CRITICAL ELEMENTS LITHIUM CORPORATION

ROSE LITHIUM-TANTALUM PROJECT

FEASIBILITY STUDY NI 43-101 TECHNICAL REPORT

July 26, 2022

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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
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 .... cm^2
square foot .... ft^2
square inch .... in^2
square kilometre km2
square metre .... m^2
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/hm^3
volt V
week .... wk
weight/weight .... w/w
wet metric ton .... wmt

ACRONYMS

CAAQS .... Canadian Ambient Air Quality Standards
CAPEX .... Capital Expenditures
CAR .... Clean Air Regulation
CAN$ .... Canadian Dollars
CELC .... Critical Elements Lithium Corporation
CIF .... Cost, Insurance, and Freight
CIM .... Canadian Institute of Mining, Metallurgy and Petroleum
COFEX .... JBNQA Federal Review Panel
COMEV .... JBNQA Evaluating Committee
COMEX .... JBNQA Review Committee
Cp .... Run-Off Coefficient
Deutsche Bank .... Deutsche Bank Market Research
DMS .... Dense Medium Separation
DOL .... Direct-on-line
EEM .... Environmental Effects Monitoring
EPCM .... Engineering, Procurement, Construction Management
ESS .... Energy Storage Systems
EV .... Electric Vehicles
FOB .... Free on Board
FS .... Feasibility Study
GDP .... Gross Domestic Product

GHG .... Greenhouse Gas
HDPE .... High-Density Polyethylene
HLS .... Heavy-liquid Separation
HMI .... Human Machine Interface
IBA .... Impacts and Benefits Agreement
ISO .... International Organization for Standardization.
JBNQA .... James Bay and Northern Québec Agreement
LA-ICP-MS .... Laser Ablation Technique
LCE .... Lithium Carbonate Equivalent
LCT .... Locked Cycle Test
LNG .... Liquid Natural Gas
LOM .... Life of Mine
LoOP .... Life of Operations Plan
LRS .... Electrolytic Starter
MDDELCC .... Ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques
MERN .... Ministère de l'Énergie et des Ressources naturelles
MLEGB .... Middle and Lower Eastmain Greenstone Belt
MMER .... Metal Mining Effluent Regulations
MMU .... Mobile Manufacturing Unit
MRNQ .... Ministère des Ressources naturelles du Québec
MSE .... Mechanically Stabilized Earth
MTO .... Material Take-Off
NPAG .... Non-Potentially Acid Generating
NPV .... Net Present Value
NSR .... Net Smelter Return
OEE .... Overall Equipment Efficiency
PF .... Powder Factor
PLC .... Programmable Logic Controller
ppm .... Part per Million
PPSRTC .... Politique de protection des sols et de réhabilitation des terrains contaminés
Project (the) .... Rose Lithium-Tantalum Project
Property (the) .... Rose Property
PV .... Photovoltaic
RF .... Revenue Factor
RFQ .... Request for Quotation
ROM .... Run-of-Mine
Roskill .... Roskill Information Services Limited
SCADA .... Supervisory Control and Data Acquisition
SS .... Soft-Start
TCLP .... Toxicity Characteristic Leaching Procedure
TEFC .... Totally Enclosed, Fan Cooled
THUA .... Thickener Hydraulic Unit Area

TSP .... Total Suspended Particulate
TSS .... Total Suspended Solids
TUFUA .... Thickener Underflow Unit Area
UPS .... Uninterruptible Power System
USGS .... United States Geological Survey
US$ .... United States Dollars
VFD .... Variable Frequency Drives
WBS .... Work Breakdown Structure
WHIMS .... Wet High-Intensity Magnetic Separation
WSI .... Weh-Sees Indohoun
XRD .... X-ray Diffraction

1 SUMMARY

1.1 Geology Setting and Mineralization

The Rose Property (the Property) is located in the southern portion of the Middle and Lower Eastmain Greenstone Belt (MLEGB). Although the MLEGB shows a wide variety of rock types, most of the Property is underlain by intrusive lithologies. These are mainly syntectonic (2,710 to 2,697 Ma), with lesser volumes of late to post-tectonic intrusions (<2,697 Ma).

Gabbros, pyroxenites, and diorites cut across the Property geology. Pegmatites occur as irregular but generally continuous lenses within biotite schists. Historical work in the 1960s by the Ministère des Ressources naturelles du Québec (MRNQ), now the Ministère de l'Énergie et des Ressources naturelles (MERN), followed by additional regional-scale government work, uncovered four showings on the Property, two of which (Rose and Pivert) were have been examined more closely by the issuer. Both are showings of lithium and rare-element mineralization in pegmatites.

Other rock types, including gneiss, dacite, quartzite and conglomerate, have also been reported. Lithologies are generally well foliated with a SE orientation, except for the more massive and unfoliated granites and pegmatites.

Mineralization recognized to date on the Property includes rare-element LCT-type pegmatites and molybdenum occurrences

Critical Elements started drilling the Property in late 2009. This report considers 255 holes drilled by the company for a total of 29,135.50 m. Of those 255 holes, 202 (totalling 25,200.90 m) were included in the current resource estimate.

1.2 Mineral Processing and Metallurgical Testing

Metallurgical test work performed at SGS Lakefield was used to define design criteria for the spodumene plant. Bench scale metallurgical test work was performed on outcrop and drill core samples having lithium grades from 1.0% Li_2O (bench scale test work) to 1.45% Li_2O (pilot scale test work). Variability drill core composites tested had head grades; 0.99% Li_2O to 2.15% Li_2O except for one composite (PEG2) with 0.80% Li_2O that did not produce acceptable grade-recovery due to the presence of higher levels of amphiboles and pyroxenes in the ore.

Metallurgical test work on nine representative drill core composites having a lithium head grade varying between 0.50% Li_2O and 1.70% Li_2O was conducted at SGS laboratory to investigate its effect on grade/recovery. Results show that a head grade of 0.87% Li_2O could produce a chemical grade lithium concentrate of 5.5% Li_2O with a recovery over 90% or a technical grade lithium concentrate of 6.0% Li_2O with a recovery over 87%.

Tantalum upgrading test work at SGS Lakefield shows that tantalum grading 2.0% Ta_2O_5 recovered by magnetic separation could be upgraded to 20% Ta_2O_5 by gravity separation.

The proposed flowsheet is comprised of conventional three-stage crushing and single-stage grinding followed by magnetic separation for the recovery of tantalum, mica flotation, and spodumene flotation.

Settling and filtration tests were performed by rewetting the combined dry tailings from the production tests to obtain design criteria for sizing thickener and filtration equipment. Dry spodumene concentrate available from previous test work was used to perform settling and filtration tests to generate design criteria for sizing spodumene concentrate dewatering circuit.

1.3 Mineral Resource Estimate

The 2022 Rose Deposit Mineral Resource Estimate presented in this report (the 2022 MRE) was prepared by Carl Pelletier, P.Geo., using all available information. The 2022 MRE was prepared as part of a mandate assigned by Critical Elements in 2022.

The 2022 main resource area measures 1,600 m along strike, 1,300 m wide and 300 m deep. The resource estimate is based on a compilation of all recent diamond drillholes and wireframed mineralized zones largely inspired by previous work. The final model was constructed by the QP. The result of this study is a single Mineral Resource Estimate for 23 mineralized zones. The estimate includes Indicated and Inferred resources for open pit and underground scenarios. The effective date of the resource estimate is May 27, 2022, based on compilation status.

Mineral Resources were compiled using a minimum NSR cut-off of CAN$121.12 for the underground potential extraction scenario and CAN$31.4 for the open-pit potential extraction scenario. Parameters used to determine such cut-offs are presented in the report. The NSR cut-offs must be re-evaluated continually according to prevailing market conditions and other factors, such as lithium and tantalum prices, exchange rate, mining method, related costs, etc.

Table 1.1 displays the results of the in situ Mineral Resource Estimate for the Project at the $31.4 NSR cut-off for the open-pit potential extraction scenario and at the $121.12NSR cut-off for the underground potential extraction scenario.

Table 1.1: Project Mineral Resource Estimate

Category		Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Indicated	Pit-constrained	30.4	216	0.99	0.91	150
	Underground	1.1	200	0.92	0.86	100
	Total Indicated	31.5	215	0.99	0.91	148
Inferred	Pit-constrained	2.0	181	0.85	0.76	157
	Underground	0.7	179	0.83	0.78	100
	Total Inferred	2.7	180	0.85	0.77	141

Notes:

- The Independent and Qualified Person for the Mineral Resource Estimate, as defined by NI 43101, is Carl Pelletier, P.Geo., of InnovExplo Inc. The effective date of the estimate is May 27, 2022. The MRE follow 2014 CIM Definition Standards and the 2019 CIM MRMR Best Practice Guidelines.
- These Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability.
- The model includes 23 mineralized zones.
- The reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open -pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades. The mineral resource is reported at a cut-off of $31.4 NSR for the open-pit potential; and of $121.12 NSR for the underground potential based on market conditions (metal price, exchange rate and production cost).
- A range of densities was used on a per-zone basis based on statistical analysis of all available data.
- A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.
- High grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.
- Compositing was done on drillhole intercepts falling within mineralized zones (composite lengths vary from 1.5 m to 3 m in order to distribute the tails adequately).
- Resources were evaluated from drill holes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).
- The inferred category is only defined within the areas where blocks were interpolated during pass 1 or pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drill hole. The indicated category is only defined by blocks interpolated by a minimum of two drillholes in areas where the maximum distance to the closest drill hole composite is less than 40 m for blocks interpolated in Pass 1.
- Results are presented in situ. The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43101.
- The qualified persons are not aware of any known environmental, permitting, legal, title-related, taxation, socio-political or marketing issues, or any other relevant issue, that could materially affect the potential development of mineral resources other than those discussed in the MRE.

1.4 Mineral Reserve Estimate

The Mineral Reserves estimate (Table 1.2) for the Project was prepared by Mr. Simon Boudreau, P.Eng, an employee of InnovExplo Inc. and is effective as of May 27, 2022. The Mineral Reserves estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources. Measured and Indicated Resources are inclusive of Proven and Probable Reserves.

The Feasibility Study (FS) Life-of-Mine plans and Mineral Reserves estimate were developed from the geological block model prepared by InnovExplo, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS. As of the date of this report, the QP has not identified any risks, legal, political, or environmental, that would materially affect potential development of the Mineral Reserves.

Table 1.2: Mineral Reserves Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	204	0.92	0.87	138
Total	26.3	204	0.92	0.87	138

Notes:

- The Independent and Qualified Person for the Mineral Reserve Estimate, as defined by NI 43-101, is Simon Boudreau, P.Eng, of InnovExplo Inc.
- The effective date of the Mineral Reserves estimate is May 27, 2022.
- The reserve estimate is based on the current resource estimate with the exception of a constant recovery of 85% Li_2O. Metal prices are set at US$20,000/t Li_2O and US130/kg Ta_2O_5 using an exchange rate of 1.25 CAN$:US$. Metallurgical recoveries set constant at 85% for Li_2O and 64% for Ta_2O_5. The cut-off NSR value of CAN$29.70/t.
- The reserve estimate includes 9.6% dilution and 5% ore loss.
- The model includes 20 mineralized zones, of which 17 are included in the mining plan.
- Calculations used metric units (metres, tonnes and ppm).
- The number of metric tons was rounded to the nearest hundred thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing or other relevant issue that could materially affect the Mineral Reserve Estimate.

1.5 Mining Methods

The Rose deposit is made of stacked mineralized lenses oriented N296° with an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface, so the FS is based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprising 26.3 Mt of ore, 182.4 Mt of waste and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 1,610,000 tonnes per year. To achieve these milling production targets, the yearly mining production rate will vary accordingly between 11 and 16 Mt of rock material and decrease towards the end of the mine life. All overburden material will be mined by a contractor. The open pit mining schedule resulted in a LOM of approximately 19 years, starting with 19 months of pre-production, just over 16 years of production, and ending with 5 months of stockpile processing. The mine plan includes four different phases to delay overburden removal, to keep the ore extraction rate relatively constant, and to improve mill feed grade in the first years of the Project.

1.5.1 Geotechnical Considerations

The pit design for the Project is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°.

1.5.2 Final Pit Design

The final pit design is based on the selected optimized pit shell and geotechnical parameters. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

1.5.3 Mining Phase Designs

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By subdividing the ultimate pit into these four separate phases, the ore mining rate is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

1.5.4 Mine Production Schedule

The life-of-mine (LOM) plan for the Project is based on an ore processing rate of 1,610,000 t per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined, and to send higher grade ore to the mill in the first years of operation.

1.5.5 Waste Rock, Overburden, and Tailings Management

Two stockpiles have been designed to store mining waste. One large waste rock stockpile is located directly to the west of the pit and near the main ramp exit, and one overburden stockpile is located south of the pit.

The waste rock pile will be constructed in two phases. A co-deposition strategy will be used to store dry tailings from the mill and mined waste rock on the same pile.

1.5.6 Mining Equipment

Based on the production targets and operational constraints, the loading fleet comprise a 7.4 m3 backhoe excavator for ore handling, a 15 m3 electric hydraulic front shovel for waste rock handling, and a 13.8 m3 production wheel loader for operational flexibility.

The ore mined from the pit will be hauled by a maximum of seven ±65t payload trucks while, while waste mining, dry tailings transport and reclaimed ore will be hauled by a maximum of seven ±135t payload trucks.

Most production drilling will occur in waste as the strip ratio for the Project is high. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls. During the pre-production period, this drill will also perform all drilling in waste panels.

1.5.7 Manpower

A total of 220 employees will be needed at the peak of mining operations, not including contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

1.6 Recovery Method

The spodumene plant will be located near the open pit mine. The plant will be designed to process 4,900 tonnes per day and 365 days per year at 90% availability. Run-of-Mine (ROM) will be transported to the crushing plant. The ore will be crushed to a P_{80} 12.7 mm in three stages using conventional crushing equipment: jaw crusher, secondary cone crusher, and tertiary cone crusher. The crushed ore will be stockpiled under a storage dome.

Crushed ore will be ground in a ball mill to a grind size, P_{80} 220 µm. The ground ore will feed the magnetic separation circuit for recovering tantalum grading 2.0% Ta_2O_5 from the flotation feed. Tantalite recovered will be thickened, filtered, dried to 1% moisture in a rotary dryer, and stored in a 100-tonne tantalite silo. A bagging system installed under the silo will be used to ship the tantalite concentrate in 1.0 tonne bags.

The non-magnetics from the magnetic separation circuit will be deslimed ahead of mica flotation. The flotation circuit consists of mica flotation followed by attrition scrubbing prior to spodumene flotation.

Mica concentrates, slimes from scrubbing, and spodumene scavenger tailings will be thickened and filtered in a vacuum disc filter for producing tailings with a moisture content of 15% for dry stacking. Truck and loading arrangement will be used to dispatch tailings to the waste rock facility. The spodumene flotation concentrate will be thickened, filtered, and dried to 5% moisture in a rotary dryer. The dried spodumene concentrate will be stored in a silo. A truck loading system installed under the spodumene silo will be used to ship the concentrate in bulk loads.

1.7 Project Infrastructure

The Project is accessible year-round from the Cree community of Nemaska using the well-maintained Eastmain-1. Nemaska is accessible via Route du Nord (North Road) from Chibougamau or from Matagami using paved Billy-Diamond Road to reach Route du Nord. The closest airport is located in Nemaska, 30 km south of the Project, near Nemiscau electrical station (50 km by road). The airport is owned and operated by

Hydro-Québec and weekday flights to Montréal via Air Creebec are offered. Figure 1.1 shows the Property location.

Figure 1.1: Rose Property Location

The project infrastructure includes:

- Waste rock and dry tailings co-deposit stockpile
- Ore stockpile and industrial pad
- Main access, service and haulage roads
- Overburden stockpile
- Surface water management ponds, ditches, pumping stations and piping
- Explosive and cap magazine storage
- Liquid Natural Gas (LNG), diesel and gasoline storage and distribution
- Truck shop, warehouse, administrative building, and gatehouse
- Spodumene process plant
- Main electrical substation and distribution
- Communication system
- Final effluent treatment plant
- Fresh and potable water supply
- Sewage system

The combined waste rock and dry tailings co-deposit stockpile was selected to reduce infrastructure footprint. The total capacity of the pile is 102M m³, which is sufficient to contain the waste rock and the dry tailings during mining operation. A toe berm for the dry tailings retention and dripping water filtration is included. Dry tailings will be prepared in the spodumene process plant and hauled to the waste stockpile by mine trucks.

The ore pad will have an approximate capacity of 3.9M T (1.6M m³) and will be adjacent to industrial pad. An overburden stockpile with a capacity of 11.3M T (6.0M m³) will contain materials coming from the pit excavation required to reach bedrock and other infrastructure development.

Installed on the industrial pad, LNG storage and distribution will supply natural gas required for the buildings heating of the and for the concentrates drying.

The diesel (45,000 litres) and gasoline (10,000 litres) storage and distribution system will also be installed on the industrial pad. In order to reduce the equipment required on site, it is planned that a contractor operated diesel tanker truck will directly fill the mobile and mining fleet.

The truck shop, wash bay, and warehouse structural steel arch-type fabric buildings will be installed side by side on the industrial pad and mounted on sea. The truck shop will offer four repair bays, a lube unit room, a tool crib, and offices and will be equipped with an overhead crane. The wash bay will be a dedicated building considering its special needs in terms of HVAC and water supply. The warehouse will have a storage capacity of 750 m² and will also contain a small truck repair bay and a welding bay. There will also be a smaller heated fabric building to park the emergency vehicle.

The administrative building is planned to be a two-story modular construction mounted on wood blocks with a skirt to allow heating of the piping installed underneath. The 26 modules building include offices, dry area and other required installations. The gatehouse will be an independent module also mounted on wood blocks. A 48-space parking lot and a 80,000-tonne truck scale will be installed near the gatehouse.

The contact water from waste stockpile, industrial pad, ore pad, overburden stockpile, and roads will be directed to an equalization pond for final effluent treatment.

A 315 kV electrical transmission line owned by Hydro-Québec runs north-south over the eastern section of the Project. The transmission line will need to be relocated approximately 500 m east of the mining pit by Hydro-Québec. The Project main substation will be fed by this 315 kV line (15.6 MVA load).

The internet will be supplied via microwave towers linked with the Eeyou Communications network in Nemaska. A project-wide optic fibre network will link all buildings, allowing transfer of data such as automation, administrative, security camera, fire alarm system and voice over IP phone communications.

1.8 Environmental Studies, Permitting, and Social, or Community Impact

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Quebec in February 2019. Critical Elements Lithium Corporation (CELC) has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, CELC announced that the Federal Minister of Environment and Climate Change had rendered a favorable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Corporation, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

The final remaining step in the Rose Project's approval process is the completion of the provincial permitting process, which runs parallel to the federal process. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment is conducted jointly by the Cree Nation Government and the Government of Quebec under the Environmental and Social Impact Review Committee ("COMEX"). The provincial assessment is already well advanced and has undergone several rounds of questions from COMEX and answered by CELC in the normal course of the assessment process. At this time, CELC remains confident in a positive outcome given the stated support for lithium project development in the Province of Québec.

CELC has been working since the beginning with the Eastmain Community, on whose lands the Project lies. The Corporation has also maintained good relations with the Grand Council of the Cree and with the neighbouring Nation of Nemaska. Consultations have been ongoing and are planned throughout the life of the Project. In 2019, CELC entered into an impact and benefits agreement with the Cree Nation of Eastmain, the Grand Council of the Cree (Eeyou Istchee), and the Cree Nation Government called the Pihkuutaau Agreement.

The Corporation's mine closure and restoration plan was accepted by the Ministry of Energy and Natural Resources of the Province of Québec (MERN) in May 2022.

1.9 Economic Analysis

A LOM cash flow model was constructed based on the LOM production schedule for the Rose deposit. The key outcomes of the economic evaluation for 100% of the Project, before any financing costs, are presented in Table 1.3. All costs are estimated in Canadian dollars (CA$) and referenced as '$', unless otherwise stated.

Table 1.3: Summary of Project Economics

Item	Units	Value
Production		
Project life (from start of construction to closure)	years	19
Mine life	years	17
Total mill feed tonnage	M t	26.3
Average mill feed grade		
Li_2O	% Li_2O	0.87
Ta_2O_5	ppm Ta_2O_5	138
Lithium Concentrate Production		
% of Production, Chemical Grade	%	75
% of Production, Technical Grade	%	25
Mill recoveries		
Li_2O, Chemical Grade	%	90
Li_2O, Technical Grade	%	87
Ta_2O_5	%	40
Payable		
5.5% Li_2O Concentrate, Chemical Grade	t	2,798,000
6% Li_2O Concentrate, Technical Grade	t	829,000
Ta_2O_5 contained in concentrate	kg	1,453,000
Commodity Prices		
5.5% Li_2O Concentrate, Chemical Grade, LoOP Average	US$/t $_{conc.}$	1,852
6% Li_2O Concentrate, Technical Grade, LoOP Average	US$/t $_{conc.}$	4,039
Ta_2O_5 contained in concentrate	US$/kg $_{contained}$	130
Exchange rate		1 US$: 1.30 CA$
		0.77 US$: 1 CA$
Project Costs		**CA$**
Average Mining Cost	$/t milled	37.89
Average Milling Cost	$/t milled	19.88
Average General & Administrative Cost	$/t milled	20.30
Average Concentrate Transport Costs	$/t milled	18.66
Project Economics		**CA$**
Gross Revenue	$M	10,855
Total Selling Cost Estimate	$M	236
Total Operating Cost Estimate	$M	2,543
Total Sustaining Capital Cost Estimate	$M	160
Total Capital Cost Estimate	$M	464
Duties and Taxes	$M	3,098
Average Annual EBITDA	$M	493
Pre-Tax Cash Flow	$M	7,452
After-Tax Cash Flow	$M	4,354
Discount Rate*		8%
Pre-Tax Net Present Value @ 8%	$M	4,368
Pre-Tax Internal Rate of Return		125.0%
Pre-Tax Payback Period	years	1.0
After-Tax Net Present Value @ 8%	$M	2,487
After-Tax Internal Rate of Return		82.4%
After-Tax payback period	years	1.4

Note* Discounting starts with commencement of commercial production.

A sensitivity analysis was conducted on the economic model to test changes in key economic assumptions, namely commodity prices, operating cost, capital cost, and exchange rate. The Project's pre-tax and after-tax NPV were most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. All sensitivities were analyzed as mutually exclusive variations.

1.9.1 Risks

Factors such as the ability to obtain permits to construct and operate a mine, obtain major equipment and skilled labour on a timely basis may impact the ability to achieve the presented production plans and cost estimates, thus causing actual results to differ substantively from those presented in the economic analysis.

Project financing:

- As with all resource development projects there is an inherent risk that the project will not be able to raise the necessary capital to fund any new construction.

Commodity pricing:

- This Project is exposed to commodity pricing on the world markets, and in fact shows its greatest sensitivity to commodity pricing. Tight control on Capital and Operating spending will alleviate some of the sensitivity to commodity pricing, but under an extended period of depressed lithium markets, the Project would be marginal to uneconomical.

2 INTRODUCTION

This Technical Report was prepared to support a Feasibility Study (FS) in Québec's Regulation 43-101 respecting standards of disclosure for mineral projects. The main objective of the FS is to demonstrate that the Rose Lithium-Tantalum Project (the Project) has sufficient merit from a technical, environmental and economic point-of-view to justify moving towards the EPCM phase.

2.1 Purpose of the Technical Report

WSP Canada Inc. (WSP) was commissioned in April 2022 by Mr. Jean Sébastien Lavallée, Chief Executive Officer of Critical Elements Lithium Corporation (CELC), to complete an independent Technical Report on the Project. This Technical Report complies with National Instrument 43-101 Standards and Disclosure for Mineral Projects (NI 43-101), Companion Policy 43-101CP and Form 43-101F1, as amended on May 9, 2016. It includes an economic analysis of the potential viability of mining the mineral reserves of the Project.

The purpose of the FS consisted in evaluating the potential for mining, milling and metallurgical processes of the Project. This FS took into account all necessary infrastructure required for the development of the Project. The results of the FS were disclosed by CELC in a News Release on June 13, 2022.

This FS is based on developing the Project over a 17-year production period using a conventional truck and shovel open pit operation and a conventional milling process to produce technical and chemical grade spodumene concentrates and a tantalite concentrate.

This Technical Report was prepared as a collaborative effort between InnovExplo of Val-d'Or, Québec for the Mineral Resources, Reserves and Mining, Bumigeme of Montréal, Québec for the Metallurgy and Mineral Processing, and WSP, Québec and Ontario for all other aspects of the study including, surface infrastructures, assessment of a market study, economic analysis, environmental considerations and report integration. The Report presents the Qualified Persons' findings, conclusions, and recommendations.

The economic analysis presented in this Technical Report is based on Probable Mineral Reserves. Probable Mineral Reserves contain Indicated Mineral Resources only. Inferred Mineral Resources have not been considered as these are considered too geologically speculative to have mining and economic considerations applied to them that would enable them to be categorized as Mineral Reserves. There are currently no Proven Mineral Reserves for the Rose Lithium Open Pit.

2.2 Issuer of the Technical Report

This Technical Report was prepared for Critical Elements Lithium Corporation (CELC), a Canadian mining exploration company based in Montréal, Québec, Canada. CELC is the issuer of this Technical Report as per NI 43-101.

Critical Elements Lithium Corporation is listed on the *Registre des entreprises du Québec* (Registry of Québec Companies) as:

Name of company: Corporation Lithium Éléments Critiques
Critical Elements Lithium Corporation

Québec company number (NEQ): 1164063159

Address: 1080, Côte du Beaver Hall, Bureau 101
Montréal (Québec) H2Z 1S8
Canada

Critical Elements Lithium Corporation was incorporated under the Canadian Business Corporations Act R.S.C., 1985, c. C-44 on September 11, 2006 which is still in effect. Initially registered as Exploration First Gold Inc., the company changed its name to Critical Elements Corporation on February 18, 2011.

Mr. Jean-Sébastien Lavallée is the chief executive officer on record of Critical Elements Lithium Corporation (CELC). The shares of CELC currently trade on the TSX Venture Exchange under the ticker symbol CRE, the American Over-the Counter QX (OTCQX) Exchange under the ticker symbol CRECF, and the Frankfurt Exchange under the ticker symbol F12. According to the Registry of Québec Companies, Critical Elements is a company in good standing, is not under bankruptcy, has never been the object of legal procedures by another company, is not the object of a continuation or transformation and is not the subject of liquidation or dissolution.

Critical Elements Lithium Corporation was registered on SEDAR on September 11, 2006, under the CUSIP Number 320377. Its reporting jurisdictions include: Québec.

CELC has interests in 11 properties in the province of Québec including: Rose Lithium-Tantalum, Nisk, Amiral, Arques, Bourier, Caumont, Dumulon, Duval, Lemare, and Valiquette. Further details concerning CELC's projects and company structure, including news releases about the Rose Project, can be found on the company website at www.cecorp.ca.

2.3 Qualified Persons

This Technical Report was prepared for CELC by or under the supervision of Qualified Persons (QPs). WSP Canada, InnovExplo, and Bumigeme are responsible for various items of this Technical Report. The QPs responsible for the preparation of the Technical Report, as defined in NI 43–101 and in compliance with Form 43–101F1 are as follows:

1. Mr. Carl Pelletier, P.Geo., InnovExplo, Val-d'Or, Québec.
2. Mr. Simon Boudreau, P.Eng., InnovExplo, Val-d'Or, Québec.
3. Mr. Florent Baril, P.Eng., Bumigeme; Montréal, Québec.
4. Mr. William Richard McBride, P.Eng. WSP, Sudbury, Ontario.
5. Mr. Éric Poirier, P.Eng. WSP, Val-d'Or, Québec.
6. Mr. Olivier Joyal, P.Geo., WSP, Montréal, Québec.

The QPs' areas of responsibility for the various Items of the Technical Report are outlined in Table 2.1.

Table 2.1: Responsibilities of Qualified Persons

Qualified Person	Responsibility
Carl Pelletier	Items 6 to 12, 14, 23, and portions of Items 1, 2, 3, 24, 25, 26 and 27 that are based on those Items.
Simon Boudreau	Items 15, 16, 21.4, 21.6.1 and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items.
Florent Baril	Item 13, 17, 18.14, 21.5, 21.6.2 and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items.
William Richard McBride	Items 2, 19, 22 and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items.
Éric Poirier	Items 5 (excluding 5.2 to 5.4), 18 (excluding 18.14), 20.3.1, 21.1, 21.2, 21.3, 21.6.3, 21.6.4 and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items.
Olivier Joyal	Items 4, 5.2 to 5.4, 20 (excluding 20.3.1) and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items.

During the preparation of Items under his responsibility, Mr. Éric Poirier supervised a multi-disciplinary team for surface infrastructure design.

2.4 Terms of Reference

The technical information and economic parameters used to prepare this Technical Report and FS are current as of the following effective dates:

- Effective date of the Technical Report: June 28, 2022.
- Press release by CELC: June 13, 2022.
- Effective date of the Mineral Resource Estimate: May 27, 2022.

In general, the Project components and costs were developed to a ±15% level of accuracy, commensurate with that of a Feasibility Study. Budgetary prices were obtained from various vendors for several items including mining equipment and infrastructure components. Other elements of the study were compared to those used in similar projects or estimated from costing manuals.

An exchange rate was assumed between the Canadian and the American dollars: (CA$1.00/US$0.77). The prices for tantalum, technical grade lithium, and chemical grade lithium concentrates used in this FS were respectively set at values varying yearly that average US$130/kg, US$4039/t and US$1852/t over the Life of Operations Plan.

Capital and Operating costs were estimated in 2022 Canadian dollars. An economic evaluation of the Project was conducted using the Internal Rate of Return (IRR) and Net Present Value (NPV) methods.

2.5 Sources of Information

- Mr. Carl Pelletier, P.Geo., InnovExplo, Val-d'Or, QC, did not recently visit the site.
- Mr. Simon Boudreau, P.Eng., InnovExplo, Val-d'Or, QC, visited the site on May 31, 2022.
- Mr. Florent Baril, Eng., Bumigeme; Montréal, QC, did not visit the site.
- Mr. Éric Poirier, Eng., PMP, WSP Canada Inc., Val-d'Or, QC, visited the site on November 15, 2016.
- Mr. Olivier Joyal, Geo., WSP Canada Inc., Montréal, QC, did not visit the site.
- Mr. William Richard (Rick) McBride, P.Eng., WSP Canada Inc., Sudbury, ON, did not visit the site.

CELC, WSP Canada Inc., InnovExplo, and Bumigeme were in constant communication while carrying out the mandate. WSP prepared this Technical Report using the input data provided by CELC and the parties listed in Table 2.1.

A portion of the background information and technical data presented in this Technical Report came from technical reports listed below and previously filed on SEDAR for the Rose Property by CELC. No other companies filed NI 43-101 compliant reports or other technical reports concerning the Rose Property on SEDAR.

At the request of CELC, InnovExplo prepared three independent NI 43-101 compliant Technical Reports on the Property which described the ongoing exploration work performed on the Property. InnovExplo's Technical Reports are dated as follows:

1. September 30, 2010: Technical Report on the Pivert-Rose Property.
   (This report does not include a Mineral Resources estimate).
2. January 24, 2011: Technical Report on the Pivert-Rose Property.
   (This report includes a Mineral Resources estimate but no Mineral Reserves estimate).

3 September 7, 2011: 43-101 Technical Report and Resource Estimate on the Pivert-Rose Property. (This report includes an update of the Mineral Resources estimate dated July 20, 2011, but no Mineral Reserves estimate).

At the request of CELC, WSP, InnovExplo and Bumigeme co-authored an independent NI 43-101 compliant Technical Reports on the Property dated November 29, 2017, which described a FS undertaken for the purposes of evaluating the potential for mining, milling and metallurgical processes of the Project.

The present Technical Report and Feasibility Study is based on the most recent Mineral Resources and Mineral Reserve (MRMR) estimates prepared by InnovExplo for the Property. The MRMR is dated May 27, 2022 and presented in Items 14 and 15 of this report. Mineral reserves are based on results prior to receiving the variable recovery equations and are dated May 27, 2022.

Other sources of information are listed at the end of this Technical Report in Item 27 - References.

3 RELIANCE ON OTHER EXPERTS

The Qualified Persons (QP) who prepared this report relied on information provided by experts who are not QPs. The QPs who authored the Items in this report believe that it is reasonable to rely on these experts, based on the assumption that the experts have the necessary education, professional designations, and relevant experience on matters relevant to the Technical Report.

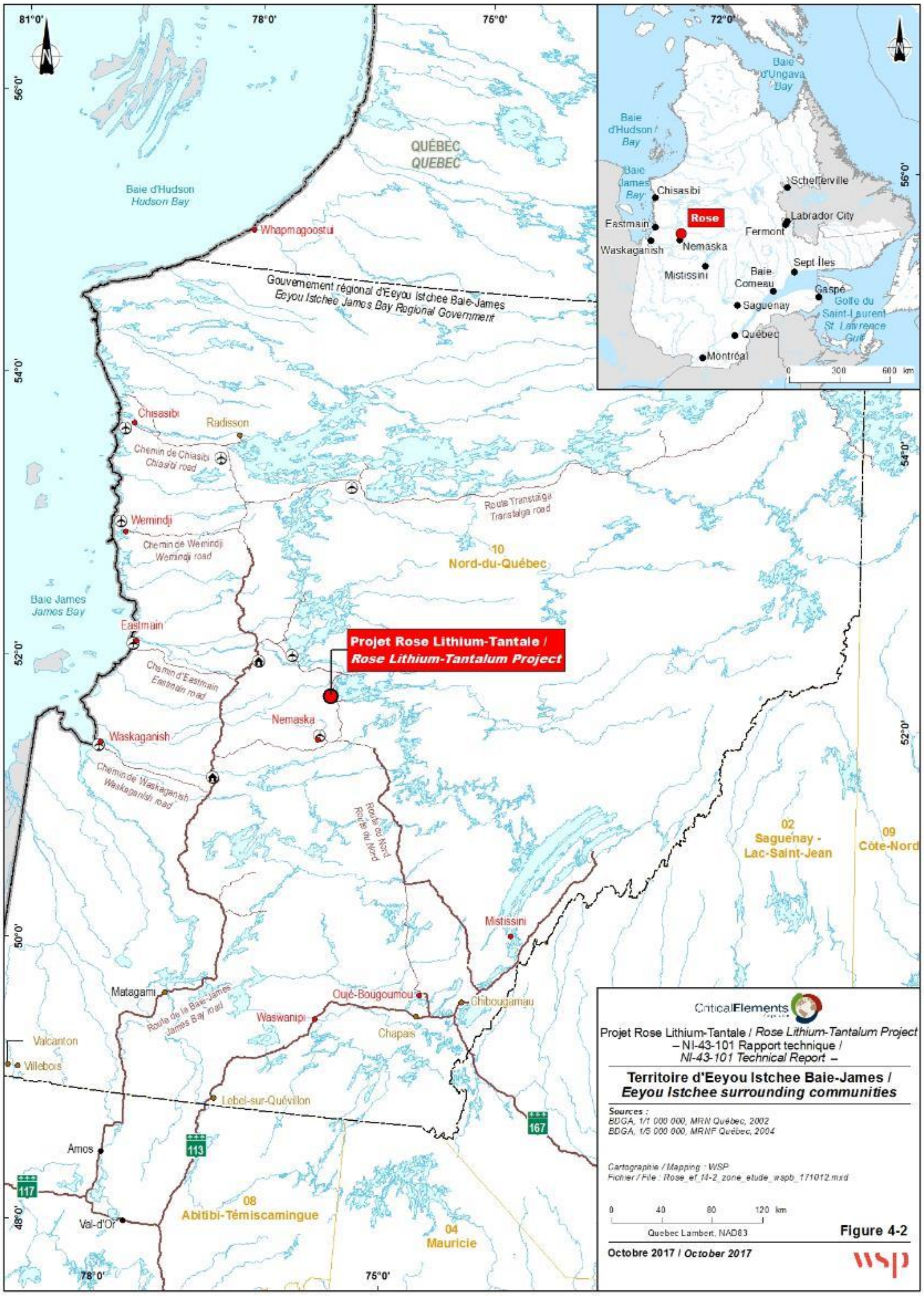
- Olivier Joyal, relied upon GESTIM Plus from Énergie et Ressources Naturelles du Québec for the mining titles extracted from their website as well as CELC for guidance on the titles that are part of the Property described in Item 4.
- Olivier Joyal, relied upon CELC for the description of their relationship with stakeholders described in Item 20.
- Rick McBride, relied upon independent consultant, Gerrit Fuelling, Diplome Ingenieur (TU) for market studies and contracts information used in Item 19.
  - Mr. Fuelling's relevant experience is as follows. Since April 1989 he has worked in the Lithium business, sales and marketing as well as management of Chemetall GmbH, later Rockwood Lithium GmbH till November, 2015. This company and its successor is one of the leading integrated lithium suppliers in the world. He has been instrumental and responsible amongst other business duties for the Asian set up of the lithium business for more than 25 years as well as from 2011 initiator and mentor for the QA/QC program related to establish quality systems which comply with automotive standards. Between 2011 and 2015 Mr. Fuelling was President of Rockwood Lithium Asia and member of the management team of Rockwood Lithium GmbH and as such reporting to Dr. Steffen Haber, at that time CEO of the Rockwood Lithium Group. Asia is the focus of the global lithium battery and related materials development and his work was essentially to lead, align adjust the business of Rockwood Lithium to this industry in this region (i.e. redirecting the business set up towards the emerging battery business for electro-mobility). As such, he has been in, and commanded over, business and personal relationships with most active and relevant market players on the customer side.
- Rick McBride relied upon CELC and its external advisors for guidance on royalties and buy-back options as well as taxes and other government levies of the economic analysis described in Item 22.
- Rick McBride relied on CELC for the implementation schedule described in Item 24.

4 PROPERTY DESCRIPTION AND LOCATION

4.1 Location

The Property is located in northern Québec's administrative region, on the territory of Eeyou Istchee James Bay, on Category III land, on the Traditional Lands of the Eastmain Community, some 40 km north of the Cree village of Nemaska. The latter is located at more than 300 km north-west of Chibougamau. Figure 4.1 shows the detailed Project location.

Figure 4.1: Detailed Project Location



The approximate central geographic coordinates of the Rose Pit area are presented in Table 4.1.

Table 4.1: Approximate Central Geographic Coordinates of the Rose Pit Area

WSG, 1984	UTM (Zone 18, NAD83)
52°0' 59,785'' North	5 761 000 m North
76°9' 36,711'' West	409 700 m East

4.2 Property Ownership and Agreement

The Project is made of 473 active mining titles spread over 24,654 hectares (ha). Mining titles are grouped into one continuous block (Figure 4.2).

The mineralization identified, to date, on the Project includes LCT-type pegmatites and molybdenum indices. An iron index is also mentioned in the government database.

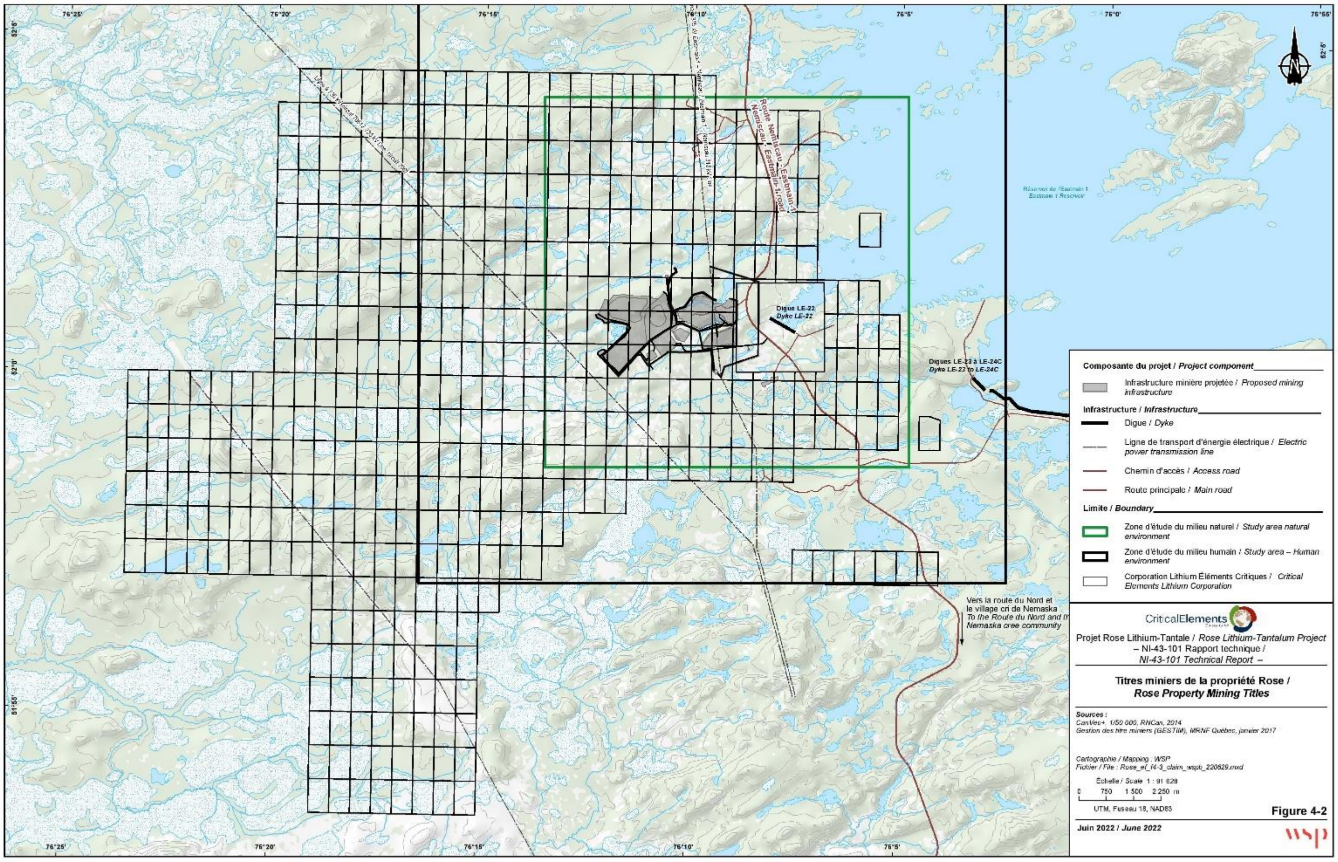
A table showing the mining titles comprising the Project as of June 28, 2022, is included in Appendix 4-A.

According to the GESTIM database (Québec's mining title management system), all mining titles comprising the Project are currently registered to Critical Elements Lithium Corporation. Other than what is discussed in the above transactions, no liens or charges appear to be registered against the Property.

All claims seem to be in good standing according to the GESTIM database (Québec's mining title management system), although a total of 69 active claims are affected by electrical power transmission lines.

On November 29, 2010, First Gold (now Critical Elements Lithium Corporation) announced the closing of a transaction with Jean-Sébastien Lavallée (a director and the interim president and chief executive officer of First Gold), Jean-Raymond Lavallée and Fiducie Familiale St-Georges (together the Vendors) to increase its interest in the Pivert-Rose project from 85% to 100% in consideration of a cash payment of $225,000 and the issuance of 7,500,000 common shares of First Gold. Critical Elements Lithium Corporation fulfilled its obligations and now owns 100% of the Rose property. The Vendors retained a 2 % net smelter return royalty on the Property, half of which (1 %) can be bought back by Critical Elements Lithium Corporation for $1,000,000.

Figure 4.2: Project Mining Titles



4.3 Tenure Rights

A land lease will need to be obtained from the provincial government (the custodian of the Crown lands). This will be applicable to all lands where construction work is required (surface rights). This land lease will need to be acquired before permit requests. As such, a land lease request will be prepared and submitted to the MERN at least a year before the permits are required as the Ministry must include consultation with Aboriginal Communities before delivery of the land lease.

