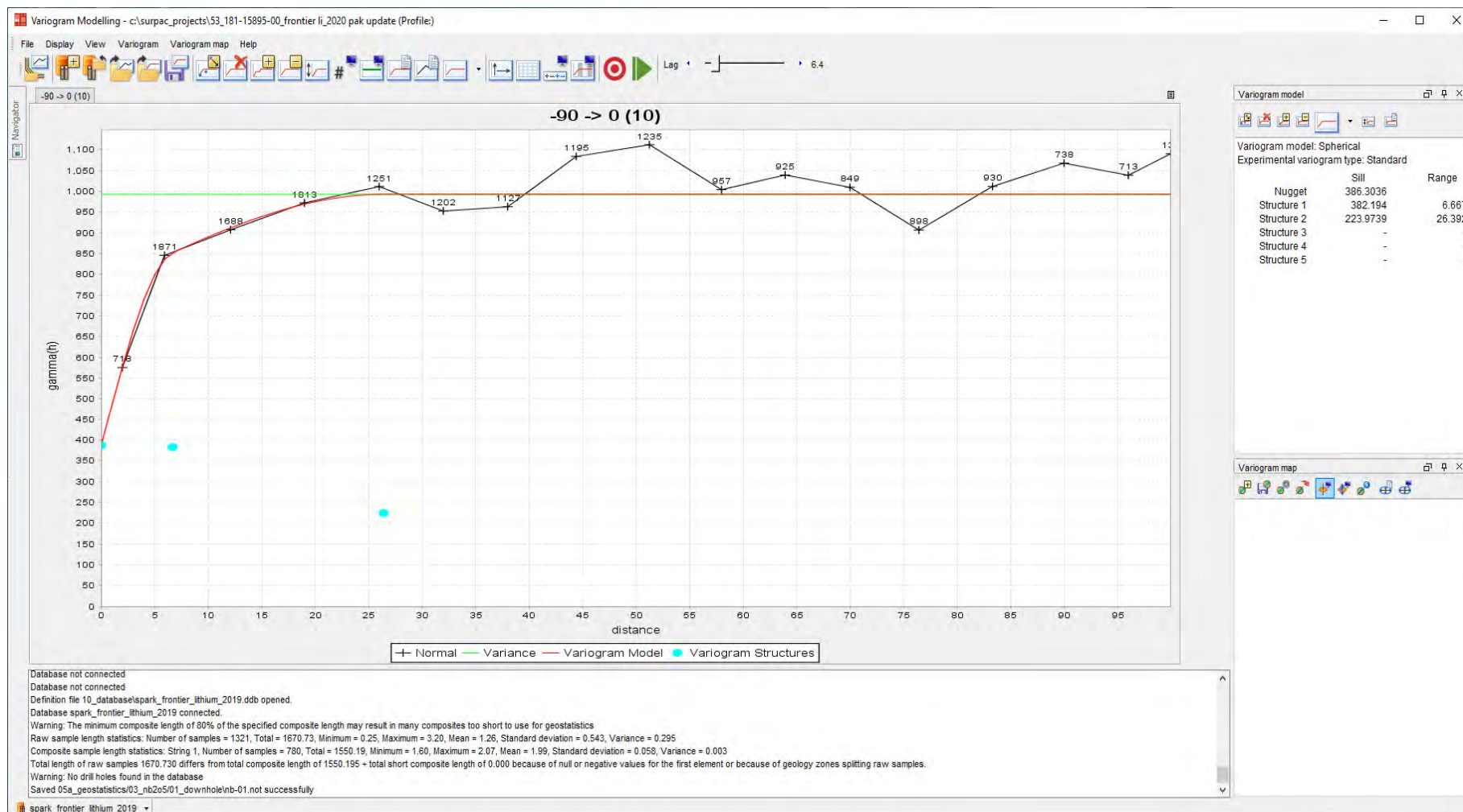
Cs₂O Semi-Major Axis Variogram



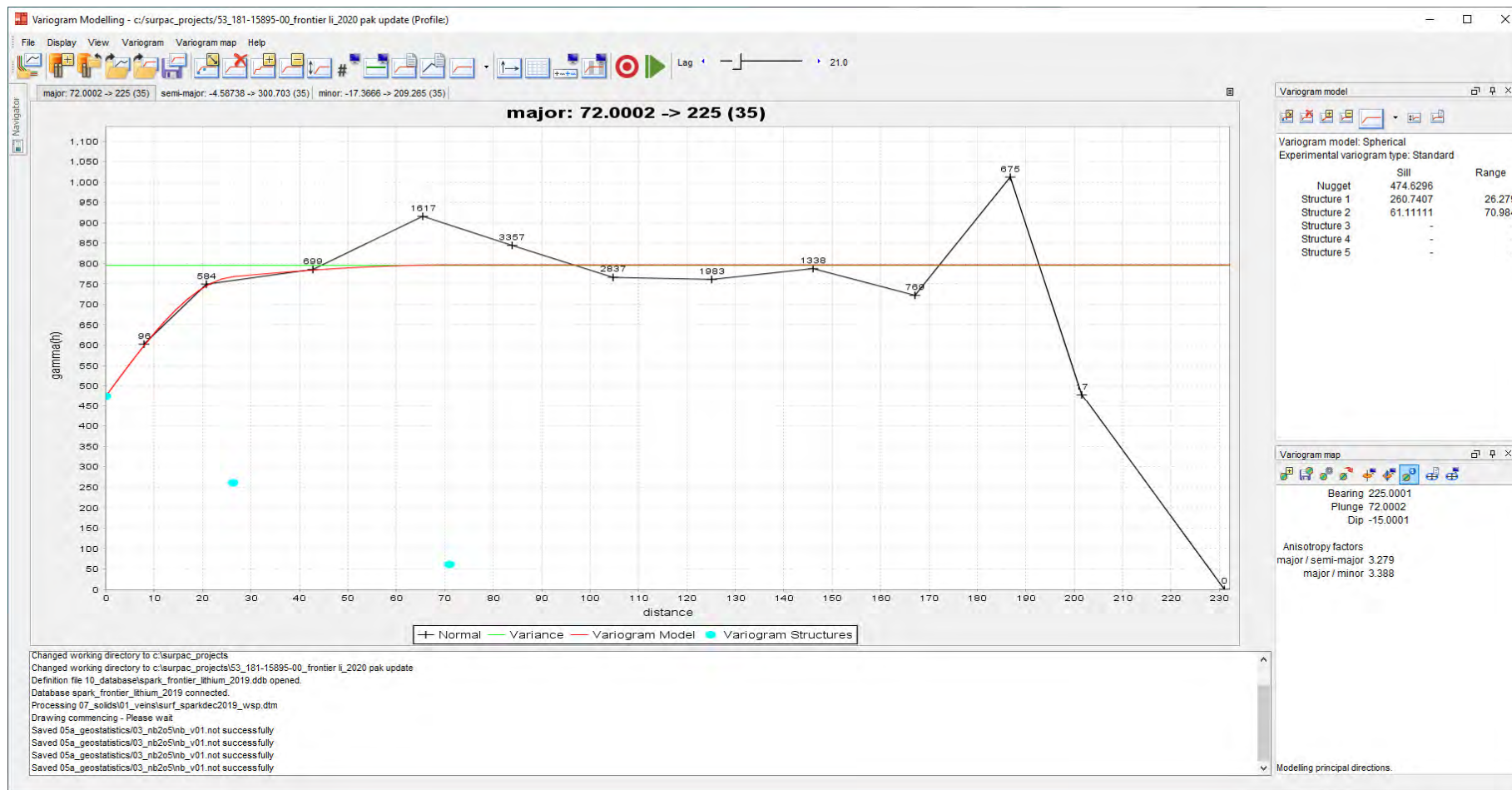
CS₂O Minor Axis Variogram



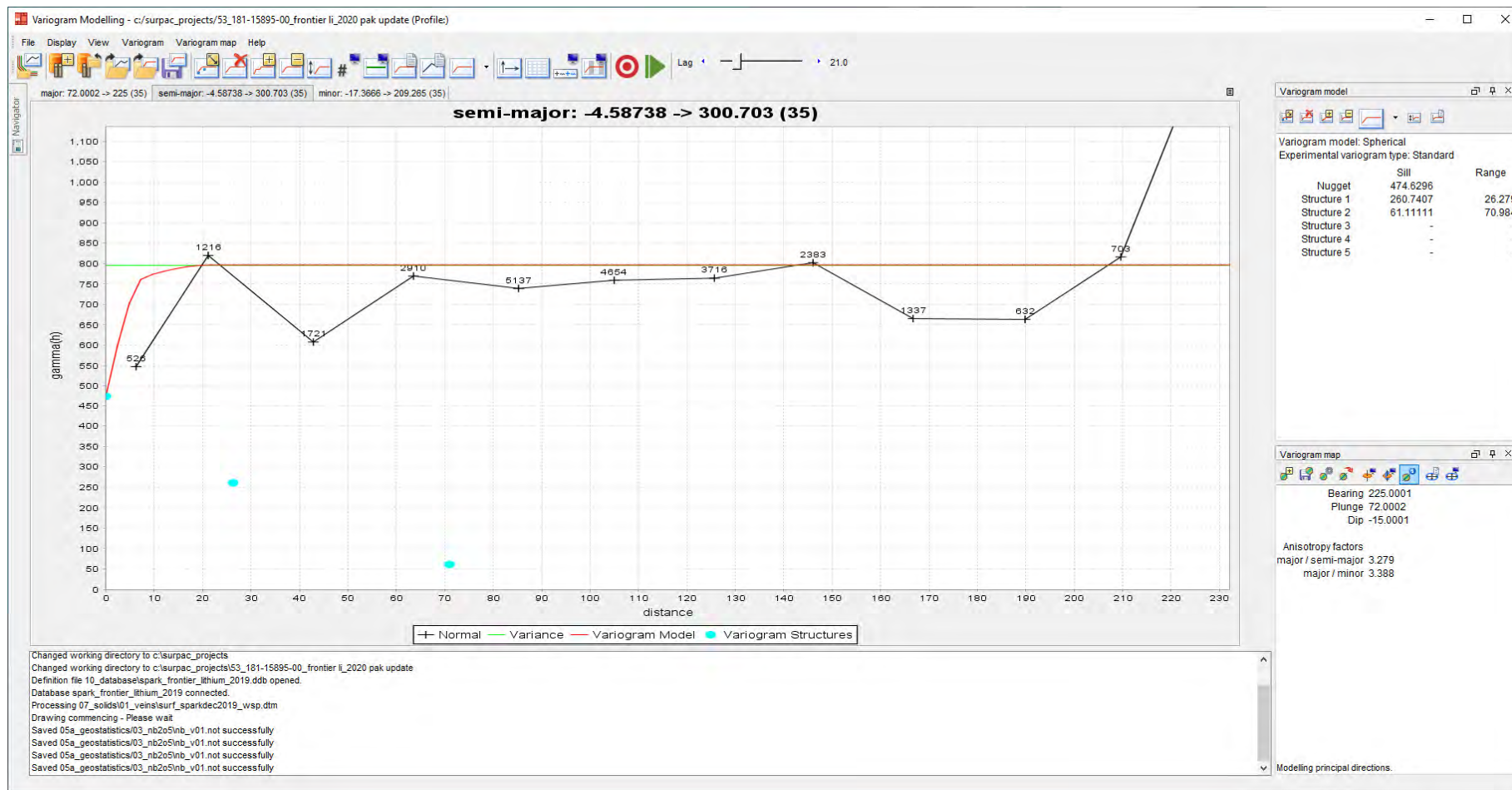
Nb₂O₅ Downhole Variogram



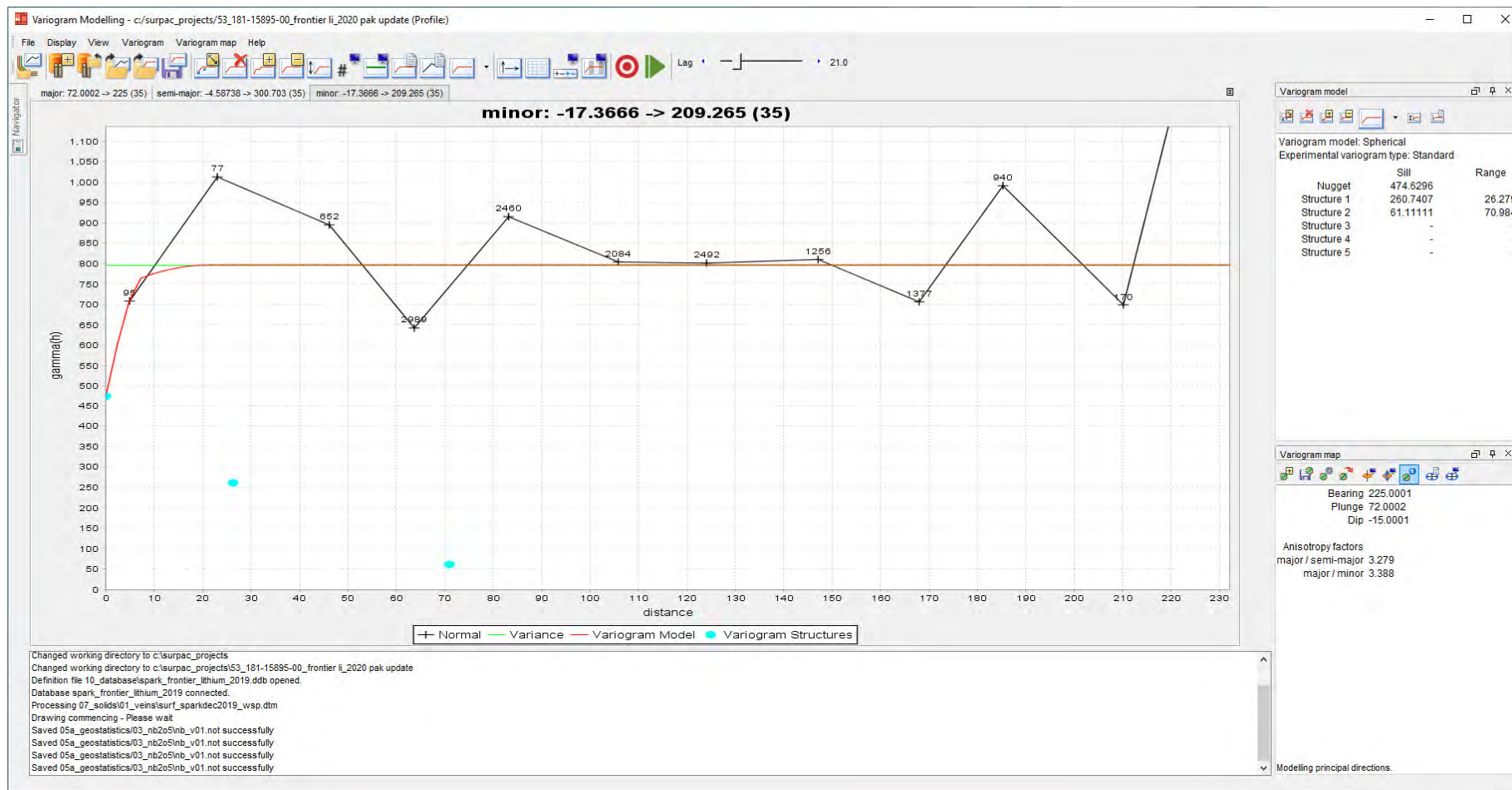
Nb₂O₅ Major Axis Variogram



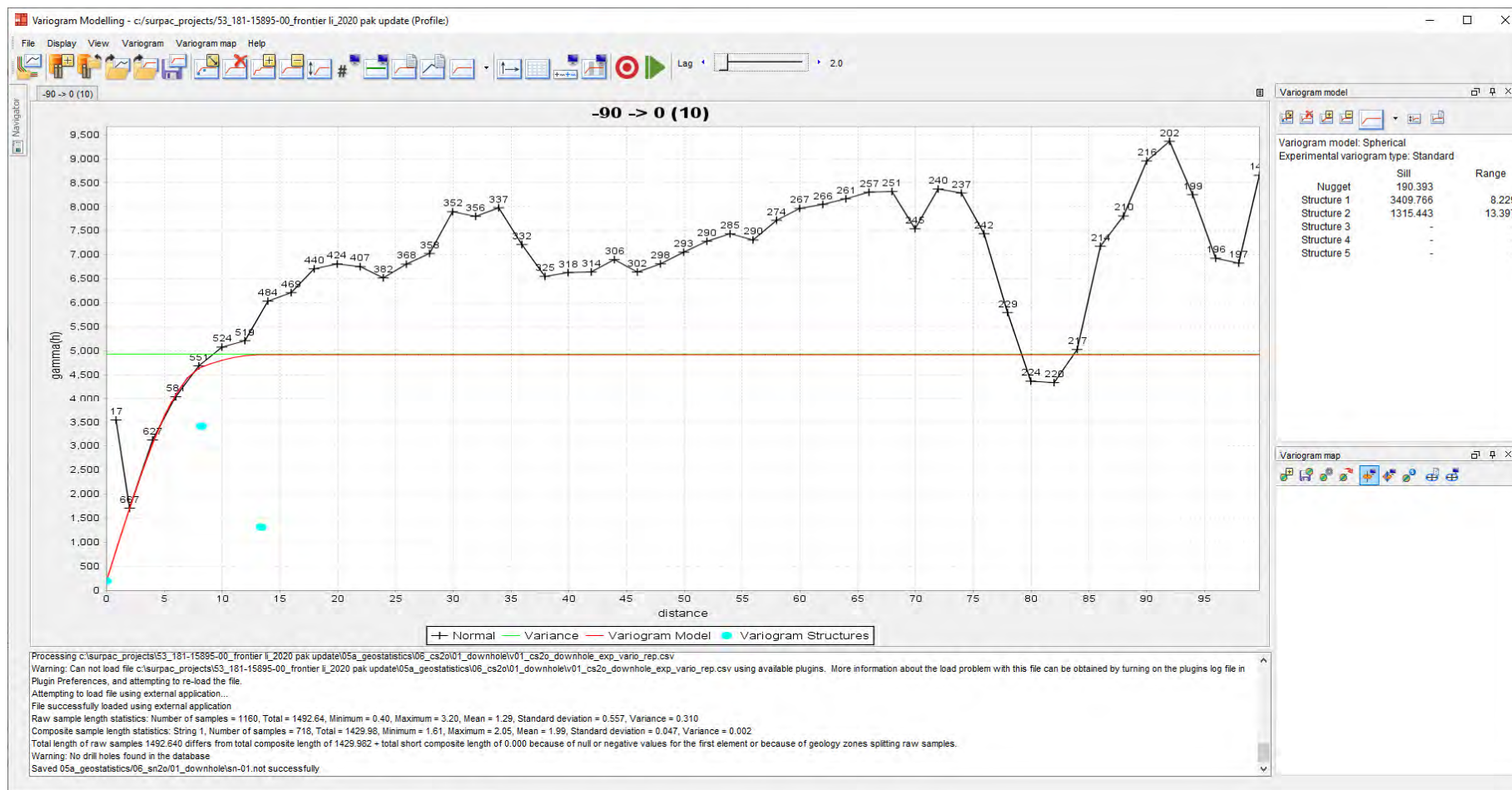
Nb₂O₅ Semi-Major Axis Variogram



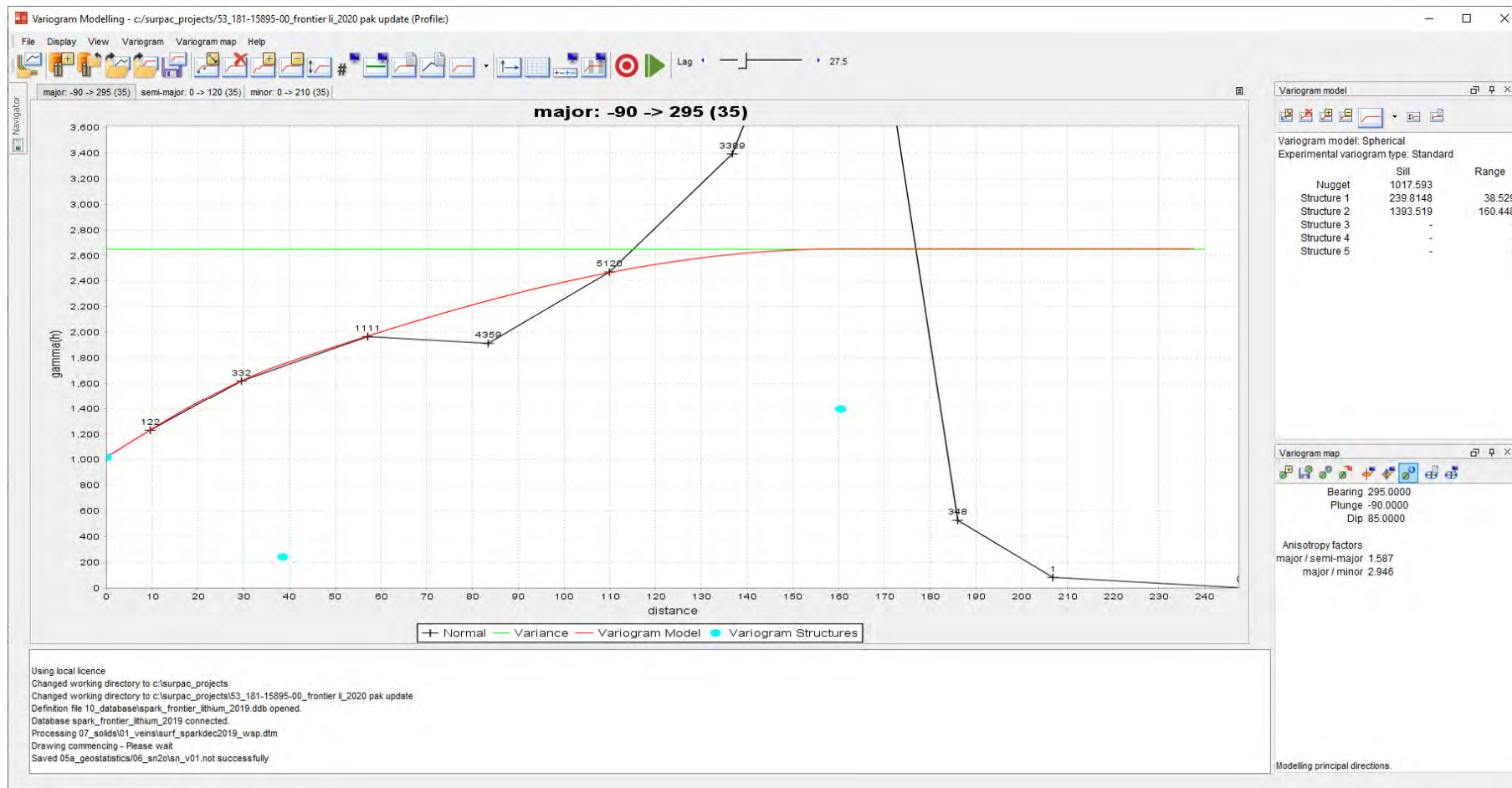
Nb₂O₅ Minor Axis Variogram



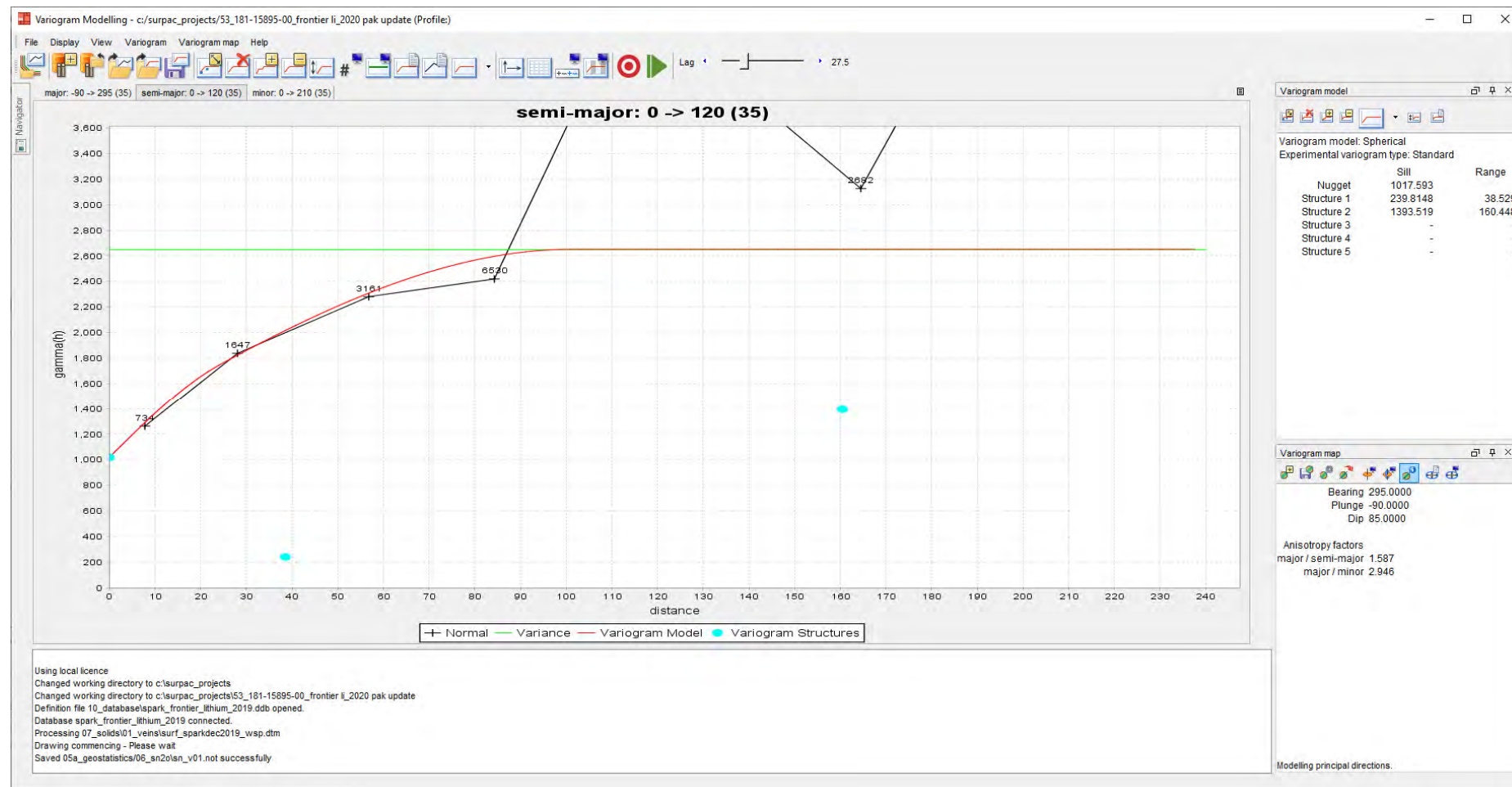
Sn₂O Downhole Variogram



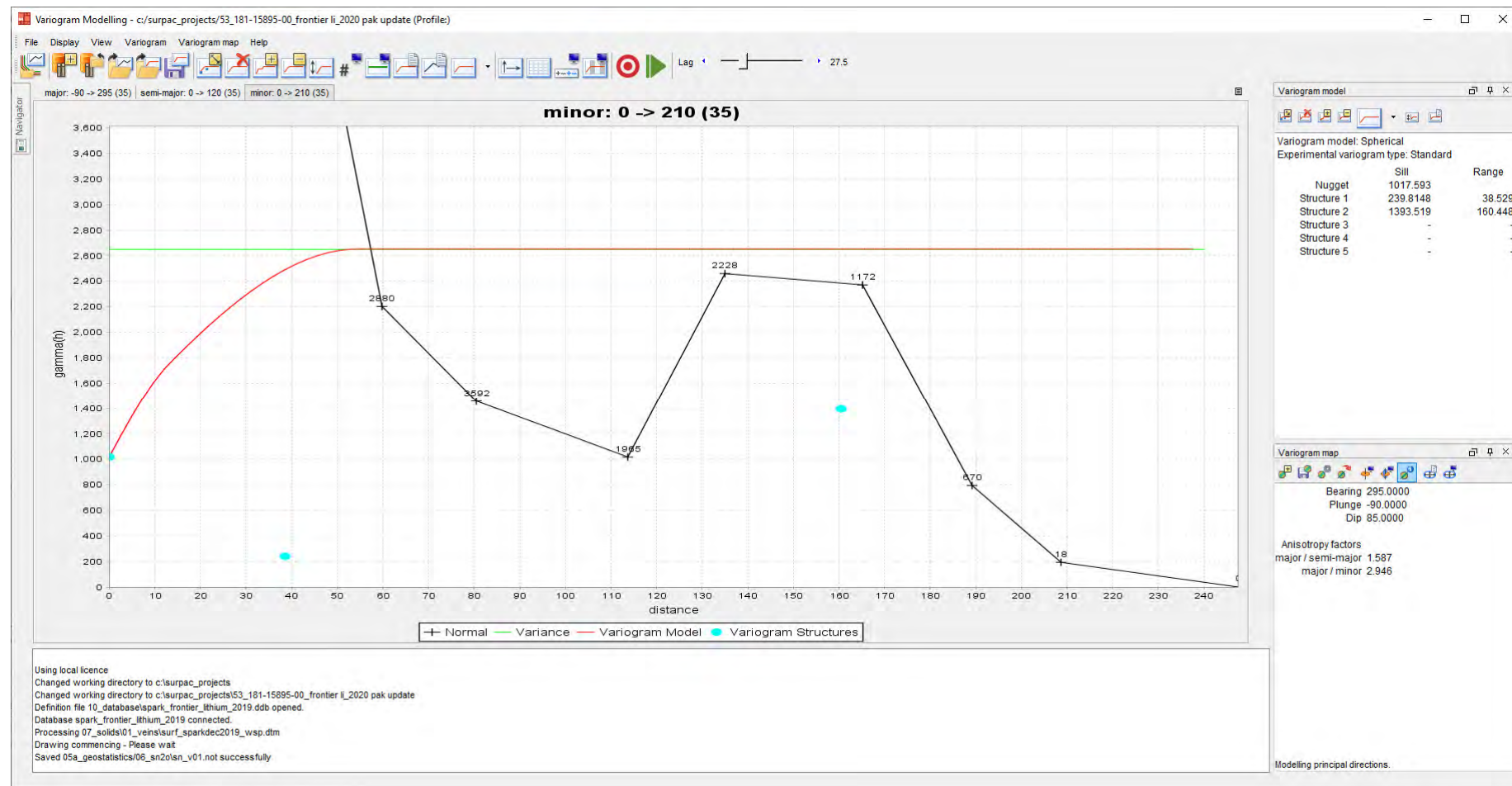
SnO₂ Major Axis Variogram



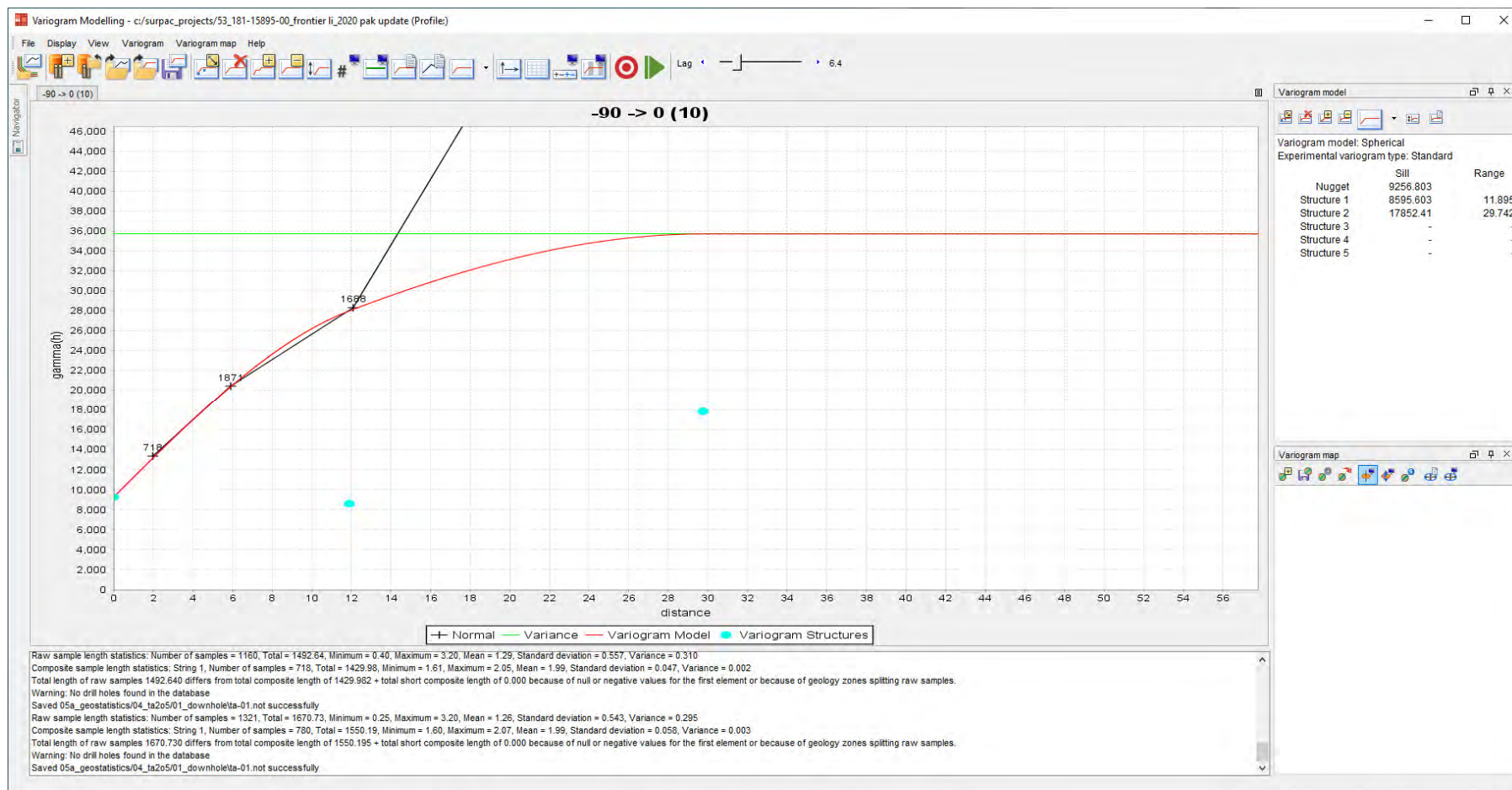
SnO₂ Semi-Major Axis Variogram



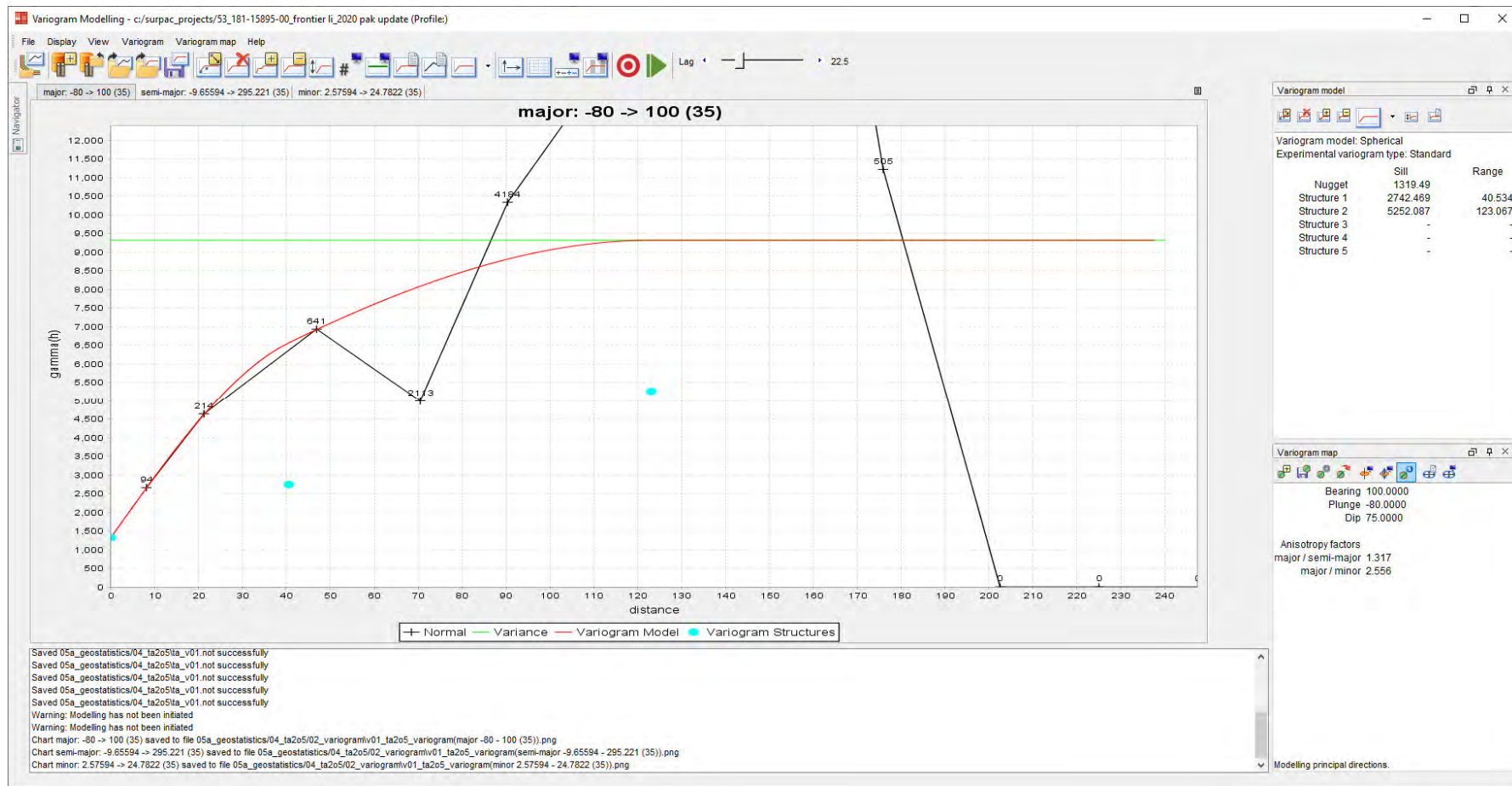
SnO₂ Minor Axis Variogram



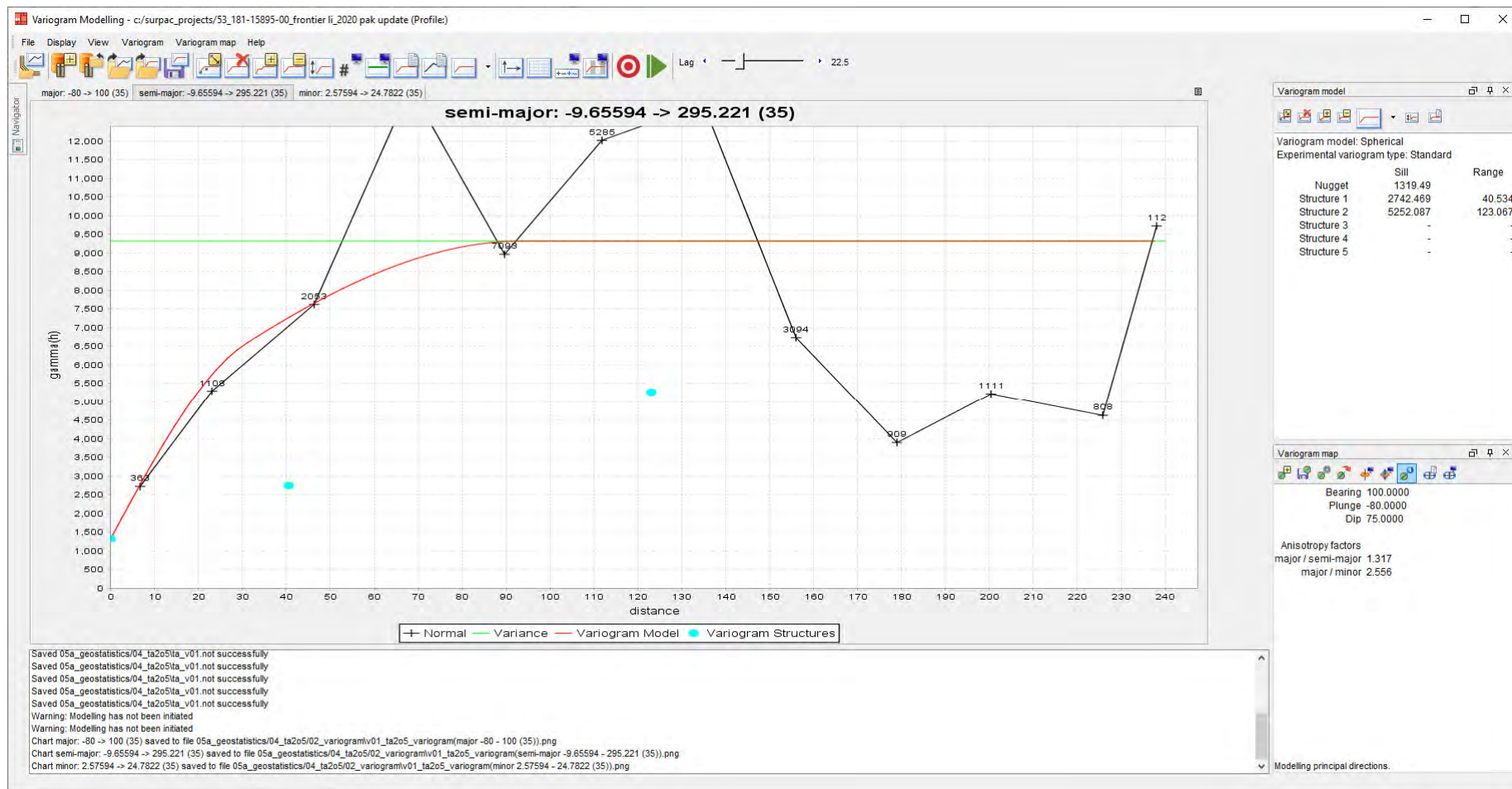
Ta₂O₅ Downhole Variogram



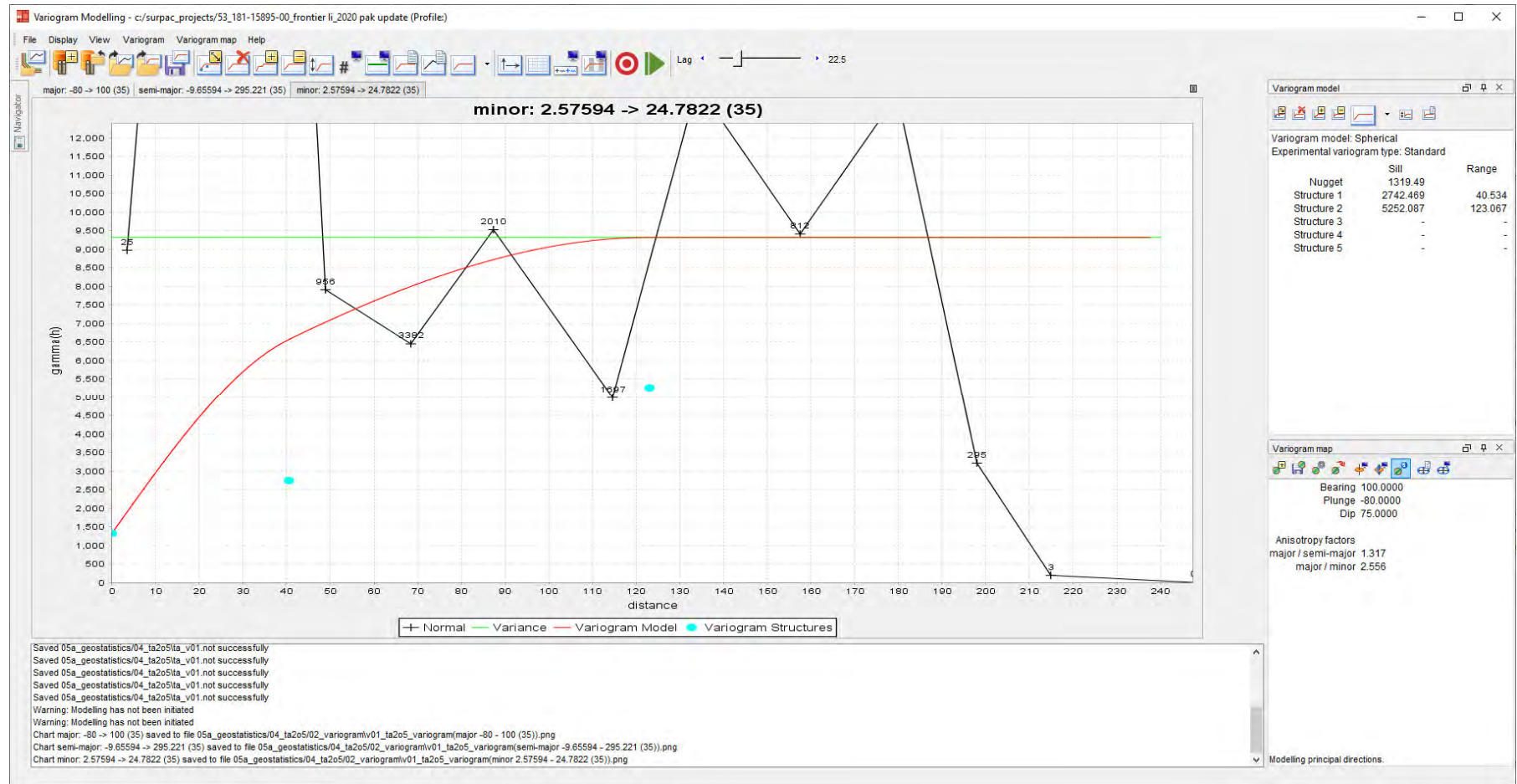
Ta₂O₅ Major Axis Variogram



Ta₂O₅ Semi-Major Axis Variogram



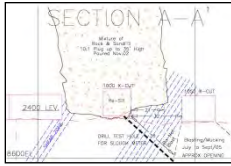
Ta₂O₅ Minor Axis Variogram



APPENDIX

D

ROB WHIPPLE