A mining lease will also be needed for the area where the pit will be located.

4.3.1 James Bay and Northern Québec Agreement

The territorial regime introduced by the James Bay and Northern Québec Agreement (JBNQA) is a determining factor in land use. It provides for the division of the territory into Category I, II, and III lands.

Category I lands are reserved for the exclusive use of the Cree. They may be used for residential, community, commercial, industrial or other purposes. In addition, the Cree have an exclusive right to hunting, fishing and trapping.

Category II lands are contiguous to Category I lands. They are part of the public domain of Québec. These are lands where the Cree have exclusive rights of hunting, fishing and trapping. They are part of the public domain of Québec.

Category III lands represent all lands in the Agreement Area not included in Category I and Category II lands. On these lands, the Cree enjoy the exclusive right to trap fur animals. In addition, certain wildlife species are reserved for their hunting and fishing activities. In these territories, hunting and fishing are permitted for both native and non-native people. In Category III lands, mining rights belong to the provincial government. The Project is located on Category III lands.

4.4 Royalties and Related Information

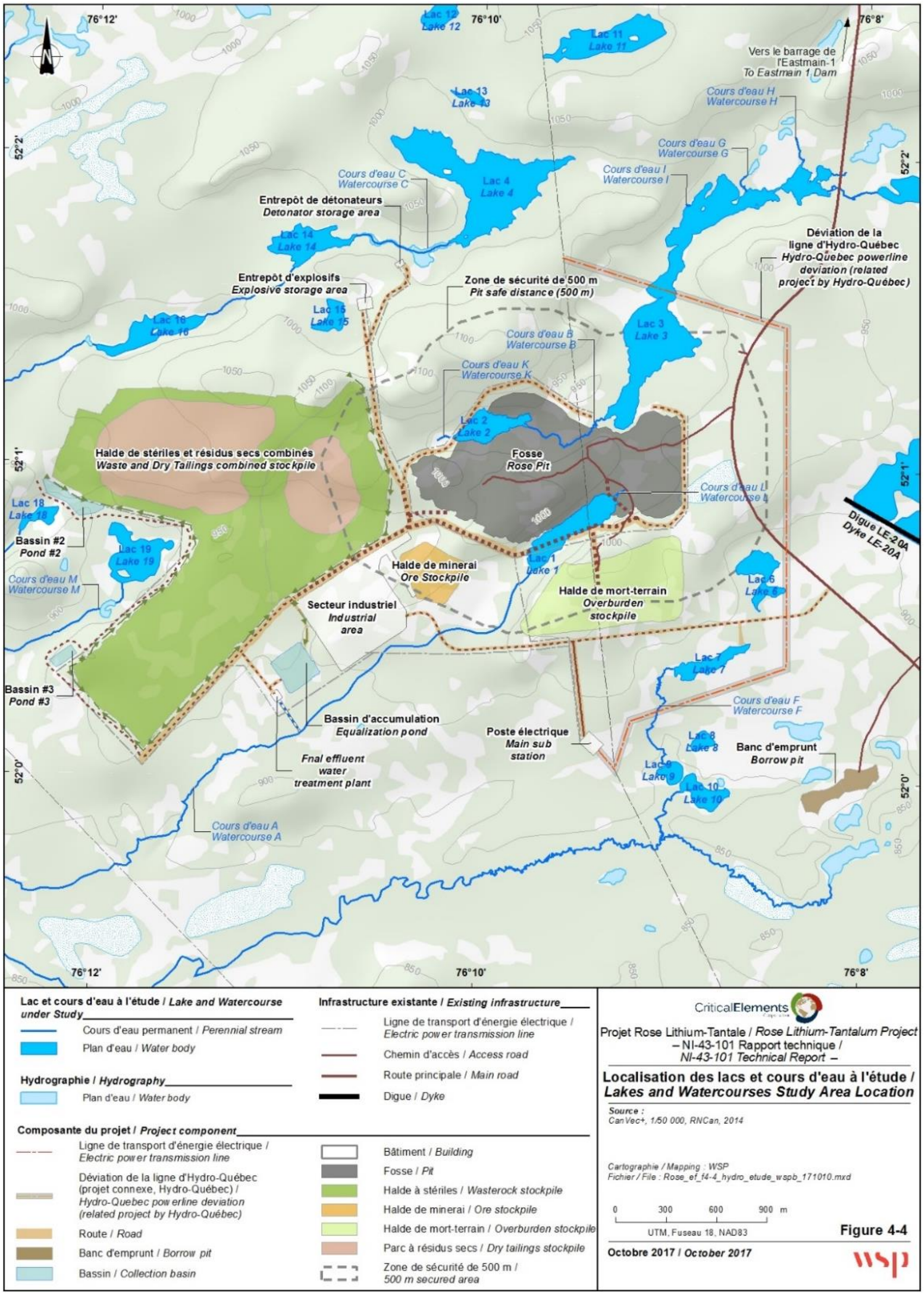
The Property is subject to a 2% net smelter return royalty to Jean-Raymond Lavallée, Jean-Sébastien Lavallée, and Fiducie Familiale St-Georges. CELC may purchase half of the net smelter return (1%) for $1,000,000.

4.5 Environmental Liabilities

The mineral reserves will be mined by excavating an open pit to a depth of 200 m. The pit itself will disturb an area of about 140 ha. The combined pit and infrastructures of the Project will directly impact an area of approximately 725 ha.

It is worth noting that the development of the proposed open pit for the Project will require drainage of two small bodies of water, identified as Lake 1 and Lake 2 on Figure 4.3.

Figure 4.3: Location of Lakes 1 and 2 within the Project



4.6 Permits

All required permits to conduct exploration work are current.

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Québec in February 2019. CELC has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, CELC announced that the Federal Minister of Environment and Climate Change had rendered a favourable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Company, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

The final remaining step in the Rose Project's approval process is the completion of the provincial permitting process, which runs parallel to the federal process. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment is conducted jointly by the Cree Nation Government and the Government of Quebec under the Environmental and Social Impact Review Committee ("COMEX"). The provincial assessment is well advanced and has undergone several rounds of questions from COMEX and answered by CELC in the normal course of the assessment process.

Following receipt of the COMEX EIA approval, CELC will require several approvals, permits and authorizations to initiate the construction phase, operate and close the Project. In addition, CELC will be required to comply with any other terms and conditions associated by both provincial and federals global authorizations.

4.7 Other Relevant Factors

Three high-voltage power transmission lines cross over the Property. One of these crosses over the planned open pit operation and will need to be relocated.

The Eastmain hydroelectric reservoir is located to the east of the Property. Hydro-Québec has an exclusion zone east of the Project. Any work on the exclusion zone would require the consent of Hydro-Québec.

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

5.1 Accessibility

5.1.1 Road

The Project is accessible year-round from Nemaska using the well-maintained Eastmain-1 gravel road . Nemaska is accessible via Route du Nord (North Road) from Chibougamau or from Matagami using paved Billy-Diamond Road to reach Route du Nord. Figure 5.1 shows the main access roads to the site.

The Route du Nord is a 407 km entirely unpaved road in central Québec. It starts at km 0 in Chibougamau and ends at a junction with Billy-Diamond Road (formerly James Bay highway), 275 km north of Matagami. Extensive logging is present along the southern half of the Route du Nord.

A junction with a main gravel road leading to the Eastmain-1 hydroelectric power station exists at km 291 of the Route du Nord. The Project is located some 43 km north of that junction. The east part of the Project overlaps the Eastmain-1 road so that the road passes a mere 320 m east of the proposed open pit. The Project is located less than 20 km south of the Eastmain-1 power station (24 km using roads).

5.1.2 Airport

The closest airport is located in Nemaska, 30 km south of the Project, at km 294 of the Route du Nord, near Nemiscau electrical station (50 km by road). The airport is owned and operated by Hydro-Québec. The Nemaska airport offers weekday flights to Montréal, via Air Creebec, a regional air carrier. Flight time from Nemaska to Montréal is approximately two-and-a-half hours.

Small craft landing strips are also located in Eastmain, 164 km west of the Project (258 km by road), and in Waskaganish, 190 km west of the Property (297 km by road).

5.1.3 Port

Limited Port facilities are found in Eastmain, 170 km west of the Project in the James Bay. Several marine terminals are found along the Saint-Lawrence seaway offering deep-sea general cargo port facilities, year-round activity, and accredited by the International Ship and Port Facility Code to receive vessels from abroad of more than 100,000 deadweight tonnes. They provide direct connection with international ocean shipping lines.

5.1.4 Railroad

The planned railway is in Matagami, providing a connection with the North American railroad network. Rail service is also available in Chibougamau. Figure 5.1 shows the location of Northern Québec’s main roads, airports, ports, and railroads.

Figure 5.1: Northern Québec Main Roads, Airports, Ports, and Railroads

5.2 Physiography

The Project is located at the 52nd parallel north in Central Québec, Canada, well south of Nunavik's southern limit. The Project is characterized by a relatively flat topography (Figure 5.2). The relief in the vicinity of the Project consists of rounded hills separated by low vegetation-covered valleys. Elevations range between 269 masl and 328 masl.

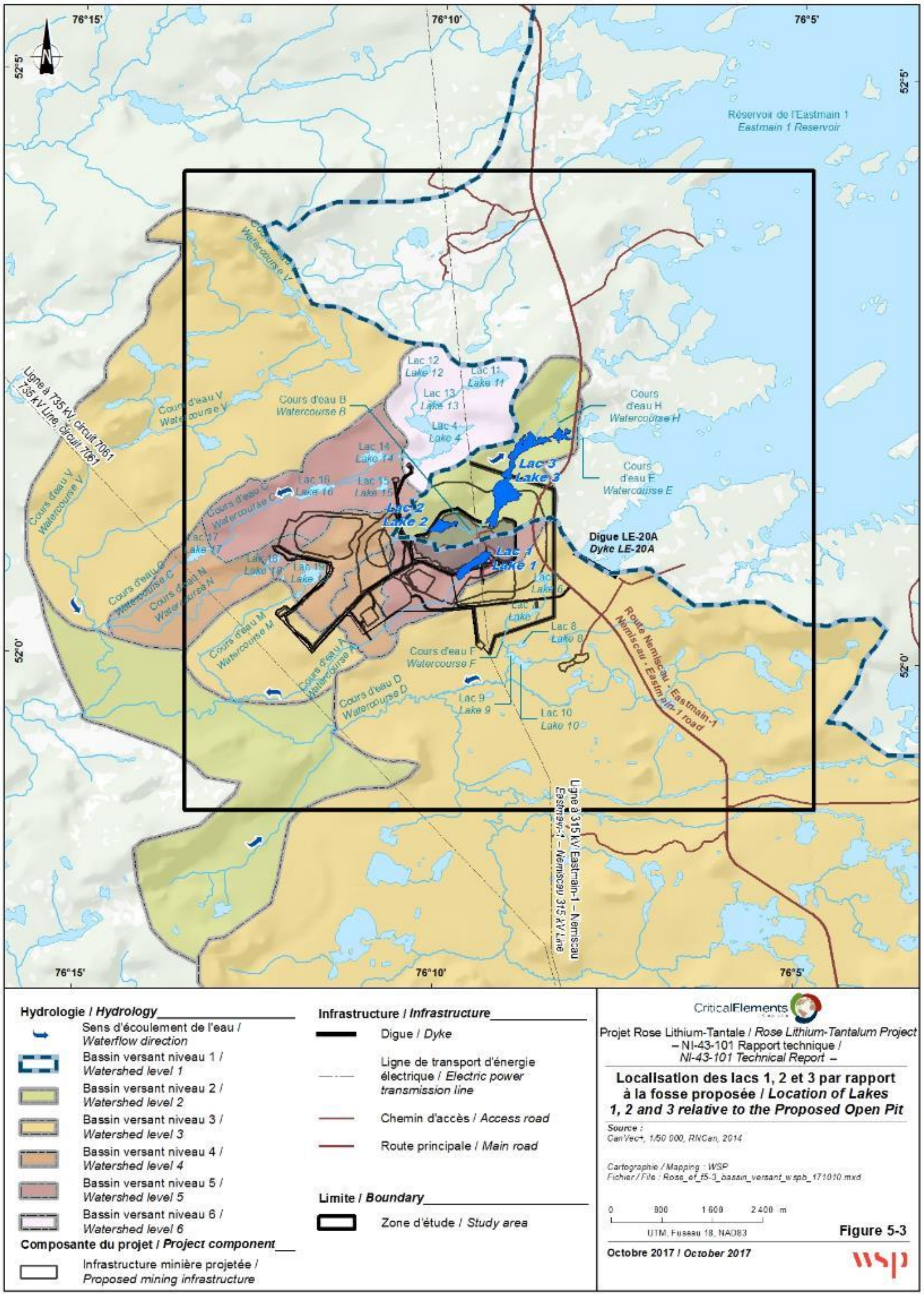
Figure 5.2: View of the Project Landscape – Lake 2 View

Source: WSP site visit

The Project lies on the line of demarcation of the Eastmain and Pontax watersheds. Figure 5.3 shows the various watersheds within the Property with the proposed infrastructure and open pit.

Several waterbodies are found on the Property. The proposed mining plan includes drainage of two small lakes identified as Lake 1 and Lake 2. Lake 3 is not drained. The shoreline of these three lakes lies at elevation 288 masl. Lake 1 is located on the south side of the proposed open-pit, Lake 2 on its northwest side, and Lake 3 on the northeast side.

Figure 5.3: Rose Property Watersheds



A bathymetric assessment of Lake 1 and Lake 2 revealed that they are small and shallow waterbodies. Lake 1 has an elongated oval shape oriented in a general northeastern direction. Lake 1 is approximately 660 m long x 120 m wide x 2.3 m at its deepest point (Figure 5.4). Lake 2 has a diamond shape oriented in a general northeastern direction. Lake 2 is approximately 480 m long x 200 m wide x 6.5 m at its deepest point (Figure 5.5). The volume of water contained is estimated at approximately 90,050 m^3 for Lake 1, and at 186,300 m^3 for Lake 2.

Figure 5.4: Bathymetry of Lake 1 - South of the Proposed Rose Open-Pit

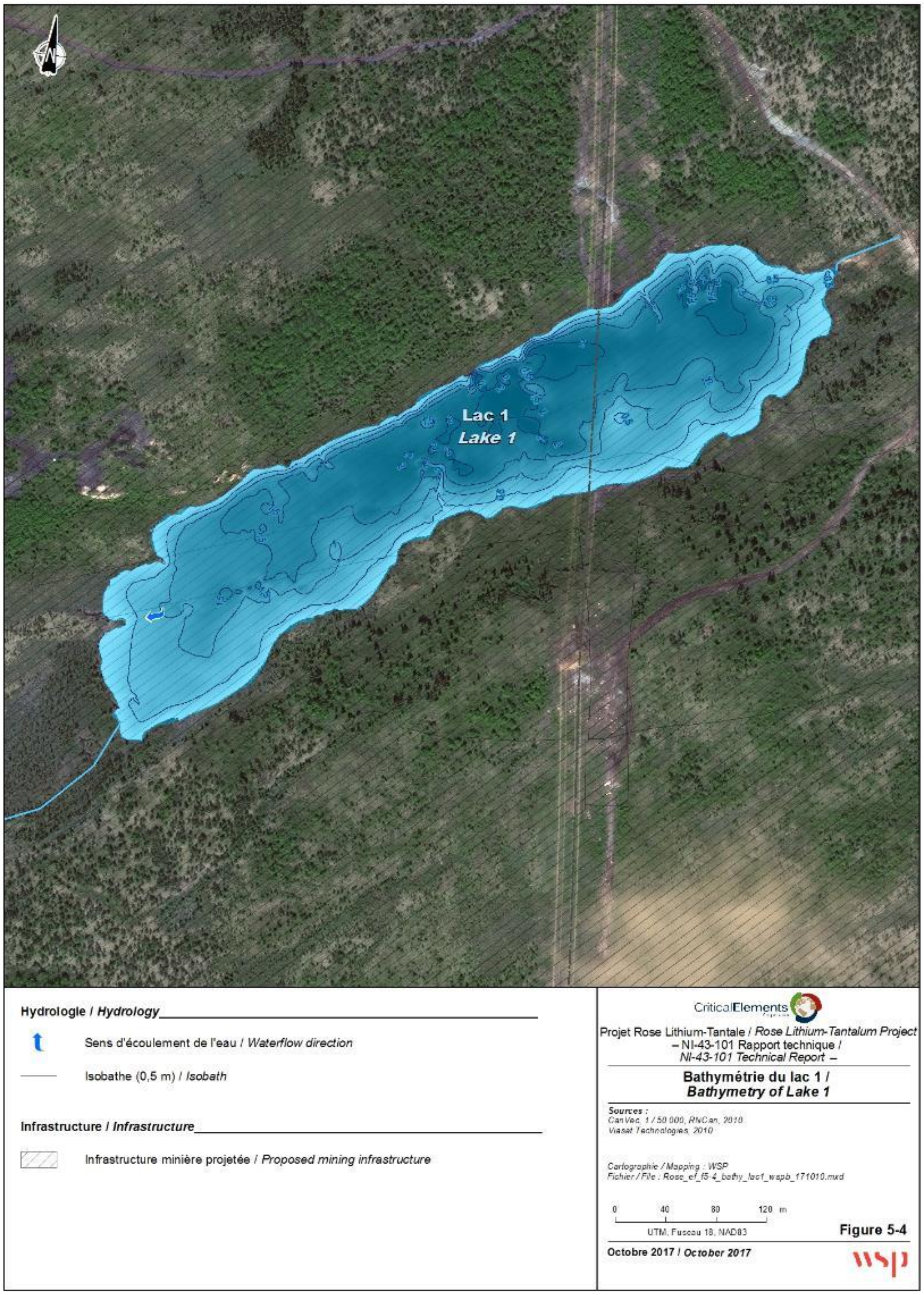
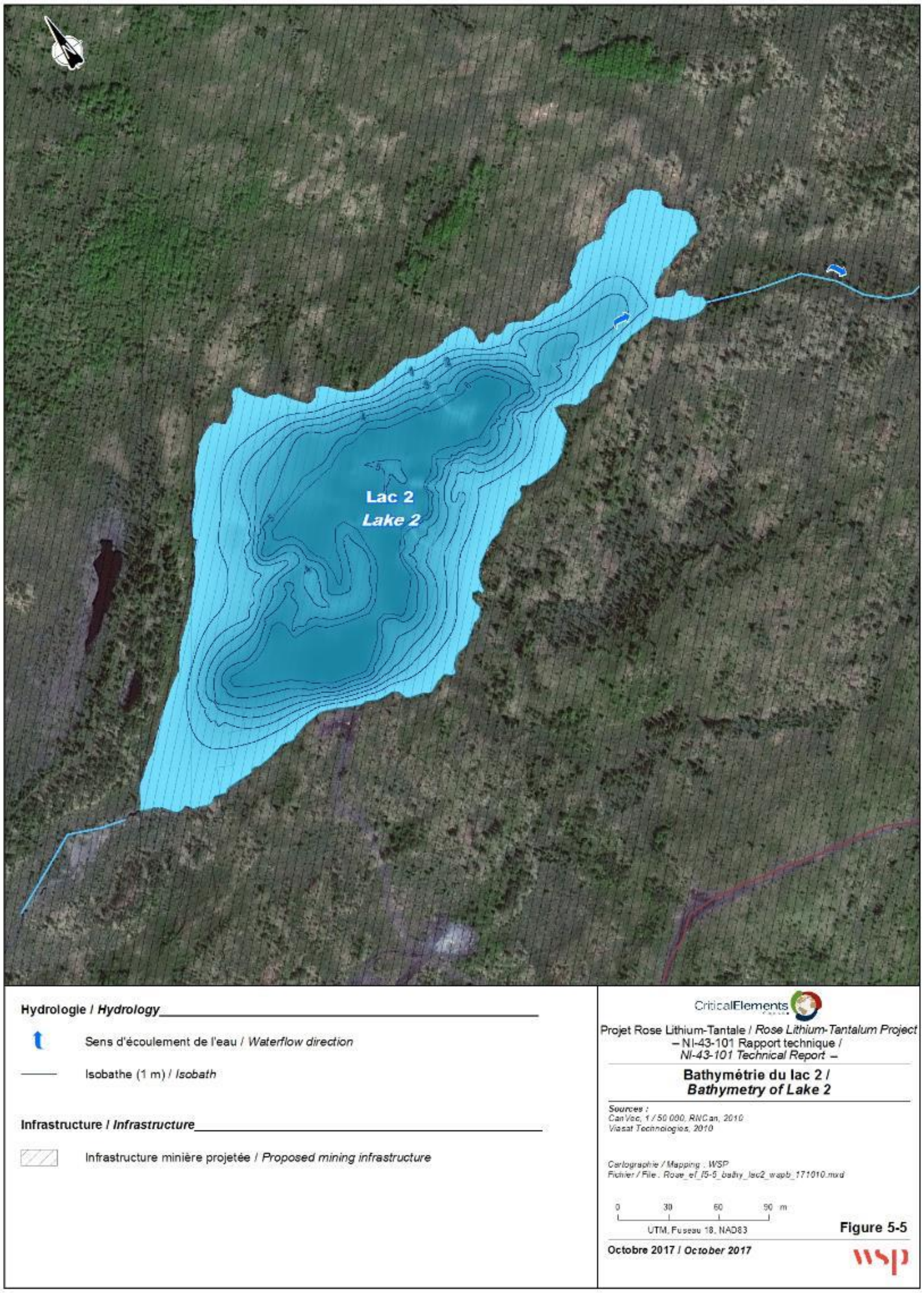
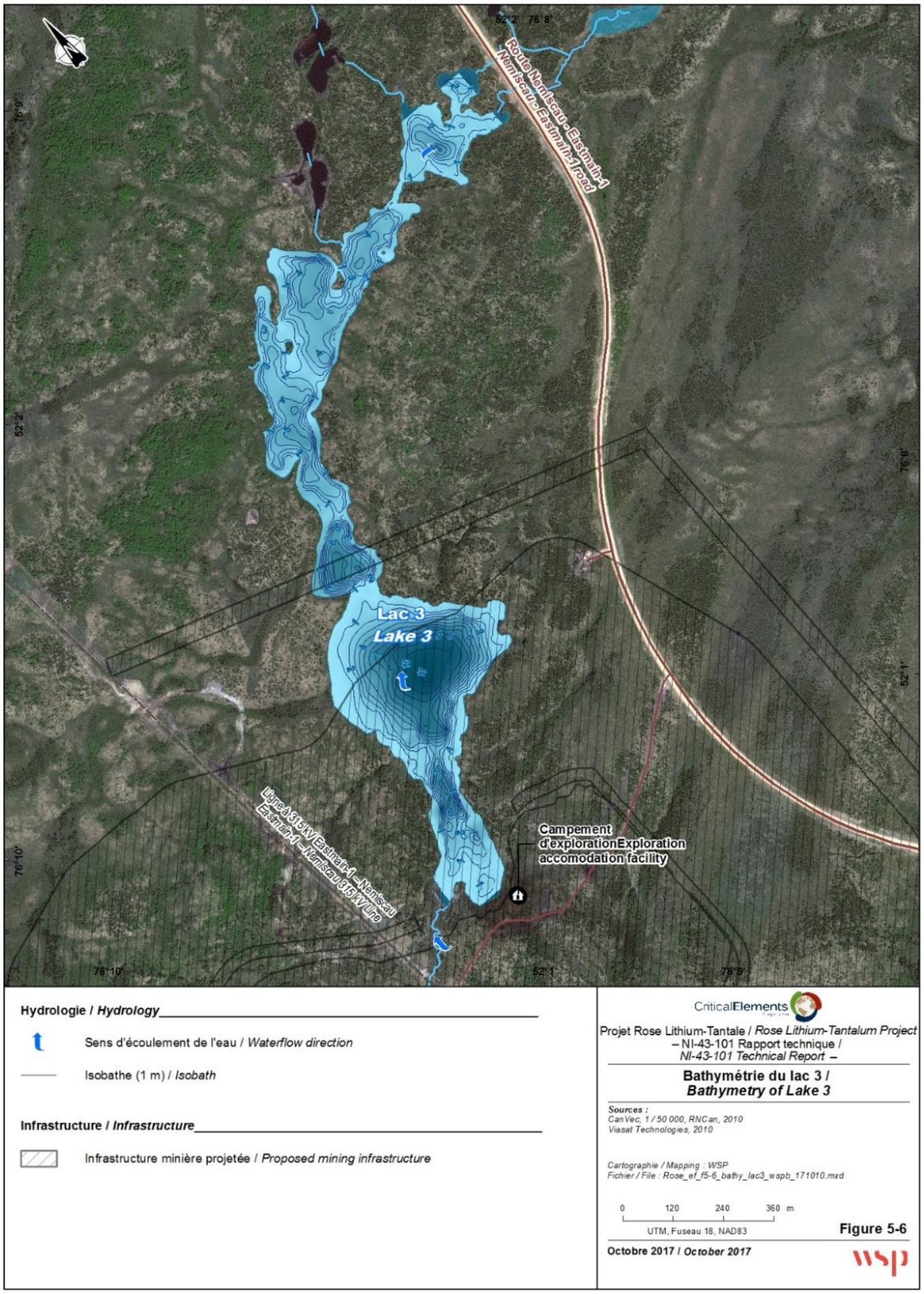


Figure 5.5: Bathymetry of Lake 2 - North-West of the Proposed Rose Open-Pit



Lake 3 is significantly larger than Lake 1 and Lake 2. It has an irregular shape roughly made of a circular middle extending into two arms along a northeastern direction (Figure 5.6). Lake 3 is approximately 2,000 m long x 455 m wide at its widest point, and 11 m at its deepest point. However, the average width of Lake 3 is about 130 m. The volume of water contained in Lake 3 is estimated at approximately 1,082,640 m^3.

Figure 5.6: Bathymetry of Lake 3 - North-East of the Proposed Rose Open-Pit



5.3 Fauna and Flora

The vegetation of the Project is typical of the boreal forest (Figure 5.7). Mature black spruce constitutes the predominant tree species, with occasional birches, poplars, alders and deciduous bushes. The predominance of peatland and black spruce increases towards the north. The tree stratum is mostly composed of gray pine, black spruce and white spruce. The shrub stratum is mainly composed of green alder, sheep-laurel, Labrador tea, lowbush blueberry and few willows. The herbaceous stratum is sparse and little diversified. Eight wetland classes were identified in the study area, totalling a surface area of approximately 3,100 ha. No plant at risk was observed during the various field campaigns.

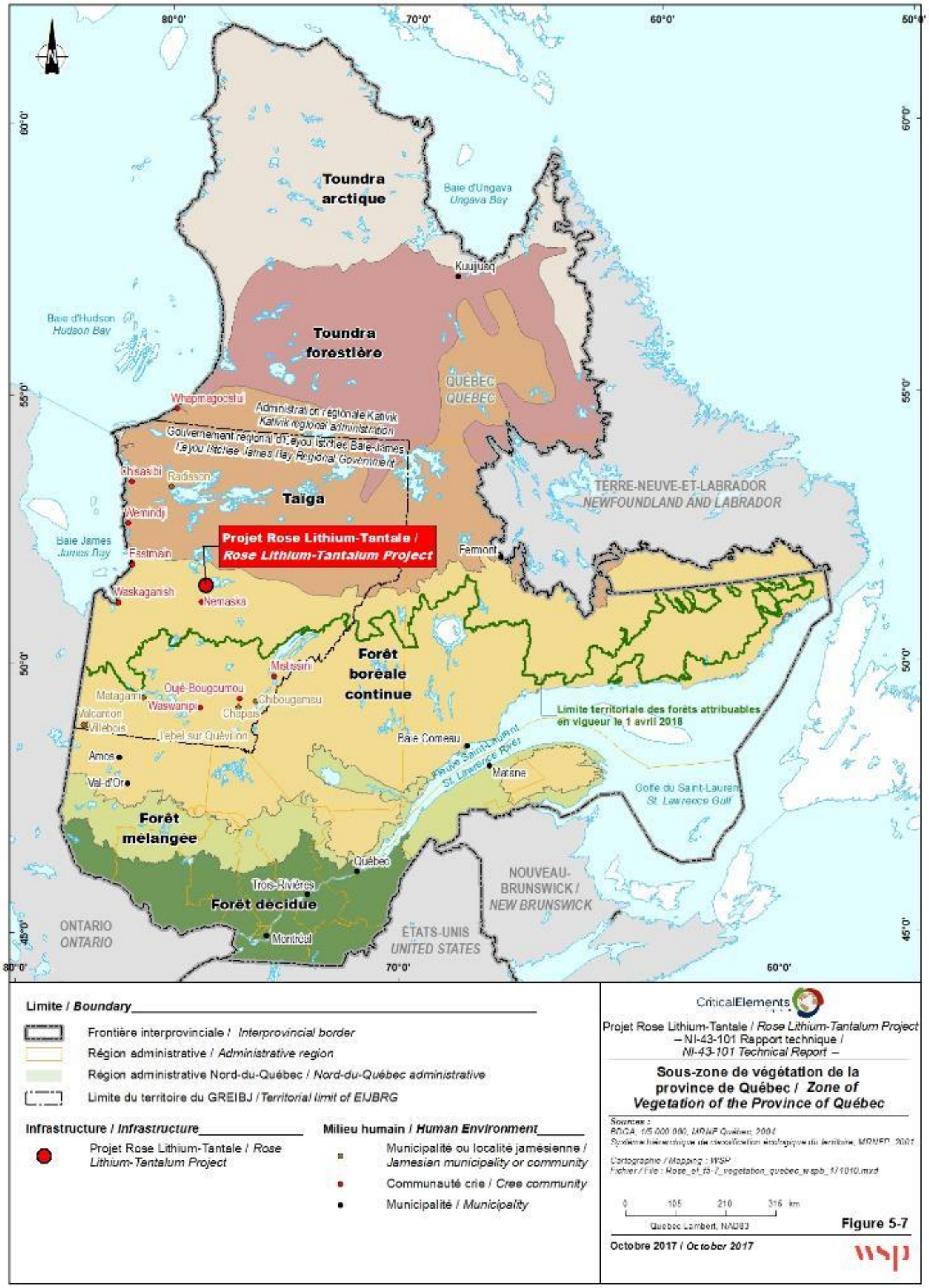
Field surveys have confirmed the presence of 12 fish species within the study area (WSP, 2017a). No species at risk were captured during surveys. Species caught are: white sucker, northern pike, yellow perch, lake whitefish, yellow walleye, brook trout, burbot, lake chub, pearl dace, longnose dace, mottled sculpin, and slimy sculpin. According to the Act respecting Hunting and Fishing Rights in the James Bay and Northern Québec Territories, lake sturgeon, white sucker, burbot, and lake whitefish are strictly limited to the use of First Nations.

Several herpetofauna species were observed during field surveys: american toad, northern spring peeper, mink frog, green frog, wood frog, northern two-lined salamander, and common garter snake. No species at risk were observed.

The various field surveys confirmed the presence of 87 bird species belonging to 30 families (WSP, 2017b). Nine species were confirmed to have the breeding status, 21 species the probable breeding status, and 38 the possible status. Five bird species at risk were observed in the study area: peregrine falcon, rusty blackbird, bald eagle (immature), short-eared owl, and common nighthawk.

Mammals found in the vicinity of the Project include moose, bear, fox, and caribou (woodland and migratory ecotypes).

Figure 5.7: Zones of Vegetation in the Province of Québec



5.4 Climate and Operating Season

Because of its continental location approximately 200 km east of James Bay, the Project area receives less precipitations than other regions located at similar latitude along the shore. The climate is sub-arctic, characterized by long cold winters and short cool summers. Break-up usually occurs early in June and freeze-up in early November.

Weather conditions have been recorded at La Grande Rivière A since 1975 (Table 5.1).

Table 5.1: Weather Station Located near the Project

Weather Station	Latitude	Longitude	Altitude (m)	Distance from Project (km)	Recording Period
La Grande Rivière A	53°38'00" N	77°42'00" W	194.8	205	1971-2010

Data recorded at the above weather stations include air temperature, wind speed, wind direction, precipitations and relative humidity. Each station records some of the data for part of the year. Details concerning climatic conditions found at the Project will be provided in a separate report currently being prepared for the Environmental Impact Assessment study.

On average, the Project site gets about 444 mm of rain and 267 cm of snow per year. Prevalent winds come from the south-east at an average speed of 15 km/h. Average wind speeds are fairly constant over the year, varying between 14 and 16 km/h.

Average annual temperature ranges between -23ºC in January and 14ºC in July (Table 5.2). The coldest temperature recorded at La Grande Rivière A weather station was -45ºC, while the warmest was 35ºC (WSP, 2017c).

Access to the Project is available year-round.

Table 5.2: Average Air Temperature between 1971 and 2000 – La Grande Rivière A Weather Station

Month	Average (°C)	Maximum (°C)	Minimum (°C)
January	-23.2	-18.3	-28.0
February	-21.6	-15.8	-27.4
March	-14.6	-8.2	-20.9
April	-4.9	0.7	-10.5
May	4.3	10.3	-1.6
June	10.5	17.1	3.9
July	13.7	20.0	7.4
August	12.9	18.4	7.4
September	7.4	11.6	3.1
October	1.2	4.4	-2.0
November	-6.3	-3.3	-9.4
December	-17.1	-13.0	-21.2

Source: Environment Canada 2011

5.5 Local Resources and Infrastructures

5.5.1 Local Resources

Limited services are available along the Billy Diamond Road and the Route du Nord. At km 290 of Route du Nord, the Cree Construction Company offers fuel and repair services. Also, fuel, food, and lodging can be obtained in the Cree village of Nemaska. Food and limited lodging may be available at the Eastmain-1 power station, provided prior arrangements have been made to that effect with Hydro-Québec. Eeyou-Istchee surrounding communities are shown on Figure 5.8.

The nearest significant communities to the Project are the towns of Chibougamau (population: 8,000) located 265 km south-east of the Property (350 km by road), and Matagami (population: 1,500) located 270 km south-west of the Property (430 km by road). They are major supply centres for regional resource-based industries.

5.5.2 Infrastructure

CELC maintained an exploration camp on the Project in recent years, with capacities adapted to drilling campaigns requirements. All equipment and supplies required for the exploration camp are brought on site via road transportation. Drill core samples are sent directly to Val-d'Or for storage. The Project is not fenced and no other infrastructures are currently found at the site.

Some parts of the Project are serviced by the Bell cellular telephone network, but reliability is an issue. A microcell system covering approximately 2 km wide could be added to increase reliability.

Hydro-Québec established a camp, 24 km north of the Project on the Eastmain-1 road, to service the workers' needs during the construction of the Eastmain-1 power station. This camp had a capacity to lodge over 2,500 workers, but it is now dismantled. A much smaller camp was built on the same site in recent years for Eastmain-1 power station workers, with a much smaller capacity (around 150 people). However, existing infrastructure such as potable water, sewage, and electrical power could ease construction of a new camp for mine workers. CELC is investigating the option of negotiating an agreement with local contractors to build and operate camp facilities to accommodate the Project workers.

5.5.3 Power

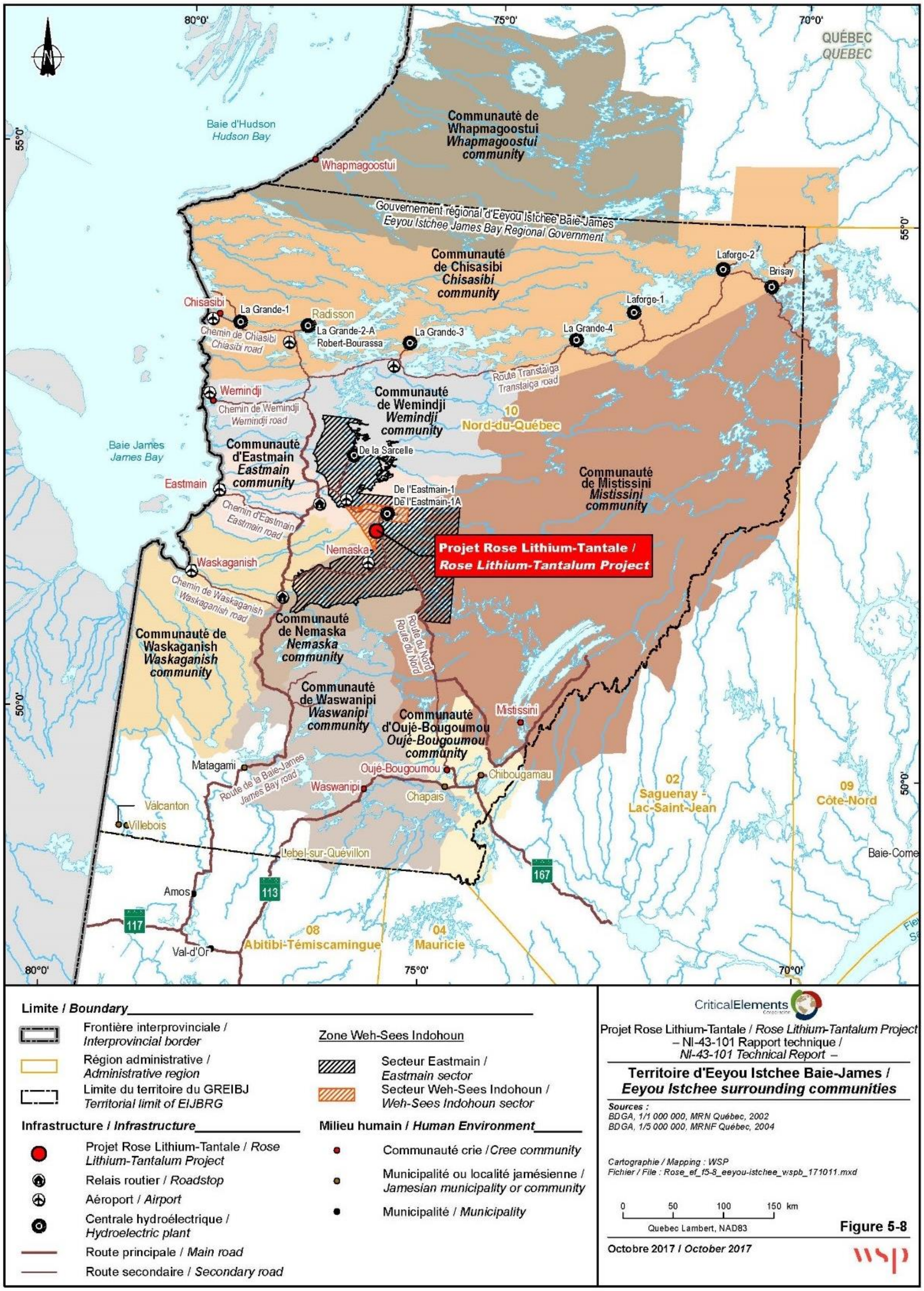
Hydro-Québec owns several infrastructures and facilities in the area including the EM1-Nemiscau 315 kV transmission line, which bisects the proposed Project open-pit from north to south, and a 735 kV transmission line located some 3.5 km south of the Property.

Development of the proposed open-pit will require dismantling five towers of the 315 kV line (length of 2.7 km) and installing 11 new ones (4.2 km), east side of the open-pit

For security reasons related to mine blasting operations, a safety distance of 500 m from open-pit walls to the existing and new towers is complied with. Furthermore, usual precautionary measures during blasting, such as the use of proper stemming within boreholes collars, road signage warning of imminent blasting, banning of radio-transmission during blasting, will need to be applied to prevent damages that could arise from fly rocks.

The Eastmain-1 hydroelectric power station, located approximately 24 km north of the proposed open pit, is planned to supply power to the future mine.

Figure 5.8: Eeyou-Istchee Surrounding Communities



6 HISTORY

Most of the historical work prior to 2005 consisted of regional surveys conducted by the Government of Québec or by a few mining companies. Recently, there has been a bit more activity from mining companies in the area. Table 6.1 summarizes historical work declared as assessment work by mining companies working on, or in the vicinity of, the Property. Drilling from 2009 to 2016 is furthermore detailed in Item 10 - Drilling.

Only one historical drillhole is known to have been drilled on the current Property. Hole 555-09 was drilled by Dios Exploration in 2008 to test a magnetic anomaly. The hole intercepted biotite granitic gneiss followed by feldspar-porphyric diorite. No samples were assayed and the core was left at the drill site.

CELC started drilling on the Property in December 2009 under the name First Gold Exploration Inc. and acquired 100% interest in the Rose Tantalum- Lithium Project in November 2010 from J.-S. Lavallée, J-R Lavallée and Fiducie Familiale St-Georges. Details concerning the current ownership of the Property are presented in Item 4.2 of the present Technical Report.

Table 6.1: Historical Work on the Rose Property

Year	Company	Work	Reference
1936	Dome Mines Ltd	Geological survey; Drilling (outside the property)	GM 09863-A
1962	MRN	Geological survey	RP 483(A)
1963	MRN	Geological survey	CARTE 1510
1968	MRN	Geological survey	RG 136(A)
		Geological survey	RG 136
1972	Caron, Dufour, Séguin & Associates	Technical evaluation; Compilation	GM 34000
1974	MRN	Geochemistry	DP 419
		Geological survey	DP 278
	SDBJ	Geological survey; Geochemistry	GM 30960
		Geological survey; Ground Geophysics	GM 34071
		Geochemistry	GM 34044
		Technical evaluation	GM 34002
1975	MRN	Geological survey	DP 329
	SDBJ	Technical evaluation; Compilation	GM 34001
		Geochemistry	GM 34046
		Airborne geophysics	GM 34073
1976	MRN	Geological survey	DP 358
	SDBJ	Geochemistry	GM 34047
1978	MRN	Geological survey	DPV 574
		Geological survey	DPV 585
1979	SDBJ	Technical evaluation	GM 38167
1980	SDBJ	Geological survey; Geochemistry	GM 37998
1985	MRN	Geochemistry	MB 85-11
1990	MSV Resources Inc.	Airborne geophysics	GM 49771
1994	MRN	Technical evaluation	PRO 94-05
1995	MRN	Technical evaluation; Geological survey	PRO 95-06
1996	MRN	Geochemistry	MB 96-22
1998	MRN	Geochemistry; Geological survey	MB 98-10
1999	MRN	Compilation; Geological survey	MB 99-35
2000	MRN	Geological survey	RG 2000-04
2003	MRN	Geological survey; Compilation	ET 2002-05
		Geological survey; Compilation	ET 2002-06
2005	De Beers Canada Inc.	Airborne geophysics	GM 63031

Year	Company	Work	Reference
2006	Cambior Inc.	Geochemistry	GM 62452
		Technical evaluation	GM 62451
		Airborne geophysics	GM 62446
		Geochemistry	GM 62356
2007	Dios Exploration Inc. and Sirios Resources Inc.	Geochemistry	GM 62837
		Geological survey	GM 63046
		Ground and Airborne geophysics	GM 63034
	Iamgold Inc.	Geochemistry	GM 63267
	MRN	Compilation	PRO 2007-05
		Compilation	PRO 2007-06
	UQAC	Geological survey	ET 2007-01
2008	Dios Exploration Inc. and Sirios Resources Inc.	Geochemistry	GM 63475
		Technical evaluation; Geological survey	GM 63467
		Drilling (1 DDH on Block C)	GM 63907
	Iamgold Inc.	Geochemistry; Geological survey	GM 63606
	MRN	Compilation	EP 2008-02
		Compilation	PRO 2008-03
		Compilation	PRO 2008-04
	Virginia Mines Inc. and IAMGOLD Inc.	Airborne geophysics	GM 63781
2009	MRN	Compilation	EP 2009-02
		Geological survey	RP 483

7 GEOLOGICAL SETTING AND MINERALIZATION

The Property is located in the northeastern part of the Archean Superior Province (Figure 7.1) of the Canadian Shield, more precisely within the Middle and Lower Eastmain Greenstone Belt (MLEGB).

Much of the information presented in Item 7 was borrowed and modified from Card and Poulsen (1998), which provides a thorough description of the regional geology, and from Moukhsil et al. (2007), which synthesizes the geology and metallogenesis of the MLEGB. Other sources were also used to complete the description of the geological setting, such as assessment reports, the authors' personal knowledge of the region, and information provided by the issuer.

Figure 7.1: Map of the Superior Province Showing Subdivisions

Source : Map from Goutier et al. (2002), based on Card and Ciesielski (1986) and Thurston (1991)

7.1 Regional Geological Setting (Archean Superior Province)

The Archean Superior Province forms the core of the North American continent and is surrounded and truncated on all sides by Proterozoic orogens, the collisional zones along which elements of the Precambrian Canadian Shield were amalgamated (Hoffman, 1988, 1989). The Superior Province represents two million square kilometres free of significant post-Archean cover rocks and deformation (Card and Poulsen, 1998). Tectonic stability has prevailed since ca. 2.6 Ga in large parts of the Superior Province (Percival, 2007). The rocks of the Superior Province are mainly Mesoarchean and Neoarchean in age and have been significantly affected by post-Archean deformation only along boundaries with Proterozoic orogens, such as the Trans-Hudson and Grenville orogens, or along major internal fault zones, such as the Kapuskasing Structural Zone. The rest of the Superior Province has remained stable since the end of the Archean (Goodwin et al., 1972).

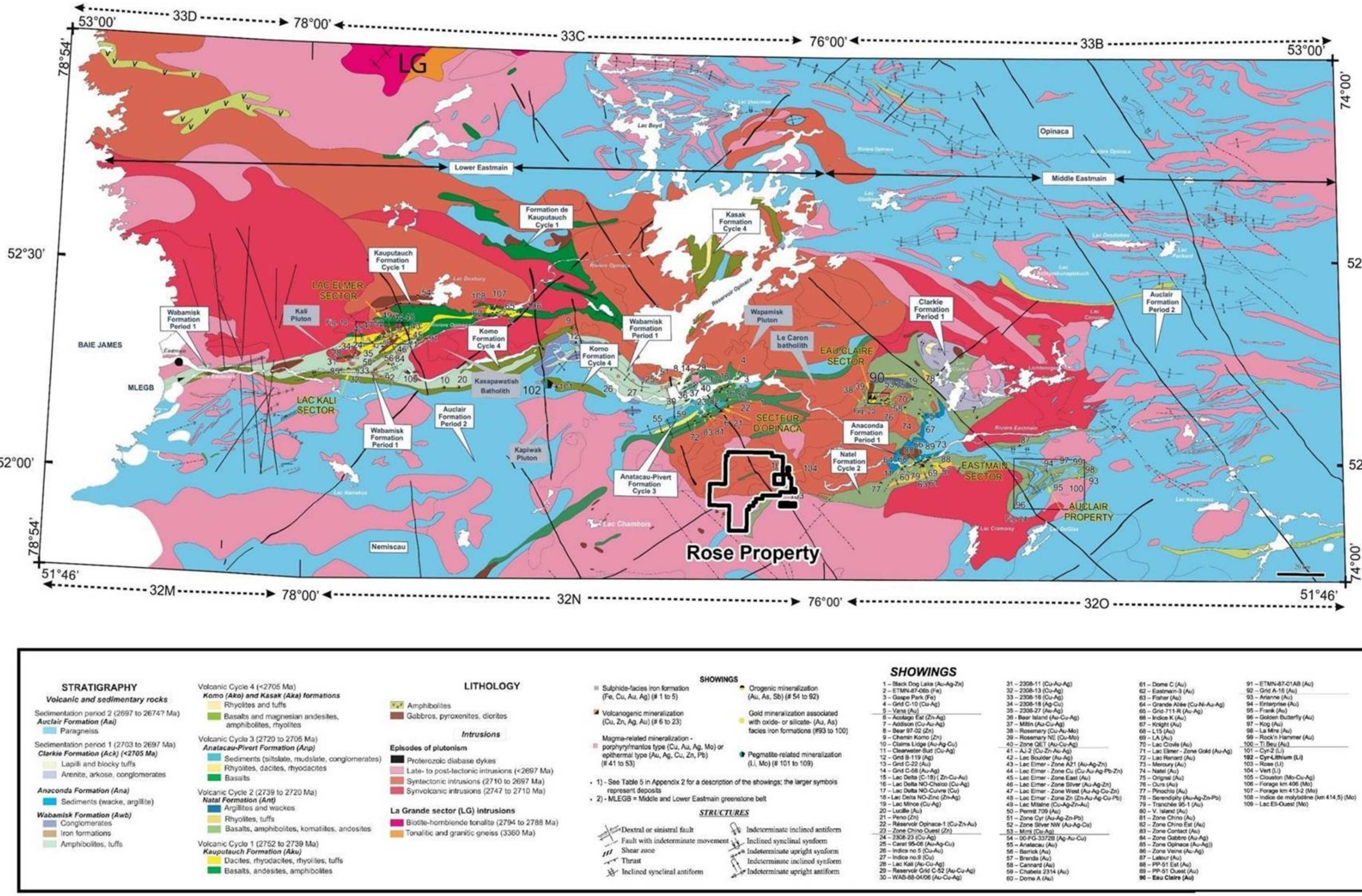
Proterozoic and younger activity is limited to rifting along the margins, emplacement of numerous mafic dyke swarms (Buchan and Ernst, 2004), compressional re-activation, large scale rotation at ca. 1.9 Ga, and failed rifting at ca 1.1 Ga. With the exception of the northwest and northeast Superior margins that were pervasively deformed and metamorphosed at 1.9 to 1.8 Ga, the craton has escaped ductile deformation. A first-order feature of the Superior Province is its linear subprovinces of distinctive lithological and structural character, accentuated by subparallel boundary faults (Card and Ciesielski, 1986). Trends in the Superior Province are generally easterly in the south, westerly to northwesterly in the northwest, and northwesterly in the northeast (Figure 7.1). The southern Superior Province (to latitude 52°N) is a major source of mineral wealth. Owing to its potential for base metals, gold and other commodities, the Superior Province continues to attract mineral exploration in both established and frontier regions.

7.2 Local Geological Setting (Middle and Lower Eastmain Greenstone Belt)

The MLEGB is located in the middle of the James Bay region, about 420 km north of Matagami (Figure 7.2). This greenstone belt trends approximately E-W and extends over an area 300 km long and 10 to 70 km wide (Moukhsil et al., 2007).

The MLEGB consists of volcano-sedimentary rock sequences derived from volcanic eruptions in an oceanic environment (i.e. mid-ocean ridges, oceanic platforms and volcanic arcs) that were subsequently injected by calc-alkaline intrusions of gabbroic to monzogranitic composition. Like the Abitibi Greenstone Belt, the MLEGB has no basement, sensu stricto. The La Pêche Pluton is the oldest intrusion, dated at 2747 +3/-2 Ma (Moukhsil and Legault, 2002), compared with 2751 +0.6/-0.8 Ma for the Kauputauch Formation (Moukhsil et al., 2001). The volcanism of the Eastmain sector therefore occurred in the absence of an ancient felsic crust (basement sensu stricto), as is evidenced by inherited zircon ages from volcanic rocks that range from 2745 to 2713 Ma and from intrusions that crosscut the MLEGB (2747 to 2723 Ma) (Moukhsil, 2000; Moukhsil et al., 2001). This contrasts sharply with the eruptive setting of the volcanic rocks of the La Grande Belt (2800 to 2738 Ma) (Figure 7.1), which was emplaced in the presence of an ancient (3520 to 2810 Ma) tonalitic protocraton (Goutier et al., 1999a,b and 1998a,b). Proterozoic activity in the MLEGB was limited to the injection of N-S, NW-SE and NE-SW diabase dykes.

Figure 7.2: Location of the Rose Property within the Geological Setting of the Middle and Lower Eastmain Belt



Source: Moukhsil et al., 2007

Note: The approximate location of the Rose Property is shown in black. The distortion when compared to other figures in this report is due to the different projection used by Moukhsil et al. (2007)

At least three deformation phases can be recognized within the MLEGB (Moukhsil et al., 2007). The first phase (D1), with an estimated age of 2710 to 2697Ma (minimum ages of syntectonic intrusions), is associated with roughly E-W schistosity (S1). The second phase (D2), with an estimated age of 2668 to 2706 Ma (Moukhsil and Legault, 2002), is associated with NE-SW schistosity (S2), roughly N-S in several areas. The D2 deformation phase is responsible for the second NNE-SSW shortening in the James Bay area and is probably equivalent to the event that occurred around 2690 Ma in Opatica (Boily, 1999). The third phase (D3), whose age is estimated at <2668 Ma (age of metamorphism), affects the syn- to post-tectonic intrusions, among others. This deformation phase was non-penetrative and less evident on a regional scale. However, it is more pronounced in the metasedimentary rocks where it trends WNW-ESE to NW-SE. The MLEGB was affected by a set of faults or shear zones. Most of these faults are spatially linked to the mineral occurrences found in the MLEGB. There are three possible orientation systems for the distribution of these structures. The first system runs E-W, the second ENE-WSW and the third NW-SE. Since the principal schistosity (S1) is E-W, Moukhsil et al. (2007) postulate that the E-W-trending faults predate the other faults. The relationship between the two other systems is not clear, but it appears that the NE-SW-trending faults predate the NW-SE-trending faults in the Lake Elmer section (Moukhsil et al., 2007).

There are several major tight to isoclinal regional-scale folds (Moukhsil and Doucet, 1999). Franconi (1978) prepared a synthesis on this topic, concluding that the MLEGB features a large synclinorium with an E-W axis, whose core is occupied by the rocks of Opinaca.

Metamorphism ranges from greenschist to amphibolite facies. Gauthier and Laroque (1998) and Moukhsil (2000) identified a metamorphic front characterized by large folds overturned to the south at the contact between Nemiscau metasediments and MLEGB volcanics. Contact metamorphism is amphibolite facies, especially around syn- to post-tectonic intrusions. Granulite facies has been identified mainly in the middle of the sedimentary basins of Nemiscau and Opinaca. Locally, a few orthopyroxene grains are observed in the paragneisses of the Auclair Formation (Moukhsil and Legault, 2002).

7.3 Property Geology

The Property is located in the southern portion of the Middle and Lower Eastmain Greenstone Belt (Figure 7.3).

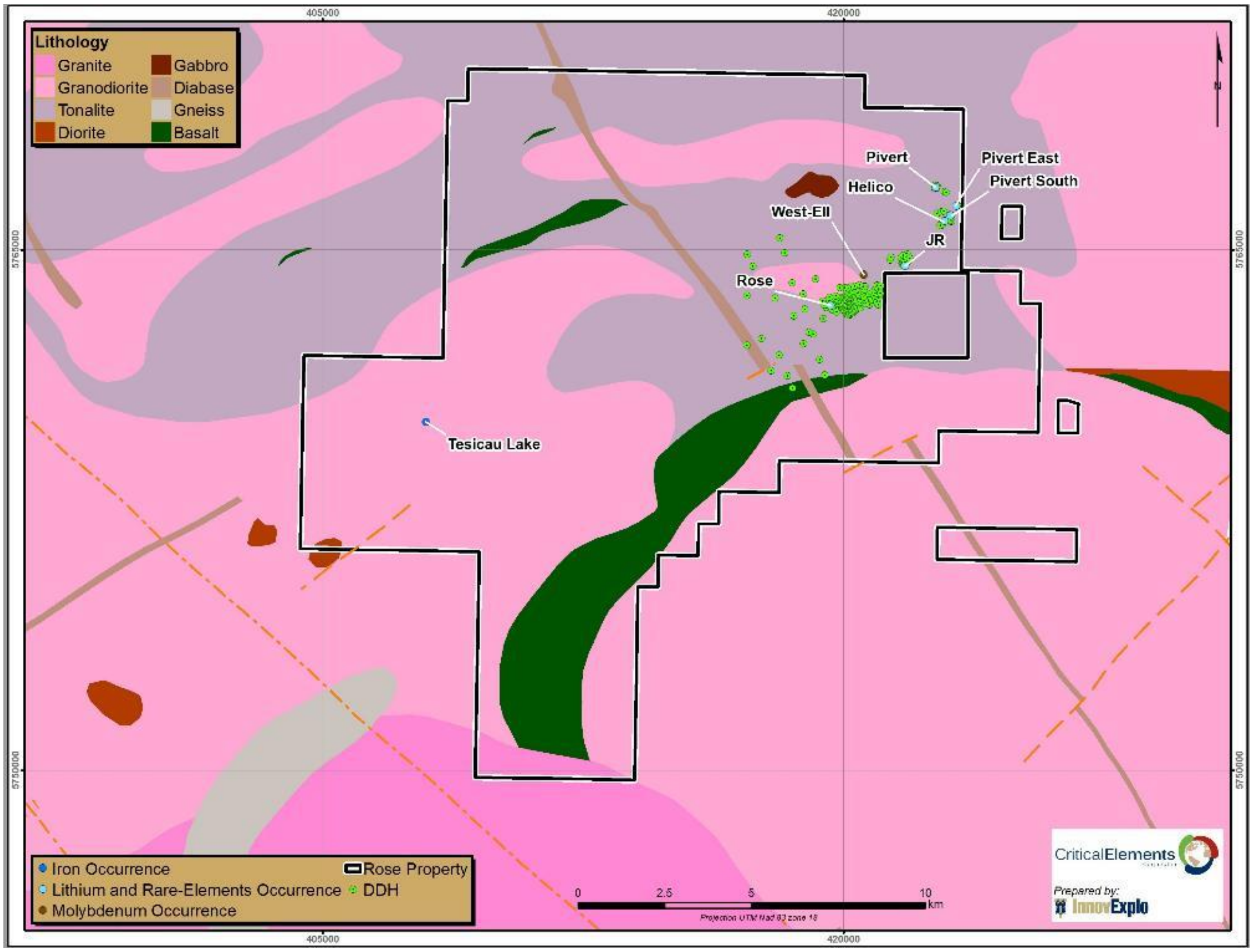
Although the MLEGB shows a wide variety of rock types, most of the Property is underlain by intrusive lithologies. Based on the regional geology interpretation of Moukhsil et al. (2007), these are mainly syntectonic (2,710 to 2,697 Ma), with lesser volumes of late to post-tectonic intrusions (<2,697 Ma).

Gabbros, pyroxenites, and diorites cut across the Property geology. Pegmatites occur as irregular but generally continuous lenses within biotite schists. Historical work in the 1960s by the Ministère des Ressources naturelles du Québec (MRNQ), now the Ministère de l'Énergie et des Ressources naturelles (MERN), followed by additional regional-scale government work, uncovered four showings on the Property, two of which (Rose and Pivert) have been examined more closely by the issuer. Both are showings of lithium and rare-element mineralization in pegmatites.

Other rock types, including gneiss, dacite, quartzite and conglomerate, have also been reported. Lithologies are generally well foliated with a SE orientation, except for the more massive and unfoliated granites and pegmatites.

Mineralization recognized to date on the Property includes rare-element LCT-type pegmatites (Block A) and molybdenum occurrences (Block A). An iron occurrence (Block B) is also mentioned in the government database.

Figure 7.3: Geology of the Rose Property Area



7.3.1 Pivert Showing

First discovered in 1961 by the MRNQ, the Pivert showing was later revisited during the MRNQ's regional mapping program in 2001. The showing is approximately 4.6 km south of Pivert Lake on Block A.

The MRNQ recognized lithium and beryllium mineralization in a pegmatite dyke hosted by paragneiss units. The pegmatite dyke was described as being approximately 10 m wide and of unknown length because it only cropped out for a few metres. It contains approximately 20% spodumene (lithium aluminum silicate), with crystals up to 20 cm long. Beryl (beryllium aluminum silicate) and molybdenite (molybdenum sulphide) were also noted. A grab sample taken from the MRNQ yielded 1.16% Li and 74 ppm Be.

CELC collected four grab samples from the Pivert showing as discussed in Item 9 - Exploration, and drilled eight holes as discussed in Item 10 - Drilling. The work added rare elements (Rb, Cs, Ta, Ga) to the original Li-Be mineralization reported by the MRNQ.

7.3.2 Rose Deposit

Like the Pivert showing, the original Rose showing was discovered in 1961 by the MRNQ and revisited during a regional MRNQ mapping program in 2001. It is approximately 2.3 km southwest of Pivert on Block A.

The MRNQ's description of the Rose showing in 1961 was similar to the description for Pivert: lithium and beryllium in pegmatite dykes hosted by melanocratic gabbro. In contrast to Pivert, where only one pegmatite dyke was recognized at surface, Rose was described as several pegmatite dykes, with one up to 20 m wide.

The MRNQ reported that spodumene and lepidolite (potassium lithium aluminum silicate) constituted up to 40% of the pegmatites. A grab sample collected by the MRNQ yielded 0.21% Li and 129 ppm Be.

CELC collected 25 grab samples on the Rose deposit as discussed in Item 9 - Exploration, and drilled 181 holes as discussed in Item 10 – Drilling. The company's work added rare elements (Rb, Cs, Ta, Ga) to the original Li-Be mineralization reported by the MRNQ.

7.3.3 JR Showing

Discovered by CELC while prospecting in the vicinity of the Rose and Pivert showings, the JR showing is approximately 2.4 km south-southwest from Pivert. It is easily accessible because it crops out on both sides of the main gravel road. It is now considered part of the Rose deposit.

CELC collected 3 grab samples from the JR showing as discussed in Item 9 - Exploration, and drilled 23 holes as discussed in Item 10 - Drilling. The JR showing is very similar to the Rose and Pivert showings in terms of geological context and mineralization. It consists of Li, Be, Rb, Ta, Cs, and Ga enrichment in pegmatite dykes. Surface observations were insufficient to determine the length of the dyke because it crops out for only 30 m.

7.3.4 Helico Showing

The Helico showing was discovered by CELC while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SSE of the Pivert showing.

CELC drilled 12 holes as discussed in Item 10 - Drilling. Helico is very similar to Rose, Pivert and JR in terms of geological context and mineralization. It consists of Li, Be, Rb, Ta, Cs, and Ga mineralization in pegmatite dykes.

7.3.5 Pivert East Showing

The Pivert East showing was discovered by CELC while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SE of Pivert.

CELC drilled two holes as discussed in Item 10 - Drilling. Pivert East is very similar to Rose, Pivert, and JR in terms of geological context and mineralization. It consists of Li, Be, Rb, Ta, Cs, and Ga mineralization in pegmatite dykes.

7.3.6 Pivert South Showing

The Pivert South showing was discovered by CELC while prospecting in the vicinity of the Rose and Pivert showings. It is located approximately 1 km SE of Pivert.

CELC drilled two holes as discussed in Item 10 - Drilling. Pivert South is very similar to Rose, Pivert, and JR in terms of geological context and mineralization. It consists of Li, Be, Rb, Ta, Cs, and Ga mineralization in a pegmatite dyke.

7.3.7 Other Occurrences

Mr. Richard examined another occurrence not mentioned in the government database: a molybdenite- and spodumene-bearing pegmatite dyke on the side of the main gravel road (UTM83, Zone18: 422188E, 5765993N), midway between the Pivert (900 m NE) and JR showings (1.5 km SSW) (Figure 7.4). Molybdenite and spodumene were observed in the pegmatite, which cuts through a deformation zone without showing any signs of being affected by it.

No samples were analyzed, but its presence suggests other occurrences are likely in the area.

Figure 7.4: Another Pegmatite Occurrence (a road cut) in the Vicinity of the Rose and Pivert Showings

Photo taken by P.-L. Richard during a field visit

8 DEPOSIT TYPES

The Middle and Lower Eastmain Greenstone Belt (MLEGB) contains more than a hundred mineral showings exhibiting a variety of ages, host rocks, styles (disseminated sulphides, massive sulphides, veins and dykes) and metal suites.

The mineral occurrences of the MLEGB have been divided into six types according to Moukhsil et al. (2007):

- Type 1: Sulphide facies iron formation;
- Type 2: Volcanogenic mineralization;
- Type 3: Magma-related mineralization;
- Type 4: Orogenic mineralization;
- Type 5: Gold-bearing mineralization associated with oxide- or silicate-facies iron formations;
- Type 6: Pegmatite-related mineralization

Types 1 to 3 are associated with an episode of volcanic arc construction (volcanic cycles 1 to 4). Types 4 and 5 are contemporaneous with major deformation events (D1 and D2), whereas Type 6 is associated with post-tectonic intrusions.

Based solely on its geological environment, the Property has the potential to host a number of deposit types. However, based on the known discoveries, only the type recognized in Type 6 (Rare-Element LCT-type Pegmatite) will be discussed herein.

Pegmatites constitute a category of granite-related ore deposits that are distinct from the magmatic ores disseminated within granites and from hydrothermal assemblages. Granitic pegmatites have been the subject of numerous attempts at classification, but Cerny and Ercit (2005) provided the most recent update. These authors stipulate that, in addition to geochemical composition, the geological location should also be taking into account in the classification of granitic pegmatites, leading to the following division of five classes:

- Abyssal
- Muscovite
- Muscovite – rare-element
- Rare-element
- Miarolitic

Most of these classes can be subdivided into subclasses with fundamentally different geochemical (and in part geological) characteristics. Further subdivision of most subclasses into types and subtypes is based on more subtle differences in geochemical signatures or pressure and temperature conditions of solidification, expressed as different accessory mineral assemblages. The second approach proposed by Cerny and Ercit (2005) is petrogenetic and developed for pegmatites derived by igneous differentiation from plutonic parents. Three families are distinguished:

- An NYF family with progressive accumulation of Nb, Y and F (besides Be, REE, Sc, Ti, Zr, Th, and U), fractionated from subaluminous to metaluminous A- and I-type granites that can be generated by a variety of processes involving depleted crust or mantle contributions.
- A peraluminous LCT family marked by prominent accumulation of Li, Cs and Ta (besides Rb, Be, Sn, B, P, and F), derived mainly from S-type granites, less commonly from I-type granites.
- A mixed NYF + LCT family of diverse origins, such as contamination of NYF plutons by digestion of undepleted supracrustal rocks.

8.1 General Model for Rare Element LCT-Type Pegmatites

Based on the pegmatite classification in Cerny and Ercit (2005) and the assay results from the Property, the pegmatites recognized to date are clearly of the rare-element LCT-type. Thus, only this subtype will be discussed further.

8.1.1 General Characteristics

According to Cerny et al. (2005), rare-element pegmatite deposits of the LCT family are encountered in orogens from the early Archean to very recent; i.e. from ~3 Ga (Trumbull, 1995) to 6.8 Ma (Pezzotta, 2000). The granite-pegmatite suites are syn- to late orogenic and related to fold structures, shears and fault systems. The pegmatites vary greatly in form, controlled mainly by the competency of the enclosing rocks, the depth of emplacement, and the tectonic regime during and after emplacement. The pegmatites rarely occur within their parent granites, but in such cases they form swarms or networks of fracture-filling dykes hosted by contraction fractures or structures generated by post-consolidation stresses (e.g. Ginsburg et al., 1979). Most of the deposits are hosted by schists and gneisses, and their shapes vary from lenticular, ellipsoidal, turnip- or mushroom-like forms in plastic environments, to fracture-filling dykes and stocks in brittle host rocks (e.g. Cameron et al., 1949). The length of a mineralized pegmatite intrusion is typically tens to hundreds of metres, but they may attain several kilometres (Greenbushes, Australia; Partington et al., 1995), and interconnected dyke systems are known to be up to 12 km long (Manono, Zaire; Thoreau, 1950).

An important pattern emerges in the generalized scenario and especially in the zoning sequences for individual pegmatite districts (Cameron et al., 1949; Norton, 1983; Cerny et al., 2005). The minerals present in each zonal assemblage decrease in number from the margins (border and wall zones) to the central or latest primary unit, termed the core. Assemblages of the border and wall zones typically consist of quartz-plagioclase-microcline-muscovite-biotite-garnet-tourmaline-(beryl-apatite), and the internal zoning sequence usually ends with nearly monomineralic masses of microcline followed by a monomineralic quartz core. Crystallization along a liquidus surface, wherein the number of coexisting phases increases with decreasing temperature, produces the opposite trend in the sequence of mineral assemblages (e.g. Burnham and Nekvasil, 1986).

The shape and attitude of pegmatite intrusions have considerable control over the internal structure of the deposits (Cerny et al., 2005). Homogeneous bodies are exceptional, and a primary oriented fabric is generally restricted to the albite-spodumene type (e.g. Oyarzábal and Galliski, 1993). The pegmatites are largely concentrically zoned or layered, or they display a combination of both features (Cameron et al., 1949; Beus, 1966; Cerny, 1991b). Concentric patterns typical of substantially three-dimensional bodies can be extensively disturbed in flat pegmatites. Sub-vertical dykes commonly exhibit telescoping of strongly asymmetric zoning patterns, with the inner zones prominently shifted upward. The zoning progresses from finer grained zones of more or less granitic composition on the outside to inner zones that exhibit enrichment in rare-element mineralogy and textural diversity, but some are also near-monomineralic.

In conjunction with the accumulation of rare-element mineralization in the inner zones, complex pegmatites also show inwardly increasing geochemical fractionation in rock-forming minerals (e.g. Cerny et al. 1985; Cerny, 2005; London, 2005, which serves as an important exploration guide (e.g. Cerny, 1992).

More detailed descriptive information on general features of granitic pegmatite deposits, including mineralogy, geochemistry, REE abundances, and fluid inclusion studies can be found in Cameron et al. (1949), Beus (1966), Solodov (1962), Cerny (1989a, 1991b), and Cerny et al. (1998).

8.1.2 Emplacement of Pegmatite Melts

Passive emplacement of pegmatite magma was historically advocated by many authors, but structural-geological analysis contradicts this interpretation (Cerny et al., 2005). Forcible intrusion is indicated in all closely examined cases (Brisbin, 1986) and relevant theoretical considerations and experiments (e.g. Rubin, 1995a, b). Beus (1966) arrived empirically at 2 km for the maximum distance of a pegmatite from its parent granite. In contrast, Baker (1998) considers the magma pressure in the parental chamber sufficient to propel low-viscosity pegmatite melts up to 10 km from the source.

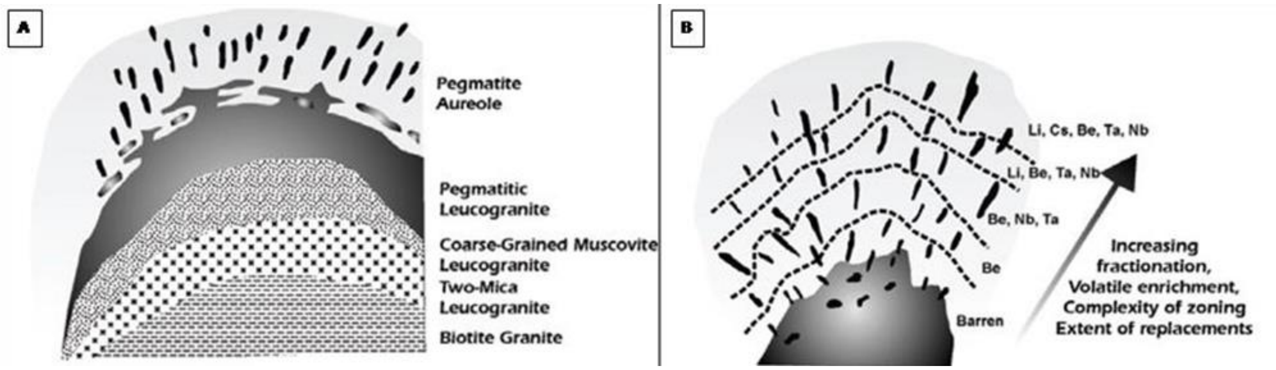
Increasing contents of Li, B, P, F, and H2O reduce polymerization, increase fluidity and mobility, and enhance thermal stability of pegmatite melts to lower temperatures (Cerny et al., 2005). Thus, the pegmatite melts that are most enriched in volatiles and rare-elements can travel the farthest from their source (Figure 8.1). This explains the regional zoning of rare-element pegmatites around parental granites (Cerny, 1992. The Li-rich complex pegmatites in general and the lepidolite-subtype dykes in particular, are invariably the most distal ones relative to the parent plutons (Cerny et al., 2005). These categories of LCT rare-element pegmatites locally appear to be divorced from granites by interplay of host structures and erosional exposure. In individual pegmatite dykes, internal diversity in fluidity promotes geochemical and paragenetic telescoping (e.g. Beus, 1948; Cerny and Lenton, 1995).

Pegmatite dykes commonly occur as groups of similar pegmatite-types that originated from the same parent granite intrusion. A pegmatite field can occur over territories of hundreds to thousands of square kilometres when favourable conditions are met. Finally, pegmatite provinces are described as huge terranes characterized by commonality of geologic history that tend to generate arrays of pegmatite fields that are at least loosely related in time, structural style, and mode of origin. A more detailed definition of these terms is given by Cerny et al. (2005):

- A pegmatite group is a spatially and genetically coherent pegmatite population, generated by differentiation of a single granitic pluton. Pegmatite dykes interior, marginal, and exterior to a particular fertile granite intrusion may be neatly distributed around the plutonic parent, although asymmetric arrays are much more common (Fig. 8.1; Beus, 1966; Kuzmenko, 1976; Cerny, 1989b, 1990, 1991c; Cerny et al. 2005). Radiometric dating confirms in many cases the link between fertile granites and surrounding pegmatite dykes (e.g. Baadsgaard and Cerny, 1993; Trumbull, 1995; Breaks et al., 2005). The pegmatites tend to show different kinds and degrees of mineralization in a regional zonal pattern, concentric to unidirectional. The common progression from proximal to distal pegmatites is from barren to Be, Be-Nb-Ta, Li-Be-Ta-Nb, and Li-Cs-Be-Ta-(F) assemblages, with B, P, and Sn appearing at (and generally also increasing from) locally different stages. The zoning tends to be particularly strongly developed vertically, with the most evolved pegmatites at the top of the three-dimensional array. Locally, the more evolved pegmatites are relatively late, as they crosscut the primitive dykes (e.g. Cerny, 1991c, 1992b).
- Pegmatite fields are the results of favourable conditions for partial melting that generate fertile granites and are regional in scale, and they commonly lead to intrusion and differentiation of multiple fertile plutons over territories of hundreds to thousands of square kilometres (Cerny et al., 2005). The ensuing pegmatite fields contain granite-pegmatite suites that are more or less closely related, having been mobilized and differentiated from related or identical metamorphic protoliths during a single anatectic event. This results in similarities in mineral assemblages and geochemical signatures of the granite-pegmatite groups.
- Pegmatite provinces are huge terranes characterized by commonality of geologic history that tend to generate arrays of pegmatite fields that are at least loosely related in time, structural style, and mode of

origin; geologic provinces locally represent rare-element pegmatite provinces of enormous dimensions (Landes, 1935; Gordiyenko, 1974; Ginsburg et al., 1979; Cerny, 1991a, c).

Figure 8.1: Regional Zoning in Fertile Granites and Pegmatites



(Modified from Cerny, 1991b and Selway et al., 2005)

Notes: A) Regional zoning of a fertile granite (outwardly fractionated) with an aureole of exterior lithium pegmatites.

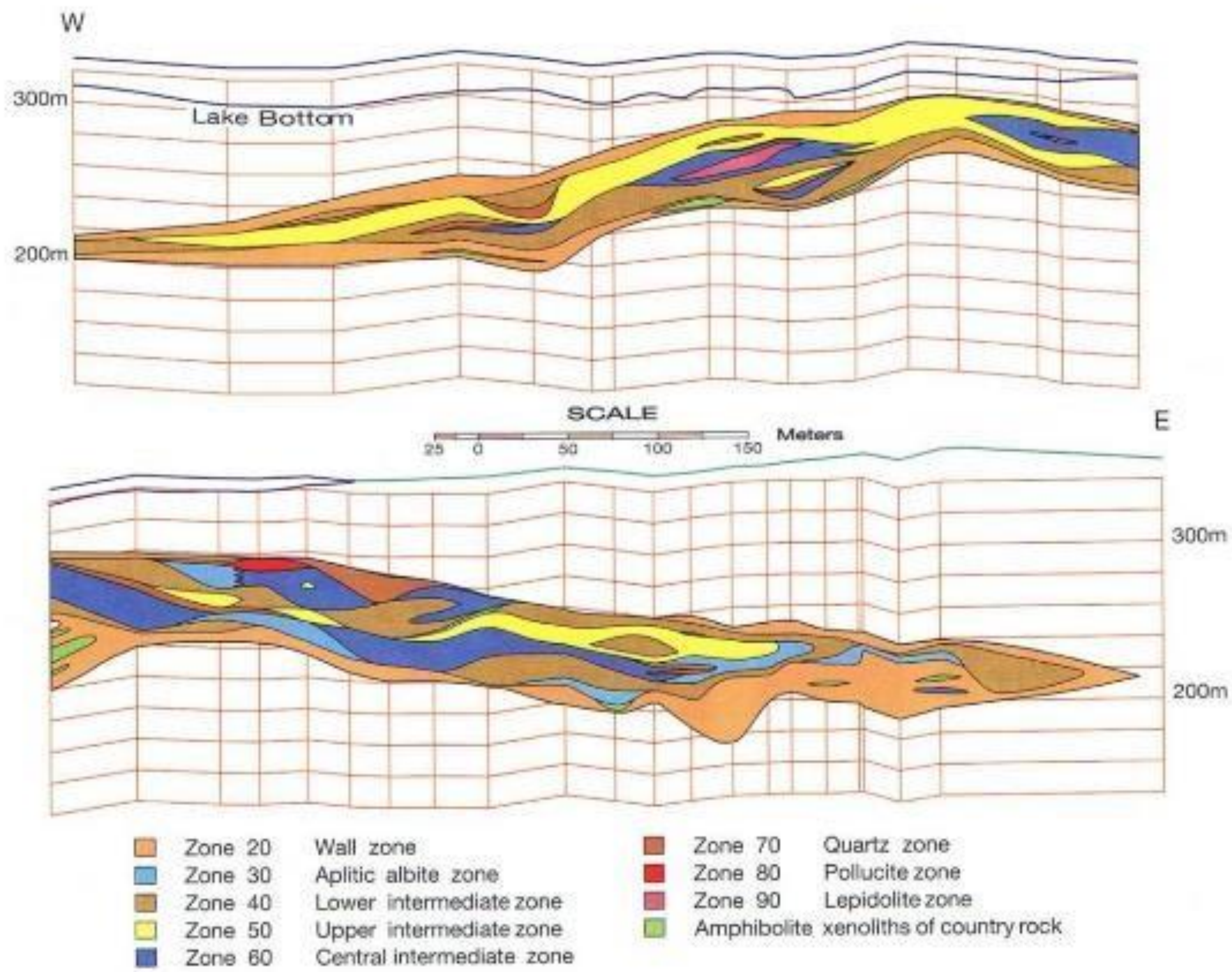
B) Schematic representation of regional zoning in a cogenetic parent granite and pegmatite group. Pegmatites increase in degree of evolution with increasing distance from the parent granite.

8.1.3 Well-Studied Pegmatite Ore Deposits

Two examples of well-studied pegmatite deposits showing similarities with the known Rose pegmatites are presented here as a reference. At the current exploration stage of the Property, the extent of the mineralized pegmatites has not yet been fully investigated. Therefore, the authors do not make any assumption that the Rose pegmatites are comparable in terms of tonnage and/or grade to the deposits presented in this Item. These deposits should be considered in light of their general characteristics and not in terms of their established economic characteristics.

The first example is the extensively studied Tanco deposit (Figure 8.2) in the Archean Superior Province of the Canadian Shield in southeast Manitoba. It is described in Cerny et al. (1998), Cerny (2005), Stilling et al. (2006) and Cerny et al. (2005). This 2640 Ma pegmatite is completely hidden and forms a subhorizontal lenticular body consisting of four concentric and five layered zones about 1.3 km long (Fig 8.2; Cerny et al., 2006). It belongs to an extensive series of cogenetic, closely associated pegmatites, but the parent granite is not exposed. However, nearby pegmatite groups of similar character show a clear connection to pegmatitic leucogranites. Near-extreme igneous fractionation of Rb, Cs, Ga, and Ta characterizes Tanco, which is enriched in these metals as well as Li, Be, B, and P, and a variety of industrial minerals. Nevertheless, the overall composition of the pegmatite is close to granitic, despite the assemblage of approximately 100 minerals (Stilling et al., 2006). Petalite, largely decomposed into secondary spodumene + quartz, dominates over minor late primary spodumene and over subordinate amblygonite-montebrasite and lepidolite.

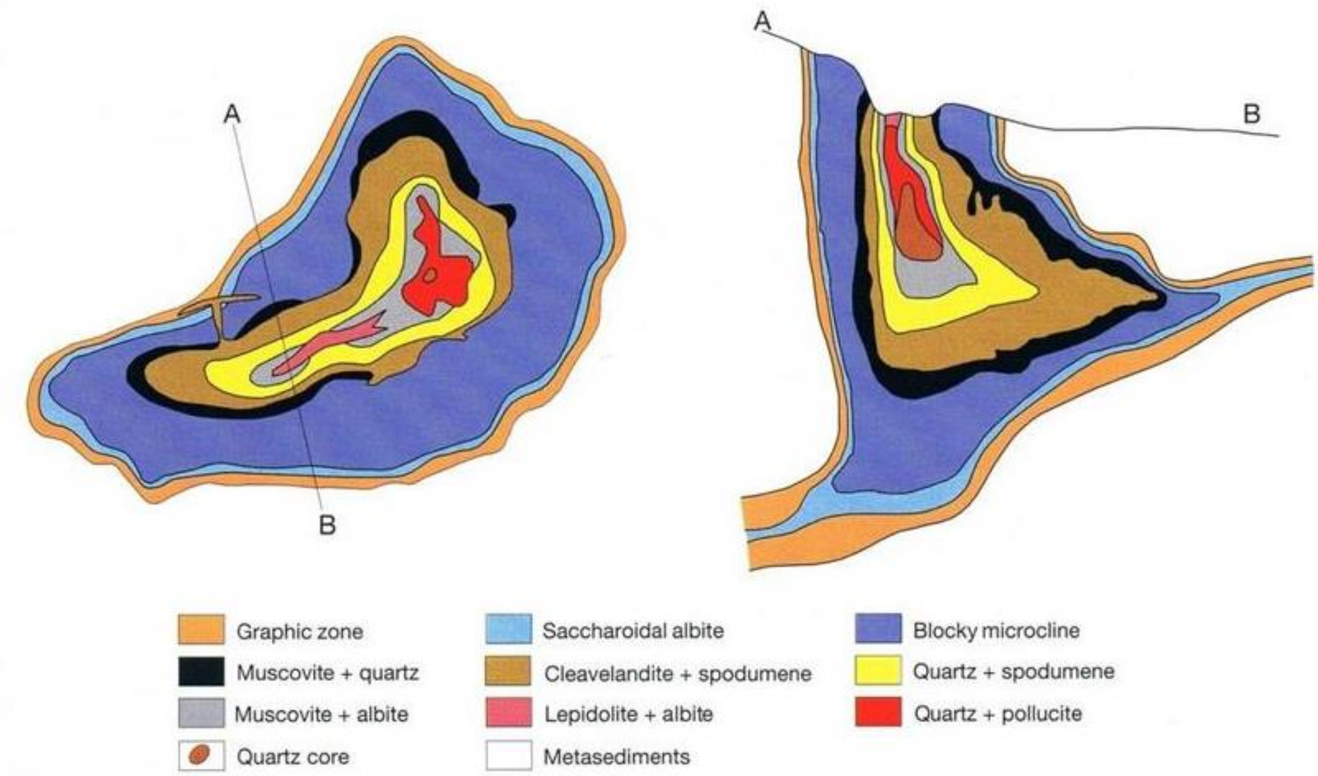
Figure 8.2: Longitudinal Fence Diagram (west to east section through the Tanco pegmatite)



Source: Modified from Stilling et al., 2006; Cerny et al., 2005
Note: The border zone (Zone 10) is too thin to be shown at this scale.

The second example is the Mongolian Altai 3 deposit (Figure 8.3), which shows extensive reserves of spodumene (Cerny et al., 2005). Mongolian Altai 3 (also known as Keketuhai, Keketuohai, or Koktogai), dated at 330 Ma, is located in the central part of an Altai Caledonian-Hercynian fold belt in northwest China. It belongs to an extensive suite of cogenetic leucogranites and pegmatites. The pegmatite forms a vertical plug with far-reaching sub-horizontal sheets branching from its base (Figure 8.3). Ten concentric zones show a classic progression from mineralogically simple outer assemblages to complex and then near-monomineralic associations in the interior. Multi-generational minerals show the same progressive fractionation pattern as in the Tanco pegmatite above.

Figure 8.3: Horizontal and Vertical Sections through the Mongolian Altai Pegmatite No. 3



Source: Modified from Lu et al., 1997; Cerny et al., 2005

Note: In the horizontal section at left, the pegmatite is approximately 150 x 250 m in size; the scale of the vertical section at right is slightly reduced.

8.2 Rare-Element Pegmatites from the Superior Province

Although Selway et al. (2005) reviewed only rare-element pegmatites in the Superior Province of Ontario and Manitoba, excluding the large portion of the Superior Province in Québec, the authors of this report consider the study to be applicable to the Québec portion of the Superior in which the Property is situated. The following text has been largely adapted from Selway et al. (2005).

According to Selway et al. (2005), rare-element pegmatite dykes within the Superior Province (in Ontario and Manitoba) usually cluster to form pegmatite fields that contain one or two large and highly fractionated pegmatites and numerous small pegmatite dykes. For example, the Bernic Lake pegmatite group, part of the Cat Lake-Winnipeg River pegmatite field in southeastern Manitoba, includes the Tanco pegmatite (1.99 km long x 1.06 km wide x 100 m thick; Stilling, 1998) and eight other smaller, less-fractionated pegmatite dykes (Cerny et al., 1981). The Separation Rapids pegmatite group lies to the east of the Cat Lake–Winnipeg River pegmatite within the same Bird River–Separation Lake metavolcanic belt (Breaks et al., 1975). The Separation Rapids pegmatite group contains two large highly fractionated pegmatites: Big Whopper (350 m in strike length x 60 m thick) and Big Mack (30 x 100 m; Breaks and Tindle, 1997 Breaks et al., 1999). The Big Whopper and Big Mack pegmatites are members of the Southwestern pegmatite subgroup, which contains at least 23 additional smaller pegmatite dykes. Additional large pegmatite fields in the Superior Province of Ontario with economic potential include: the Dryden pegmatite field, which includes the highly-fractionated Fairservice pegmatite dykes and Tot Lake pegmatite, and the Seymour Lake pegmatite group, which includes the highly-fractionated North Aubry and South Aubry pegmatites (Breaks et al., 2003). These pegmatites contain elevated Rb, Cs, Be, and Ta contents. The Case pegmatite in northeastern Ontario is unique in that it is a large, fractionated pegmatite with no identified associated smaller pegmatite dykes, likely due to thick overburden (Breaks et al., 2003).