ENGINEERING INC.
MEMORANDUM
BRIEF



ROB WHIPPLE ENGINEERING INC.
1848 Gemini Crescent
SUDBURY, ONTARIO
CANADA P3E 5X3

Tel: +1 (705) 669-1806

e-mail: rwhipple@eastlink.ca

Memorandum brief

April 16, 2018

To: Roy Levesque, NORDMIN ENGINEERING LIMITED (NORDMIN)

Copy: David Wood, P.Eng., David F. Wood Consulting Ltd. (DFWCL)

From: Robert Whipple P.Eng., M.Eng., Rob Whipple Engineering Inc. (Whipple)

Re: Frontier Lithium Inc., PAK Deposit Preliminary Stope Dimension Engineering

Two empirical methods: critical scaled span and Mathews modified stability chart are used in a desktop study to set preliminary underground stope dimensions for the PAK Lithium Deposit.

Data provided included an engineering geotechnical report, two MSPowerpoint® files containing diamond drill logs and an Adobe® format 3D CADD scalable model showing lithologies and planned development accesses. The geotechnical report contains information from four NQ/NQ3 diamond drill holes.

From the information provided, Whipple made a number of assumptions:

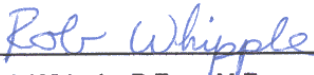
- in-situ stress field including magnitude and direction,
- no over-stress rockmass conditions are present,
- set a conservative Stress Reduction Factor value (SRF=2.5) for rockmass quality measurements

Preliminary dimensions are 50 metres vertical (level-to-level) x 20 metres horizontal (along strike) x 15 to 25 metres (hangingwall-footwall; perpendicular to strike).

This study is preliminary and suitable for a Preliminary Economic Assessment (PEA). Any increased accuracy will require the following scope:

- a geotechnical assessment (diamond drill core logging) of the deeper FL diamond drill holes to quantify the intrusives/metasediments contact zone and hence, increase confidence of existing joint properties,
- deeper geotechnical drilling is necessary to retrieve rockmass data at depths of planned mining to collect data at the intrusives/metasediments contact zone,
- geotechnical diamond drilling to quantify rockmass quality of any identified fault(s),
- as mentioned in the geotechnical report, drilling should evaluate different orientations to ensure rockmass joint orientations are correct and none have been missed, and
- a plan for the sill pillar between the pit bottom and stope back. This sill pillar if to be left intact, it will require significant additional effort to determine its long-term stability. If it is to be mined, short-term stability and removal sequence will be important.

Respectfully submitted:


Rob Whipple, P.Eng., M.Eng.

Rob Whipple, P.Eng., M.Eng.

President

Rob Whipple Engineering Inc.

1848 Gemini Crescent, Sudbury, Ontario, P3E 5X3

Appendix:

Grever, Garth, PAK_RQD.pptx and PAK_RQDVer2.pptx from Frontier via NORDMIN; depth, RQD, lithology, fracs/m, foliation and joint dip/orientations, January 16, 2018

Levesque, Roy, personal communication, January 29, 2018

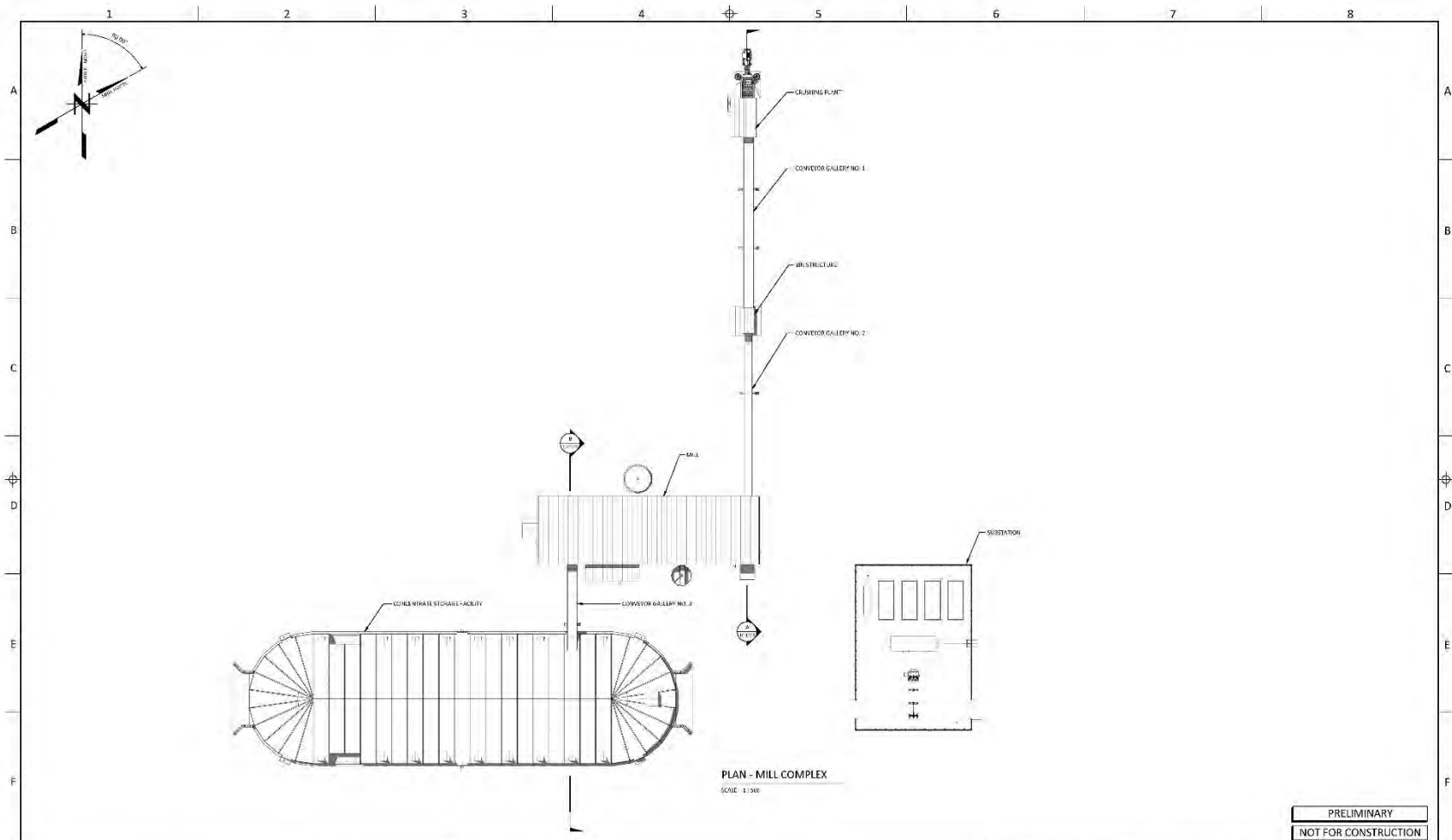