Selway et al. (2005) also report on several geological features that are common among pegmatites of the Superior Province of Ontario (Breaks and Tindle, 2001; Breaks et al., 2003) and Manitoba (Cerny et al., 1981; Cerny et al., 1998):

- The pegmatites tend to occur along subprovince boundaries. For example, Tanco (Manitoba) and Separation Rapids (Ontario) pegmatites within the Bird Lake-Separation Lake metavolcanic belt occur along the boundary between the English River and Winnipeg River subprovinces; the beryl-phosphate Sandy Creek and McCombe pegmatites, and the Lilypad Lake pegmatite field occur along the Uchi–English River subprovincial boundary; the Dryden pegmatite field occurs within the Sioux Lookout Domain along the Winnipeg River–Wabigoon subprovincial boundary; and the North Aubry, South Aubry, and Tebishogeshik pegmatites occur along the English River–Wabigoon subprovincial boundary north of Armstrong.
- Most pegmatites in the Superior Province (in Ontario and Manitoba) occur along subprovince boundaries, except for those that occur within the metasedimentary Quetico Subprovince. Examples of pegmatites occurring in this area from west to east are: Wisa Lake (south of Atikokan), the Georgia Lake pegmatite field (north of Nipigon), and the Lowther Township (south of Hearst) pegmatites.
- Pegmatites are present at greenschist to amphibolite metamorphic grade. In Ontario and Manitoba, pegmatites are absent in the granulite terranes of the Quetico and English River subprovinces.
- Most pegmatites in the Superior Province (Ontario and Manitoba) are genetically derived from fertile parent granite. The Cat Lake–Winnipeg River pegmatite field (Manitoba) contains six leucogranite intrusions (Greer Lake, Eaglenest Lake, Axial, Rush Lake, Tin Lake, and Osis Lake) emplaced along east trending faults, which are parents to numerous pegmatites (Cerny et al., 1981; Cerny et al., 1998). In contrast, the Tanco pegmatite has no fertile granite outcropping in reasonably close vicinity that could be its potential parent (Cerny et al., 1998). The peraluminous Separation Rapids pluton (4 km wide) is the parent to the Separation Rapids pegmatite field, including Big Whopper and Big Mack pegmatites, north of Kenora, Ontario. The peraluminous Ghost Lake batholiths (80 km wide) is the parent to the Mavis Lake pegmatite group, including the Fairservice pegmatite dykes, north of Dryden, Ontario.
- Highly fractionated spodumene- and petalite- subtype pegmatites are commonly hosted by mafic metavolcanic rocks (amphibolite) in contact with a fertile granite intrusion along subprovincial boundaries, whereas numerous beryl-type pegmatites are hosted by metasedimentary rocks (metawacke or metapelite) of the Sioux Lookout Domain. Pegmatites within the Quetico Subprovince are hosted by metasedimentary rocks or their fertile granitic parents. For example, the spodumene-subtype Wisa Lake pegmatite is hosted by metasedimentary rocks south of Atikokan, Ontario. The MNW petalite-subtype pegmatite, north of Nipigon, Ontario, is enclosed within a medium-grained biotite-muscovite granite of the MNW stock, which is presumed to be its parent (Pye, 1965). The lepidolite-subtype Lowther Township pegmatite, south of Hearst, Ontario is enclosed within its parent garnet-biotite pegmatitic granite (Breaks et al., 2002). The spodumene-subtype Case pegmatite system is hosted by orbicular biotite tonalite in the southeastern part of the Case batholith north of Cochrane, Ontario, within the Opatica Subprovince.
- Biotite and tourmaline are common minerals within metasomatic aureoles in mafic metavolcanic host rocks to pegmatites. Tourmaline, muscovite, and biotite are common within metasomatic aureoles in metasedimentary host rocks.

— Most of the pegmatites of the Superior Province contain spodumene and/or petalite as the dominant Li mineral, except for the Lilypad Lake, Swole Lake, and Lowther Township pegmatite (all in Ontario), and the Red Cross Lake lithium pegmatite (Manitoba), which have lepidolite as the dominant Li mineral. Amblygonite- and elbaite-dominant pegmatites have not yet been found in the Superior Province, although amblygonite and elbaite occur in the Tanco pegmatite.

— Cesium-rich minerals only occur in the most extremely fractionated pegmatites. Pollucite occurs in the Tanco, Marko's, and Pakeagama petalite-subtype pegmatites, the Tot Lake spodumene-subtype pegmatites, and the Lilypad Lake lepidolite-subtype pegmatites (Teertstra and Cerny, 1995). The Pakeagama pegmatite is located in northwestern Ontario along the Sachigo-Berens River subprovincial boundary. Cesium-rich beryl occurs in the spodumene-subtype North Aubry, South Aubry, Case, Tot Lake, and McCombe pegmatites and the lepidolite-subtype Lowther pegmatite, all in Ontario, and in the Tanco pegmatite, Manitoba.

— Most pegmatites in the Superior Province contain ferro-columbite and mangano-columbite as the dominant Nb-Ta-bearing minerals. Some pegmatites contain mangano-tantalite as the dominant Ta-oxide mineral, for example the North Aubry, South Aubry, Fairservice, Tot Lake, and Tebishogeshik pegmatites. The Tanco pegmatite contains wodginite as the dominant Ta-oxide mineral. Tantalum-bearing cassiterite is relatively rare in pegmatites of the Superior Province, except for the Separation Rapids and Tanco pegmatites.

— Fine-grained Ta-oxides (e.g. manganotantalite, wodginite, and microlite) commonly occur in the aplite, albitized K-feldspar, mica-rich, and spodumene core zones in pegmatites in the Superior province. At Tanco, Ta mineralization occurs in the albitic aplite zone (30), central intermediate muscovite-quartz after microcline zone (60), and lepidolite zone (90).

9 EXPLORATION

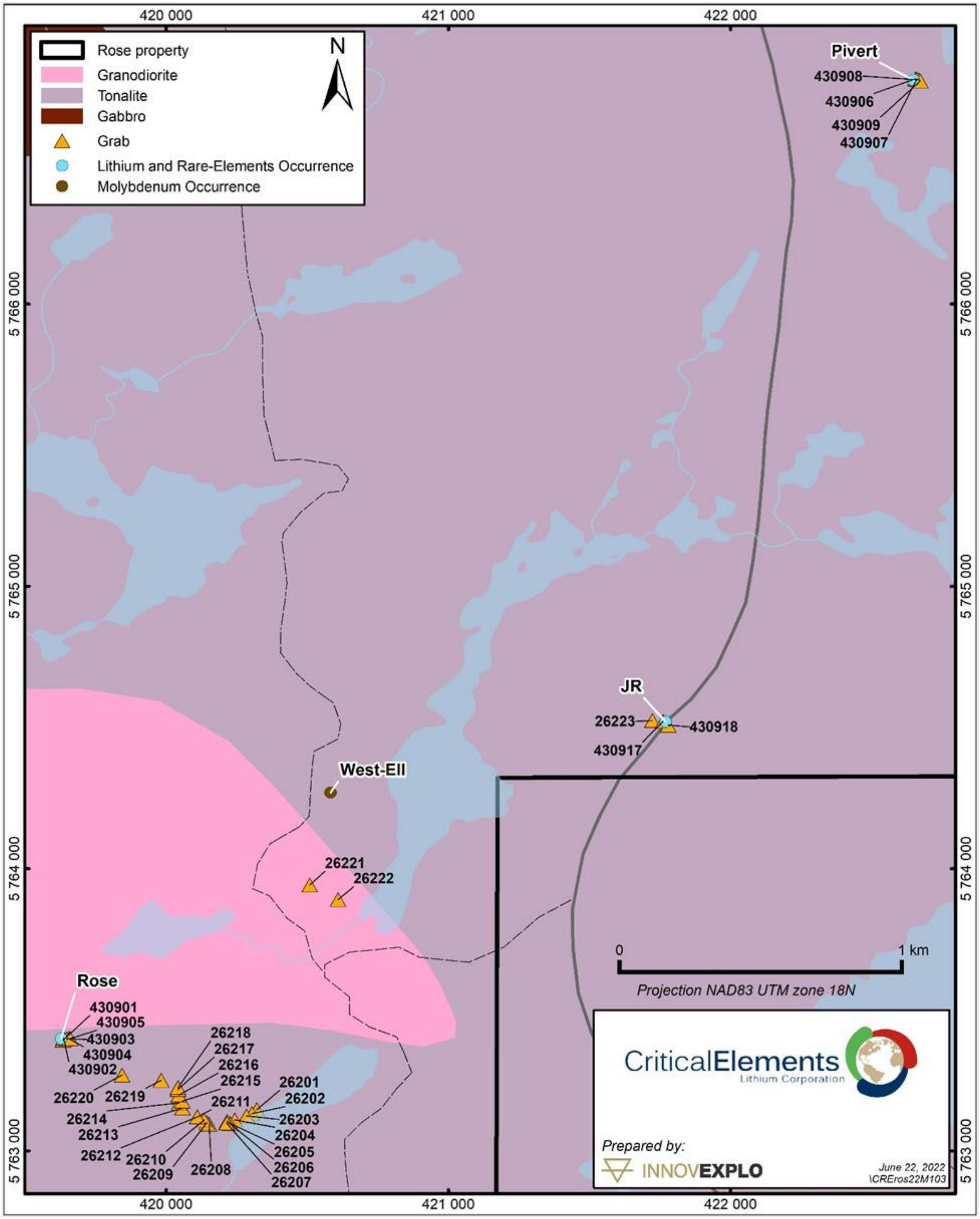
In addition to drilling (see Item 10), CELC also performed limited prospecting activities on the Property that were restricted to the Pivert showing and Rose deposit areas. The work, which took place in the last decade, focused on grab sampling and the visual reconnaissance of pegmatites at both localities, and outcrop mapping at Rose only.

A total of 34 grab samples were collected and sent for analysis (Table 9.1). Grades for Li, Ta, Rb, Cs, and Be are reported in this Item as parts per million (ppm). Location of the grab samples on the Property are presented on Figure 9.1. Sampling and assaying protocols are further described in Item 11.

Table 9.1: Grab Samples Collected on the Rose Property by CELC

Sample	Area	UTM83 Zone 18		Li	Rb	Ta	Cs	Be	Ga
		Easting	Northing	ppm	ppm	ppm	ppm	ppm	ppm
26221	Hydro	420509	5763942	7,270	900	110	70	67	92
26222	Hydro	420609	5763891	4,440	580	290	50	227	70
26223	JR	421723	5764524	12,900	490	120	20	57	114
430917	JR	421761	5764522	21,200	390	51	22	90	107
430918	JR	421779	5764508	14,700	1,290	44	50	65	93
430906	Pivert	422655	5766797	9,660	n/a	n/a	n/a	n/a	70
430907	Pivert	422660	5766796	8,020	n/a	n/a	n/a	n/a	60
430908	Pivert	422667	5766794	8,870	n/a	n/a	n/a	n/a	70
430909	Pivert	422672	5766790	454	n/a	n/a	n/a	n/a	50
26201	Rose	420321	5763147	5,700	2,520	79	67	38	75
26202	Rose	420304	5763132	11,500	680	31	45	270	75
26203	Rose	420285	5763124	4,990	4,740	210	150	176	69
26204	Rose	420243	5763110	7,330	1,520	99	67	206	61
26205	Rose	420227	5763098	2,760	1,320	89	45	150	60
26206	Rose	420216	5763105	6,980	1,390	91	64	191	86
26207	Rose	420214	5763099	1,580	2,720	140	110	224	80
26208	Rose	420152	5763095	12,400	660	85	51	117	98
26209	Rose	420144	5763100	10,300	620	80	38	107	107
26210	Rose	420134	5763110	9,810	1,340	74	49	115	81
26211	Rose	420110	5763121	9,490	1,350	80	70	202	82
26212	Rose	420110	5763121	9,320	2,200	170	210	842	74
26213	Rose	420058	5763152	7,080	2,050	140	90	289	81
26214	Rose	420046	5763171	7,210	1,150	190	60	280	65
26215	Rose	420057	5763177	13,300	1,760	220	60	56	110
26216	Rose	420045	5763198	8,160	1,580	88	46	102	88
26217	Rose	420042	5763219	8,800	3,280	61	91	119	72
26218	Rose	420042	5763225	9,510	1,500	60	50	147	79
26219	Rose	419982	5763251	8,580	3,290	490	130	134	92
26220	Rose	419844	5763269	3,870	1,060	220	80	147	68
430901	Rose	419635	5763393	10,200	n/a	n/a	n/a	n/a	70
430902	Rose	419637	5763400	6,220	n/a	n/a	n/a	n/a	70
430903	Rose	419647	5763397	2,840	n/a	n/a	n/a	n/a	90
430904	Rose	419655	5763398	7,140	n/a	n/a	n/a	n/a	80
430905	Rose	419660	5763398	11,500	n/a	n/a	n/a	n/a	80

Figure 9.1: CELC Grab Sample Location

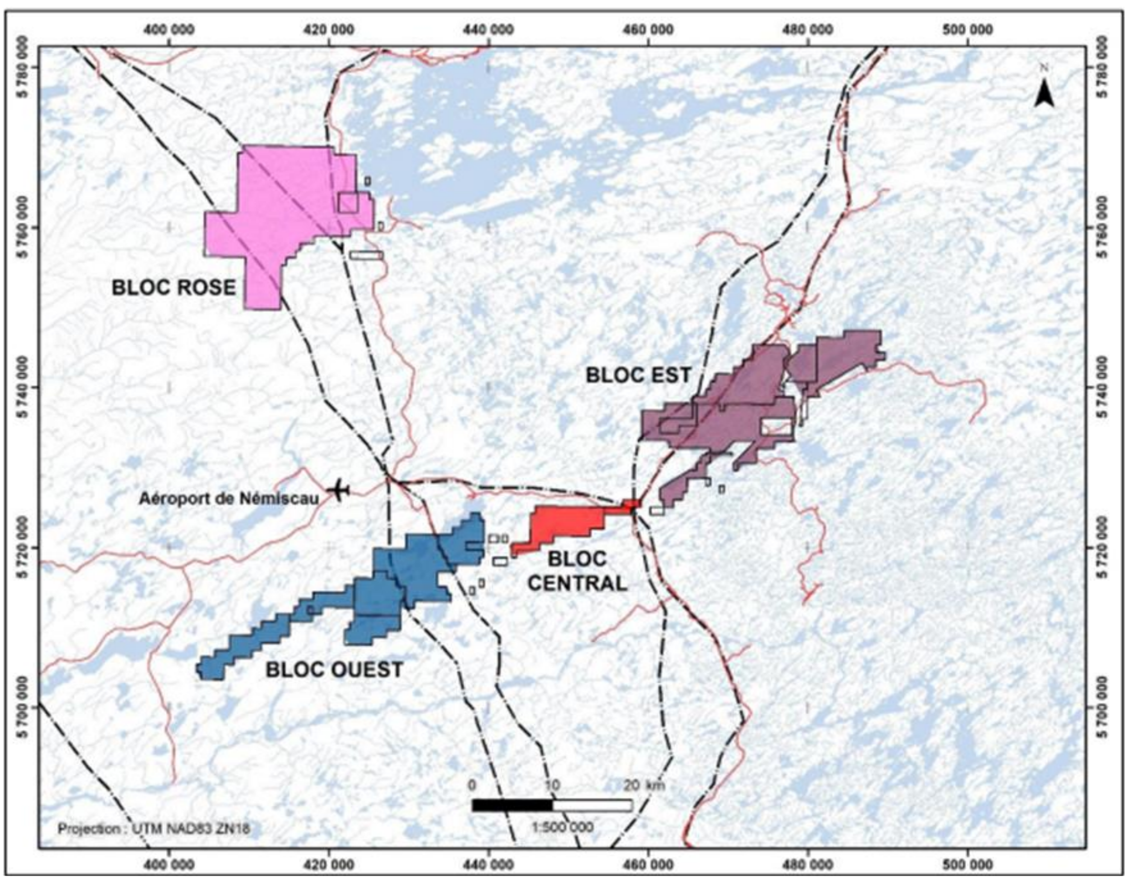


9.1 2021 High-Resolution Helicopter Borne Magnetometric Survey

During the month of March 2021, CELC contracted Geo Data Solutions GDS/Geo Data Solutions GDS Inc. (GDS), to perform high-resolution helicopter-borne magnetometric survey on its properties located in the Eeyou Istchee James Bay region. Four blocks, Rose, East, West and Central, were covered for a total of 15,508 one-kilometre on flight lines. The nominal traverse line spacing was 50 m while control line spacing was 500 m for each survey block. The survey was flown following a pre-determined flight surface having a rate of climb and descent of 20% and a minimum ground clearance of 35 m. The data were recorded using a split-beam cesium vapour magnetometer mounted in a stinger fixed to the helicopter. The GDS technical report (Technical report high-resolution helicopter-borne magnetic survey Quebec's Eeyou Istchee James Bay projects) details the instrumentation, verification procedures and raw data processing. Figure 9.2 geographically locates the four claim blocks covered near the Cree village of Némaska and the Némiscau airport.

The high-resolution helicopter-borne magnetometric survey has made it possible to precisely locate lineaments, discontinuities and magnetic domains which enrich the geological interpretation of the region. Also, some direct exploration targets have been identified based on the types of mineralization potentially present and the geological context. Most targets such as Au, Ni-Cu or VMS targets are based on already recognized data, criteria, or assumptions. However, the diamondiferous potential that has also been identified is little known and recognized in the region.

Figure 9.2: Location Map of the Four Claim Blocks



Source: Work report by Jean-Sébastien Lavallée, 2017 GM 70347

10 DRILLING

CELC started drilling the Property in late 2009. This report considers 255 holes drilled by the company for a total of 29,135.50 m. Of those 255 holes, 202 (totalling 25,200.90 m) were included in the current resource estimate.

10.1 Drilling on the Pivert Showing

Diamond drilling on the Pivert showing is limited to eight holes (NQ core; total of 671.60 m) completed by CELC in 2009, 2010, and 2016 (Table 10.1). The objective of the program was to confirm the continuity of the mineralized pegmatite observed at surface.

The orientations of the eight holes varied from N210 to N010 and the dip varied from 45° to 75°.

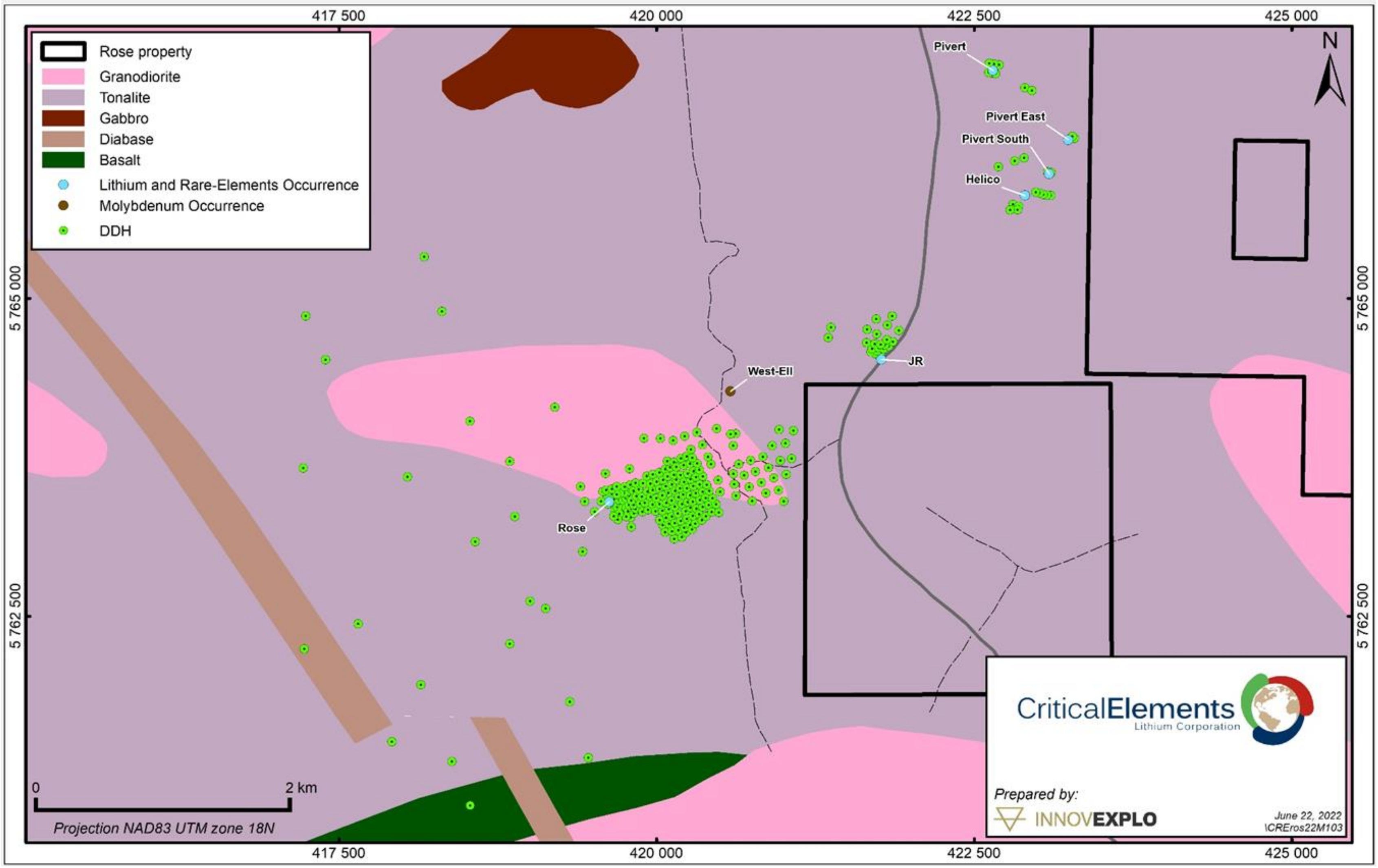
All holes were supervised, logged, and sampled by Consul-Teck Exploration Inc. (Consul-Teck). The Pivert program produced 125 core samples. Hole LP-09-01 returned anomalous values in Li, Cs, and Rb, and Hole LP-09-02 returned anomalous values in rare elements such as Rb and Cs. Hole LP-09-03 did not intersect any significant values. Holes LP-10-04 and LP-10-06 reported intersected Li, Ta, Rb, Cs, Be, and Ga mineralization, while hole LP-10-06 reported only anomalous values.

Table 10.1: CELC Diamond Drillholes on the Pivert Showing

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LP-09-01	422 643	5 766 773	301	10	-45	126
LP-09-02	422 670	5 766 770	301	10	-45	123
LP-09-03	422 617	5 766 777	301	10	-45	103
LP-10-04	422 698	5 766 838	300	210	-60	54
LP-10-05	422 658	5 766 843	305	190	-60	51
LP-10-06	422 620	5 766 850	304	210	-60	51
LP-16-01	422 900	5 766 657	303	200	-75	83
LP-16-02	422 956	5 766 635	297	200	-50	81
Total 8 holes						**672**

Figure 10.1 shows the location of drillholes on the Pivert showing.

Figure 10.1: CELC Diamond Drillholes on the Pivert Showing



10.2 Drilling on the Rose Deposit

CELC drilled 207 holes (NQ core size; 25,581.90 m) on the Rose deposit in 2009, 2010, 2011, and 2016 (Table 10.2 and Table 10.3). Holes from the Hydro and JR showings are included in this total because they are now considered part of the Rose deposit after drilling expanded the original Rose showing to encompass Hydro and JR.

The original objective of the program was to confirm the continuity of the mineralized pegmatites observed at surface. This objective was quickly upgraded to systematic drilling of the mineralized pegmatites. Table 10.4 shows best assay results

The Rose drillholes were supervised, logged, and sampled by Consul-Teck. The program produced 4,446 core samples.

Table 10.2: CELC Diamond Drillholes on the Rose Deposit

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
HD-10-01	420 624	5 763 935	293	210	-60	51
HD-10-02	420 584	5 763 932	294	210	-60	54
HD-10-03	420 473	5 763 975	298	210	-60	60
LR-09-01	419 674	5 763 337	294	335	-48	126
LR-09-02	419 638	5 763 408	295	157	-45	78
LR-09-03	419 669	5 763 417	297	156	-44	83
LR-09-04	419 655	5 763 458	300	155	-45	114
LR-09-05	419 692	5 763 357	294	335	-45	114
LR-09-06	419 723	5 763 371	295	335	-46	108
LR-09-07	419 705	5 763 412	297	335	-43	114
LR-09-08	419 733	5 763 348	296	335	-51	201
LR-09-09	419 735	5 763 411	297	335	-47	111
LR-09-10	419 762	5 763 351	298	335	-47	108
LR-10-11	419 763	5 763 350	299	335	-86	81
LR-10-12	419 776	5 763 324	300	335	-78	150
LR-10-13	419 799	5 763 276	301	335	-80	84
LR-10-14	419 822	5 763 309	303	316	-79	90
LR-10-15	419 784	5 763 373	299	334	-79	93
LR-10-16	419 760	5 763 427	299	324	-80	102
LR-10-17	419 762	5 763 282	300	335	-80	60
LR-10-18	419 708	5 763 306	296	335	-80	84
LR-10-19	419 618	5 763 380	295	335	-80	87
LR-10-20	419 837	5 763 343	303	335	-80	102
LR-10-21	419 696	5 763 259	295	335	-80	60
LR-10-22	419 663	5 763 285	295	335	-80	60
LR-10-23	419 820	5 763 374	302	335	-80	120
LR-10-24	419 785	5 763 446	302	335	-79	117
LR-10-25	419 801	5 763 410	298	335	-80	102
LR-10-26	419 769	5 763 477	305	335	-80	141
LR-10-27	419 743	5 763 468	305	332	-79	123
LR-10-28	419 712	5 763 465	304	335	-80	117
LR-10-29	419 688	5 763 456	302	335	-80	105

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-10-30	419 610	5 763 468	298	342	-80	114
LR-10-31	419 604	5 763 415	292	345	-81	105
LR-10-32	419 564	5 763 403	292	335	-80	69
LR-10-33	419 578	5 763 479	297	335	-80	120
LR-10-34	419 603	5 763 491	299	342	-70	141
LR-10-35	419 649	5 763 499	304	335	-70	159
LR-10-36	419 688	5 763 520	306	342	-70	153
LR-10-37	419 750	5 763 517	309	335	-70	138
LR-10-38	419 794	5 763 533	308	343	-70	150
LR-10-39	419 819	5 763 484	308	335	-80	141
LR-10-40	419 842	5 763 443	299	331	-80	123
LR-10-41	419 872	5 763 384	306	335	-80	117
LR-10-42	419 890	5 763 320	305	335	-79	126
LR-10-43	419 933	5 763 336	310	318	-81	129
LR-10-44	419 908	5 763 390	308	330	-80	129
LR-10-45	419 885	5 763 439	304	328	-80	135
LR-10-46	419 860	5 763 496	304	335	-80	150
LR-10-47	419 836	5 763 547	303	335	-80	153
LR-10-48	419 894	5 763 546	303	326	-80	159
LR-10-49	419 931	5 763 479	305	335	-80	156
LR-10-50	419 955	5 763 436	308	335	-80	156
LR-10-51	419 969	5 763 377	312	335	-80	162
LR-10-52	419 994	5 763 325	311	335	-81	105
LR-10-53	420 050	5 763 215	309	335	-80	75
LR-10-54	420 069	5 763 160	317	335	-79	102
LR-10-55	420 139	5 763 107	306	335	-80	51
LR-10-56	420 199	5 763 121	306	322	-80	45
LR-10-57	420 234	5 763 159	308	335	-80	75
LR-10-58	420 121	5 763 166	313	336	-80	45
LR-10-59	420 099	5 763 224	308	335	-80	51
LR-10-60	420 076	5 763 274	306	335	-80	75
LR-10-61	420 027	5 763 255	306	335	-80	51
LR-10-62	420 048	5 763 328	310	134	-79	132
LR-10-63	420 024	5 763 381	318	152	-81	102
LR-10-64	420 001	5 763 427	313	154	-79	165
LR-10-65	419 973	5 763 491	302	152	-81	165
LR-10-66	419 952	5 763 540	298	142	-80	156
LR-10-67	419 925	5 763 601	301	155	-80	174
LR-10-68	419 973	5 763 615	298	155	-80	189
LR-10-69	420 002	5 763 557	303	150	-80	183
LR-10-70	420 026	5 763 500	311	142	-80	102
LR-10-71	420 098	5 763 340	313	150	-80	111
LR-10-72	420 122	5 763 283	309	151	-81	63
LR-10-73	420 144	5 763 230	309	155	-80	54
LR-10-74	420 172	5 763 175	310	156	-80	51
LR-10-75	420 077	5 763 391	317	146	-80	84

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-10-76	420 218	5 763 196	310	146	-80	51
LR-10-77	420 193	5 763 249	310	155	-80	60
LR-10-78	420 169	5 763 306	311	155	-80	69
LR-10-79	420 145	5 763 361	314	155	-80	87
LR-10-80	420 121	5 763 409	318	155	-80	102
LR-10-81	420 095	5 763 468	317	155	-80	180
LR-10-82	420 074	5 763 520	310	155	-80	171
LR-10-83	420 051	5 763 571	303	153	-80	201
LR-10-84	420 024	5 763 629	299	155	-80	207
LR-10-85	420 069	5 763 655	295	136	-80	228
LR-10-86	420 089	5 763 599	305	148	-80	210
LR-10-87	420 122	5 763 535	308	155	-80	192
LR-10-88	420 046	5 763 450	317	136	-80	99
LR-10-89	420 148	5 763 484	313	155	-80	99
LR-10-90	420 174	5 763 436	315	155	-80	99
LR-10-91	420 201	5 763 382	313	155	-80	87
LR-10-92	420 230	5 763 325	313	155	-80	72
LR-10-93	420 239	5 763 264	312	150	-80	60
LR-10-94	420 264	5 763 217	309	150	-80	42
LR-10-95	420 281	5 763 181	306	155	-80	27
LR-10-96	420 306	5 763 226	306	152	-80	51
LR-10-97	420 285	5 763 288	311	155	-79	99
LR-10-98	420 267	5 763 352	312	155	-80	105
LR-10-99	420 246	5 763 396	312	150	-80	108
LR-10-100	420 209	5 763 455	313	155	-80	105
LR-10-101	420 185	5 763 505	309	155	-80	108
LR-10-102	420 157	5 763 573	309	152	-79	126
LR-10-103	420 137	5 763 612	308	155	-80	144
LR-10-104	420 108	5 763 670	295	152	-78	147
LR-10-105	420 085	5 763 718	295	158	-80	159
LR-10-106	420 138	5 763 712	295	155	-80	183
LR-10-107	420 156	5 763 674	295	155	-80	150
LR-10-108	420 190	5 763 609	306	168	-79	138
LR-10-109	420 219	5 763 555	304	145	-80	138
LR-10-110	420 239	5 763 505	308	155	-80	114
LR-10-111	420 266	5 763 449	311	143	-80	117
LR-10-112	420 287	5 763 400	311	155	-80	114
LR-10-113	420 315	5 763 346	310	155	-80	102
LR-10-114	420 335	5 763 300	309	155	-80	84
LR-10-115	420 358	5 763 255	305	155	-79	63
LR-10-116	420 390	5 763 285	305	155	-79	69
LR-10-117	420 364	5 763 358	309	155	-80	108
LR-10-118	420 342	5 763 412	310	155	-80	114
LR-10-119	420 311	5 763 467	308	155	-80	123
LR-10-120	420 289	5 763 522	305	154	-80	123
LR-10-121	420 269	5 763 578	300	140	-80	135

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-10-122	420 245	5 763 622	300	152	-80	135
LR-10-123	420 214	5 763 688	293	145	-80	174
LR-10-124	420 191	5 763 741	293	153	-80	201
LR-10-125	420 238	5 763 757	291	145	-80	204
LR-10-126	420 265	5 763 700	291	155	-80	159
LR-10-127	420 292	5 763 639	296	148	-80	177
LR-10-128	420 311	5 763 592	294	152	-80	135
LR-10-129	420 340	5 763 535	303	153	-79	135
LR-10-130	420 364	5 763 477	308	152	-80	123
LR-10-131	420 389	5 763 428	309	142	-79	120
LR-10-132	420 412	5 763 373	307	140	-79	105
LR-10-133	420 436	5 763 319	304	140	-80	87
LR-10-134	420 491	5 763 315	298	154	-80	90
LR-10-135	420 470	5 763 378	305	150	-78	117
LR-10-136	420 441	5 763 426	307	148	-77	129
LR-10-137	420 416	5 763 484	306	144	-80	132
LR-10-138	420 395	5 763 532	304	167	-80	153
LR-10-139	420 365	5 763 599	293	141	-79	150
LR-10-140	420 339	5 763 650	292	157	-80	201
LR-10-141	420 319	5 763 701	289	155	-80	183
LR-10-142	420 282	5 763 745	289	155	-80	201
LR-10-143	420 272	5 763 810	292	155	-80	228
LR-11-144	420 502	5 763 477	306	158	-76	150
LR-11-145	420 487	5 763 568	301	150	-75	174
LR-11-146	420 431	5 763 695	291	149	-75	201
LR-11-147	420 406	5 763 753	290	151	-76	225
LR-11-148	420 362	5 763 846	293	156	-74	243
LR-11-149	420 317	5 763 945	293	159	-76	276
LR-11-150	420 223	5 763 915	296	150	-75	276
LR-11-151	420 131	5 763 880	294	155	-76	234
LR-11-152	420 032	5 763 897	295	154	-76	252
LR-11-153	419 902	5 763 898	295	149	-73	300
LR-11-154	419 787	5 763 659	292	153	-76	153
LR-11-155	420 625	5 763 446	301	155	-75	150
LR-11-156	420 612	5 763 538	301	191	-71	210
LR-11-157	420 605	5 763 620	298	204	-71	192
LR-11-158	420 648	5 763 696	292	198	-71	186
LR-11-159	420 689	5 763 606	301	196	-71	177
LR-11-160	420 731	5 763 514	299	189	-71	150
LR-11-161	420 753	5 763 405	288	199	-71	126
LR-11-162	420 863	5 763 466	289	196	-69	150
LR-11-163	420 826	5 763 552	290	195	-70	174
LR-11-164	420 781	5 763 637	297	193	-69	219
LR-11-165	420 742	5 763 724	290	205	-68	201
LR-11-166	420 838	5 763 753	286	199	-69	204
LR-11-167	420 882	5 763 667	291	189	-69	183

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
LR-11-168	420 923	5 763 588	292	190	-71	99
LR-11-169	420 963	5 763 490	291	197	-69	81
LR-11-170	421 003	5 763 403	294	186	-70	84
LR-11-171	421 021	5 763 616	294	192	-71	126
LR-11-172	420 976	5 763 723	293	199	-69	144
LR-11-173	420 912	5 763 841	287	194	-70	180
LR-11-174	420 966	5 763 967	287	196	-71	210
LR-11-175	421 016	5 763 860	288	196	-69	177
LR-11-176	421 065	5 763 739	297	197	-69	132
LR-11-177	421 078	5 763 959	288	192	-71	186
LR-11-178	420 604	5 763 841	286	198	-68	224
LR-11-179	419 801	5 763 200	295	10	-58	102
LR-11-180	419 436	5 763 401	290	9	-58	99
LR-11-181	419 600	5 763 620	299	14	-60	138
Total 184 holes						**24 088**

Table 10.3: CELC Diamond Drillholes on the JR Zones (part of the Rose deposit)

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
JR-10-01	421 750	5 764 549	308	210	-60	54
JR-10-02	421 720	5 764 566	307	210	-60	57
JR-10-03	421 688	5 764 579	304	210	-60	57
JR-10-04	421 768	5 764 575	307	210	-60	48
JR-10-05	421 736	5 764 586	304	210	-60	75
JR-10-06	421 699	5 764 603	303	210	-60	45
JR-10-07	421 719	5 764 641	302	210	-60	45
JR-10-08	421 751	5 764 612	303	210	-60	45
JR-10-09	421 789	5 764 602	306	210	-60	45
JR-10-10	421 830	5 764 623	305	210	-60	45
JR-10-11	421 798	5 764 633	303	210	-60	45
JR-10-12	421 767	5 764 638	303	210	-60	66
JR-11-13	421 862	5 764 658	305	210	-75	75
JR-11-14	421 816	5 764 676	303	210	-75	99
JR-11-15	421 734	5 764 719	309	210	-75	69
JR-11-16	421 730	5 764 838	313	210	-75	84
JR-11-17	421 818	5 764 790	309	210	-75	81
JR-11-18	421 909	5 764 747	302	210	-75	78
JR-16-01	421 655	5 764 651	298	210	-75	54
JR-16-02	421 658	5 764 755	308	210	-75	99
JR-16-03	421 857	5 764 862	304	210	-80	99
JR-16-04	421 352	5 764 691	296	210	-75	75
JR-16-05	421 374	5 764 772	299	210	-75	54
Total 23 holes						**1 494**

Table 10.4: CELC Best Assay Results on the Rose Deposit

Hole ID	From (m)	To (m)	Core Length (m)	Li_2O (%)	Ta_2O_5 ppm (g/t)
LR-10-140	113.6	119.4	5.8	1.23	138
LR-10-141	148.75	150.35	1.6	0.82	52
and	151.1	159	7.9	1.38	115
LR-10-142	169.3	185.4	16.1	1.32	114
LR-10-143	173.75	176.65	2.9	0.78	104
and	191.5	204.95	13.45	1.29	103
LR-11-14	31.75	36.95	5.2	1.41	120
and	50.9	52.1	1.2	0.7	107
LR-11-144	110.05	119.65	9.6	0.91	136
and	131.4	137.45	6.05	1.17	82
LR-11-145	137.15	151.15	14	0.98	78
LR-11-146	162.85	175.9	13.05	1.47	100
LR-11-148	217.65	230.65	13	0.84	71
LR-11-150	214.1	225.6	11.5	1.42	71
LR-11-151	179.6	187.05	7.45	1.42	134
and	188.5	189.6	1.1	1.6	147
and	191.85	194.45	2.6	0.82	111
LR-11-152	167.05	168.85	1.8	1.01	138
and	204.8	209.3	4.5	1.59	128
LR-11-153	183.45	186.65	3.2	0.81	58
and	231.05	235.65	4.6	0.86	77
LR-11-154	81.9	85.1	3.2	1.23	249
LR-11-155	93.85	106.55	12.7	0.92	110
LR-11-156	122.75	135.3	12.55	1.14	64
LR-11-157	150.45	155.7	5.25	1.22	101
LR-11-158	20.25	24.5	4.25	0.97	286
LR-11-159	131.35	145.35	14	1.29	66
LR-11-160	122.5	133.15	10.65	1.22	105
and	32	35.2	3.2	0.91	405
and	53.35	56.8	3.45	0.93	387
LR-11-161	83.55	90.95	7.4	1.41	85
LR-11-162	44.95	55.2	10.25	1.55	161
LR-11-163	134.85	139.75	4.9	0.93	114
and	14.6	18.25	3.65	0.97	319
and	45.9	55.1	9.2	1.64	226
LR-11-164	150.05	161.9	11.85	0.71	82
and	16.65	20.15	3.5	1.02	300
and	51.05	54.7	3.65	1.26	197
LR-11-165	161.7	173.7	12	1.77	67
LR-11-166	42.65	48.1	5.45	0.77	167
LR-11-167	32.6	38.5	5.9	1.29	275
and	95.4	103.75	8.35	1.3	133
LR-11-168	21.15	29.8	8.65	1.02	254
and	83.3	91.05	7.75	1.25	154
LR-11-169	57	59.9	2.9	0.77	78

Hole ID	From (m)	To (m)	Core Length (m)	LI_2O (%)	Ta_2O_5 ppm (g/t)
and	66.55	73.75	7.2	1.11	249
LR-11-170	55.45	58.75	3.3	0.98	164
LR-11-171	112.55	119.35	6.8	0.89	172
LR-11-172	127.85	136.8	8.95	1.09	101
LR-11-175	93.4	101.15	7.75	0.83	137
LR-11-176	85.2	94	8.8	1.06	206
LR-11-178	218	224.05	6.05	1.42	103

Table 10.5: CELC Best Assay Results on the JR Deposit

Hole ID	From (m)	To (m)	Core Length (m)	LI_2O (%)	Ta_2O_5 ppm (g/t)
JR-10-01	4.85	10	5.15	1.38	218
JR-10-02	2.1	7.6	5.5	1.53	151
and	17.8	20.3	2.5	0.89	257
JR-10-03	19.2	20.8	1.6	0.99	185
JR-10-04	12.4	24	11.6	1.15	173
JR-10-05	2.7	6.4	3.7	1.55	132
and	11	13.15	2.15	2.03	199
and	22.1	25.5	3.4	0.73	144
JR-10-06	20.9	22.6	1.7	1.96	415
JR-10-08	14	21.5	7.5	1.04	159
and	28	32.6	4.6	0.78	164
JR-10-09	16.15	26.3	10.15	0.98	205
JR-10-10	25.2	31	5.8	0.96	139
JR-10-11	20.9	22.45	1.55	0.83	240
and	23.25	26.8	3.55	1.53	135
and	29.1	31.4	2.3	1.12	152
and	35.4	36.65	1.25	1.96	190
JR-10-12	30.65	34.25	3.6	1.51	181
JR-11-17	63.65	66.8	3.15	0.93	145
JR-11-18	42.8	48.95	6.15	0.83	98
and	61	64.9	3.9	0.95	74

Figure 10.2 shows the location of drillholes on the Rose deposit; Figure 10.3 shows the location of drillholes on the JR Showing Area.

Figure 10.2:CELC Diamond Drillholes on the Rose Deposit

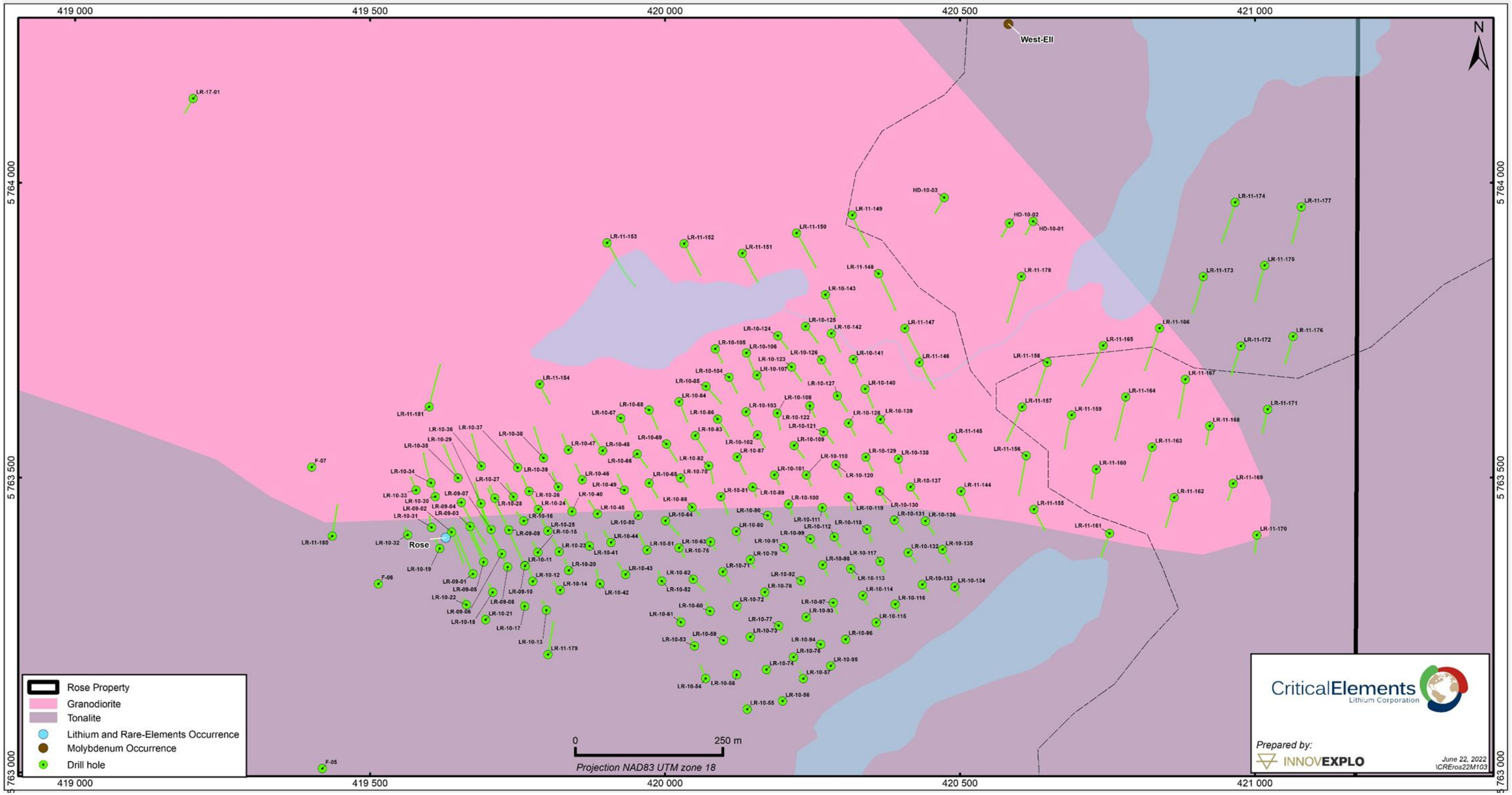
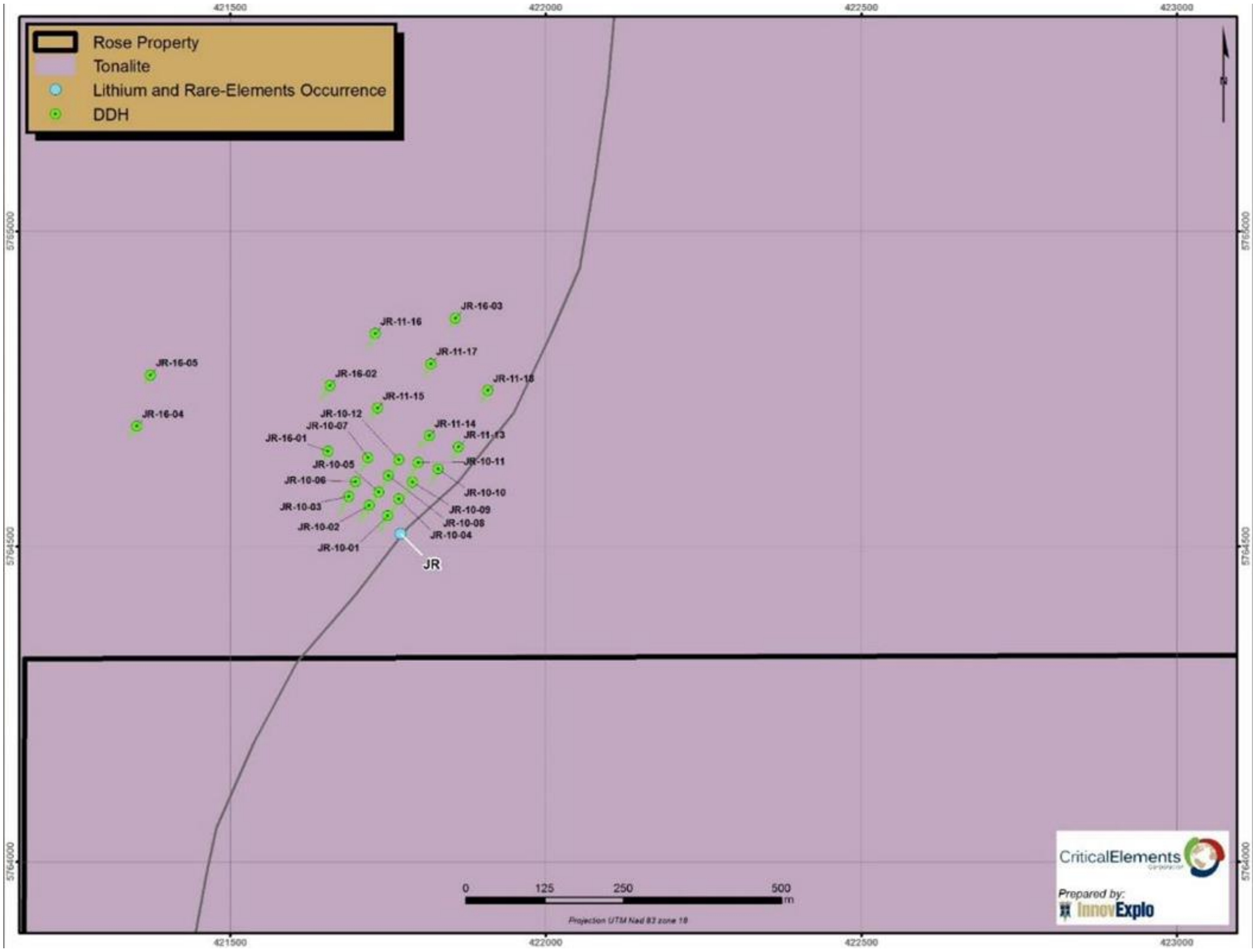


Figure 10.3: CELC Diamond Drillholes on the JR Showing Area



10.3 Drilling on Other Showings

Three other showings were drilled in 2010 and 2016 (Table 10.6). Nine holes totalling 879 m were drilled on the Helico showing, two totalling 102 m on Pivert East, and two totalling 102 m on Pivert South.

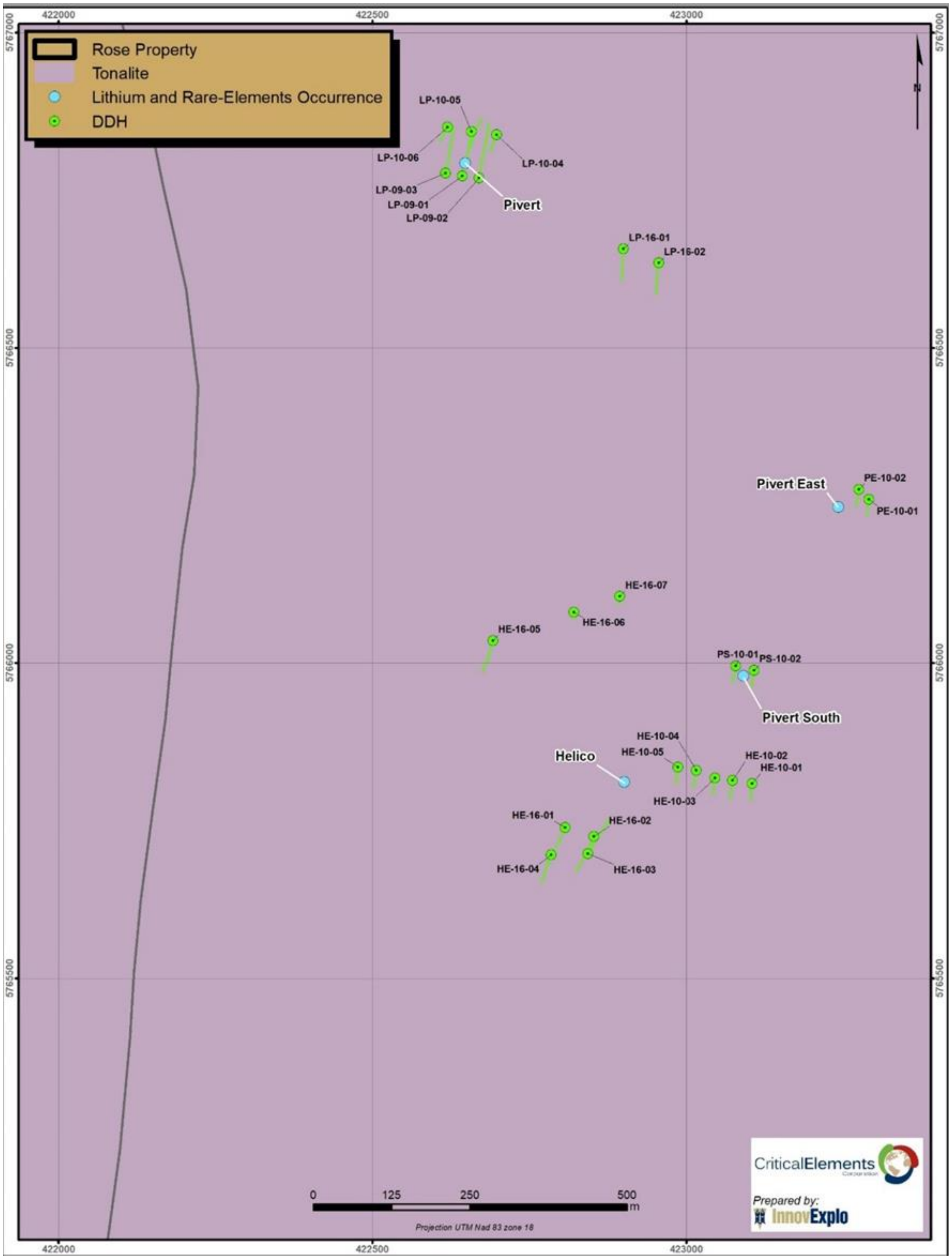
The original objective of the program was to confirm the continuity of the mineralized pegmatites observed at surface. Drillholes were supervised, logged, and sampled by Consul-Teck. The program produced 157 samples.

Table 10.6: CELC Diamond Drillholes on Other Known Showings on the Rose-Pivert Property

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
HE-10-01	423 105	5 765 809	293	190	-60	51
HE-10-02	423 074	5 765 814	292	190	-60	60
HE-10-03	423 046	5 765 818	292	190	-60	51
HE-10-04	423 016	5 765 830	292	190	-60	51
HE-10-05	422 987	5 765 835	292	190	-60	51
HE-16-01	422 807	5 765 739	276	200	-50	102
HE-16-02	422 853	5 765 725	292	200	-50	102
HE-16-03	422 843	5 765 698	287	30	-50	102
HE-16-04	422 785	5 765 696	283	200	-50	75
HE-16-05	422 692	5 766 036	305	200	-50	84
HE-16-06	422 821	5 766 081	299	200	-80	75
HE-16-07	422 894	5 766 106	301	200	-80	75
PE-10-01	423 291	5 766 260	300	190	-60	51
PE-10-02	423 275	5 766 276	300	190	-60	51
PS-10-01	423 079	5 765 996	300	190	-60	51
PS-10-02	423 108	5 765 989	300	190	-60	51
Total 16 holes						**1 083**

Figure 10.4 shows the location of drillholes on other showings.

Figure 10.4: CELC Diamond Drillholes on Other Showings



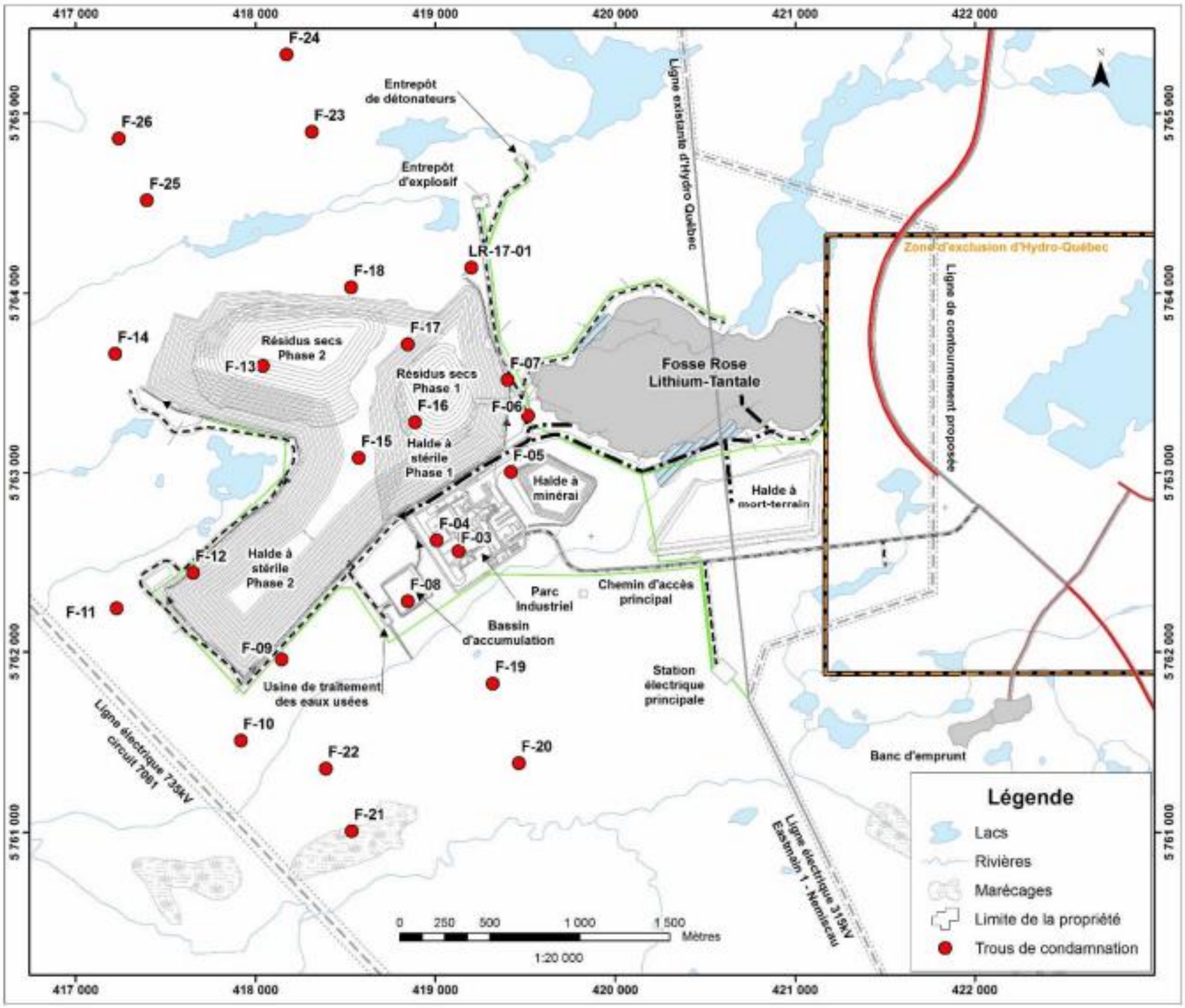
10.4 Condemnation Drilling

From January 24 to February 16, 2017, 25 holes totalling 1,880 m were drilled on the Property to confirm the absence of mineral resource potential in areas of proposed infrastructure. Table 10.7 lists the holes and Figure 10.5 shows location of condemnation drillholes and surface infrastructures. Only four pegmatite intervals totalling 6.8 m were intersected and no samples were taken as no spodumene mineralization was observed. Drillholes were supervised, logged, and sampled by Consul-Teck (Jourdain, J., 2018).

Table 10.7: CELC Condemnation Diamond Drillholes on the Property

Hole	UTM83 Zone 18		Elevation	Azimuth	Dip	Length
	Easting	Northing	(m)			(m)
F-03	419 128	5 762 558	286	0	-90	75
F-04	419 006	5 762 617	277	0	-90	75
F-05	419 419	5 763 007	268	0	-90	75
F-06	419 514	5 763 320	281	0	-90	75
F-07	419 401	5 763 518	290	0	-90	75
F-08	418 845	5 762 281	275	0	-90	75
F-09	418 145	5 761 959	265	0	-90	75
F-10	417 917	5 761 510	265	0	-90	75
F-11	417 226	5 762 241	274	0	-90	75
F-12	417 651	5 762 438	286	0	-90	75
F-13	418 039	5 763 595	300	0	-90	75
F-14	417 219	5 763 664	282	0	-90	75
F-15	418 573	5 763 085	287	0	-90	75
F-16	418 886	5 763 283	283	0	-90	75
F-17	418 845	5 763 716	308	0	-90	75
F-18	418 531	5 764 033	330	0	-90	75
F-19	419 317	5 761 824	274	0	-90	75
F-20	419 463	5 761 385	256	0	-90	75
F-21	418 534	5 761 008	242	0	-90	75
F-22	418 390	5 761 354	266	0	-90	75
F-23	418 312	5 764 897	296	0	-90	75
F-24	418 171	5 765 327	304	0	-90	75
F-25	417 395	5 764 517	282	0	-90	75
F-26	417 239	5 764 861	290	0	-90	74
LR-17-01	419200	5764143	315	210	-70	81
Total 24 holes						**1,880**

Figure 10.5: Location Map of Condemnation Drillholes and Surface Infrastructures



11 SAMPLE PREPARATION, ANALYSES, AND SECURITY

11.1 Sampling Method and Approach

Regarding sampling method and approach the following process was enacted:

- The drill core is boxed, covered and sealed at the drill rig and moved to the side of the main gravel road by the drillers, where they are piled either on the ground or on a trailer. Consul-Teck personnel then carry the boxes once or twice a week to the core logging and sample preparation facility in Val-d'Or.
- After being examined and described (logged), the core is sampled according to an established protocol. The core of the selected section is first cut in half using a typical table-feed circular rock saw, with one half put aside for shipment to the laboratory. The second half of the core is put back in its place in the core box, and a tag bearing the same number is placed at the end of the sawed core halves forming the sampled length. Core sample intervals are selected based on the presence of favourable geological units (pegmatite) and placed into sample bags before being shipped to the assay laboratory.
- Channel samples collected from the Property by CELC are referred to in company press releases as 'non-chosen grab samples' because the collection process differs from traditional channel sampling. Unlike traditional channel samples, they are not necessarily perpendicular to the interpreted strike of the pegmatite and they are of variable lengths. This type of channel sampling was employed in lieu of grab sampling since traditional grabs are very difficult or impossible to obtain from the smooth, hard outcrops surfaces using a hammer and chisel. The resulting samples, however, are similar to grab samples in that they are selective by nature and unlikely to represent average grades. The purpose of such sampling was to rapidly determine whether mineralization is constant throughout the outcropping pegmatite. The channels are approximately 5 cm wide and cut with a motorized circular saw to a depth of approximately 5 cm. Most are approximately 1 m long and entirely within the pegmatite dyke. As mentioned above, they are not necessarily perpendicular to the interpreted strike of the pegmatite. According to the issuer, samples were placed whole into bags before sending to the laboratory.
- Most core samples range in length from 0.10 to 2.00 m, with only a few exceptions exceeding 2.00 m. This is discussed further in Item 12 - Data Verification.
- Every pegmatite unit was systematically sampled. Samples collected by diamond drilling are generally intact with little possibility of loss due to wash out and are considered to be of good quality. Overall, the author Carl Pelletier considers the drill core sample recovery from mineralized zones to be representative.
- Consul-Teck's core logging facility in Val-d'Or was used for the drilling program. Consul-Teck defined the sample preparation, analysis, and security protocols for the CELC drilling programs. Assays were mostly performed at the independent and accredited facilities of ALS Laboratory in Val-d'Or (ALS), but nine of the first grab samples (430901 to 430909) were sent to Techni-Labs S.G.B Abitibi Inc. in Ste Germaine-Boulé (Tech-Labs).
- After having been logged and sampled at Consul-Teck's Val-d'Or facility, the samples are delivered to the laboratory by Consul-Teck personnel.
- Upon arrival at ALS, the samples are dried then crushed (jaw crushers) to 70% passing 10 mesh (i.e. 2 mm). Samples are then riffle-split (Jones riffle splitters) to reduce the sample size for pulverization to a maximum of 1 kg. The 1-kg samples are then pulverized (ring and puck) to 85% passing 200 mesh (i.e. 75 µm). Analytical protocols require that all samples be analyzed for 48 elements by the Ultra-Trace Level method using ICP MS and ICP-AES (ALS internal code ME-MS61).

- The ALS protocol for this type of analysis stipulates that a prepared sample (0.25 g) is digested by perchloric, nitric, hydrofluoric, and hydrochloric acids. The residue is topped up with dilute hydrochloric acid and analyzed by inductively coupled plasma–atomic emission spectrometry (ICP-AES). Following this analysis, the results are reviewed for high concentrations of bismuth, mercury, molybdenum, silver, or tungsten and diluted accordingly. Samples with high concentrations are then analyzed by inductively coupled plasma–mass spectrometry (ICP-MS). Results are corrected for spectral inter-element interferences. ALS notes that although the four-acid digestion is able to dissolve most minerals, it is described as 'near-total digestion' because not all elements may be quantitatively extracted, depending on the sample matrix.
- In cases where Li is higher than the detection limit of the ME-MS61 method, selected samples are then analyzed using the ALS Ore Grade Lithium method by four-acid digestion with ICP-AES finish (ALS internal code Li-OG63). Approximately 0.4 g is first digested with $HClO_4$, HF, and HNO_3 until dryness. The residue is subsequently re-digested in concentrated HCl, cooled and topped up to volume. The samples are analyzed for Li by ICP-AES spectroscopy.
- In cases where Ta and/or Cs are higher than the detection limit of the ME-MS61 method, selected samples are then analyzed using the ALS Pressed Pellet Geochemical Procedure method (ALS internal code ME-XRF05). A finely ground sample powder (10-g minimum) is mixed with a few drops of liquid binder (Polyvinyl Alcohol) and then transferred into an aluminum cap. The sample is subsequently compressed in a pellet press at approximately 30 tons/in^2. After pressing, the pellet is dried to remove the solvent and analyzed by WDXRF spectrometry for the desired elements.
- In addition to the regular sampling and assaying of samples, Consul-Teck externally initiates additional quality control protocols by preparing various duplicate samples to evaluate the precision (i.e. reproducibility) and accuracy (i.e. correctness) of the values reported. According to the company database, a total of 192 samples from the Property were duplicated. In addition, 198 blank samples were inserted in the batches sent to the laboratory to verify that contamination did not occur during the preparation process. ALS also conducts internal quality control protocols.
- The laboratory delivered the results in electronic format, sent by e-mail only to Jean-Sébastien Lavallée. Assay results were then transferred directly to the CELC database.

There is no indication of anything in the drilling, core handling and sampling procedures or in the sampling methods and approach that could have had a negative impact on the reliability of the reported assay results.

11.2 Analytical Methods

The QP obtained assay certificates from ALS to create an independent database. The QP used the independently compiled database to recalculate the results according to the following rules:

- For Li, two methods were present in the database: ME MS61 and ME OG63. ME OG63 is only available when ME MS61 shows >10,000 ppm and is a method capable of returning results for higher grades. Therefore, values from ME OG63 were used when available.
- For Be, two methods were present in the database: ME MS61 and ME ICP61a. ME ICP61a is only available when ME MS61 shows >500 ppm and is a method capable of returning results for higher grades. Therefore, values from ME ICP61a were used when available.
- For Rb, two methods were present in the database: ME MS61 and ME MS81. When both methods were available, an average of the two methods was applied. In cases where the result was >10,000 ppm Rb, a value of 10,000 was applied before proceeding with the average.
- For Ta, three methods were present in the database: ME MS61, ME MS81, and ME XRF05. When more than one method was available, an average was applied. In cases where Ta values were >100 ppm using

method ME MS61, the average of ME MS81 and ME XRF05 was used. In each instance where this occurred, the results from either ME MS81 or ME XRF05 (or both) were available. In cases where Ta values were >10,000 ppm using method ME XRF05, the value of 10,000 was used.

- For Cs, three methods were present in the database: ME MS61, ME MS81 and ME XRF05. When more than one method was available, an average was applied. In cases where Cs values were >500 ppm using method ME MS61, the average of ME MS81 and ME XRF05 was used. In each instance where this occurred, results from either ME MS81 or ME XRF05 (or both) were available.
- For Ga, two methods were present in the database: ME MS61 and ME MS81. When both methods were available, an average of the two methods was applied.
- Grades for Li, Ta, Rb, Cs, and Be are reported in this section as parts per million (ppm).

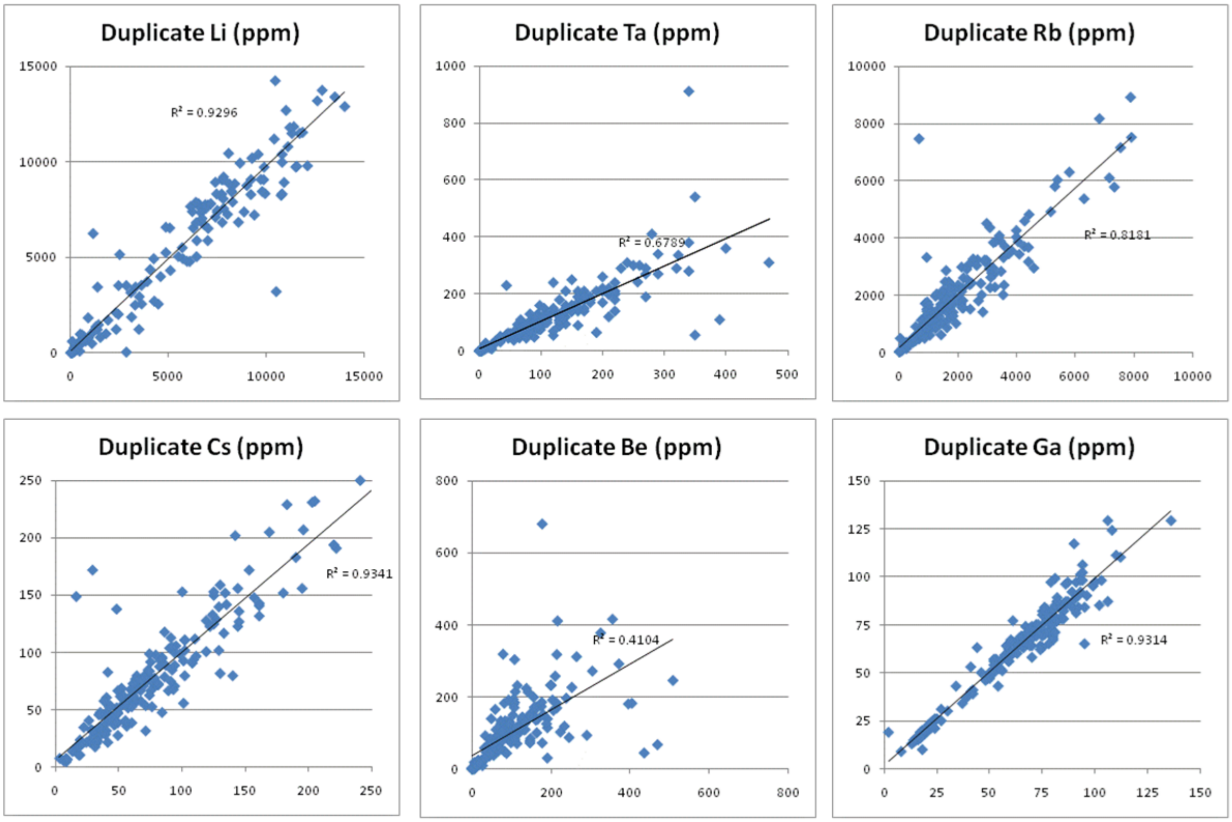
11.3 CELC Quality Control

The quality control database for drill core assays contains 198 blank and 192 core duplicate samples that were sent to ALS as part of the program. Core duplicates are quarter-splits using what is left in the box after taking the original half-split sample. Certified standards were not included in the sample protocol.

According to the database, not every hole had blanks and/or core duplicates, but the majority did.

Field duplicates returned values similar to the original assays Figure 11.1), the only exception being Be and Ta which show less (although reasonable) coherence. Only four blanks (Samples 738810, 747847, 883610, and 883661) returned abnormally high results. After reviewing the weights received at the laboratory, the authors came to the conclusion that there must have been a mistake in the tag identification of Sample 747847 rather than a laboratory issue. However, the three batches containing Samples 738810, 883610, and 883661 should be quarter-split and re-assayed with new blanks and duplicates. With the exception of those three suspicious batches, there were no signs of significant contamination.

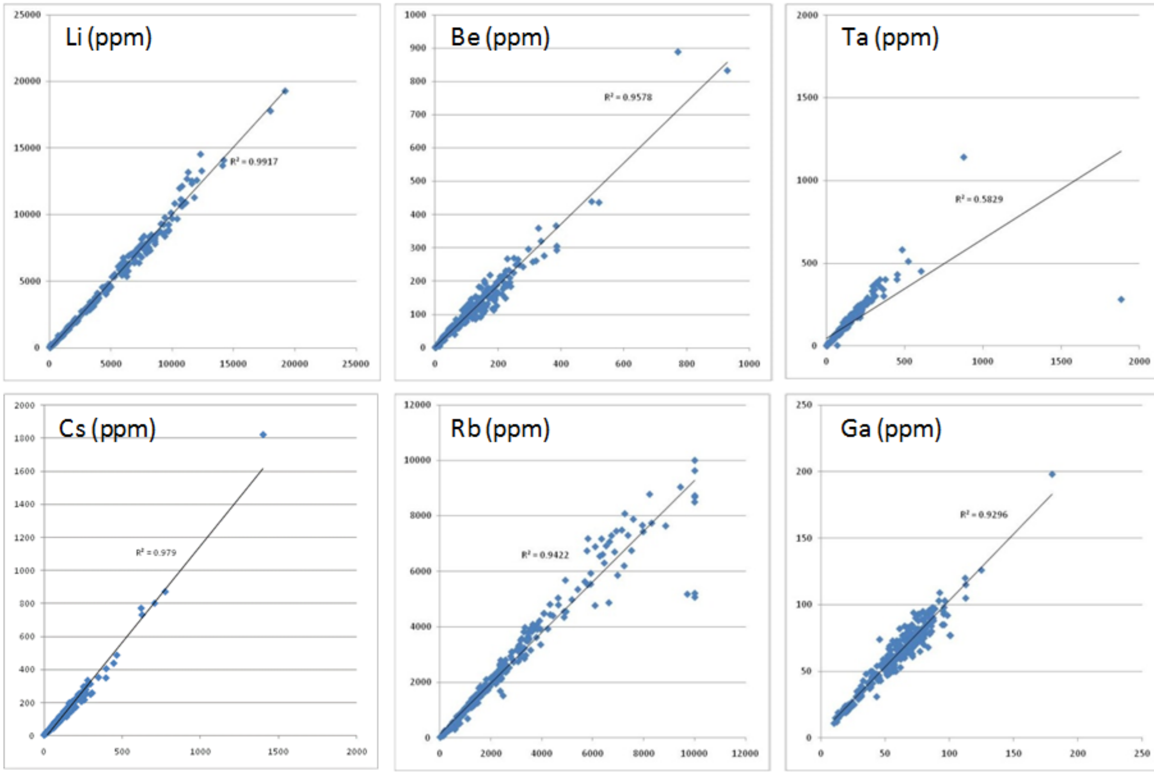
Figure 11.1: Verification of Core Duplicates



Approximately 10% of the Rose deposit samples sent to ALS were sent to a third laboratory in November 2010 to confirm the values. CELC chose Acme Analytical Laboratories Ltd (Acme) as the third laboratory, and the results were obtained on November 26, 2010, via electronic transmission.

Acme's values for pulp re-assays are similar to the original assays (Figure 11.2). Initially it may appear that this is not true for the Ta results, which show an R-squared value of 0.58, but the value becomes 0.9618 if the single outlier (lower-right corner of the chart) is omitted from the database. The QP therefore conclude that the two sets of assays correlate well.

Figure 11.2: Re-assays Performed at a Third Laboratory



Note: (Acme; Y-axis) compared against original assays (X-axis)

12 DATA VERIFICATION

Grades for Li, Ta, Rb, Cs, and Be are reported in this Item as parts per million (ppm). Refer to Table 12.1 for converting into Li_2O, Ta_2O_5, Rb_2O, Cs_2O, and BeO.

Table 12.1: Unit Conversion Factors

Element	From	To	Multiplied by	Example
Lithium	Li	Li_2O	2.1530	1 ppm Li = 2.1530 ppm Li_2O
	Li	Li_2O_3	5.3234	1 ppm Li = 5.3240 ppm Li_2O_3
Tantalum	Ta	Ta_2O_5	1.2211	1 ppm Ta = 1.2211 ppm Ta_2O_5
Rubidium	Rb	Rb_2O	1.0940	1 ppm Rb = 1.0940 ppm Rb_2O
Cesium	Cs	Cs_2O	1.0600	1 ppm Cs = 1.0600 ppm Cs_2O
Beryllium	Be	BeO	2.7750	1 ppm Be = 2.7750 ppm BeO

12.1 Historical Work

The historical information used in this report was taken mainly from reports issued by the Québec government's geological survey (the MRNQ, now the MERN) as part of its vast regional programs. Little information is available about sample preparation or analytical and security procedures in these documents, but the QP assumes that the government's exploration activities were in accordance with prevailing industry standards at the time.

Only one historical drillhole is reported for the current Property. There was therefore no historical database for the author to validate.

12.2 CELC Database

The CELC ACCESS database comprises 217 NQ-size diamond drillholes totalling 26,176.5 m. A total of 4,631 core samples (4,406 from the Rose deposit and 225 from the Pivert, Pivert-East, Pivert-South and Helico showings) are included, as are 390 QA/QC samples (blanks and duplicates).

The QP was granted access to the official results from ALS Laboratory (ALS) for all holes and grab samples discussed in this report (holes LR-09-01 to LR-11-181; JR-10-01 to JR-11-18; HD-10-01 to HD-10-03; LP-09-01 to LP-10-06; HE-10-01 to HE-10-05; PE-10-01 to PE-10-02; PS-10-01 to PS-10-02). The QP downloaded every certificate directly from the laboratory and built the tables presented in this report using the information contained therein. Very few errors were noted in the database, and these were considered minor and of the type normally encountered in a project database. None of the observed errors would affect the integrity of the database, and it is considered to be of very good overall quality.

The QP considers the CELC database for the Project to be valid and reliable.

12.3 CELC Diamond Drilling

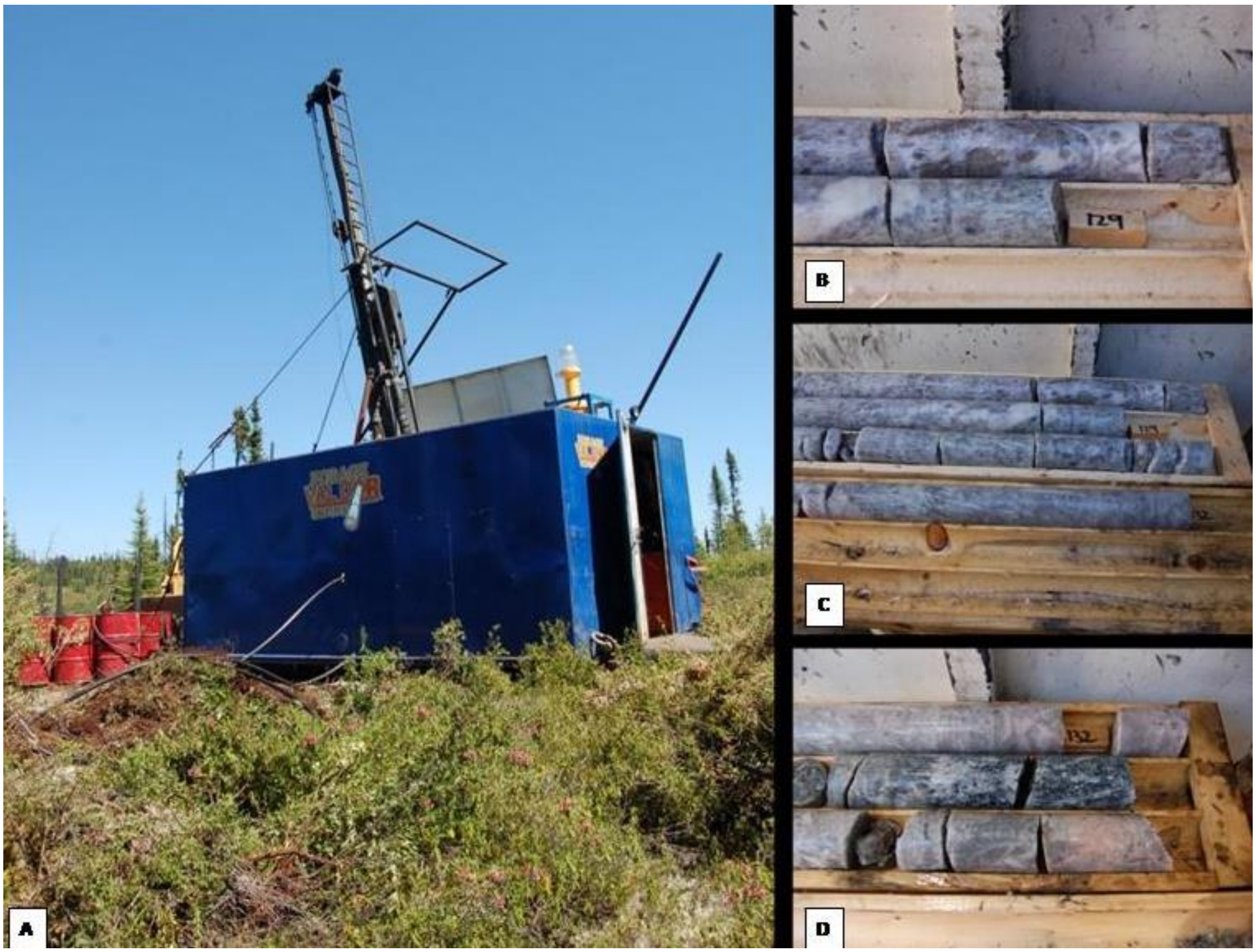
Every collar on the Rose deposit was professionally surveyed. Most of the other collars were surveyed using a handheld GPS. The surveys conducted on the Rose deposit are considered adequate for the purpose of a resource estimate. The great majority of the holes were surveyed by a Flexit instrument (single shots approximately every 60 m).

Carl Pelletier, P.GEO., QP for the 2022 MRE did not visit the property for the current mandate. The site visit done by the one of the previous QP in 2010 and 2011 was performed under his supervision. Although the information presented below are not considered as a valid site visit, the QP is of the opinion that it is relevant information for the project.

Simon Boudreau, P.Eng., QP and responsible for the site visit for Item 15has visited the Property and confirmed that no change to property was observed.

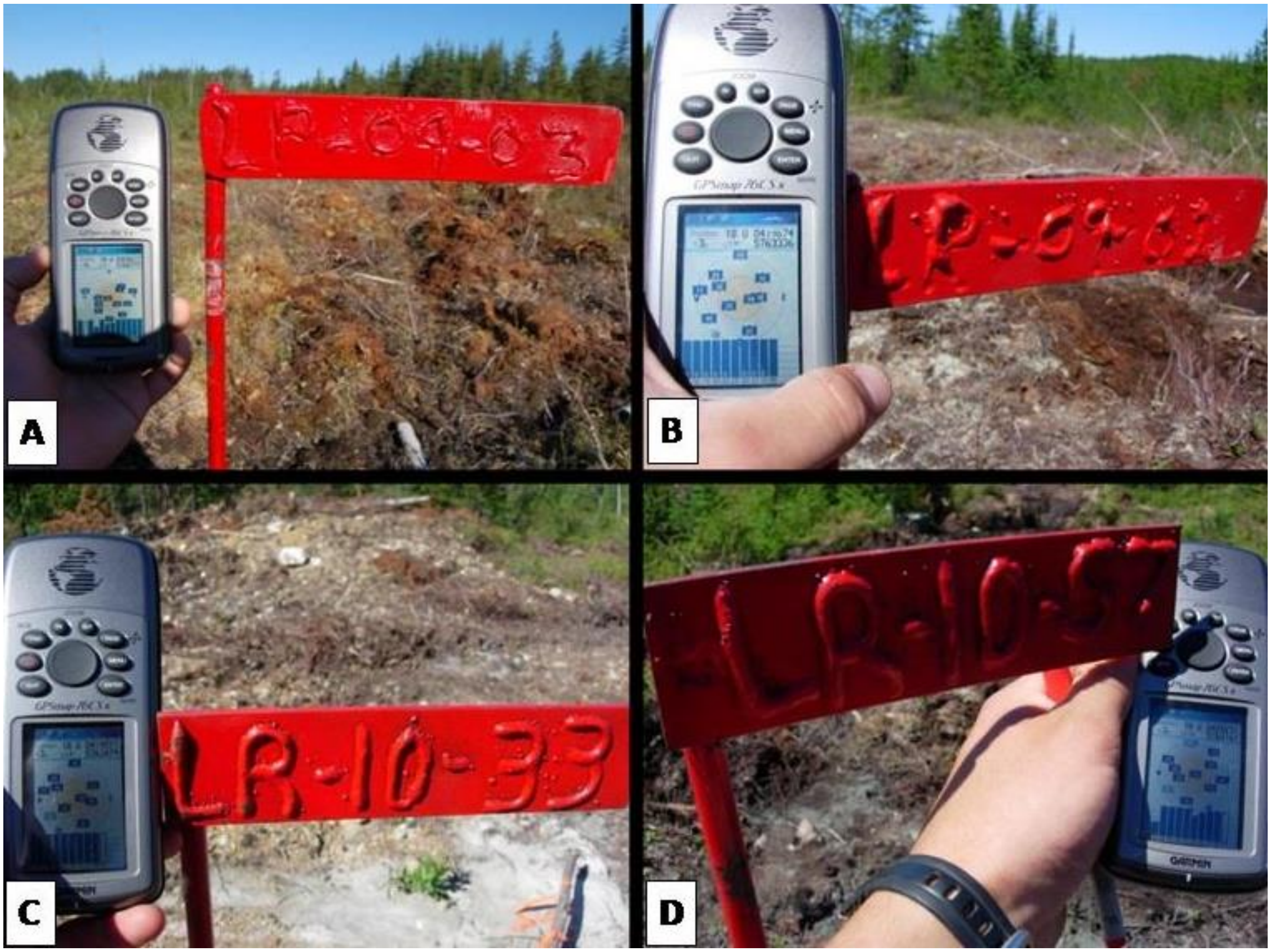
Drilling was underway (Hole LR-10-86) when previous QP first visited the site on July 13, 2010 (Figure 12.1). He visited the drill rig during the site visit and witnessed approximately 9 m of core being pulled from underground. He also observed spodumene in the core section. There was no active drill rig on site during the second visit in July 2011. He was able to confirm the location of many casings using a handheld GPS during both visits (Figure 12.2 and Figure 12.3).

Figure 12.1: Drilling at the Rose Deposit



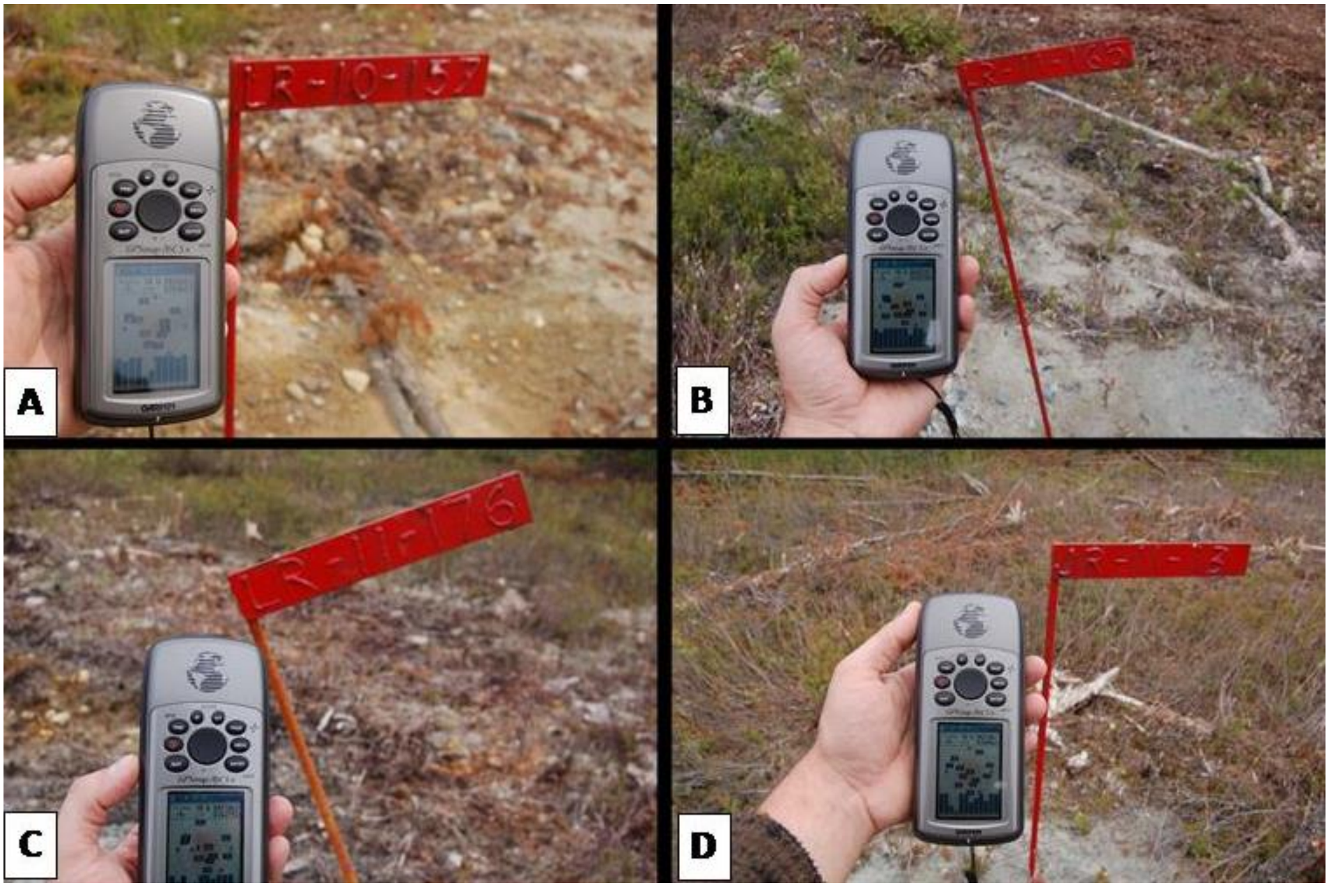
Notes: A)Drill rig in action on Hole LR-10-86 at the time of the field visit.
B) to D) Views of the Rose pegmatite in core that was drilled in the author's presence.