McCauley, R., Rougier, M., *PAK Lithium Geotechnical Drilling and Prefeasibility Slope Design Recommendations*, Golder Associates Ltd., Report No. 1665648-R-RevA, October 31, 2017, internal report to Frontier Lithium Inc.

PAK_3D_PRELIMINARY_PDF.pdf; 3D visualisation of PAK lithologies, open-pit and underground designs

APPENDIX

E

MILL COMPLEX
DETAILED DESIGNS



PRELIMINARY
NOT FOR CONSTRUCTION

REV.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR PERMIT	11 APR 18	WJ	
2	ISSUED FOR PERMIT	11 APR 18	WJ	
3	ISSUED FOR PERMIT	11 APR 18	WJ	
4	ISSUED FOR PERMIT	11 APR 18	WJ	
5	ISSUED FOR PERMIT	11 APR 18	WJ	
6	ISSUED FOR PERMIT	11 APR 18	WJ	
7	ISSUED FOR PERMIT	11 APR 18	WJ	
8	ISSUED FOR PERMIT	11 APR 18	WJ	
9	ISSUED FOR PERMIT	11 APR 18	WJ	
10	ISSUED FOR PERMIT	11 APR 18	WJ	



NORDMIN
NORTHMIN & INDUSTRIAL
ENGINEERING
NORTHMIN ENGINEERING LTD.
1000 WESTERN BLVD, SUITE 100, EDMONTON, ALBERTA T6C 1B5
Phone: (780) 488-3881 Fax: (780) 488-3882
www.nordmin.ca

DESIGNED BY: GAB
CHECKED BY: BMS
DRAWN BY: KAS
REVIEWED BY:

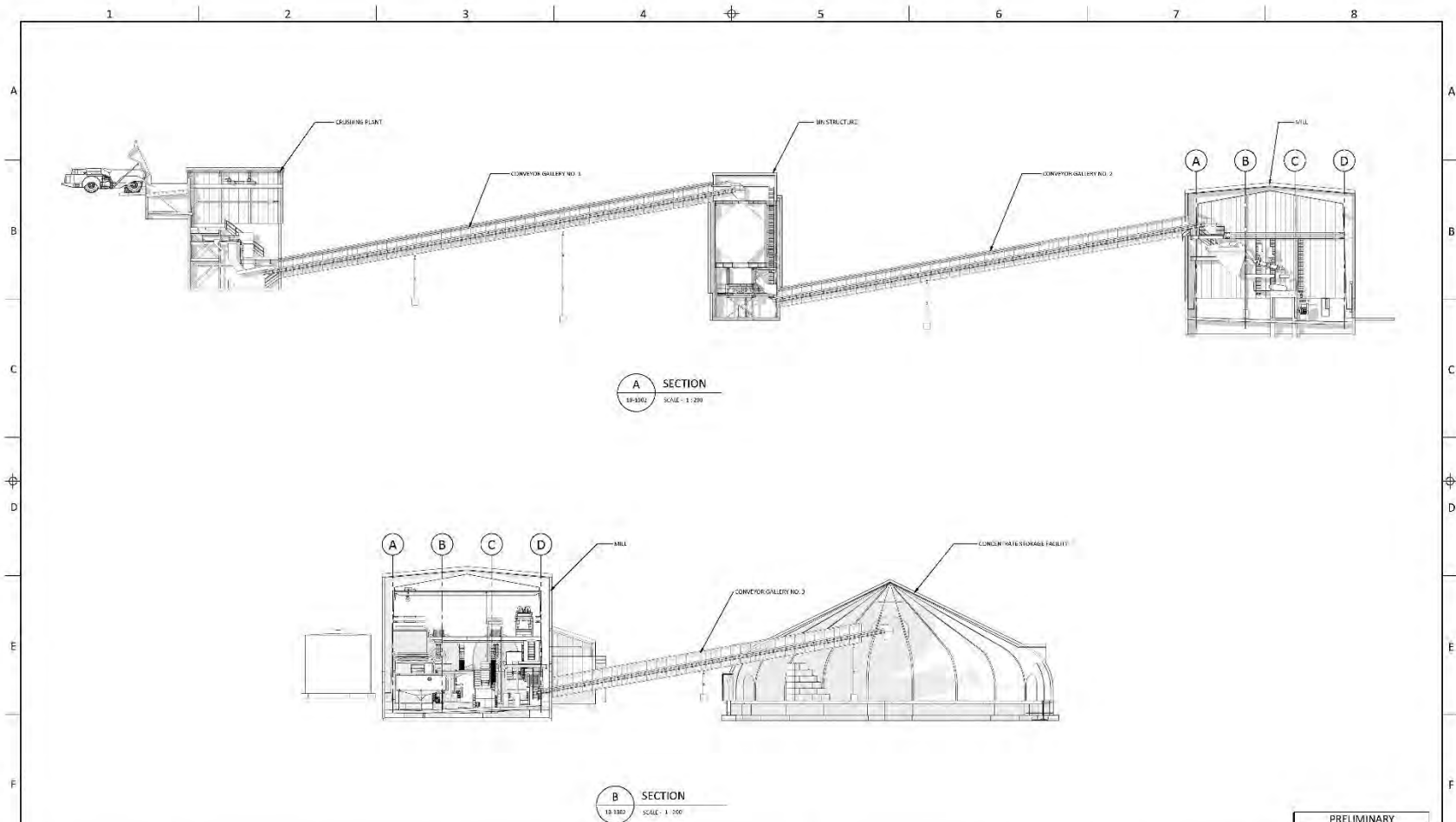
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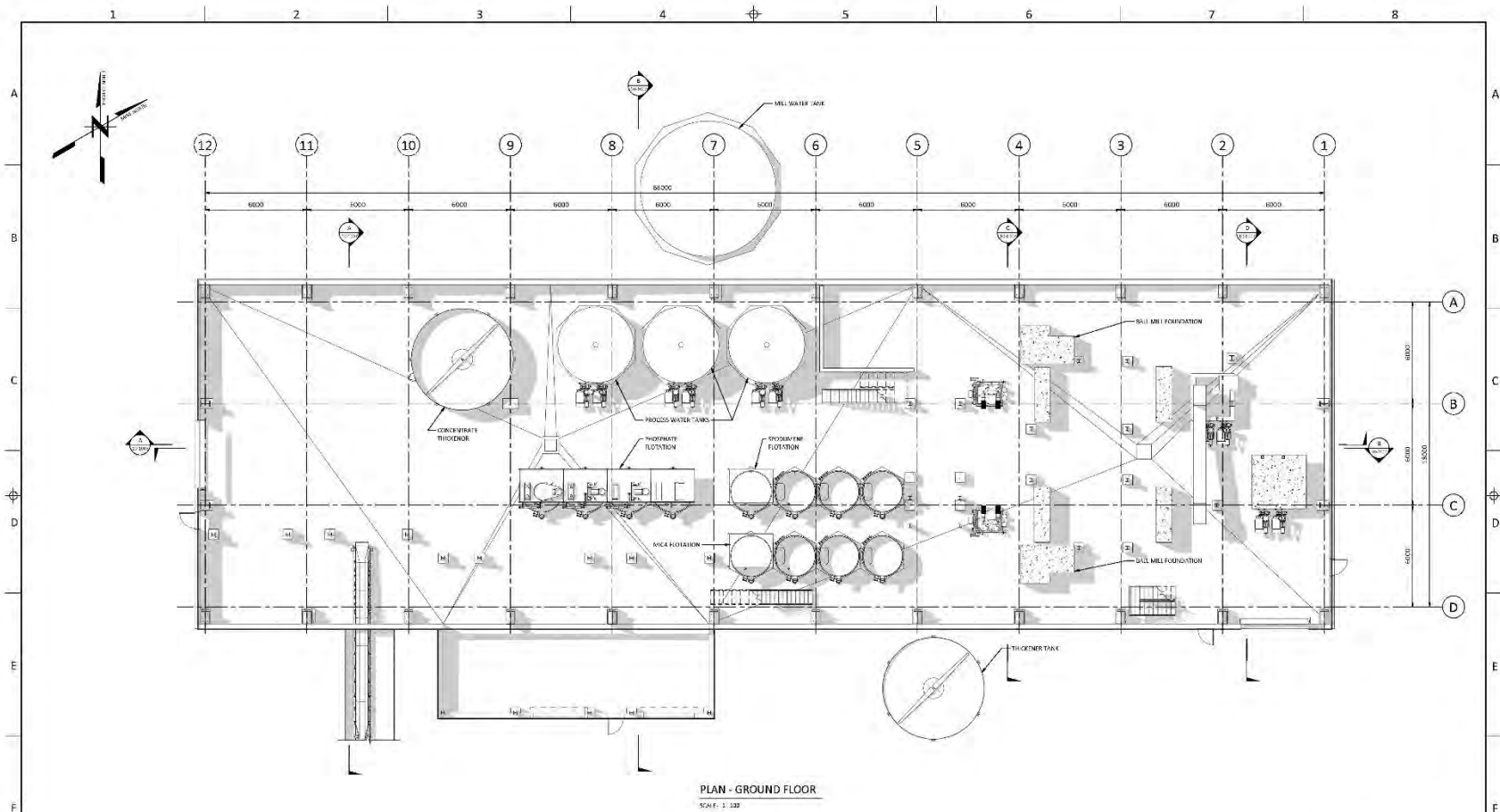
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1100 WESTERN ROAD, SUITE 100, EDMONTON, ALBERTA, CANADA T6C 1B5
Phone: (780) 448-0000 Fax: (780) 448-0001
www.northmin.com

DESIGNED BY: GAB
CHECKED BY: BMS
DRAWN BY: KAS
REVISIONS:

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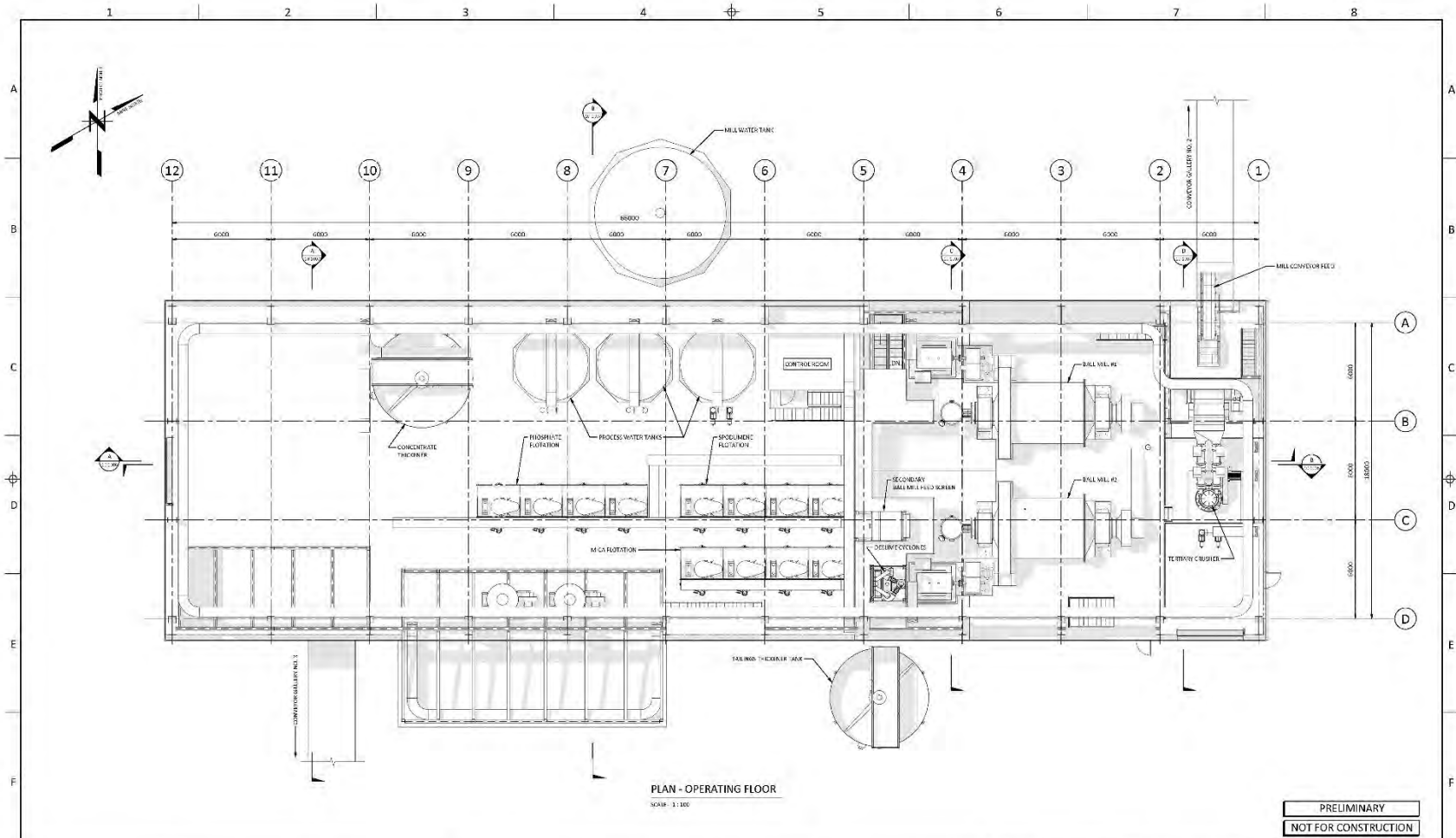


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Phone: (905) 496-0000 Fax: (905) 496-0001
www.nordmin.com