Figure 12.2: Casing Locations Verified on the Rose Property during the First Site Visit in 2010



Notes: A) LP-09-03
B) LR-09-02
C) LR-10-33
D) LR-10-57

Figure 12.3: Casing Locations Verified on the Rose Property during the Second Site Visit in 2011



Notes: A) LR-10-157
B) LR-11-165
C) LR-11-176
D) JR-11-13

12.4 CELC Outcrop Sampling

As discussed in Item 11, CELC refers to channel samples from the Property as 'non-chosen grab samples' in company press releases because the collection process differs from traditional channel sampling. Unlike traditional channel samples, they are not necessarily perpendicular to the interpreted strike of the pegmatite and they are of variable lengths.

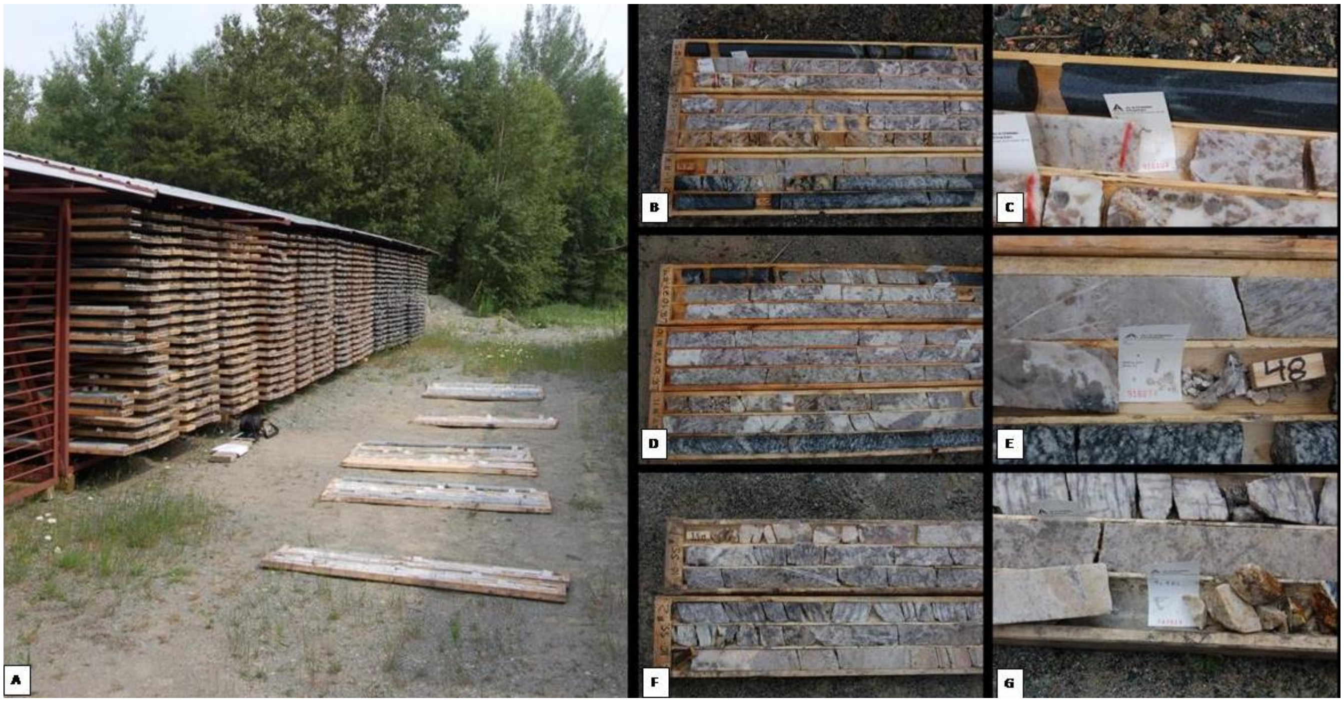
This type of channel sampling was employed in lieu of grab sampling because traditional grab samples are very difficult or impossible to obtain from smooth, hard outcrops surfaces using a hammer and chisel. However, the channel samples are similar to grab samples in that they are selective by nature and unlikely to represent average grades. The purpose of such sampling is to rapidly determine whether mineralization is constant throughout the outcropping pegmatite.

For this reason, channel samples collected on the Project to date should be considered as grab samples and not be used in any future resource estimates, even with proper surveying.

12.5 CELC Sampling and Assaying Procedures

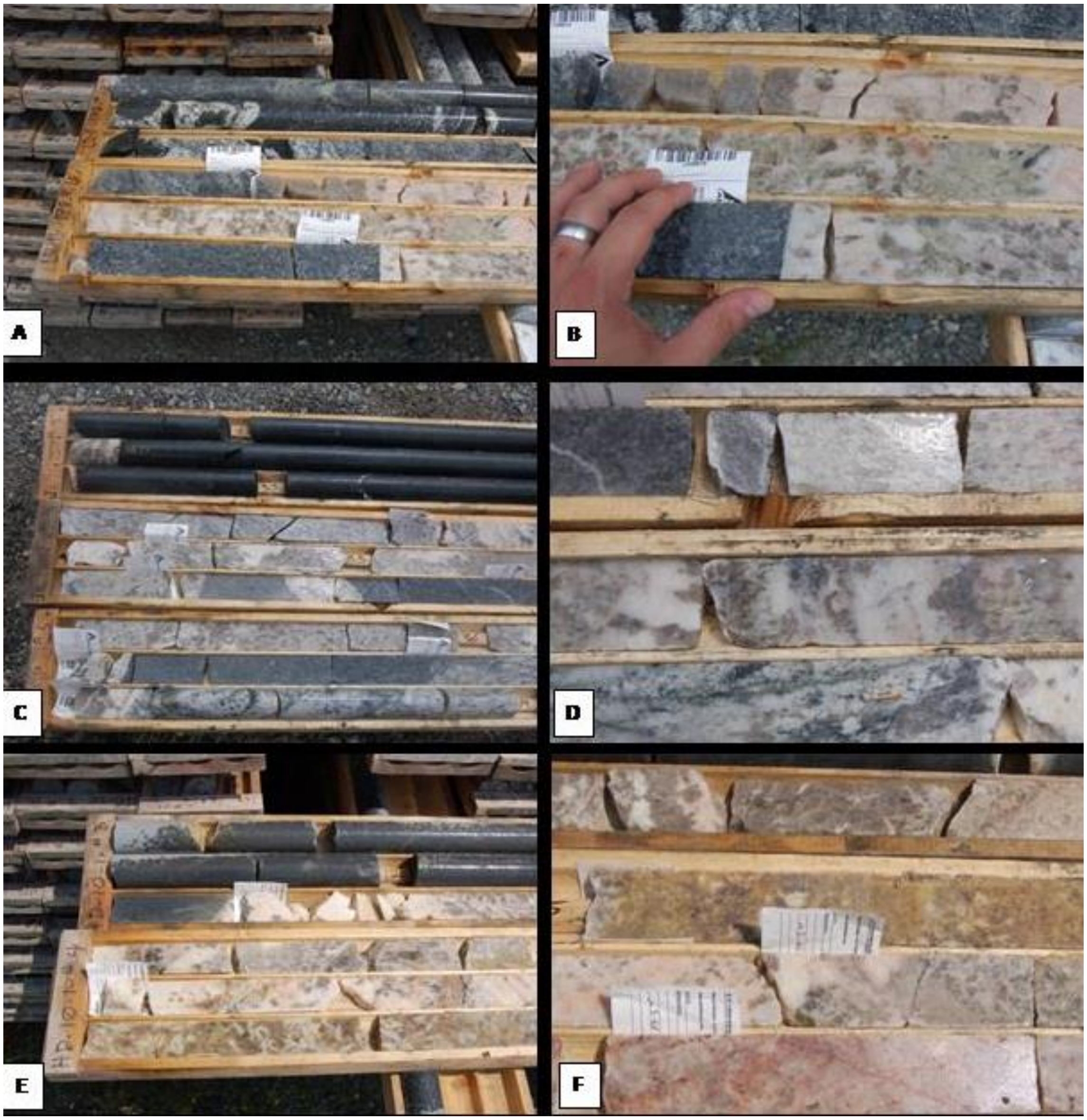
Several mineralized core sections were reviewed during the visit to the core storage facility in Val-d'Or in 2011 (Figure 12.4 and Figure 12.5). All core boxes were labelled and properly stored outside. Sample tags, located at the end of each sample, were still present in the boxes. Marks on the bottom of the box were also found, indicating sample intervals. It was possible to validate sample numbers and confirm the presence of spodumene for each of the samples in the mineralized zones.

Figure 12.4: Core Verification at the Core Storage Facility in Val-d'Or during the First Visit in 2010



Notes: A) General view of the facility and some of the boxes that were examined
B and C) Hole LR-10-11
D and E) Hole LR-10-27
F) and G) Hole LR-10-55

Figure 12.5: Core Verification at the Core Storage Facility in Val-d'Or during the Second Visit in 2011



Photos taken by P.-L. Richard
Notes: A) and B) Hole LR-11-178
C and D) Hole JR-11-13
E and F) Hole LR-10-27
F) and G) Hole HD-10-01

The entire path taken by the drill core was reviewed and judged adequate, from the drill rig to the logging and sampling facility (Figure 12.6). Core sample lengths were also reviewed. After CELC made corrections, only 6 of the 4,633 reviewed samples from the Rose deposit were found to be more than 2 m long (3.75 m being the maximum), and 728 were less than 0.50 m. The smallest sample was 0.10 m long.

Figure 12.6: Path of Core from Drill Rig to Final Storage Facility

Notes: A) Drill rig on the Rose deposit

B) Core carefully boxed and ready for transport by Consul-Teck personnel to the Val-d'Or facility

C) Consul-Teck logging facility where the core is logged and marked for sampling;

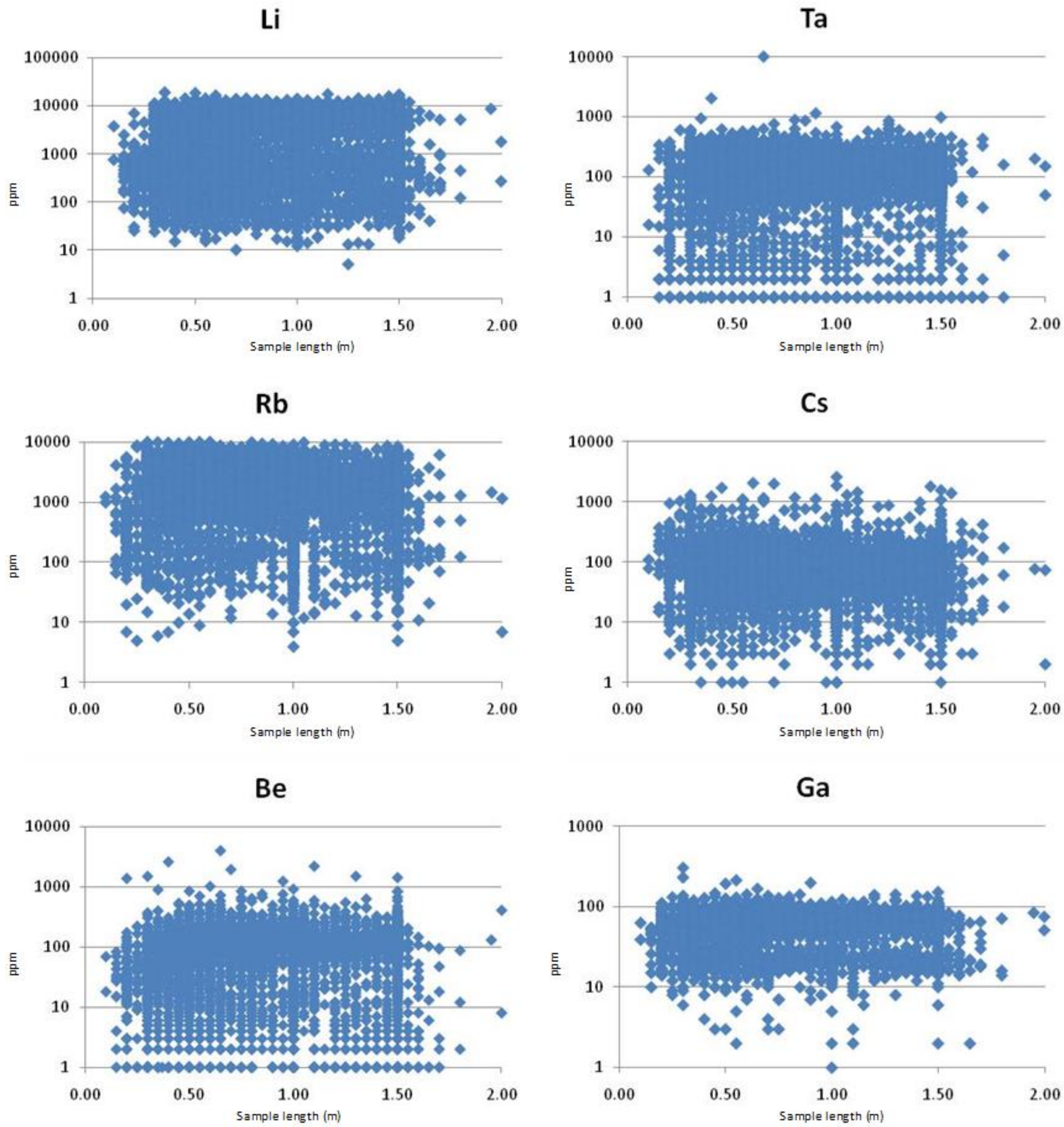
D) Core splitter used to sample the core

E) Half-core bagged by Consul-Teck personnel and later shipped to the assay laboratory

F) Core adequately stored outside in roofed-racks

The grade versus sample length graph shows a very homogeneous distribution for all elements considered (Li, Ta, Rb, Cs, Be, Ga), without any detectable bias due to small interval sampling (Figure 12.7). A comparison of grade versus sample length seemed appropriate considering more than 15% (728) of the 4,633 samples in the database are less than 0.50 m long. This kind of sampling procedure can sometimes conceal high-grade values derived from small samples by spreading them over longer composite intervals when a suitable capping grade has not been applied.

Figure 12.7: Verification of Grade vs. Sample Length for CELC Drillholes (logarithmic scale)



12.6 Independent Grab Sampling

During the 2010 site visit,12 grab samples were collected for the purpose of conducting an independent analysis. Samples were collected, bagged and delivered to ALS by one of the authors. Table 12.2 presents the results for those samples.

The goal of this verification was to confirm the presence of the reported Li, Be, Ta, Cs, Rb, and Ga mineralization. Mineralization-level values were successfully obtained for all of the visited showings, except Hydro: samples from this showing failed to yield significant results for Li, with only Ta returning significant levels (>100 ppm). However, the QP is of the opinion that all showings presented in this report truly contain Li and rare-element mineralization, and grab samples are unlikely to represent average grades.

Table 12.2: Samples Independently Collected by InnovExplo as part of Data Verification for the Rose Property

Sample	Showing	UTM83 Zone 18		Li	Rb	Ta	Cs	Be	Ga
		Easting	Northing	ppm	ppm	ppm	ppm	ppm	ppm
58001	Pivert	422649	5766795	5,570	38	45	44	1,420	64
58002	Hydro	420487	5763947	136	214	>100	23	171	61
58003	Hydro	420600	5763893	28	204	>100	22	510	60
58004	Rose	419628	5763381	7,950	128	>100	155	3,650	68
58005	Rose	419601	5763387	>10,000	171	>100	122	3,260	84
58006	Rose	419628	5763468	55	16	>100	37	1,140	69
58007	Rose	419597	5763496	111	123	36	57	1,470	34
58008	Rose	419692	5763373	7,100	96	>100	121	3,660	95
58009	Rose	420044	5763217	>10,000	133	100	47	1,260	78
58010	Rose	420047	5763174	4,320	127	45	104	3,140	57
58011	JR	421764	5764520	9,870	172	>100	54	1,360	75
58012	JR	421777	5764505	7,150	305	57	121	4,170	68

13 MINERAL PROCESSING AND METALLURGICAL TESTING

13.1 Metallurgical Test Work Summary

SGS Canada Inc., Lakefield developed a conceptual flowsheet based on a series of bench scale tests on various samples from the Rose deposit. Bench scale metallurgical test work was performed on outcrop and drill core samples having lithium grades from 1.0% Li_2O (bench scale test work) to 1.45% Li_2O (pilot scale test work). Variability drill core composites tested had head grades; 0.99% Li_2O to 2.15% Li_2O except for one composite (PEG2) with 0.80% Li_2O that did not produce acceptable grade-recovery due to the presence of higher levels of amphiboles and pyroxenes in the ore.

Metallurgical test work on nine representative drill core composites having a lithium head grade varying between 0.50% Li_2O and 1.70% Li_2O was conducted at SGS laboratory to investigate its effect on grade/recovery. Results show that a head grade of 0.87% Li_2O could produce a chemical grade lithium concentrate of 5.5% Li_2O with a recovery over 90% or a technical grade lithium concentrate of 6.0% with a recovery over 87%.

The proposed flowsheet is comprised of conventional three-stage crushing and single stage grinding followed by magnetic separation for the recovery of tantalum, mica flotation and spodumene flotation. The flowsheet is capable of producing a spodumene concentrate with a minimum of 6.0% Li_2O and lithium recovery around 85% from a spodumene ore with 1.15% Li_2O. Settling and filtration tests were also performed for sizing dewatering equipment.

Historical metallurgical test work is presented in Item 13.2. The bench scale at ACME metallurgical testing is presented in 13.2.1. The SGS bench scale test work is presented in Item 13.3. The final spodumene concentrate production tests are presented in Item 13.4. Solid-liquid separation test work is presented in Item 13.5. Flotation pilot plant test work is presented in Item 13.6. Item 13.7 shows the ongoing tantalum concentrate upgrading test work, and Item 13.8 presents the test work on the nine variability samples.

13.2 Historical Test Work Summary

13.2.1 Bench Scale Test Work – ACME Metallurgical Limited

A preliminary Economic Assessment (PEA) study was completed in 2011. Bench scale metallurgical testing was performed at ACME Metallurgical Limited in Vancouver in 2011. Details are reported in '*Technical Report and Preliminary Economic Assessment on the Rose Tantalum-Lithium Project*', Project 111-52558-00 December 10, 2011. The results from these tests were used for the PEA study. Three composites, the Rose (main structure), the Rose Sud-Est (Southeast structure) and Tantale (secondary structure with higher tantalum and lower lithium content) were subjected to various metallurgical tests.

The head assays of the samples are presented in Table 13.1 and indicate that the Rose composite is rich in lithium and low in tantalum whereas the Tantale composite is rich in tantalum and low in lithium with a lithium content of 0.3% Li_2O.

Table 13.1: Head Assay of the Composite Samples

Composite	Li_2O %	Ta %	Fe_2O_3 %	Na_2O %	K_2O %	SiO_2 %	Al_2O_3 %	CaO %	MgO %
Rose	1.30	0.015	0.76	4.51	2.31	73.4	15.6	0.15	0.02
Rose (Sud-Est)	1.16	0.022	0.73	5.8	1.99	74.0	14.9	0.32	0.07
Tantale	0.30	0.028	0.90	4.27	2.87	72.3	15.7	0.14	0.07

Most of the test work was performed on the Rose Composite as it was likely the most representative of the known resource at the time. Grindability tests, rod mill and ball mill work index tests and abrasion tests were performed on the composites. Bond rod mill index, 9.82 kWh/t, ball mill work index, 13.3 kWh/t, and an abrasion index, 0.429 Ai were determined.

Heavy-liquid separation tests performed at 2.7, 2.9, and 3.2 g/cm^3 specific gravities concluded that the mineralization was not amenable to dense media separation at a coarser grind size of 500 µm.

Mineralogical examination of the flotation products indicated that tantalum was present as mangano-tantalite in liberated grains of 50 to 150 µm and as small inclusions within spodumene minerals. The spodumene, feldspars, quartz, and mica minerals were liberated at a grind size of 150 µm.

Twenty-eight bench scale flotation tests were performed on 4 kg samples at different grinds. Test F-28 performed at the optimum grind size of 80% passing 150 µm produced a spodumene concentrate containing 5.86% Li_2O and 90.7% lithium recovery. The final flotation spodumene concentrate assayed 0.08% Ta grade with 85% Ta recovery.

Thirteen high-gradient wet magnetic separation tests were performed on the spodumene flotation concentrate to recover magnetic tantalum minerals. Tests performed up to 14,000 Gauss showed that about 60% of the tantalum contained in the spodumene concentrate was recovered in a concentrate assaying 1.14% Ta.

13.3 Bench Scale Test Work – SGS Canada Inc. Lakefield

Bench scale metallurgical test work performed at SGS Lakefield (SGS) in 2015 were aimed at optimizing a flowsheet for producing spodumene concentrate with a minimum of 6.0% Li_2O grade at about 90% lithium recovery. Improving tantalum recovery from 50% from previous study at ACME Metallurgical Limited to a higher level was also a focus. The detailed results of the metallurgical test work were reported by SGS Canada Inc. '*Phase 1 Beneficiation bench scale testing on the Rose Lithium/Tantalum Project*', Project 14120-001 Final report, April 20, 2015.

13.3.1 Sample Description

Rose outcrop and South Rose outcrop rock samples were first received at SGS Canada in June 2013. Five variability drill core composites received later in September 2013 were identified as 1st shipment variability samples. Five additional variability drill core samples received subsequently in December 2013 were identified as second shipment variability samples.

Rose outcrop rock sample was referred to as Rose sample by SGS during metallurgical test work. Mineralogical characterization, grindability, heavy-liquid testing, gravity separation, magnetic separation, and flotation tests were performed on the Rose sample.

Rose sample was used for the development of flowsheet.

The head assays of the Rose sample, South Rose sample, 1st shipment variability samples (PEG2 1st, RSE 1st, ROSE 2 1st, ROSE 3 1st, ROSE 4 1st), and 2nd shipment variability samples (PEG2, RSE, ROSE 2, ROSE 3, ROSE 4) are presented in Table 13.2.

Table 13.2: Head Assay of the Composite Samples Tested

Sample ID	Li_2O %	Ta %	Fe_2O_3 %	Na_2O %	K_2O %	SiO_2 %	Al_2O_3 %	CaO %	MgO %
Rose sample	1.00	0.0349	0.19	4.87	2.42	75.0	16.1	0.10	0.04
South Rose	2.15	0.0072	0.46	3.09	2.23	75.5	16.3	0.07	0.04
PEG2 (1st)	0.99	0.0195	0.39	4.67	2.72	74.0	15.9	0.28	0.11
RSE (1st)	1.40	0.0142	0.52	4.00	2.53	75.3	16.1	0.22	0.11
ROSE 2 (1st)	1.10	0.0292	0.84	4.29	2.65	73.2	16.1	0.56	0.37
ROSE 3 (1st)	1.25	0.0231	1.06	4.11	2.32	74.1	16.0	0.71	0.38
ROSE 4 (1st)	1.23	0.0155	0.84	4.32	2.24	74.2	15.8	0.47	0.31
PEG2	0.80	0.0164	1.79	4.45	2.63	71.2	16.0	1.36	0.78
RSE2	1.42	0.0082	0.32	4.14	2.46	74.9	16.0	0.13	0.05
Rose 2	1.33	0.0164	0.47	3.91	2.58	74.7	16.3	0.34	0.12
Rose 3	1.18	0.0164	0.28	4.41	2.97	74.9	16.4	0.19	0.04
Rose 4	1.49	0.0082	0.37	3.96	2.63	74.5	16.0	0.17	0.07

The lithium content of the samples ranged from a low of 0.80% Li_2O for the PEG2 sample to a high of 2.15% Li_2O for the South Rose sample. Tantalum was reported high at 0.0349 % Ta in the Rose sample; tantalum content in the other samples ranged from 0.0072 %Ta to 0.0292 % Ta. Deleterious elements, Fe_2O_3, CaO, and MgO are low in all samples except for PEG2 sample with high contents of 1.79% Fe_2O_3, 1.36% CaO, and 0.78% MgO which affect negatively on spodumene flotation and produce a concentrate that may not meet spodumene concentrate product specifications for certain applications. PEG2 sample is mostly composed of material from Zone 119 while all the others are mostly from Zone 115 as shown in Table 13.3. Zone 119 is not in the feasibility mine plan. Zone 115 represents more than 50% of the feasibility mine plan.

The variability tests were aimed at investigating differences in metallurgical results on ore from various areas of the operation. The sample composites were gathered from diamond drill core at different locations and depth of the pit. The composites RSE2, ROSE 2, ROSE 3, and ROSE 4 were made of material mostly from Zone 115 with the exception of composite PEG2 which is mostly composed of material from Zone 119.

Table 13.3: Source of Samples

Zone	Proportion of Zone in Composite%						
	Outcrop Samples SGS rec'd June 2013		DDH Composites – 2nd Shipment SGS received December 2013				
	Rose	South Rose	PEG2	RSE2	Rose 2	Rose 3	Rose 4
104	-	-	-	-	-	-	-
105	-	-	-	-	-	-	-
106	-	-	-	-	-	-	-
107	-	-	-	-	-	-	-
108	-	-	-	-	-	-	-
109	-	-	-	-	-	-	-
111	-	-	-	-	-	-	-
112	-	-	-	1%	-	2%	19%
113	-	-	-	-	-	-	-
114	-	-	-	-	-	-	-
115	100%	100%	-	96%	92%	98%	81%
116	-	-	-	3%	4%	-	-
117	-	-	-	-	-	-	-
118	-	-	0.3%	-	-	-	-
119	-	-	86%	-	-	-	-

Zone	Proportion of Zone in Composite%						
	Outcrop Samples SGS rec'd June 2013		DDH Composites – 2nd Shipment SGS received December 2013				
	Rose	South Rose	PEG2	RSE2	Rose 2	Rose 3	Rose 4
120	-	-	11%	-	-	-	-
NA	-	-	3%	-	0%	-	-
Total	**100%**	**100%**	**100%**	**100%**	**96%**	**100%**	**100%**

Source: CELC Corp.

13.3.2 Mineralogical Evaluation

Mineralogical studies were performed on the Rose composite sample with QEMSCAN, electron microprobe, X-ray diffraction (XRD) and electron microscopy. The Rose sample was crushed to 100% passing 600 µm, screened into four size fractions; +425 µm, -425/+300 µm, -300/+106 µm, and -106 µm to characterize the minerals present and their liberation characteristics. The mineralogical report can be found in '*An Investigation by High Definition Mineralogy into the Mineralogical Characteristics of One Beneficiation Head Sample from the Rose Lithium/Tantalum Project*', SGS Canada Inc. Project 14120-001 Final report, April 20, 2015.

Plagioclase, 43.3% was found to be the dominant mineral in the Rose sample with moderate quartz 25.5%, spodumene 14.5%, K-feldspar 13.8%, minor mica 2.7%, and trace amounts, less than 1% of tantalite and other minerals. Electron microprobe analysis showed that tantalite $[(Fe,Mn),(Nb,Ta)_2O_6]$ occurs as the main phase and liandratite $[U^{6}+ (Nb,Ta)_2O_8]$ and tantalite (Ta_2O_5) in minor amounts.

13.3.3 Grindability Tests

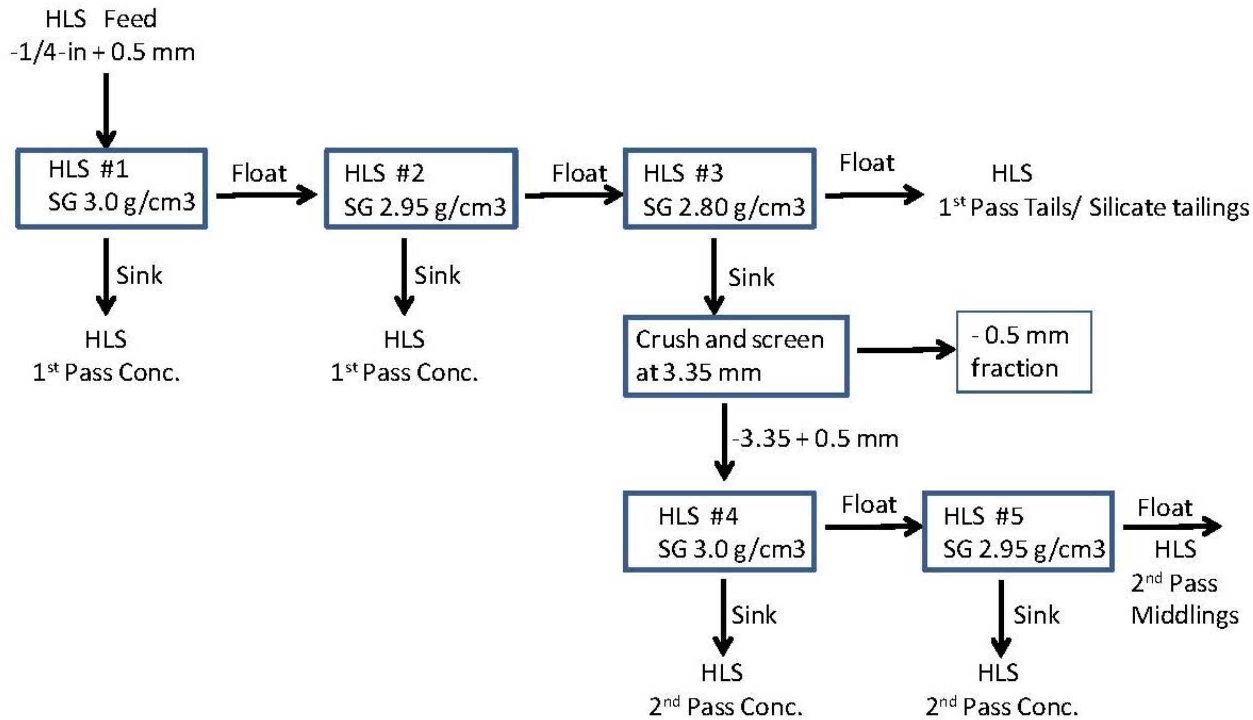
Bond grindability test was performed on the Rose sample only and it was categorized as moderately soft with a ball mill work index of 12.9 kWh/t and a rod mill work index of 8.0 kWh/t.

13.3.4 Heavy Liquid Separation Tests

Heavy-liquid separation (HLS) tests were performed on the -1/4"/+0.5 mm fraction of Rose sample for evaluating the potential for gravity separation. Methylene iodide was mixed with acetone to achieve target specific gravity (SG) for the HLS tests.

Simplified HLS test flowsheet is shown on Figure 13.1. The -1/4"/+0.5 mm fraction was separated at 3.0 g/cm^3 and the float fraction was separated further at a media specific gravity (SG) 2.95 g/cm^3. The SG 2.95 g/cm^3 float was separated at SG 2.80 g/cm^3. The sink 3.0 sinks, 2.95 sinks, and the SG 2.80 floats were collected as products. The 2.8 SG test sink product was stage crushed to 3.36 mm (6 Mesh) and the -0.5 mm fraction was screened out. The -3.36+0.5 mm fraction was sequentially separated at SG 3.0 g/cm^3 and 2.95 g/cm^3. The initial 3.0 SG sinks fraction graded 6.74% Li_2O and the second 3.0 SG sink fraction achieved a higher Li_2O grade of 6.89%.

Figure 13.1: Heavy Liquid Separation Test Flowsheet



An overview of the combined heavy-liquid test results is presented in Table 13.4.

Table 13.4: Heavy-Liquid Separation Tests Summary

Product	SG	Weight	Assay %		Distribution %	
	g/cm^3	%	Li_2O	Ta	Li	Ta
HLS Total Concentrate	2.95	8.94	6.27	0.0568	54.9	16.7
Middlings & -0.5 mm fraction		29.5	1.06	0.0443	30.8	43.0
HLS Silicate Tailings	2.80	61.5	0.24	0.0200	14.3	40.4
Feed		100	1.02	0.0305	100	100

The HLS tests produced a combined sink product at 2.95 g/cm^3 grading 6.27% Li_2O with 54.9% lithium recovery. Details of the HLS tests can be found in '*Phase 1 Beneficiation Bench Scale Testing on the Rose Lithium/Tantalum Project*', Project 14120-001 SGS Canada Inc., Final report, April 20, 2015.

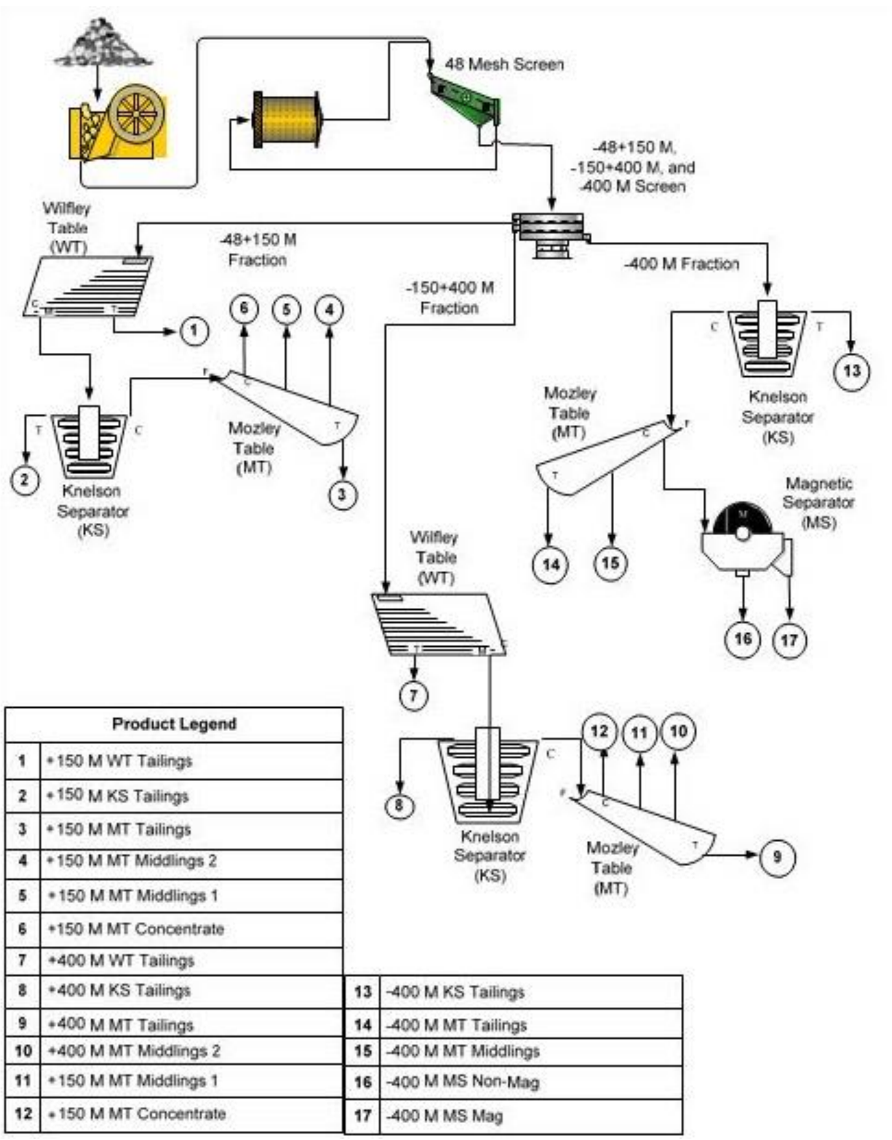
Based on these results, Dense Medium Separation (DMS) might have good potential to produce spodumene concentrate with 6.0%Li_2O in the early stage of the process prior to grinding followed by flotation. However, in such a DMS operation, the density of the media should not be lower than 2.90 g/cm^3 to produce concentrate grading higher than 6.0% Li_2O. The results also confirmed that DMS operation will be sensitive to media density, and deviation from the target media density may result in a spodumene concentrate with less than 6.0% Li_2O grade.

Low tantalum recovery of 16.7% Ta in the HLS concentrate was attributed to poor liberation of tantalum minerals at -1/4"/+0.5 mm fraction. The HLS silicate tailings at 2.8 g/cm^3 had significant spodumene loss, 14.3% lithium at 0.24% Li_2O grade with 61.5% of the mass reporting to the tailings. The losses were due to poor liberation of spodumene at -1/4"/+0.5 mm fraction.

13.3.5 Gravity Separation Tests

Gravity separation tests were performed on three size fractions of the Rose sample: -48/+150 mesh (-300/+105 µm), -150/+400 mesh (-105/+37 µm), and -400 mesh (37 µm) fractions using a combination of Wilfley Table, Knelson Concentrator, and Mozley Table. The gravity separation test flowsheet is shown on Figure 13.2. The objective of the test work was to improve the recovery of tantalum. Each size fraction was first processed on a Wilfley Table and the concentrate further processed on a Knelson Concentrator; the Knelson concentrate further upgraded on a Mozley Table. The finer size fraction, -400 mesh (-37 µm) was processed on the Knelson Concentrator; as it was too fine for processing on the Wilfley Table and the Knelson concentrate, further processed on the Mozley Table. The Mozley concentrate from the -400 mesh product stream was further processed on a low intensity magnetic separator. The combined gravity concentrate recovered about 57% tantalum with 5.6% Ta grade in 0.29% weight for the combined -48 mesh (-300 µm) fraction. Results are shown in Table 13.5.

Figure 13.2: Gravity Separation Test Flowsheet



Source: SGS Canada Project 14120-001 April 2015

Table 13.5: Summary of Gravity Separation Tests (combined -48 mesh fraction)

Combined Concentrate Fractions	Weight	Assay %		Distribution %	
	%	Ta	Li_2O	Ta	Li
-48 M Mozley conc.	0.29	5.59	0.63	56.7	0.20
-48 M Mozley conc.& Middlings 1	0.46	4.02	1.23	63.3	0.60
-48 M Mozley conc. & Middlings 1-2	0.54	3.42	1.54	64.1	0.89
-48 M Knelson conc.	1.50	1.26	2.25	65.2	3.6
+400 M Wilfley conc. & -400M conc.	16.7	0.14	1.46	81.0	25.9
Feed (-48 M fraction) (Calc.)		0.029	0.94		

However, low lithium upgrade ratios suggest that gravity flowsheet selected was not suitable for the recovery of spodumene.

The performance of gravity separation was greatly affected by the grain size. The flowsheet involving these gravity separators was complex and operating such a circuit at plant scale may not be practical.

Magnetic separation tests were performed on the -48 mesh (300 µm) Rose sample, with the aim of recovering tantalum bearing minerals without the desliming step. A simplified flowsheet is shown on Figure 13.3. Wet High-Intensity Magnetic Separation (WHIMS) tests were conducted at 5 Amps (5,000 Gauss), 15 Amps (14,000 Gauss), and at 30 Amps (20,000 Gauss). Some tests were also performed on the lithium flotation concentrates to recover tantalum.

Figure 13.3: Wet High-Intensity Magnetic Separation Test Flowsheet

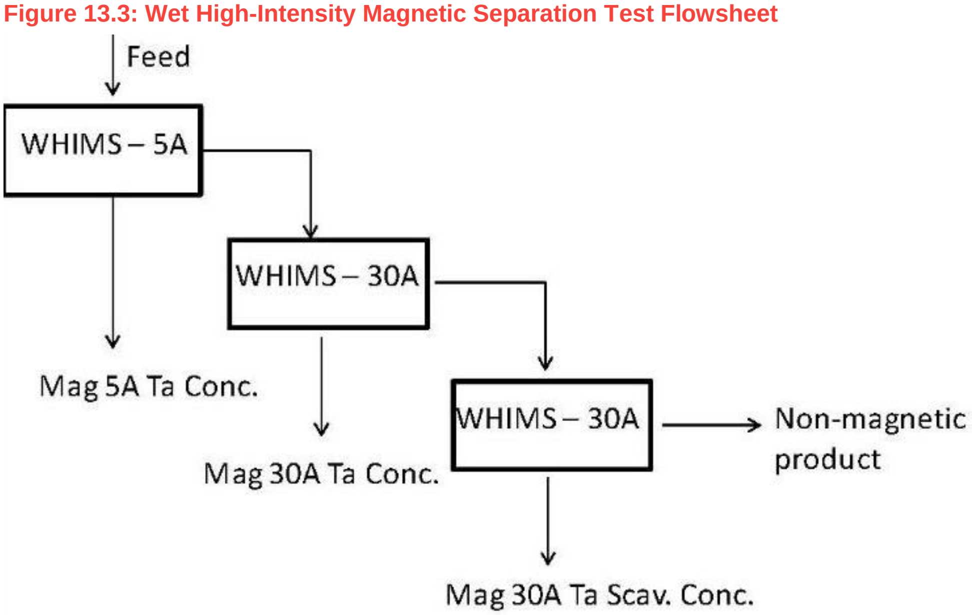


Table 13.6 shows the results of WHIMS tests. The test (Test F1), performed on spodumene concentrate produced a low recovery tantalum at 6.3%. Magnetic separation test (Test F11) performed on the -48 mesh (300 µm) feed sample produced a magnetic concentrate having a grade of 1.04% Ta with a highest recovery of 84% Ta at a mass pull of about 1.7%. The tests suggest that performing wet high-intensity magnetic separation (WHIMS) at high current intensities of 30 Amps (20,000 Gauss) on the -48 mesh feed obtained the best results for tantalum recovery. It was observed that magnetic separation greatly affected by magnetic

intensities applied and number of passes. High magnetic fields up to 20,000 Gauss and multiple passes are required to achieve high-grade tantalum and better recovery.

Table 13.6: Wet High-Intensity Magnetic Separation Tests Summary (tantalum recovery)

Test No.	Test Sample	Products	Weight	Assay %		Distribution %	
			%	Ta	Li_2O	Ta	Li
F10	-48 Mesh Feed	Mag 5A Ta Conc.	1.0	1.04	0.88	43.6	0.83
		Mag 30A Ta Conc.	0.44	1.86	1.10	34.0	0.45
		Mag 30A Ta Sca.Conc.	0.20	0.32	1.87	2.7	0.35
		Combined Ta Conc.	1.64	1.17	1.06	80.3	1.62
		Combined Ta Tail	98.4	0.004	1.07	19.7	98.4
F11	-48 Mesh Feed	Mag 5A Ta Conc.	1.01	0.65	0.69	32.1	0.73
		Mag 30A Ta Conc.	0.32	2.24	0.93	35.2	0.31
		Mag 30A Ta Scav. Conc.	0.32	1.06	1.59	16.7	0.54
		Combined Ta Conc.	1.65	**1.04**	0.91	**84.0**	1.59
		Combined Ta Tail	98.4	0.003	0.95	16.0	98.4
F12	-48 Mesh Feed	Mag (5A+30A)Ta Conc.	1.70	1.12	0.95	73.9	1.76
		Combined Ta Tail	98.3	0.006	0.92	26.1	98.2
F13	-48 Mesh Feed.	Mag (5A+30A) Ta Conc.	1.90	1.02	1.08	77.6	2.0
		Combined Ta Tail	98.1	0.005	1.00	22.4	98.0
F14	-48 Mesh Feed	Mag (5A+30A) Ta Conc.	1.77	1.00	0.97	72.2	1.6
		Combined Ta Tail	98.2	0.006	1.07	27.8	98.4
F1	Spodumene Flotation concentrate	Li 5A Mag	0.48	0.34	0.52	5.3	0.25
		Li 15A Mag	0.16	0.20	2.86	1.0	0.47
		Li 15A Non-Mag	10.5	0.002	6.52	0.9	68.5
		Li Conc (calc mag head)	11.1	0.021	6.21	7.2	69.2
		Combined Ta Conc.	0.64	0.30	1.11	6.3	0.72
		Combined Ta Tail	99.4	0.029	0.99	93.7	99.3

13.3.6 Bench Scale Flotation Tests

Fifteen flotation tests were performed on Rose sample stage-ground to 100% passing 48 mesh (300 µm). The P_{80} of the ground material was similar for different grind schemes with a P_{80} of about 220-230 µm for the flotation feed. Desliming and scrubbing processes were identified and demonstrated by all tests as necessary to achieve high-grade spodumene concentrate with high recoveries. The loss of lithium in the slimes is a function of slimes mass. Test results showed that better spodumene flotation performance was obtained after separating about 3% slimes with about 2% lithium losses.