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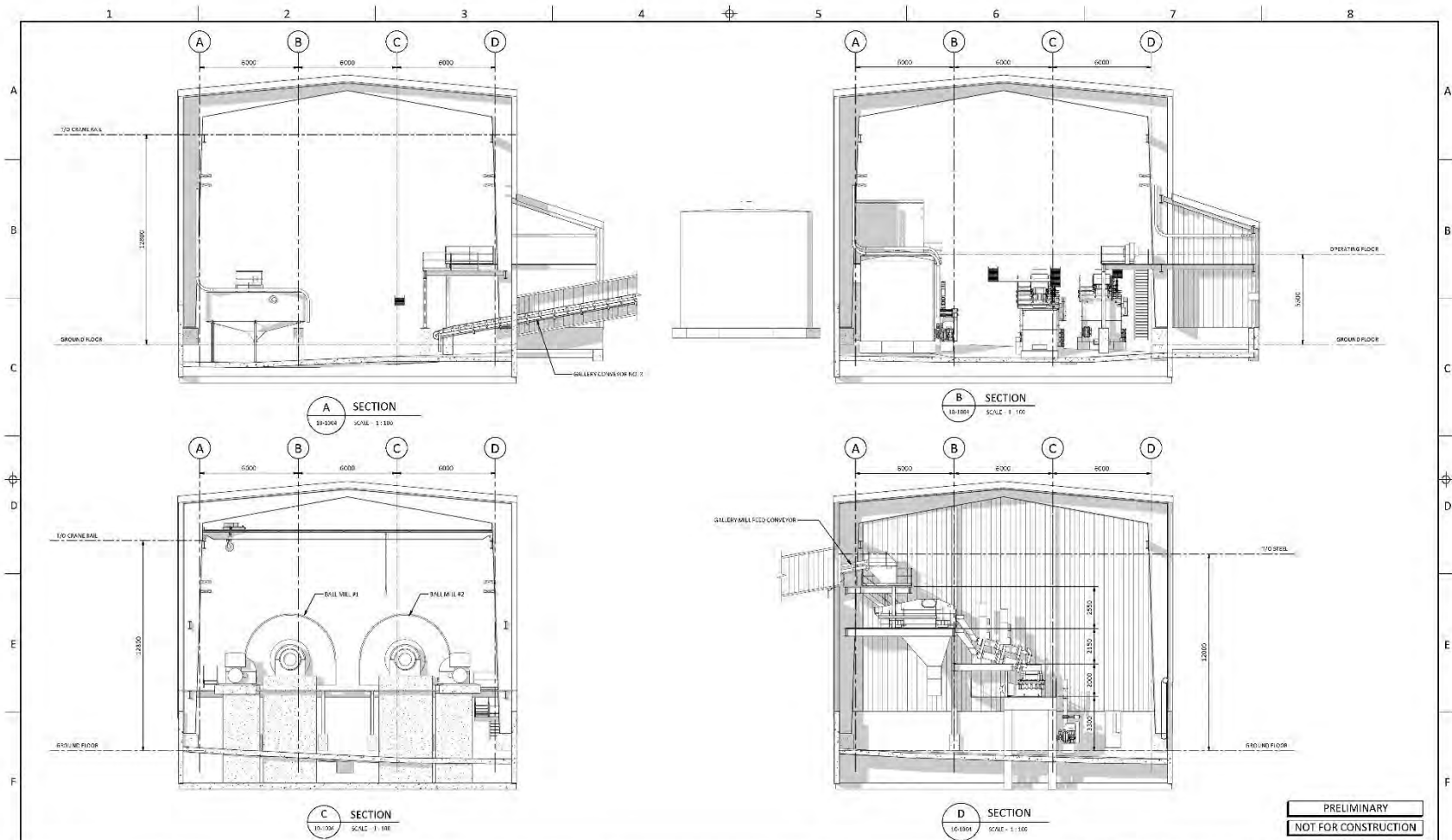
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1000 PETERSON BLVD., SUITE 100, EDMONTON, ALBERTA, CANADA T6C 1P5
Phone: (780) 488-1000, Fax: (780) 488-1001
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NORTHWEST INDUSTRIAL
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NORDMIN ENGINEERING LTD.
1000 100th Ave. S.E. Unit 100, Burnaby, BC V5A 1K1
Phone: (604) 466-1000 Fax: (604) 466-1001
www.nordmin.com

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APPENDIX

F

ANALYSIS ON
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SELLING PRICE
FOR TECHNICAL
LITHIUM
CONCENTRATE



Stormcrow Capital Limited
WaterPark Place
20 Bay St, 11th Fl
Toronto ON, M5J 2N8



CONSULTING DELIVERABLE

Analysis on Prospective Selling Price for
Technical Lithium Concentrate for
Frontier Lithium

Jon Hykawy, PhD
President
Stormcrow Capital Ltd



Stormcrow Capital Limited
WaterPark Place
20 Bay St, 11th Fl
Toronto ON, M5J 2N8

PRIVATE & CONFIDENTIAL

April 9, 2018

October 25, 2017
Frontier Lithium Inc.
2736 Belisle Drive
Val Caron, Ontario P3N 1B3

Attention: Trevor Walker, President & CEO
**Subject: Analysis on Prospective Selling Price for Technical Lithium
Lithium Concentrate for Frontier Lithium**

- Spodumene mineral concentrates play a vital role in the supply of lithium chemicals to a wide variety of downstream industries, including batteries.
- Spodumene concentrates containing low levels of iron are also the least expensive way for glass makers to obtain lithium units in order to manufacture glass that can withstand thermal shock, such as that used on cooktops.
- With an increasing demand for lithium, driven by battery growth, we anticipate an increase in supply and a weakening in the very high prices paid for lithium chemicals. However, given this competition and the desirability of low-iron spodumene concentrates, we believe that technical-grade spodumene will continue to sell at a meaningful premium to its historical level compared to lithium chemicals. In effect, we believe that the industry has re-rated the value of lithium mineral concentrates.
- This report outlines our price projections on concentrates, through 2028, and shows the effect of a re-rating on the amount paid for mineral concentrates in general, but technical-grade spodumene mineral concentrates in particular.



The Company and Concentrates

The lithium industry gets its supply of lithium atoms from one of two places. Either the lithium comes out of the ground in aqueous solution, as a brine, or it comes out of the ground as a lithium-bearing mineral, predominantly spodumene. While it is generally less expensive to produce lithium chemicals from brine, there are a few instances where having a mineral concentrate containing lithium is the most desirable and least expensive way to proceed.

In particular, the production of lithiated ceramic-glass is one of the largest consumers of lithium atoms, and while this industry is not growing nearly as quickly as the battery sector, it is being significantly impacted by the demand for lithium to be used in battery chemicals. Making glass with lithium involves blending a significant amount of lithium with silicon and aluminum atoms. As the demand for lithium chemicals for batteries has increased, the amount of concentrate available to the glass industry has declined, and it is reported to be much harder to get the required products.

An important factor in making glass is that none of the raw materials contain much iron. The largest percentage of material in these ceramic-glasses is silicon, but the lithium mineral concentrate has the potential to contain a much higher level of iron than the silicon sources. For example, Nemaska's spodumene from the Whabouchi deposit is a pleasant shade of green/grey, indicative of a high iron level, and if this lithium were to be introduced to glassmaking as a mineral concentrate, it would tint the resulting glass green unless very clean (but very expensive) iron-free silica were used, as well.

Yes, it is possible to use lithium chemicals to make ceramic-glass. Lithium carbonate or lithium hydroxide could be used, and both would be spectacularly iron free. But using either introduces its own problems. Using lithium carbonate potentially adds carbon to the glass, and using lithium adds hydroxyl groups. Plus, historically, the use of the chemicals instead of good-quality mineral concentrate would be more expensive.

The most common commercial mineral for use in glassmaking is spodumene, a lithium aluminum silicate with chemical formula $\text{LiAl}(\text{SiO}_3)_2$. Frontier Lithium's PAK



Project will produce a spodumene concentrate, and early metallurgical results suggest that the production of a 7% concentrate should be possible. Spodumene is a useful mineral in this regard because ceramic-glasses containing lithium all generally contain silicon, aluminum and lithium, and spodumene merely adds a lithium-rich source of all three. In addition, the waste material in good quality spodumene concentrate is generally silica, which is something that the glassmaker must have, anyway.

Historically, a significant amount of the so-called “technical-grade” spodumene concentrate (intended for use in making glass, because of its lower iron content) came from the Greenbushes Mine in Australia, owned and operated by Talison Lithium. Talison management have reported that they originally priced technical-grade lithium at a discount to the price of lithium chemicals, to incent and allow its use. Chemical-grade spodumene concentrates, which will be leached and purified and converted to lithium chemicals, were priced at a further discount to this level. However, this is not necessarily how prices will be set in the future, and we will discuss the evidence that this pricing change may already have occurred, below.

Analysis of Spodumene Concentrate Pricing

The problem with attempting to analyze the spodumene concentrate market is that there have been precious few suppliers of spodumene concentrate, over the years. Recently, we have Galaxy Resources (and its Mt. Cattlin mine) and NeoMetals (and their Mt. Marion project), both of Australia, shipping lithium mineral concentrates to China for processing to lithium chemicals. Historically, however, spodumene concentrates come from Talison’s Greenbushes Mine, also in Australia.

There is little historical information available regarding the selling price of their concentrates. Talison was a publicly listed company for a short period of time, before being sold to Tianqi Lithium of China. Talison never disclosed separate selling prices for technical- and chemical-grade spodumene concentrates, but only a blended overall price and a blended overall lithium carbonate-equivalent volume for the concentrates sold during a fiscal period.



Exhibit 1 – Talison Fiscal Periods and Sales Data

Period	Q1 2011 Jul-Sep	Q2 2011 Oct-Dec	Q3 2011 Jan-Mar	Q4 2011 Apr-Jun	Q1 2012 Jul-Sep	Q2 2012 Oct-Dec	Q3 2012 Jan-Mar	Q4 2012 Apr-Jun	Q1 2013 Jul-Sep	Q2 2013 Oct-Dec
Volume sold (con)	52,525	97,559	97,001	92,416	80,315	75,221	111,896	98,113	82,410	119,995
Volume produced (con)	80,729	83,548	88,315	89,505	90,708	89,015	93,563	83,842	126,558	94,911
Volume (LCE, approx.)	7,800	14,500	14,400	13,600	12,000	11,200	16,600	14,600	12,300	18,000
Revenue (AU\$, M)	21.1	32.8	29.2	26.4	25.9	22.7	37.0	34.5	28.5	43.1
Avg price per tonne con (US\$)	\$ 313	\$ 315	\$ 303	\$ 302	\$ 330	\$ 310	\$ 340	\$ 351	\$ 352	\$ 367
Avg cost per tonne con (AU\$)	\$ 221	\$ 208	\$ 195	\$ 184	\$ 207	\$ 187	\$ 195	\$ 211	\$ 202	\$ 213

Source: Company reports

We continue to believe that the price that pertains to lithium chemicals in the market is the critical factor in concentrate pricing. Lithium chemicals would be used instead of mineral concentrates, even in glassmaking, if the chemical price were relatively low enough. Obviously, since the converter that processes the spodumene concentrate into chemicals is adding cost to the raw material, the value of the chemicals must be higher, in lithium terms, than the value of the feedstock, or the converters will very quickly be out of business.

So in order to project concentrate prices, we need projections for lithium chemicals. For this, we utilize our background in the lithium market, and our conservative pricing model. This model postulates the production of a sufficient amount of lithium to satisfy demand in a given year plus a buffer in case of supply disruption at any particular supplier in the market. However, supply is insufficient to unnecessarily drive down prices, even if doing such would be, at least at the margin, in the economic interest of new suppliers.

Under these assumptions, our lithium chemical price forecasts (based on sufficient supply) are:

Exhibit 2 – Lithium Chemical Price Forecasts (US\$/Kg)

Year	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Tech Grade CO ₃	\$ 19.03	\$ 18.45	\$ 16.19	\$ 15.42	\$ 11.71	\$ 9.79	\$ 8.46	\$ 8.58	\$ 11.70	\$ 10.68	\$ 12.69	\$ 16.48
Batt Grade CO ₃	\$ 21.59	\$ 20.94	\$ 18.37	\$ 17.50	\$ 13.29	\$ 11.11	\$ 9.60	\$ 9.74	\$ 13.28	\$ 12.12	\$ 14.40	\$ 18.70
Tech Grade OH	\$ 20.80	\$ 19.47	\$ 17.08	\$ 16.27	\$ 12.36	\$ 10.33	\$ 8.92	\$ 9.05	\$ 12.34	\$ 11.27	\$ 13.39	\$ 17.39
Batt Grade OH	\$ 22.08	\$ 21.35	\$ 18.54	\$ 17.60	\$ 13.55	\$ 11.55	\$ 10.79	\$ 10.03	\$ 13.64	\$ 12.73	\$ 14.86	\$ 19.70

Source: Stormcrow (2017)



Admittedly, our price forecasts are more conservative than some. We would argue that these prices are based on increases in supply from existing producers, as well as high-quality new entrants to the space adding their production capacity from 2018-2025. These prices still provide strong gross margins to these producers, and discourage additional lower-quality new entrants from coming into the market. Lithium is a fairly common material, so suggesting that 80+% gross margins can be maintained in perpetuity is unreasonable. Whether or not buyers are able or willing to pay US\$20,000 a tonne for a given commodity is irrelevant if there are 10 potential new producers, each with acceptably low production costs, willing to saturate the market in order to gain market share and profit. However, it should be noted that our model, as the market grows, generally predicts increasing margins for incumbent producers, as the market generally becomes more robust and there is increased potential for bidding wars to break out on available lots of material.

We know that lithium chemical prices and concentrate prices are related. When we compare lithium chemical spot prices in the Chinese market with the blended average mineral concentrate prices received by Talison, the correlations are very high. For example, the correlation between technical-grade lithium carbonate prices and Talison's averaged mineral concentrate prices are 0.915 for the period in which we have data. This means that roughly 84% of price variation in mineral concentrates can be explained by variation in lithium chemical prices (and vice versa, of course).

Since the two prices are so closely linked, we have undertaken an analysis to understand likely mineral concentrate prices, for both technical- and chemical-grade, in future. Through interviewing those involved, it is our understanding that technical-grade mineral concentrates were priced against lithium chemicals, obviously allowing for some discount. Chemical-grade mineral concentrates were then priced at a discount compared to the technical-grade concentrate price, owing to the fact that the chemical-grade concentrate required substantial additional processing in order to produce the chemicals.

We do not have sufficient data to unambiguously derive the average mineral concentrate prices for each of technical- and chemical-grades for each of the periods in which Talison reported. However, we can arrive at the same place in stages.

To begin, we need to calculate the grade, in contained Li_2O , for each of the



technical- and chemical-grade concentrates sold by Talison. There are data contained in annual information forms that, assuming Talison utilized production capacity and then sold 100% of its technical-grade spodumene concentrate, shows us that the technical-grade material averaged 6% Li_2O content. From this, data on each fiscal year regarding lithium carbonate equivalent level of Talison's overall concentrate quickly shows that the content of Talison's chemical-grade concentrates is also (roughly) 6% Li_2O .

With this in place, we assume a 25% discount to technical-grade lithium carbonate prices for the equivalent lithium content, and then calculate the price for chemical-grade mineral concentrate from Talison's disclosures, and we very quickly understand why Talison had always been very anxious to sell more of its technical-grade material; the margins for technical-grade products are much higher than those for chemical-grade spodumene concentrates.

Exhibit 3 – Spodumene Concentrate Pricing (Historical, US\$/tonne)

Talison Fiscal Year	2010	2011	2012	2013
Volume sold (con)	339,501	365,545		
Volume produced (con)	342,097	357,128		
Volume (LCE, approx.)	50,300	54,400		
Avg price per tonne con	\$ 307.72	\$ 334.58		
Avg cost per tonne con	\$ 203.76	\$ 205.09		
Volume of tech-grade con (tonnes)	71,000	71,000		
Volume of chem-grade con (tonnes)	268,501	294,545		
Price, tech-grade Li_2CO_3	\$ 4,867	\$ 5,692		
Price, tech-grade con (from Li_2CO_3 price)	\$ 548	\$ 640		
Price, chem-grade con (from Talison data)	\$ 244	\$ 261		

Source: Company reports, Stormcrow

These results give us a scale on which to forecast future concentrate prices based on future lithium chemical pricing. We have very little data on which to judge whether the above still represents a reasonable view, but we do have guidance for 2017 from Galaxy Resources regarding the sale of chemical-grade spodumene concentrate



from the Mt Cattlin Mine.

Galaxy announced on 14 December 2016 that customers had agreed to buy 120,000 tonnes of spodumene concentrate for conversion to lithium chemicals, with the effective pricing being US\$905/t for 6% Li₂O content. Based on the average price seen in the spot market for technical-grade lithium carbonate in China in 2017 (130,300 RMB/t) we would have predicted a slightly higher price of US\$924/t for the same material.

One concern we have is that, since 2010-2011, the lithium market has become dominated by chemicals, especially battery-grade carbonate and hydroxide. The more dynamic nature of this end-use market, compared to those that had previously driven spodumene pricing, may be causing spodumene prices to become elevated compared to the pricing environment seen seven years ago. If we re-analyze the historical data from Talison on the basis of pricing chemical-grade spodumene concentrate against battery-grade lithium carbonate, we find that using a 65% discount to the value of the contained Li₂O in the spodumene concentrate yields a good fit to historical data. On this basis, the predicted price of 6% chemical-grade spodumene concentrate should have been US\$1,067/t in 2017.

We are inclined to believe that the pricing of spodumene concentrate will become more robust, for a number of reasons. First, in terms of the general market for spodumene concentrate that is processed to become lithium chemicals, there is a significant overabundance of processing capacity available in China, and a growing abundance of processing capacity outside China (including, for example, Nemaska's proposed facilities in Quebec as well as Tianqi Lithium's proposed new lithium hydroxide plant in Australia). If the lithium market behaves as other Chinese-dominated markets with excess processing capacity, the beneficiary of this overcapacity is the miner, as the processors compete to gain access to feedstock and market share. For example, in the case of the rare earths, prices paid for the limited amount of available rare earth concentrates rose, over just a two-year period, from roughly 40% of the contained rare earth value to 70% of that value.

Second, in spite of additional spodumene mineral concentrate being produced in the world, little of that concentrate is suitable for the making of ceramic-glass or glass. Nemaska's concentrates, for example, simply contain too much iron to make them useful to the glass market, and the same is true for many of the other potential major concentrate suppliers. As a rule of thumb, if the spodumene is tinted green, it



Stormcrow Capital Limited
WaterPark Place
20 Bay St, 11th Fl
Toronto ON, M5J 2N8

likely contains far too much iron. The technical-grade concentrate from Talison's Greenbushes Mine is very low in iron, and represents the gold standard for the glass industry.

As such, our projections into the future for 6.6% chemical- and 7.2% technical-grade spodumene concentrates are:

Exhibit 4 – Spodumene Concentrate Pricing (Forecasts, USD\$/tonne)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
6.6% Chemical	\$ 1,181	\$ 891	\$ 732	\$ 656	\$ 685	\$ 740	\$ 965	\$ 1,004	\$ 987	\$ 1,008
7.2% Technical	\$ 2,250	\$ 1,365	\$ 1,423	\$ 1,137	\$ 1,225	\$ 1,385	\$ 1,780	\$ 1,509	\$ 1,414	\$ 1,443

Source: Stormcrow

Frontier Lithium's PAK project will also produce a tantalite concentrate, a mineral concentrate processed to produce tantalum metal, a high-value, rare metal used primarily in miniaturized electronics such as modern cellular telephones. We can make an estimate of the value of such a product here.

Exhibit 5 – Tantalum Concentrate Pricing (Historical)



Source: Asian Metal

The above figure represents the market price of 30% Ta₂O₅ concentrate for the last seven years, back to January of 2010, in US\$/lb. The average price over this period is US\$82.24/lb. Appropriately scaled for the content of Ta₂O₅ in the PAK concentrate, we believe this represents a useful approximation to the long-term value of the concentrate, given this is not a major output from the proposed mine.

Conclusions

Stormcrow has completed an analysis of likely chemical- and technical-grade spodumene concentrate pricing, through to 2028. Our analysis suggests that such concentrate prices are likely to remain robust, and that, in spite of varying prices for lithium chemicals, prices of concentrate should remain strong compared to historical levels as margin is transferred from the converters in China, that process spodumene into lithium chemicals, to the producers of the feedstock. This is a pattern that we have seen repeated in basic commodities such as iron ore through to critical materials such as rare earths.



Stormcrow Capital Limited
 WaterPark Place
 20 Bay St, 11th Fl
 Toronto ON, M5J 2N8

We believe that the appropriate pricing levels for 6.6% chemical-grade and 7.2% technical-grade concentrates, as well as a defensible average price point for tantalum concentrates, are:

Exhibit 6 – Frontier Lithium Concentrate Pricing (Forecasts)

	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
6.6% Chemical-Grade (US\$/t)	\$ 1,181	\$ 891	\$ 732	\$ 656	\$ 685	\$ 740	\$ 965	\$ 1,004	\$ 987	\$ 1,008
7.2% Technical-Grade (US\$/t)	\$ 2,250	\$ 1,365	\$ 1,423	\$ 1,137	\$ 1,225	\$ 1,385	\$ 1,780	\$ 1,509	\$ 1,414	\$ 1,443
Tantalum Concentrate (US\$/lb.)	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24	\$ 82.24

Source: Stormcrow

ABOUT US

WSP is one of the world's leading professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors and environmental specialists, as well as other design, program and construction management professionals. We design lasting solutions in the Buildings, Transportation, Infrastructure, Oil & Gas, Environment, Geomatics, Mining, Power and Industrial sectors as well as project delivery and strategic consulting services. With over 8,000 talented people across Canada and 49,000 people globally we engineer projects that will help societies grow for generations to come.

HEAD OFFICE

WSP GLOBAL INC.
1600 RENÉ-LÉVESQUE BLVD WEST, FLOOR 16
MONTRÉAL, QC H3H 1P9
CANADA

T +1 514-340-0046
F +1 514-340-1337
wsp.com