Separation of mica prior to spodumene flotation was found necessary since the head sample had considerable amounts of mica impacting spodumene flotation performance. Mica reporting to spodumene concentrate could be better controlled by separating mica prior to spodumene flotation. Sulphuric acid was used to lower the pulp pH to 3.0 before conditioning with collector amine (Armac T) for achieving better performance in mica flotation.

Laser ablation technique (LA-ICP-MS) was suggested to determine the loss of spodumene to the mica concentrate to find out if lithium is present as solid solution in the mica crystal structure.

Borresperse CA, a calcium lignosulfonate reagent, was used for improving the dispersion of fine particles and improving desliming performance. Sodium hydroxide was used in scrubbing to improve slimes suspension and facilitate the separation of spodumene grains from iron contaminants. Soda ash was the preferred pH regulator in spodumene flotation. The performance of spodumene rougher flotation was found dependent on fatty acid-2 dosage and flotation time.

The upgrading of beryllium, gallium, and rubidium in the flotation products were evaluated in Tests F11, F12, and F13. The beryllium- and gallium-bearing minerals were upgraded to some extent in the spodumene concentrates. Over 40% of the beryllium and gallium minerals were distributed in the lithium rougher scavenger tailings (Test F13). Rubidium achieved fairly good upgrading in the mica concentrate and was likely to be associated with mica. Detailed results can be found in the '*Phase 1 Beneficiation bench scale testing on the Rose Lithium/Tantalum Project*', Project 14120-001 SGS Canada Inc., Final report, April 20, 2015.

Flotation Tests F11, F12, and F13 performed by duplicating F10 test conditions, obtained fairly consistent results in spodumene rougher and scavenger stage. Test F13 achieved the best performance and produced a spodumene concentrate containing 6.43% Li_2O with 91.9% lithium recovery in 14.3% weight recovery (mass pull). Flotation tests results are presented in Table 13.7.

Flotation test (F9) conducted on the -0.5 mm fraction from the HLS test produced a rougher concentrate with 3.53% Li_2O with 78.6% lithium recovery in 15.3% weight recovery. Cleaner flotation further failed to produce +6.0% Li_2O grade. Poor flotation performance was due to the different mineralogical composition of the flotation feed (HLS test, -0.5 mm fraction).

Table 13.7: Flotation Tests Summary on Rose Sample

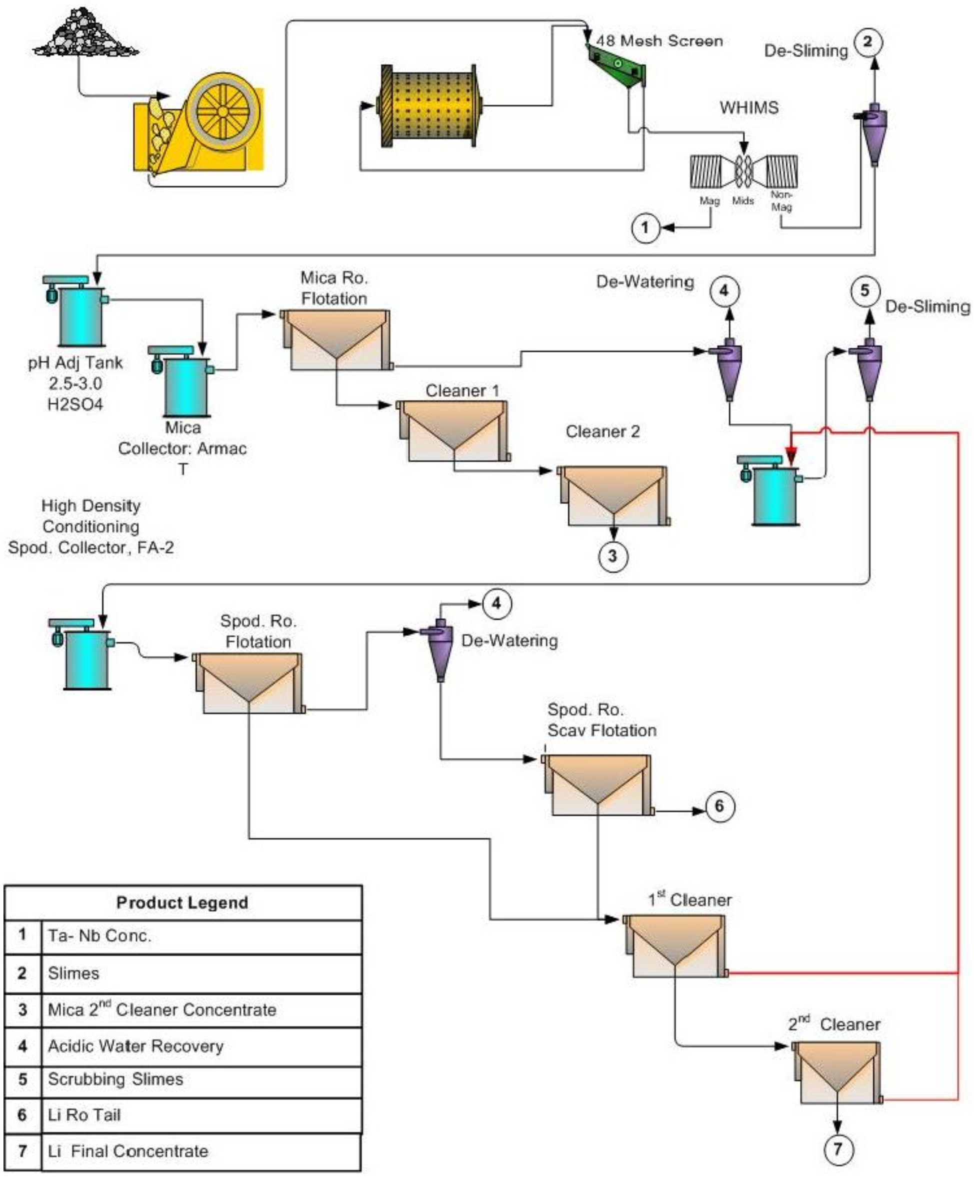
Test No.	Products	Weight	Assay %, g/t		Distribution %	
		%	Li_2O	Ta	Li	Ta
F10	Li 3rd Cl Conc.	12.2	6.89	25	78.9	1.3
	Li 2nd Cl Conc.	12.7	6.85	29	82.1	1.5
	Li 1st Cl Conc.	13.4	6.77	37	85.3	2.0
	Li Ro. Conc.	14.3	6.48	54	87.4	3.2
	Li Ro & Scav. Conc	14.8	6.43	59	89.5	3.6
	Ro Scav. Tails	74.9	0.04	36	2.6	10.9
	Scrubber Slimes	1.5	0.71	200	1.0	1.3
	Mica Ro Conc.	3.5	1.03	200	3.4	2.8
	Mica Ro Scav. Conc.	2.1	0.56	200	1.1	1.7
	Mica Slime	1.6	0.54	200	0.8	1.3
	Head (calc.)		1.06	245		
F11	Li 3rd Cl Conc.	13.3	6.24	26	87.5	1.7
	Li 2nd Cl Conc.	13.6	6.18	34	88.9	2.3
	Li 1st Cl Conc.	14.0	6.06	44	90.1	3.0
	Li Ro & Scav. Conc	15.0	5.75	60	91.3	4.4
	Ro Scav. Tails	75.3	0.02	16	1.7	5.9
	Scrubber Slimes	1.9	0.65	169	1.3	1.6
	Mica Ro Conc.	5.1	0.34	125	1.8	3.1
	Mica Slime	1.0	2.07	197	2.2	1.0
	Head (calc.)		0.95	204		
F12	Li 2nd Cl Conc.	11.1	6.76	52	82.2	2.25
	Li 1st Cl Conc.	12.0	6.61	61	86.4	2.8
	Li Ro Conc.	13.6	6.12	73	90.7	3.9
	Li Ro & Scav. Conc	14.0	6.01	76	91.6	4.1
	Ro Scav. Tails	77.2	0.02	59	2.0	17.7

Test No.	Products	Weight	Assay %, g/t		Distribution %	
		%	Li_2O	Ta	Li	Ta
	Scrubber Slimes	2.6	0.56	145	1.6	1.5
	Mica Ro Conc.	3.7	0.30	140	1.2	2.0
	Mica Slime	0.9	1.89	228	1.9	0.8
	Head (calc.)		0.92	257		
F13	Li 2nd Cl Conc.	13.7	6.59	35	90.3	1.92
	Li 1st Cl Conc.	14.3	6.43	44	91.9	2.5
	Li Ro & Scav. Conc	15.7	5.91	58	93.1	3.6
	Scav. Tails	75.5	0.03	49	2.0	14.8
	Scrubber Slimes	2.1	0.62	134	1.3	1.1
	Mica Ro Conc.	3.9	0.30	122	1.2	1.9
	Mica Slime	0.9	0.50	254	0.4	0.9
	Head (calc.)		1.00	249		
F9	Li 3rd Cl Conc.	9.8	4.56	-	65.0	-
	Li 2nd Cl Conc.	11.1	4.28	-	69.2	-
	Li 1st Cl Conc.	13.9	3.75	-	75.9	-
	Li Ro Conc	15.3	3.53	-	78.6	-
	Ro Scav. Tails	65.7	0.11	-	10.1	-
	Mica Ro Conc.	8.8	0.34	-	4.4	-
	Mica Ro Scav. Conc.	7.2	0.47	-	5.0	-
	Mica Slime	2.9	0.45	-	1.9	-
	Head (calc.)		0.69	-		-

13.3.7 Locked Cycle Tests

Two locked cycle tests (LCT) were performed on the Rose sample using the flowsheet developed. Figure 13.4 shows the flowsheet for LCT-2. The difference between the two LCT flowsheets is that LCT-2 flowsheet included two stages of mica cleaner flotation, whereas LCT-1 had only one stage of mica rougher flotation. LCT-2 flowsheet was used to produce spodumene concentrate for hydrometallurgical test work. LCT-1 tests were performed in 6 cycles whereas LCT-2 tests in 8 cycles. The results of LCT-1 presented are the average projected balance for the 2 cycles D to E. For LCT-2, the average projected balance is for three cycles from Cycle E to G.

Figure 13.4: Flowsheet for Locked Cycle Test LCT2



Product Legend	
1	Ta- Nb Conc.
2	Slimes
3	Mica 2nd Cleaner Concentrate
4	Acidic Water Recovery
5	Scrubbing Slimes
6	Li Ro Tail
7	Li Final Concentrate

Source: SGS Canada Project 14120-001 April 2015

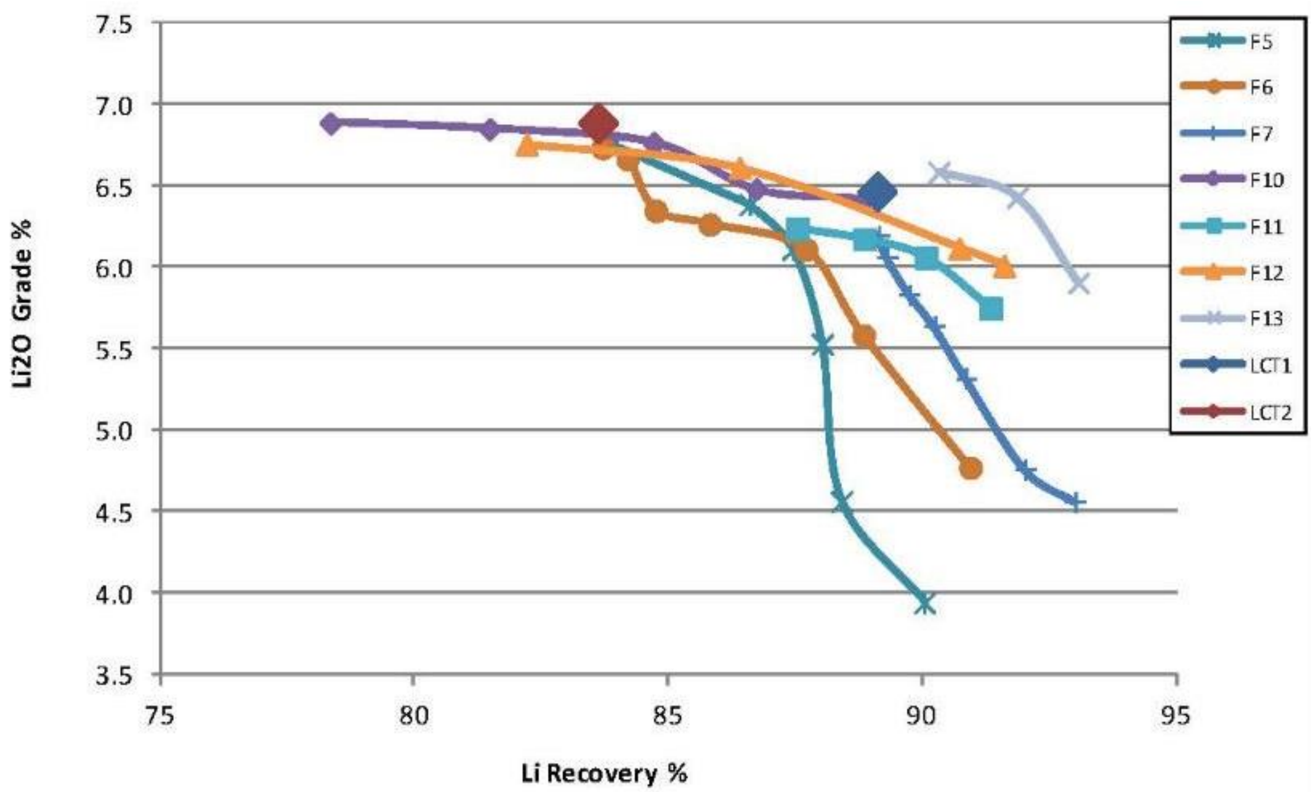
The LCT tests did not achieve higher recoveries than the batch tests due to the effect of recirculating streams that contain less than 3% lithium. LCT-1 achieved higher recovery, 89.1%, compared to LCT-2 that achieved 83.6% recovery. Low recovery in LCT-2 is mainly due to significant loss of lithium in scavenger tailings and the loss of lithium in scrubber slimes in LCT-1. Results from the LCT tests are shown in Table 13.8.

Table 13.8: Locked Cycle Tests Summary

Test No.	Products	Weight	Assay %		Distribution %	
		%	Li_2O	Ta	Li	Ta
LCT1	Li 2nd Cl Conc.	13.4	6.47	0.0087	89.1	4.8
	Li Ro Scav. Tail	75.5	0.06	0.0042	4.3	13.0
	Scrubber Slimes	3.55	0.78	0.0212	2.8	3.1
	Mica Conc.	3.91	0.29	0.0101	1.2	1.6
	Mica Slime	1.82	0.62	0.0175	1.2	1.3
	Mag Conc.	1.76	0.81	1.062	1.5	76.3
	Head (calc.)		0.98	0.0245		
LCT2	Li 2nd Cl Conc.	13.0	6.89	0.0078	83.6	4.1
	Li Ro Scav. Tails	77.6	0.15	0.0047	11.2	14.9
	Scrubber Slimes	2.54	0.92	0.0149	2.2	1.5
	Mica 2nd Cl Conc.	2.53	0.19	0.0104	0.4	1.1
	Mica 2nd Cl Tails	0.38	0.57	0.0140	0.2	0.2
	Mica 1st Cl Tails	0.86	0.52	0.0115	0.4	0.4
	Mica Slime	2.39	0.68	0.0148	1.5	1.4
	Mag Conc.	0.69	0.67	2.723	0.4	76.3
	Head (calc.)		1.07	0.0247		

Figure 13.5 presents a comparison of grade-recovery for the batch tests and LCTs for the Rose sample. It can be seen that LCT tests grade-recovery fall within the range of batch tests for the same sample.

Figure 13.5: Grade-Recovery for the Rose Sample



13.3.8 Variability Tests

A total of eight variability beneficiation tests were performed using the developed flowsheet on the samples. PEG2, Rose 2 samples from the first shipment were tested and tests on other samples were not performed as it was reported that 1st shipment samples were not the correct samples. All variability samples from the second shipment were tested; PEG2, RSE2, Rose 2, Rose 3, Rose 4, and South Rose samples. Test F13 conditions, which achieved best results on the Rose sample, were used for the variability tests.

QEMSCAN Mineralogy was not performed on the variability samples. The lithium grade of South Rose sample was relatively high at 2.15% Li_2O and varied from 0.80% to 1.49% Li_2O for other variability samples. The impurities such as MgO, CaO and Fe_2O_3 were similar compared to the Rose sample, except for PEG2 from 2nd shipment that contained relatively high impurities; 1.79% Fe_2O3, 0.78% MgO, and 1.36% CaO.

Figure 13.6 shows the grade-recovery for the variability samples and the Rose sample. The spodumene flotation results varied greatly for the variability samples using the developed flowsheet on Rose sample. Test F18 performed on South Rose sample produced superior results; 6.89% Li_2O with 90.9% lithium recovery compared to Test 13 on the Rose sample. Test F22 on PEG2 produced a low-grade concentrate, 4.15% Li_2O with 55.1% lithium recovery. Low metallurgical performance of was attributed to the presence of amphiboles and pyroxenes in the ore, which tend to float with spodumene and impair spodumene selective flotation.

Flotation tests on the variability samples indicate that a spodumene concentrate having +6.0% Li_2O with 90% lithium recoveries could be achieved. In general, the higher lithium head grade samples had better lithium recovery in an overall trend.

Tantalum performance was not evaluated on the variability samples as tantalum was assayed only on selected products. The tantalum grade of the magnetics ranged from 0.71% Ta on the PEG2 to 1.08% Ta on the Rose 3 sample and was likely dependent on the tantalum head grade.

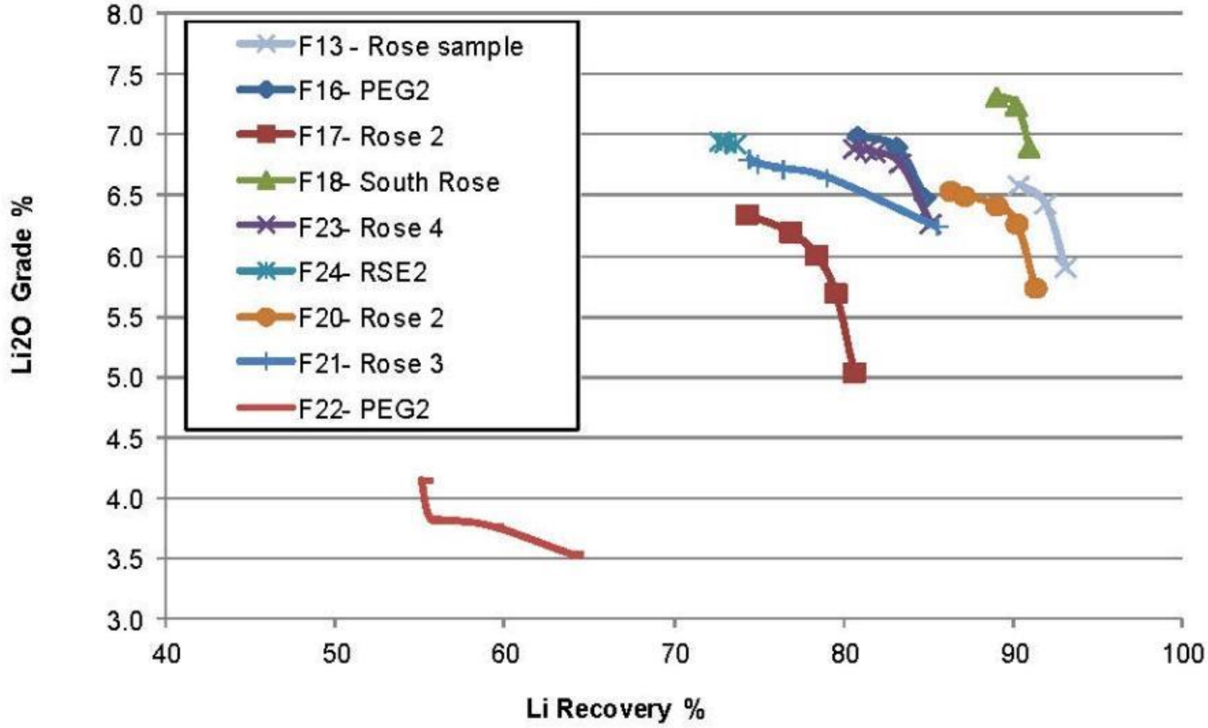
It was noted that the developed beneficiation flowsheet cannot be effective if the flotation feed contains significant amounts of amphiboles and pyroxenes, as observed in Test F22 performed on PEG2 sample.

Statistical analysis was performed on the results of grade and recovery. Variability of the results was evaluated using coefficient of variation (CV) on; 1, on same composite; and 2, between composites.

1 Rose Sample: Statistical analysis of the grade and recovery for twelve Rose samples indicate that a CV of 8% for Li_2O concentrate grade and 15% for lithium recovery. Low coefficient of variation suggests that the results are consistent within acceptable variability.

2 Between Composites: Statistical analysis of the grade and recovery for Rose composite and seven variability composites indicate that a very low CV of 1% for Li_2O concentrate grade and an acceptable CV of 58% for lithium recovery. The coefficient of variation for grade and recovery suggests that the results are consistent within acceptable variability.

Figure 13.6: Grade Recovery for the Variability Samples



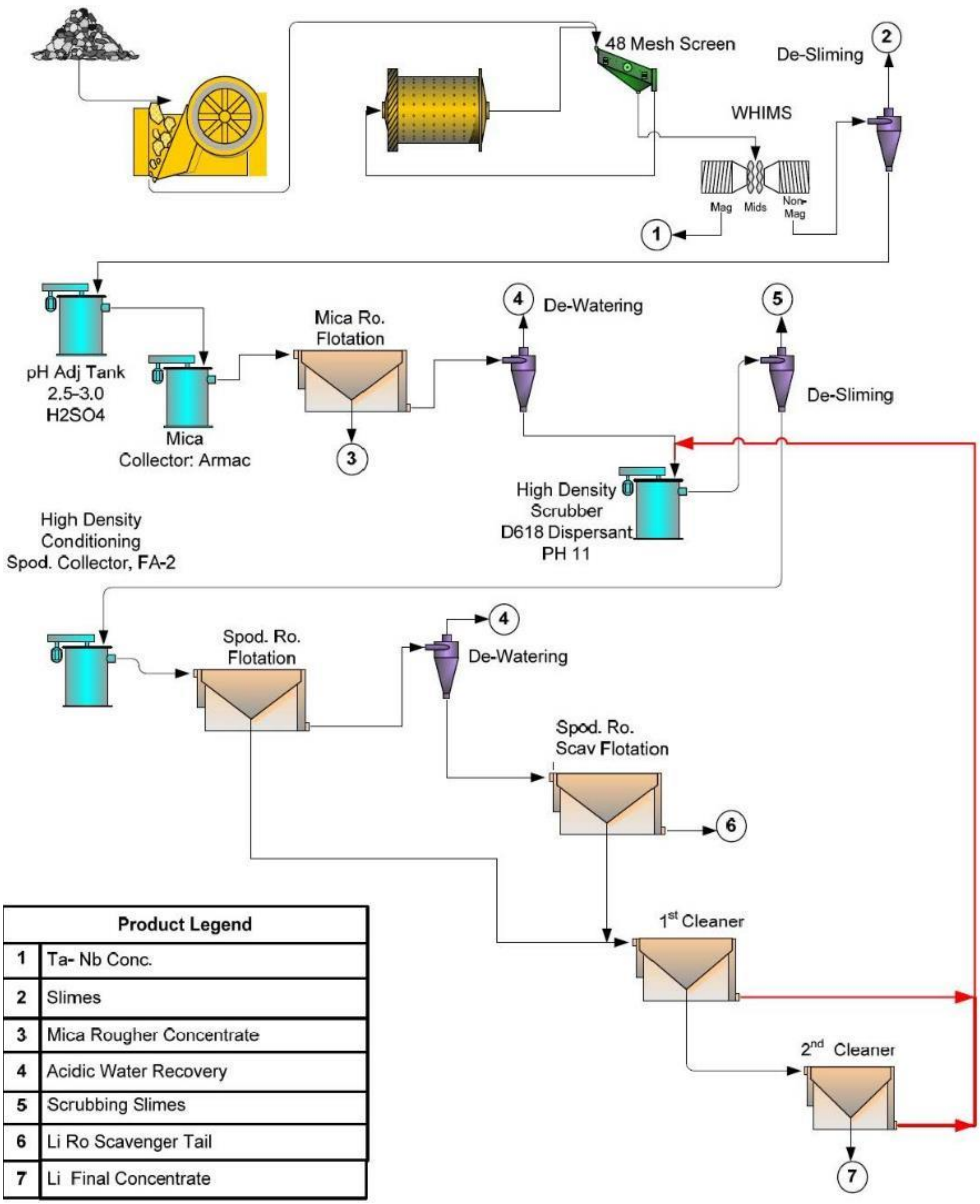
13.4 Spodumene Concentrate Production Tests – SGS Canada Inc. Lakefield

Bench scale spodumene concentrate production and phase transformation tests were performed at SGS in 2016. The test work produced around 5 kg spodumene concentrate from 40 kg Rose sample, left over from previous test program, following the previously developed beneficiation flowsheet.

The flowsheet is presented on Figure 13.7. All spodumene concentrate produced was further used for spodumene phase transformation test work.

The head assay for the Rose sample is presented in Table 13.9.

Figure 13.7: Beneficiation Flowsheet for Spodumene and Tantalum Recovery



Source: SGS Canada, Project 14120-001 Final report April 20, 2015

Table 13.9: Head Assay of Rose Sample

Sample ID	Li_2O %	Ta, %	Fe_2O_3 %	Na_2O %	K_2O %	SiO_2 %	Al_2O_3 %	CaO %	MgO %
Rose sample	0.90	0.03	0.45	4.81	2.44	74.8	15.9	0.12	0.03

The Rose sample was stage crushed and ground to -300 µm (48 mesh), with a P_{80} 203 µm.

Four beneficiation tests were performed using the flowsheet and reagent scheme developed for the Rose sample in the previous test program described in Item 13.3 Minor adjustments to reagent scheme were made for improving the spodumene concentrate grade.

The tantalum recovery circuit shown on Figure 13.7 is oversimplified and indicates a single-stage magnetic separation.

Wet high-intensity magnetic separation (WHIMS) tests were conducted at a current intensity of 5 Amps (~5,000 Gauss) and the non-magnetics passed on WHIMS at either 15 Amps (~15,000 Gauss) or 30 Amps (~26,000 Gauss) in a rougher-scavenger arrangement. The first two tests (F1-F2) and (F3-F4) were performed at 5A and 15A current intensities. Tests F5-F6 and F7-F8 were performed at 5A and 30A current intensities.

The results of WHIMS tests are shown in Table 13.10.

Table 13.10: Summary of Tantalum Recovery

Test No. & Product	Wt %	Grade, %			Distribution, %		
		Ta	Li_2O	Fe_2O_3	Ta	Li	Fe_2O_3
F1-F2 Mag. Conc.(15A)	0.9	2.09	1.25	11.0	63.4	1.1	40.3
F3-F4 Mag. Conc.(15A)	0.9	2.19	1.18	9.9	64.0	1.0	32.8
F5-F6 Mag. Conc.(30A)	1.1	1.93	1.29	13.4	68.3	1.3	37.0
F7-F8 Mag. Conc.(30A)	1.2	1.62	1.21	16.0	63.7	1.4	44.6
Head (Direct)		0.03	1.10	0.84	100	100	100

The WHIMS test results show that a tantalum concentrate (rougher-scavengers concentrate) grading 1.62% - 2.19% Ta with 63% - 68% Ta recoveries in 0.9-1.2% weight was produced by multiple-stage magnetic separation. Test F5-F6 produced highest Ta recovery of 68.3% Ta with a tantalum grade of 1.93% Ta. About 33% to 45% Fe_2O_3 in the feed reports to the tantalum concentrate. Lithium losses to the tantalum concentrate were low, from1.0% to 1.4%.

Mica flotation was performed at an alkaline pH, 9.5 using Aero 3030C as collector, eliminating the need for mica flotation in an acidic environment. The addition of dispersant F220 in the roughers and cleaners of Test F3-F4 improved lithium recoveries compared to the base case test (Test F1-F2).

The four production bench scale tests produced 4.9 kg spodumene concentrate containing an average concentrate grade 6.83% Li_2O, 63.7% SiO_2, 26.8% Al_2O_3, and 0.51% Fe_2O_3. The overall combined recovery from the open circuit tests was 84.6%. The assays for the combined spodumene concentrate are presented in Table 13.11. The detailed results for the four production tests are shown in Table 13.12. Spodumene production test report can be found in "An Investigation into Spodumene Concentrate Production and Phase Transformation", Project 14120-003 SGS Canada Inc., Final report, November 29, 2016.

Table 13.11: Combined Spodumene Concentrate Assay

Sample ID	Li_2O %	SiO_2 %	Al_2O_3 %	Fe_2O_3 %	MgO %	CaO %	Na_2O %	K_2O %	TiO_2 %	P_2O_5 %
Flotation conc.	6.83	63.7	26.8	0.51	0.04	0.10	0.49	0.19	0.01	0.02

Particle size distributions were determined for the spodumene concentrate and rougher tailings and the P_{80} for the spodumene concentrate was 209 µm, P_{80} for the rougher tailings were 220 µm and 216 µm.

Specific gravity of solids for the magnetic product was 3.72 g/cm^3, for final spodumene concentrate, 3.13 g/cm^3, for mica concentrate 2.76 g/cm^3 and for rougher tailings, 2.65 g/cm^3.

Table 13.12: Metallurgical Results for the Spodumene Concentrate Production Tests

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li_2O	Ta g/t	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3	Li	Ta	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3
F1-F2	Li 3rd Cl Conc.	1333	13.7	3.03	6.52		63.8	26.7	0.18	0.58	0.10	0.02	0.56	88.6		11.9	23.3	1.1	1.7	7.7	13.2	30.9
To produce Spod Concentrate, Base Case	Li 2nd Cl Conc.	1355	13.9	3.00	6.46		63.9	26.6	0.20	0.63	0.10	0.02	0.56	89.1		12.1	23.6	1.2	1.9	7.9	13.5	31.3
	Li 1st Cl Conc.	1409	14.5	2.93	6.30		64.1	26.3	0.25	0.77	0.10	0.02	0.55	90.4		12.6	24.3	1.6	2.4	8.3	13.7	31.9
	Li Ro Conc.	1537	15.8	2.70	5.80		65.2	25.3	0.40	1.15	0.10	0.02	0.52	90.8		14.0	25.5	2.8	3.9	9.1	15.0	33.1
	Li Ro & Scav. Conc.	1575	16.2	2.64	5.68		65.1	25.3	0.51	1.20	0.10	0.02	0.51	91.2		14.3	26.1	3.7	4.2	9.5	15.2	33.6
	Li Ro Tail	6968	71.7	0.01	0.02	---	77.5	12.5	2.24	5.68	0.11	0.02	0.04	1.1		75.4	57.0	71.2	87.4	44.3	69.2	11.5
	Slimes 1/2	349	3.6	0.33	0.71	---	70.6	17.1	3.40	4.44	1.17	0.03	0.40	2.5		3.4	3.9	5.4	3.4	23.6	5.2	5.8
	Mica Ro Conc	559	5.8	0.20	0.43	---	57.7	27.7	6.81	2.33	0.09	0.02	0.34	2.5		4.5	10.1	17.4	2.9	2.9	5.6	7.9
	Mica Slimes	179	1.8	0.42	0.90	---	72.4	15.2	2.59	4.66	1.70	0.03	0.13	1.7		1.8	1.8	2.1	1.8	17.6	2.7	1.0
	15A Mag Conc (F1+F2)	88.4	0.9	0.58	1.25	20900	43.3	17.9	0.42	1.36	0.41	0.05	11.0	1.1	63.4	0.5	1.0	0.2	0.3	2.1	2.2	40.3
	Head (calc.)	9719	100	0.47	1.01		73.7	15.7	2.25	4.66	0.18	0.02	0.25	100		100	100	100	100	100	100	100
	Head (Dir.)			0.42		300	74.8	15.9	2.44	4.81	0.12	0.02	0.45									
F3-F4	Li 2nd Cl Conc.	1288	13.3	3.09	6.65		63.3	26.6	0.20	0.53	0.11	0.02	0.43	87.5		11.3	22.6	1.2	1.6	7.1	9.0	21.6
To produce Spod Concentrate, Base Case	Li 1st Cl Conc.	1352	13.9	3.02	6.50		60.3	25.3	0.19	0.50	0.10	0.02	0.41	89.7		11.3	22.6	1.2	1.6	7.1	9.0	21.6
	Li Ro Conc.	1505	15.5	2.75	5.93		57.0	23.7	0.23	0.59	0.10	0.02	0.38	91.1		11.9	23.5	1.5	2.0	7.5	9.4	22.2
	Li Ro Tail (F3+F4)	7122	73.4	0.01	0.03	---	78.5	12.6	2.30	5.48	0.13	0.03	0.11	1.9		77.4	59.1	74.2	88.8	46.2	74.4	30.6
	Slimes 2/3 (F3+F4)	281	2.9	0.35	0.75	---	71.1	15.7	2.92	4.46	1.81	0.03	0.23	2.2		2.8	2.9	3.7	2.9	25.4	2.9	2.5
	Mica Conc (F3+F4)	483	5.0	0.21	0.45	---	55.1	29.3	7.02	2.00	0.10	0.04	0.33	2.2		3.7	9.3	15.3	2.2	2.4	6.7	6.2
	Slimes 1 (F3+F4)	225	2.3	0.33	0.71	---	69.6	16.9	3.35	4.27	1.41	0.05	0.52	1.6		2.2	2.5	3.4	2.2	15.8	3.9	4.6
	15A Mag (F3+F4)	85.0	0.9	0.55	1.18	21900	43.0	17.9	0.42	1.27	0.40	0.05	9.90	1.0	64.0	0.5	1.0	0.2	0.2	1.7	1.5	32.8
	Head (calc.)	9701	100	0.47	1.01		74.4	15.7	2.28	4.53	0.21	0.03	0.26	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									
F5-F6	Li 2nd Cl Conc.	1153	12.0	3.37	7.25		63.2	26.8	0.22	0.42	0.10	0.02	0.53	79.4		10.1	20.5	1.2	1.1	6.2	6.6	16.5
To produce Spod Concentrate and to study the addition of Sodium Silicate N in Cleaners	Li 1st Cl Conc.	1361	14.2	3.20	6.89		53.5	22.7	0.19	0.36	0.08	0.02	0.45	89.0		10.1	20.5	1.2	1.1	6.2	6.6	16.5
	Li Ro Conc.	1607	16.7	2.82	6.06		53.5	22.6	0.37	0.51	0.08	0.02	0.42	92.5		11.9	24.0	2.7	1.9	7.1	7.2	18.1
	F5+F6 Li Ro Tail	7170	74.6	0.01	0.02	---	78.6	13.0	2.41	5.43	0.12	0.04	0.19	1.6		78.3	61.8	79.6	89.3	46.2	82.5	36.8
	F5+F6 Slimes 2/3	363	3.8	0.36	0.77	---	71.4	15.9	2.99	4.38	1.49	0.02	0.23	2.7		3.6	3.8	5.0	3.6	29.0	2.1	2.3
	F5+F6 Mica Conc	252	2.6	0.23	0.50	---	58.5	27.2	6.44	2.56	0.11	0.05	0.37	1.2		2.0	4.5	7.5	1.5	1.5	3.6	2.5
	F5+F6 Slimes 1	120	1.2	0.32	0.69	---	67.5	17.5	3.48	4.09	1.96	0.05	0.66	0.8		1.1	1.4	1.9	1.1	12.6	1.7	2.1
	F5+F6 30A Mag	102.1	1.1	0.60	1.29	19300	43.4	17.1	0.48	1.44	0.38	0.05	13.40	1.3	68.3	0.6	1.2	0.2	0.3	2.1	1.5	37.0
	Head (calc.)	9613	100	0.51	1.10		74.9	15.7	2.26	4.54	0.19	0.04	0.39	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									
F7-F8	Li 2nd Cl Conc.	1183	12.3	3.24	6.97		64.7	27.3	0.16	0.43	0.11	0.02	0.51	82.9		10.6	21.3	0.9	1.2	6.8	6.7	14.8
To produce Spod Concentrate and to Study FA2 Mix Collector	Li 1st Cl Conc.	1283	13.4	3.16	6.79		59.7	25.2	0.15	0.40	0.10	0.02	0.47	87.6		10.6	21.3	0.9	1.2	6.8	6.7	14.8
	Li Ro Conc.	1460	15.2	2.87	6.18		57.0	23.7	0.18	0.50	0.10	0.02	0.43	90.7		11.5	22.9	1.2	1.7	7.2	6.9	15.6
	F7+F8 Li Ro Tail	7016	73.1	0.01	0.03	---	79.1	12.7	2.32	5.54	0.11	0.04	0.17	1.8		77.0	58.9	74.1	88.6	40.1	78.9	29.3
	F7+F8 Slimes 2/3	268	2.8	0.40	0.86	---	70.4	15.2	2.68	4.40	2.13	0.02	0.22	2.3		2.6	2.7	3.3	2.7	29.7	1.5	1.5
	F7+F8 Mica Conc	501	5.2	0.19	0.41	---	56.8	28.5	6.96	2.21	0.09	0.04	0.42	2.1		3.9	9.4	15.9	2.5	2.3	5.6	5.2
	F7+F8 Slimes 1	246	2.6	0.33	0.71	---	70.4	16.7	3.32	4.30	1.37	0.06	0.44	1.8		2.4	2.7	3.7	2.4	17.5	4.2	2.7
	F7+F8 30A Mag	113.3	1.2	0.56	1.21	16200	45.8	16.4	0.70	1.78	0.35	0.06	16.00	1.4	63.7	0.7	1.2	0.4	0.5	2.1	1.9	44.6
	Head (calc.)	9604	100	0.48	1.04		75.0	15.8	2.29	4.57	0.20	0.04	0.42	100		100	100	100	100	100	100	100
	Head (Dir.)			0.51	1.10	300	73.2	16.1	2.65	4.29	0.56	0.05	0.84									

Source: SGS Canada, Project 14120-003, Final report November 29, 2016

13.5 Solid-Liquid Separation Test Work – SGS Canada Inc. Lakefield

Solid-liquid separation tests were performed on the spodumene concentrate and combined mica, spodumene flotation tailings in 2016. Details of these tests can be found in *'Solid-liquid separation responses of process samples from the Rose Deposit'*, SGS Project No. CALR-14120-003, Final report April 05, 2017. Since all of the concentrate produced was used for the phase transformation tests, spodumene concentrate available from previous test work was used for determining the design criteria for sizing thickener and filtration equipment.

Static settling tests were performed only on the spodumene concentrate due to shortage of sample; Table 13.13 shows the results. Static settling tests on the spodumene concentrate indicated that the concentrate settled well in the presence of 7 g/t BASF Magnafloc 10 flocculant, producing 73% w/w solids underflow from a 15% w/w solids thickener feed. Resulting supernatant appeared clear after 30 minutes of elapsed settling time. The total suspended solids (TSS) were 33 mg/L.

Table 13.13: Settling Test Summary for Spodumene Concentrate

Feed % w/w	U/F % w/w	TUFUA $m^2/(t/d)$	THUA $m^2/(m^3/d)$	ISR $m^3/m^2/d$	Supernatant Visual %	TSS mg/L	Flocculant Dosage g/t
15	73	0.026	0.006	905	Clear	33	7.0

Relevant thickener sizing data included was 0.026 $m^2/(t/d)$ thickener underflow unit area (TUFUA), 0.006 $m^2/(m^3/d)$ thickener hydraulic unit area (THUA) and 905 $m^3/m^2/d$ rise rate. An abridged version of standard vacuum filtration tests were conducted on the thickener underflow due to limited spodumene concentrates sample availability. Results are shown in Table 13.14. Tests were performed at reduced vacuum level of about 20 inches mercury level (0.68 bar) due to rapid filtration rate. Micronics 89415 cloth was selected for spodumene concentrate filtration tests. Filter cake thickness ranged from 25 to 40 mm. The resulting solids throughput ranged from 2 022 to 18 8803 $kg/m^2.h$. The discharge cake residual moisture content ranged from 7.9% to 19.9% w/w. The filtrates were clear by visual observation and TSS ranged from 44 to 67 mg/L.

Settling tests were performed on a spodumene-mica combined flotation tailings sample prepared by SGS Lakefield. Both static and dynamic settling tests were performed on the tailings sample. Dynamic settling tests on the combined spodumene mica flotation tailings sample indicated that the tailings settled well in the presence of 30 g/t BASF Magnafloc 10 flocculant, producing 60.3% w/w solids underflow from a 25% w/w feed density. The test results are presented in Table 13.15.

Relevant thickener sizing data included was 0.05 $m^2/(t/d)$ TUFUA, 0.02 $m^2/(m^3/d)$ THUA. This corresponded to 54 $m^3/m^2/d$ net rise rate, 0.833 $t/m^2/h$ solids loading, and 2.25 $m^3/m^2/h$ net hydraulic loading. The TSS contained in the overflow was 56 mg/L. Vacuum filtration test results for the combined tailings are presented in Table 13.16. Vacuum filtration tests were conducted on the tailings underflow from the thickener tests at about 24 inches mercury vacuum level (0.85 bar). Testori P6124Q cloth was selected for tailings filtration tests. For the tests at 60% feed solids, the cake thickness ranged from 30 to 49 mm. The resulting solids throughput ranged from 1 915 to 16 136 $kg/m^2.h$. The discharge cake residual moisture content ranged from 10.7% to 24.6% w/w. The filtrates were hazy by visual observation and TSS ranged from 26 to 115 mg/L. Test performed at 40% feed solids produced a cake thickness, 47 mm at a solids throughput rate, 961 $kg/m^2.h$. Discharge cake moisture was 14.5% w/w and total solids suspended in the overflow, 26 mg/L.

Table 13.14: Summary Spodumene Concentrate Vacuum Filtration Tests Results

Operating Conditions					General Filter Throughput				
Feed Solids % w/w	Vacuum Level Inch, Hg	Form Time, Sec	Dry Time, Sec	Form/Dry Ratio	Cake Thickness, mm	Feed Rate, Dry kg/m^2.h	Cake Moisture % w/w	Filtrate TSS, mg/L	Cake Texture
68.0	20-17	10	1	8.50	40.0	18803	19.9	56	Tacky
		8	2	4.33	28.0	16031	18.9	67	Tacky
		8	40	0.19	28.0	3216	9.5	44	Tacky
		6	60	0.10	25.0	2022	7.9	60	Dry to touch

Table 13.15: Dynamic Settling Test Result Summary for Combined Tailings

Feed % w/w	U/F % w/w	TUFUA m^2/(t/d)	THUA m^2/(m^3/d)	Net Rise Rate m^3/m^2/d	Solids Loading t/m^2/h	TSS mg/L	Net Hydraulic Loading m^3/m^2/h
25.0	60.3	0.050	0.02	54.0	0.833	56	2.25

Table 13.16: Summary for Combined Tailings Vacuum Filtration Test Results

Operating Conditions					General Filter Throughput				
Feed solids % w/w	Vacuum level Inch, Hg	Form Time, Sec	Dry Time, Sec	Form/Dry Ratio	Cake Thickness, mm	Feed rate, Dry kg/m^2.h	Cake Moisture % w/w	Filtrate TSS, mg/L	Cake Texture
60	24.8 -23.0	14	2	7.7	49	15272	16.0	73	Dry to touch
		11	2	6.0	41	16136	24.6	110	
		15	9	1.7	41	8651	21.7	43	
		10	17	0.6	42	7581	16.2	115	
		16	75	0.2	43	2388	13.2	94	
		7	70	0.1	30	1915	10.7	85	
40		35	175	0.2	47	961	14.5	26	

13.6 Pilot Plant Flotation Test Work – SGS Canada Inc. Lakefield

A pilot plant program based on the previously developed beneficiation flowsheet (Figure 13.7) was conducted in early 2017. Pilot tests report can be found in “An Investigation into Flotation Pilot Plant testing on Material from the Rose Lithium/Tantalum Project”, SGS Canada Inc. Project 14120-005 – Final report August 18, 2017. The main objective of pilot plant program was to produce spodumene concentrate for further pilot scale tests for producing lithium carbonate. Secondary objectives were to prove metallurgical performance on a continuous pilot scale and to generate metallurgical and operating data for further studies.

13.6.1 Head Sample Characterization

The Rose sample graded 0.67% Li (1.44% Li_2O) and 250 g/t Ta, while the Rose South sample graded 0.71% Li (1.53% Li_2O) and 170 g/t Ta. The two samples had similar size distributions, with K80 values of approximately 7 mm at minus 9.45 mm (3/8”) and 2.5 mm at minus 3.35 mm (6 mesh). X-ray diffraction analysis indicated that mineral proportions of both samples were similar, with 31.5-34.3% quartz, 26.4-35.4% albite, and 16.4-19.5% spodumene.

13.6.2 Comminution Testing

The two samples were very similar in terms of grindability, with the Rose South sample generally slightly harder than the Rose sample. Results are summarized in Table 13.17.

Table 13.17: Comminution Test Results Summary

Sample Name	Relative Density	CWI (kWh/t)	BWI (kWh/t)	AI (g)
Rose	2.74	7.9	14.4	**0.302**
Rose South	2.71	8.5	14.8	**0.300**
Rose PP ComP	-	-	13.6	**-**
Rose South PP ComP	**-**	**-**	**14.1**	**-**

13.6.3 Bench Scale Gravity Separation Testing

Heavy-liquid separation (HLS) testing on the feed samples at a density of 3.00 g/cm^3 generated a concentrate grading 6.4% Li_2O at a lithium recovery of 36-37%. More than 40% of the mass was rejected as barren silicates, with lithium losses of 2.5-3.3%. These results indicate that dense medium separation (DMS) would likely be a viable process option for generating lithium concentrate and rejecting a substantial portion of the silicate gangue minerals.

Lithium in the flotation feed (which mainly consisted of HLS middlings and the undersize fraction) was upgraded from 0.7% Li_2O to ~0.9% Li_2O, with a mass pull of approximately 50%. The majority of the tantalum (74%) reported to the flotation feed and can likely be recovered by magnetic separation.

Heavy-liquid testing on the combined flotation rougher and cleaner tailings sample recovered ~45% of the tantalum from the flotation tailings.

A Wilfley Table test conducted on the pilot plant SLon magnetic separator feed from the PP-07 campaign recovered ~49% of the tantalum at a grade of 9,113 g/t Ta with a concentrate mass pull of 1%. Approximately 3% of the lithium was lost to the tantalum concentrate.

13.6.4 Bench Scale Flotation Testing

Nine batch flotation tests were conducted on the Rose and Rose South samples to re-evaluate the previously developed flotation scheme and grind size with the pilot plant feed samples. The feed for the bench scale flotation tests was prepared by stage grinding, followed by magnetic separation and mica pre-flotation.

For the Rose sample, 62% of the tantalum was recovered into a magnetic concentrate with a mass pull of 1% and grade of ~1.5% Ta. For the Rose South sample, tantalum recovery was lower, at ~47%, with a magnetic concentrate mass pull of 0.7% and grade of ~1.1% Ta.

On average, the mica concentrate mass pull was 5.7% at a K_2O grade of 6.3% and K2O recovery of 15.6%. About 2% of the lithium was lost into the mica concentrate.

There was no significant difference in lithium flotation performance using either Aero 3030C or Armac T as the collector.

One locked-cycle test was conducted on each of the Rose and Rose South samples. In both cases, the final spodumene concentrate graded 6.65% Li_2O, with higher than 89% lithium recovery and ~20% weight recovery.

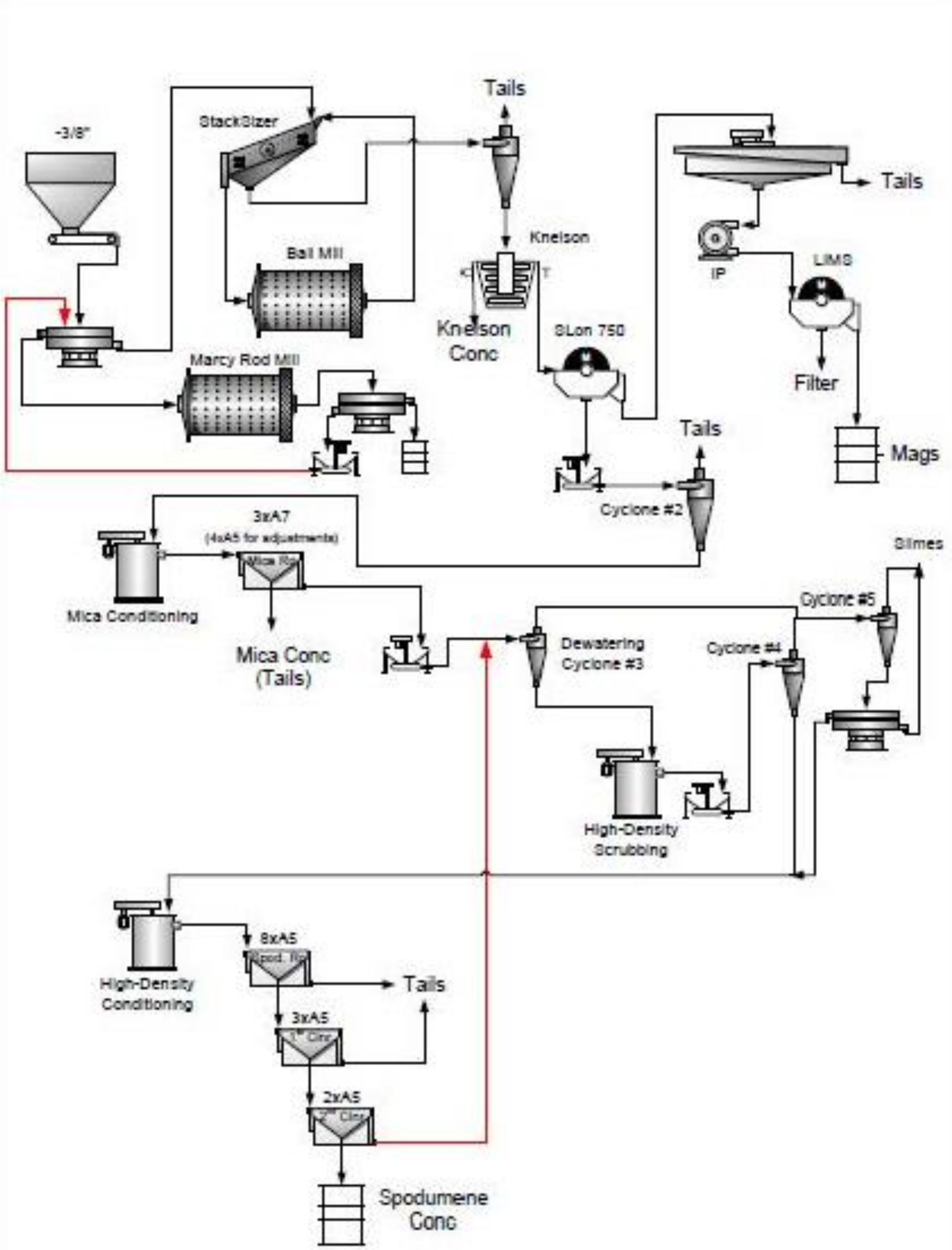
13.6.5 Pilot Plant Operations

Pilot plant testing commenced on February 14, 2017 and was completed on March 17, 2017, in a series of twenty-two shifts. The pilot plant was constructed according to the flowsheet displayed on Figure 13.8. The pilot plant was designed to process material at a target feed rate of approximately 250 kg/h.

The first eleven operating shifts were completed on the Rose South sample. Shifts PP-01 to PP-07 were considered as commissioning and optimization day shifts, followed by four shifts (PP-08 to PP-11) of round-the-clock continuous operation, to demonstrate metallurgical performance and generate products over an extended uninterrupted period.

The final eleven operating shifts were completed on the Rose sample. A low-intensity drum magnetic separator was added to the magnetic separation circuit to treat the SLon magnetics stream, and the spodumene third cleaner stage was removed, such that only two stages of cleaning of the spodumene rougher concentrate were required. The focus of day shifts PP-12 and PP-13 was to transition the pilot plant to the new sample and achieve operating stability with some degree of optimization. The final nine shifts (PP-14 to PP-22) were intended as continuous operation to demonstrate metallurgical performance and generate products over an extended uninterrupted period.

Figure 13.8: Pilot Plant Flowsheet



Source: SGS Canada, Project 14120-005 Final report August 18, 2017

During the continuous operation of the Rose South sample, the overall grinding circuit unit energy consumption was 9.7 kWh/t, for an operating work index of 17.6 kWh/t. During the continuous operation of the Rose sample, the overall grinding circuit unit energy consumption was 9.3 kWh/t, for an operating work index of 16.3 kWh/t. Consistent with the observations at bench scale, the Rose South sample required slightly more energy than did the Rose sample.

During the continuous operation of the Rose South sample, the magnetic concentrate represented 1.0% of the original feed mass, at a tantalum recovery of 47.8% and an associated lithium loss of 1.8%. During the continuous operation of the Rose sample shifts that included a Knelson Concentrator, the combined Knelson gravity concentrate, and SLon 750 magnetic concentrate represented 3.5% of the original feed mass, at a tantalum recovery of 63.5% and an associated lithium loss of 6.2%.

Spodumene flotation was conducted in a rougher stage followed by either three (Rose South) or two (Rose) stages of cleaning. The feed K80 values were almost identical for the two samples during the extended runs, at 216~218 µm on average. Slightly different dosages of FA-2 collector were employed for the two samples, at 772 g/t for the Rose South sample extended run and 854 g/t for the Rose sample extended run.

13.6.6 Pilot Plant Metallurgical Results

Concentrate grades varied from 4.5% Li_2O to 6.4% Li_2O during the start-up and commissioning runs on the Rose South sample, PP-01 to PP-07. Concentrate grades were consistently above the target of 6.0% Li_2O for all other shift surveys, from PP-08 to PP-22, indicating stable operation and metallurgical performance throughout the extended run of the Rose South sample and the entire campaign of the Rose sample.

Lithium recoveries ranged from 45% to 60% during the start-up and commissioning runs on the Rose South sample, PP-01 to PP-07. During the Rose South extended run, PP-08 to PP-11, lithium recoveries were significantly improved, ranging from 56% to 82%, and averaging 68%. Lithium recoveries during the Rose sample campaign were consistently in the range from 74% to 83%, and averaged 79%.

Metallurgical performance of the Rose sample campaign, from shifts PP-12 to PP-22, was better than that of the Rose South sample campaign, from shifts PP-01 to PP-11, in terms of both consistency and overall performance. This is undoubtedly due, at least in part, to instability of the circuit during the commissioning and optimization runs PP-01 to PP-07, with the continual manipulation of circuit parameters. Once stability had been achieved (i.e., during the extended run, starting at PP-08), the operation and metallurgical performance of the Rose South sample was in line with that of the Rose sample.

Table 13.18 summarizes the results of the best shift and the comparable bench test results (from the locked cycle testing) for the two samples. Lithium recoveries were lower in the piloting campaign than that achieved in the locked cycle tests, which was due in part to less efficient desliming in the pilot plant, resulting in higher lithium losses to the slimes streams. Further optimization in continuous operation should focus on improvements in that area.

Table 13.18: Summary of Results – Optimal Shift Metallurgy and LCT Results

PP ID	Product	Mass %	Assay (Adjusted) %							Distribution %						
			Li_2O	Ta (g/t)	SiO_2	Al_2O_3	Fe_2O_3	Na_2O	K_2O	Li	Ta	SiO_2	Al_2O_3	Fe_2O_3	Na_2O	K_2O
Optimal Rose South (PP-11)	O/F Cyclones Mag Conc. Mica Conc.	14.8	1.16	109	72.5	16.3	0.88	3.54	3.52	12.2	13.9	14.1	15.7	23.5	15.4	19.5
	Li Ro Tail	0.8	2.54	6460	54.3	18.8	13.4	1.34	1.35	1.5	44.8	0.6	1.0	19.6	0.3	0.4
	Li 1st Cl Tail	6.7	0.38	43	74.7	15.6	0.35	2.66	5.30	1.8	2.5	6.6	6.8	4.2	5.3	13.3
	Li 3rd Cl Conc.	58.8	0.05	33	81.1	11.8	0.19	4.28	2.78	2.0	16.7	62.6	45.1	19.9	74.2	61.5
		1.4	0.60	104	78.2	13.8	0.28	4.47	2.59	0.6	1.2	1.4	1.2	0.7	1.8	1.3
		17.5	6.56	139	64.4	26.5	1.01	0.60	0.60	81.9	20.9	14.8	30.3	32.1	3.1	4.0
Optimal Rose (PP-15)	O/F Cyclones Mag Conc. Mica Conc.	12.6	1.07	229	73.2	16.3	0.61	4.65	2.44	10.6	27.8	12.3	12.8	19.5	12.7	14.9
	Li Ro Tail	0.6	1.12	2230	47.3	15.4	21.0	2.05	0.90	0.5	12.3	0.4	0.5	30.3	0.3	0.2
	Li 1st Cl Tail	7.6	0.30	71	69.0	20.0	0.20	3.73	5.09	1.8	5.2	7.0	9.5	3.8	6.2	18.8
	Li 2nd Cl Conc.	61.6	0.07	67	79.1	12.7	0.16	5.75	2.03	3.2	39.8	65.2	48.9	24.9	77.1	60.7
		0.9	0.75	238	74.9	15.7	0.39	5.29	2.16	0.5	2.0	0.9	0.8	0.8	1.0	0.9
		16.7	6.38	81	63.8	26.2	0.49	0.75	0.53	83.4	13.0	14.3	27.4	20.7	2.7	4.3
Benchmark	O/F Cyclones	5.7	1.1		69.5	16.2	1.12	4.13	2.69	4.1		5.3	5.8	18.2	5.9	7.7
	Mag Conc.	0.8	1.5		43.3	17.0	15.6	1.33	0.47	0.8	64.4	0.5	0.9	36.5	0.3	0.2
LCT Rose Sample	Mica Conc.	6.8	0.4	1.95	62.0	24.8	0.24	2.85	6.39	1.8		5.7	10.6	4.8	4.8	21.8
	Li Ro Tail	63.3	0.0		80.7	11.7	0.08	5.26	2.04	1.8		68.0	46.4	15.2	82.6	64.5
	Li 1st Cl Tail	3.2	1.1		77.5	14.2	0.15	4.56	1.82	2.2		3.3	2.8	1.3	3.6	2.9
	Li 3rd Cl Conc.	20.2	6.7		64.4	26.4	0.42	0.57	0.29	89.3		17.3	33.5	24.0	2.8	2.9
Benchmark	O/F Cyclones	8.1	0.9		70.5	15.7	1.10	3.74	3.41	5.1		7.6	8.4	16.4	9.2	10.6
	Mag Conc.	0.7	1.6		44.9	15.3	20.8	1.18	0.87	0.8	48.1	0.4	0.7	26.6	0.2	0.2
LCT Rose South Sample	Mica Conc.	3.8	0.4	1.18	56.8	27.5	0.99	1.82	7.98	0.9		2.9	6.9	7.0	2.1	11.7
	Li Ro Tail	64.4	0.0		80.5	10.9	0.13	4.18	2.92	1.7		68.9	46.3	14.9	81.9	72.2
	Li 1st Cl Tail	2.9	1.0		77.1	14.1	0.26	3.71	2.73	1.9		3.0	2.7	1.4	3.3	3.0
	Li 3rd Cl Conc.	20.2	6.6		64.6	26.2	0.91	0.54	0.29	89.7		17.3	34.9	33.8	3.3	2.3

Source: SGS Canada, Project 14120-005 Final report August 18, 2017

13.7 Tantalite Concentrate Upgrading Tests

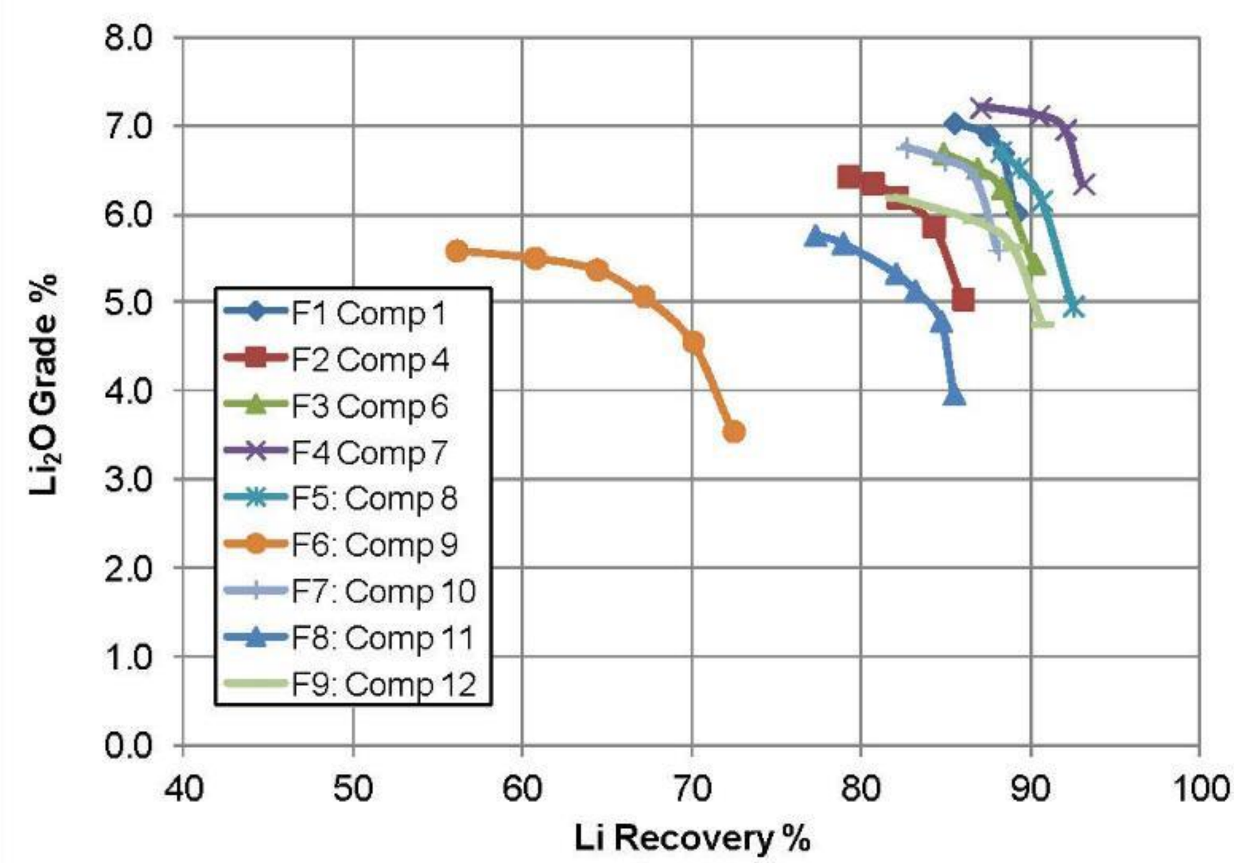
Tests are ongoing at SGS Lakefield laboratory with the objective of improving the tantalite concentrate grade obtained from the pilot plant. Magnetic separation, heavy liquids separation, Wilfley table separation, Knelson concentrator, and flotation are being explored.

Preliminary results indicate that the pilot plant tantalite concentrate may be upgraded to 20% Ta_2O_5 with a recovery over 60%.

13.8 Lithium Variability Tests

SGS laboratory conducted a small test program in August 2017 to investigate grade/recovery results with varying lithium head grades using the design process flowsheet (Figure 13.9). Nine samples were tested having head grades varying between 0.50% Li_2O and 1.70% Li_2O; the results are shown in Table 13.19. The grade-recovery results show that samples with head grades higher than 1.0% Li_2O produce a lithium concentrate of 5.0% Li_2O with a recovery over 90% and of 6.0% Li_2O with a recovery over 86%. The sample with a 0.50% Li_2O head grade produces a concentrate 5.0% Li_2O with a recovery of 67%. A head grade of 0.85% Li_2O produces a 5.0% Li_2O concentrate with a recovery of over 85%.

Figure 13.9: Grade-Recovery Relationships for the Variability Test Results



Source: SGS Canada, Project 14120-008 Flotation Tests-Variability August, 2017

Table 13.19: Metallurgical Results for the Lithium Variability Tests

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li_2O	Ta g/t	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3	Li	Ta	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3
F1	Comp 1- F1 Li 3rd Cl Conc.	343	13.8	3.27	7.04		63.8	26.0	0.22	0.55	0.16	0.03	0.73	85.4		11.8	23.6	0.8	2.1	7.7	18.3	25.4
Using Developed Flowsheet on Comp 1 Sample	Comp 1- F1 Li 2nd Cl Conc.	358	14.4	3.21	6.90		64.1	25.8	0.27	0.65	0.16	0.03	0.72	87.4		12.3	24.4	1.1	2.5	8.2	18.8	26.3
	Comp 1- F1 Li 1st Cl Conc.	372	15.0	3.11	6.70		64.5	25.4	0.33	0.78	0.17	0.03	0.72	88.3		12.9	25.0	1.4	3.2	8.7	19.3	27.1
	Comp 1- F1 Li Ro Conc.	418	16.8	2.80	6.02		66.1	24.0	0.59	1.19	0.17	0.03	0.66	89.1		14.9	26.6	2.8	5.4	9.8	21.0	28.0
	Comp 1- F1 Li Ro Tail.	1638	65.9	0.02	0.03		78.9	12.3	3.74	4.44	0.14	0.02	0.16	1.9		69.6	53.3	68.9	79.3	32.1	58.2	26.6
	Comp 1-F1 Mica Conc	295	11.9	0.16	0.34		68.0	18.6	6.92	3.16	0.12	0.02	0.33	3.6		10.8	14.5	22.9	10.2	4.9	10.5	9.9
	Comp 1-F1 Total Slimes	110	4.4	0.41	0.88		67.5	15.2	3.88	3.74	3.25	0.04	1.28	3.4		4.0	4.4	4.8	4.5	50.1	7.8	14.4
	Comp 1-F1 Mag 5A	13.0	0.5	0.91	1.96		59.2	17.5	1.84	2.13	0.93	0.05	3.31	0.9		0.4	0.6	0.3	0.3	1.7	1.2	4.4
	Comp 1-F1 Combined Mag Prod.	25.4	1.0	1.03	2.21		58.2	17.2	1.96	2.16	0.86	0.05	8.19	2.0		0.8	1.2	0.6	0.6	3.0	2.5	21.1
	Head (calc.)	2487	100	0.53	1.14		74.7	15.2	3.58	3.69	0.29	0.02	0.40	100		100	100	100	100	100	100	100
	Head (Dir.)			0.56	1.21	100	74.9	15.1	3.53	3.62	0.12	0.02	0.24									
F2	Comp 4- F2 Final Li Conc.	335	14.3	2.99	6.44		64.3	25.2	0.43	0.74	0.20	0.11	1.05	79.2		12.2	23.4	2.7	2.6	11.1	52.0	19.9
Using Developed Flowsheet on Comp 4 Sample	Comp 4- F2 Li 3rd Cl Conc.	345	14.7	2.95	6.36		63.9	25.1	0.44	0.74	0.20	0.11	1.19	80.6		12.5	24.1	2.9	2.7	11.6	53.4	23.2
	Comp 4- F2 Li 2nd Cl Conc.	360	15.4	2.88	6.20		64.3	24.8	0.49	0.83	0.20	0.11	1.19	82.0		13.1	24.8	3.3	3.2	12.0	53.9	24.2
	Comp 4- F2 Li 1st Cl Conc.	391	16.7	2.73	5.87		65.1	24.1	0.58	1.01	0.20	0.10	1.17	84.2		14.4	26.1	4.3	4.2	12.8	54.7	25.9
	Comp 4- F2 Li Ro Conc.	464	19.8	2.34	5.05		67.2	22.2	0.76	1.51	0.19	0.09	1.07	85.9		17.6	28.6	6.7	7.4	14.7	55.7	28.0
	Comp 4- F2 Li Ro Tail.	1378	58.7	0.02	0.05		81.7	11.8	1.97	5.09	0.16	0.01	0.24	2.4		63.6	45.1	51.4	74.0	36.6	19.4	18.7
	Comp 4-F2 Mica Conc	335	14.3	0.19	0.41		67.0	19.9	5.34	3.61	0.13	0.03	0.73	5.0		12.7	18.5	33.9	12.8	7.2	14.2	13.8
	Comp 4-F2 Total Slimes	121	5.1	0.42	0.90		68.3	15.8	2.72	3.90	1.93	0.04	2.17	4.0		4.7	5.3	6.2	5.0	38.7	6.8	14.9
	Comp 4-F2 Mag 5A	21	0.9	0.65	1.40	7300	53.3	18.2	1.52	1.87	0.39	0.05	5.66	1.1		0.6	1.0	0.6	0.4	1.3	1.5	6.6
	Comp 4-F2 Combined Mag Prod.	48.6	2.1	0.70	1.50	5004	51.1	18.6	1.86	1.64	0.34	0.06	8.96	2.7		1.4	2.5	1.7	0.8	2.8	3.8	24.6
	Head (calc.)	2346	100	0.54	1.16		75.4	15.4	2.25	4.04	0.26	0.03	0.75	100		100	100	100	100	100	100	100
	Head (Dir.)			0.53	1.14	100	75.3	15.3	2.25	4.12	0.13	0.04	0.56									
F3	Comp 6- F3 Li 3rd Cl Conc.	346	15.1	3.11	6.69		64.6	26.4	0.41	0.62	0.14	0.03	0.48	84.8		13.2	25.4	2.4	2.2	7.4	20.1	18.3
Using Developed Flowsheet on Comp 6 Sample	Comp 6- F3 Li 2nd Cl Conc.	364	15.9	3.03	6.53		64.7	26.2	0.48	0.73	0.14	0.03	0.49	86.8		13.9	26.5	3.0	2.7	8.0	20.8	19.5
	Comp 6- F3 Li 1st Cl Conc.	383	16.7	2.93	6.30		65.0	25.8	0.57	0.89	0.15	0.03	0.49	88.2		14.7	27.5	3.7	3.4	8.6	21.6	20.6
	Comp 6- F3 Li Ro Conc.	453	19.8	2.53	5.44		66.6	24.1	0.88	1.48	0.15	0.03	0.46	90.2		17.8	30.4	6.8	6.8	10.7	22.9	22.8
	Comp 6- F3 Li Ro Tail.	1578	69.0	0.02	0.04		77.9	12.8	2.83	5.22	0.13	0.02	0.18	2.2		72.4	56.2	76.1	83.2	31.5	61.2	31.3
	Comp 6-F3 Mica Conc	61	2.7	0.16	0.34		57.9	26.8	7.84	2.31	0.11	0.03	0.62	0.8		2.1	4.6	8.2	1.4	1.0	3.6	4.2
	Comp 6-F3 Total Slimes	163	7.1	0.38	0.81		68.9	16.0	2.92	4.71	2.16	0.03	1.13	4.9		6.6	7.3	8.1	7.8	54.2	9.5	20.3
	Comp 6-F3 Mag 5A	14.6	0.6	0.75	1.61		56.3	18.7	1.24	2.33	0.57	0.04	2.76	0.9		0.5	0.8	0.3	0.3	1.3	1.1	4.4
	Comp 6-F3 Combined Mag Prod.	31.8	1.4	0.79	1.70		57.7	18.0	1.61	2.63	0.54	0.05	6.11	2.0		1.1	1.6	0.9	0.8	2.6	2.8	21.4
	Head (calc.)	2287	100	0.56	1.20		74.2	15.7	2.57	4.33	0.29	0.02	0.40	100		100	100	100	100	100	100	100
	Head (Dir.)			0.58	1.25	200	74.8	15.8	2.61	4.27	0.11	0.02	0.25									
F4	Comp 7- F4 Li 3rd Cl Conc.	584	22.1	3.35	7.21		64.4	26.8	0.13	0.43	0.10	0.02	0.35	86.9		19.2	36.4	1.2	2.7	9.1	21.5	29.7
Using Developed	Comp 7- F4 Li 2nd Cl Conc.	615	23.3	3.31	7.12		64.6	26.6	0.15	0.49	0.10	0.02	0.35	90.4		20.3	38.1	1.5	3.3	9.7	22.7	31.3
	Comp 7- F4 Li 1st Cl Conc.	639	24.3	3.24	6.97		64.9	26.3	0.19	0.60	0.10	0.02	0.35	92.0		21.2	39.2	2.0	4.1	10.3	23.6	32.2

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li_2O	Ta g/t	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3	Li	Ta	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3
Flowsheet on Comp 7 Sample	Comp 7- F4 Li Ro Conc.	709	26.9	2.95	6.35		66.2	25.1	0.40	0.98	0.11	0.02	0.33	93.1		24.0	41.3	4.5	7.4	12.1	26.2	34.1
	Comp 7- F4 Li Ro Tail.	1672	63.4	0.01	0.03		79.4	11.9	2.87	4.73	0.14	0.02	0.14	1.0		67.8	46.3	76.5	84.5	36.5	61.7	34.0
	Comp 7-F4 Mica Conc	114	4.3	0.22	0.47		59.0	26.1	7.45	2.34	0.09	0.02	0.36	1.1		3.4	6.9	13.5	2.8	1.6	4.2	6.0
	Comp 7-F4 Total Slimes	114	4.3	0.66	1.42		68.9	16.0	2.73	3.82	2.68	0.02	1.07	3.3		4.0	4.2	5.0	4.7	47.6	5.2	17.7
	Comp 7-F4 Mag 5A	21	0.8	1.10	2.37	11700	57.3	19.4	1.05	1.72	0.47	0.04	2.08	1.0		0.6	0.9	0.3	0.4	1.5	1.5	6.2
	Comp 7-F4 Combined Mag Prod.	27.7	1.1	1.18	2.54	11392	58.8	19.5	1.13	1.92	0.53	0.05	2.06	1.5		0.8	1.3	0.5	0.6	2.3	2.7	8.3
	Head (calc.)	2636	100	0.85	1.84		74.3	16.3	2.38	3.55	0.24	0.02	0.26	100		100	100	100	100	100	100	100
	Head (Dir.)			0.79	1.70	200	74.7	15.9	2.41	3.72	0.13	0.02	0.31									
F5	Comp 8- F5 Li 3rd Cl Conc.	368	15.6	3.12	6.72		64.6	25.6	0.37	0.79	0.17	0.03	0.94	88.2		13.5	25.5	2.5	2.7	8.7	21.0	26.0
Using Developed Flowsheet on Comp 8 Sample	Comp 8- F5 Li 2nd Cl Conc.	383	16.2	3.03	6.53		65.0	25.2	0.42	0.91	0.17	0.03	0.93	89.2		14.1	26.2	3.0	3.2	9.2	21.6	26.7
	Comp 8- F5 Li 1st Cl Conc.	412	17.5	2.86	6.16		65.8	24.5	0.52	1.15	0.18	0.03	0.89	90.6		15.4	27.4	4.0	4.4	10.1	22.7	27.6
	Comp 8- F5 Li Ro Conc.	522	22.1	2.31	4.97		68.4	22.2	0.88	1.94	0.18	0.03	0.74	92.4		20.2	31.3	8.5	9.4	13.0	26.8	29.2
	Comp 8- F5 Li Ro Tail.	1622	68.8	0.01	0.03		78.7	12.9	2.45	5.60	0.17	0.02	0.16	1.5		72.4	56.7	73.1	84.3	38.5	61.7	19.6
	Comp 8-F5 Mica Conc	109	4.6	0.17	0.37		60.3	24.9	7.24	2.80	0.12	0.02	0.92	1.4		3.7	7.3	14.5	2.8	1.8	4.1	7.5
	Comp 8-F5 Total Slimes	64.0	2.7	0.43	0.92		66.0	15.1	2.57	4.29	4.84	0.03	1.48	2.1		2.4	2.6	3.0	2.5	43.1	3.7	7.1
	Comp 8-F5 Mag 5A	21.2	0.9	0.72	1.55	5300	55.6	19.1	1.01	2.08	0.62	0.04	3.67	1.2		0.7	1.1	0.4	0.4	1.8	1.6	5.9
	Comp 8-F5 Combined Mag Prod.	42.8	1.8	0.77	1.66	4341	54.0	17.4	1.20	2.24	0.60	0.05	11.36	2.5		1.3	2.0	0.9	0.9	3.6	3.7	36.6
	Head (calc.)	2359	100	0.55	1.19		74.8	15.6	2.30	4.57	0.30	0.02	0.56	100		100	100	100	100	100	100	100
	Head (Dir.)			0.54	1.16	200	75.6	15.5	2.37	4.59	0.17	0.02	0.47									
F6	Var-F6 Final Li Conc.	114	4.7	2.60	5.60		62.5	24.4	0.40	1.21	1.91	0.96	1.26	56.0		4.2	7.2	0.5	1.3	8.6	48.4	4.9
Using Developed Flowsheet on Comp 9 Sample	Var-F6 Li Conc. After 5 A Meg	126	5.2	2.56	5.51		62.1	24.3	0.48	1.24	1.94	0.92	1.58	60.6		4.6	7.9	0.6	1.4	9.6	51.2	6.8
	Var-F6 3rd Li Conc.	137	5.6	2.50	5.38		61.5	24.2	0.63	1.22	1.96	0.90	2.04	64.3		4.9	8.5	0.9	1.5	10.6	54.2	9.5
	Var-F6 Li 2nd Cl Conc.	151	6.2	2.36	5.08		61.6	23.9	0.71	1.48	2.01	0.83	2.13	67.0		5.5	9.3	1.1	2.0	12.0	55.5	10.9
	Var-F6 Li 1st Cl Conc.	175	7.2	2.12	4.56		62.0	23.4	0.85	1.92	2.11	0.74	2.25	70.0		6.4	10.5	1.6	3.1	14.6	56.9	13.4
	Var-F6 Li Ro Conc.	233	9.6	1.65	3.55		63.5	22.0	1.12	2.76	2.23	0.57	2.15	72.4		8.7	13.2	2.8	5.9	20.6	58.7	17.0
	Var-F6 Li Ro Tail.	1702	70.1	0.01	0.03		73.3	14.4	3.77	5.03	0.85	0.02	0.22	4.2		73.4	63.0	68.4	78.6	57.3	15.0	12.7
	Var-F6 Mica Conc	316	13.0	0.19	0.41		63.7	19.2	5.61	3.65	0.78	0.12	2.88	11.3		11.8	15.6	18.9	10.6	9.7	16.7	30.9
	Var-F6 Total Slimes	100	4.1	0.17	0.38		66.1	17.0	4.71	4.15	2.43	0.13	2.07	3.3		3.9	4.3	5.0	3.8	9.6	5.8	7.0
	Var-F6 5A Mag	32	1.3	0.51	1.10	1600	50.8	18.3	5.43	1.81	0.96	0.14	11.40	3.1		0.9	1.5	1.8	0.5	1.2	2.0	12.3
	Var-F6 Combined Mag Prod.	78.6	3.2	0.60	1.29	1124	49.0	19.1	5.97	1.54	0.91	0.11	12.1	8.9		2.3	3.9	5.0	1.1	2.8	3.8	32.4
	Head (calc.)	2428	100	0.22	0.47		70.0	16.0	3.87	4.48	1.04	0.09	1.21	100		100	100	100	100	100	100	100
	Head (Dir.)			0.23	0.50		71.5	16.1	3.91	4.44	1.01	0.10	1.19									
F7	Var-F7 Li 3rd Cl Conc.	247	11.4	3.14	6.76		64.4	25.9	0.33	0.67	0.21	0.06	0.96	82.6		10.1	18.2	1.0	1.7	11.0	19.3	27.7
Using Developed Flowsheet on Comp 10 Sample	Var-F7 Li 2nd Cl Conc.	259	11.9	3.07	6.62		64.6	25.7	0.37	0.77	0.21	0.06	0.98	84.9		10.6	18.9	1.2	2.1	11.7	19.8	29.8
	Var-F7 Li 1st Cl Conc.	273	12.6	2.98	6.41		64.9	25.3	0.44	0.92	0.22	0.06	0.98	86.7		11.2	19.7	1.5	2.6	12.7	20.3	31.4
	Var-F7 Li Ro Conc.	318	14.6	2.60	5.60		66.4	23.9	0.77	1.39	0.22	0.05	0.91	88.0		13.4	21.7	2.9	4.6	14.5	21.5	33.8
	Var-F7 Li Ro Tail.	1470	67.7	0.01	0.02		75.5	13.7	4.02	5.19	0.16	0.03	0.16	1.4		70.3	57.4	71.1	79.9	49.7	57.5	27.5
	Var-F7 Mica Conc	286	13.2	0.17	0.37		67.6	19.6	6.23	3.87	0.16	0.04	0.50	5.2		12.2	16.0	21.4	11.6	9.7	14.9	16.7

Test No, Objective	Product	Weight		Assays %, g/t										Distribution %								
		g	%	Li	Li_2O	Ta g/t	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3	Li	Ta	SiO_2	Al_2O_3	K_2O	Na_2O	CaO	P_2O_5	Fe_2O_3
	Var-F7 Total Slimes	71	3.2	0.35	0.76		68.0	17.0	4.42	4.33	1.55	0.04	1.23	2.6		3.0	3.4	3.8	3.2	23.0	3.8	10.1
	Var-F7 5A Mag Conc	18	0.8	0.83	1.79	7800	59.4	19.1	2.26	2.35	0.49	0.06	3.86	1.6		0.7	1.0	0.5	0.4	1.9	1.4	8.2
	Var-F7 Combined Mag Prod.	28.4	1.3	0.91	1.96	7225	60.5	19.2	2.44	2.51	0.52	0.06	3.6	2.8		1.1	1.6	0.8	0.7	3.1	2.4	11.9
	Head (calc.)	2173	100	0.43	0.93		72.7	16.2	3.83	4.40	0.22	0.04	0.39	100		100	100	100	100	100	100	100
	Head (Dir.)			0.46	0.99		73.5	16.2	3.71	4.48	0.18	0.03	0.33									
F8	Var-F8 Final Li Conc.	193	8.7	2.68	5.77		63.9	24.7	0.63	1.07	0.77	0.38	0.85	77.2		7.7	13.9	1.5	2.1	12.5	45.0	9.1
Using Developed Flowsheet on Comp 11 Sample	Var-F8 Li Conc. After 5 A Meg	200	9.1	2.64	5.68		63.6	24.6	0.67	1.08	0.90	0.38	1.03	78.8		7.9	14.3	1.7	2.3	15.3	46.8	11.4
	Var-F8 3rd Li Conc.	222	10.0	2.48	5.34		62.1	24.2	0.89	1.07	1.37	0.38	2.01	82.0		8.6	15.6	2.4	2.5	25.7	51.2	24.6
	Var-F8 Li 2nd Cl Conc.	233	10.6	2.39	5.14		62.5	23.9	0.96	1.20	1.35	0.36	2.00	83.1		9.1	16.2	2.8	2.9	26.6	51.9	25.8
	Var-F8 Li 1st Cl Conc.	254	11.5	2.23	4.80		63.3	23.2	1.10	1.43	1.30	0.34	1.94	84.6		10.0	17.1	3.5	3.8	28.0	52.9	27.3
	Var-F8 Li Ro Conc.	310	14.1	1.84	3.97		65.9	21.4	1.44	2.03	1.16	0.28	1.68	85.4		12.7	19.3	5.5	6.5	30.4	53.9	28.9
	Var-F8 Li Ro Tail.	1525	69.1	0.01	0.02		76.5	13.6	3.74	5.10	0.21	0.02	0.20	2.3		72.7	60.3	70.8	80.8	27.0	18.7	16.9
	Var-F8 Mica Conc	234	10.6	0.15	0.32		65.7	19.8	5.89	3.51	0.39	0.11	1.01	5.2		9.6	13.5	17.1	8.5	7.7	15.8	13.1
	Var-F8 Total Slimes	71	3.2	0.26	0.55		66.5	16.0	4.14	4.12	2.76	0.12	1.68	2.7		3.0	3.3	3.7	3.1	16.6	5.5	6.6
	Var-F8 5A Mag	30.6	1.4	0.37	0.80	2700	48.5	18.50	2.90	1.42	2.66	0.12	8.71	1.7		0.9	1.6	1.1	0	6.9	2.3	14.7
	Var-F8 Combined Mag Prod.	66	3.0	0.44	0.96	2273	49.6	18.4	3.50	1.56	3.29	0.15	9.51	4.4		2.0	3.5	2.9	1.1	18.3	6.1	34.5
	Head (calc.)	2206	100	0.30	0.65		72.7	15.6	3.65	4.36	0.54	0.07	0.82	100		100	100	100	100	100	100	100
	Head (Dir.)			0.32	0.69		72.9	15.5	3.57	4.49	0.48	0.08	0.74									
F9	Var-F9 Li 3rd Cl Conc.	285	13.6	2.88	6.20		63.8	25.6	0.67	1.08	0.24	0.05	0.99	82.0		11.6	22.6	3.3	3.4	10.6	26.4	31.7
Using Developed Flowsheet on Comp 12 Sample	Var-F9 Li 2nd Cl Conc.	314	15.0	2.76	5.94		64.1	25.3	0.78	1.27	0.25	0.05	0.98	86.6		12.8	24.6	4.2	4.4	12.0	27.4	34.6
	Var-F9 Li 1st Cl Conc.	339	16.2	2.62	5.64		64.5	24.8	0.91	1.48	0.25	0.05	0.96	88.9		14.0	26.1	5.3	5.6	13.1	28.4	36.5
	Var-F9 Li Ro Conc.	409	19.5	2.21	4.77		66.3	23.1	1.23	2.06	0.24	0.04	0.85	90.6		17.3	29.4	8.6	9.4	15.5	31.0	39.3
	Var-F9 Li Ro Tail.	1452	69.3	0.01	0.03		78.7	12.6	2.99	5.00	0.14	0.02	0.15	1.9		73.0	56.8	74.4	80.9	31.6	53.8	24.5
	Var-F9 Mica Conc	63	3.0	0.16	0.34		56.0	27.2	7.68	2.29	0.16	0.04	1.38	1.0		2.2	5.3	8.3	1.6	1.6	4.7	9.7
	Var-F9 Total Slimes	135	6.4	0.29	0.62		69.0	15.6	3.22	4.62	2.30	0.03	0.81	3.9		5.9	6.5	7.4	6.9	48.1	7.5	12.3
	Var-F9 5A Mag Conc	25	1.2	0.64	1.38	5200	62.1	17.7	2.02	2.86	0.54	0.04	3.74	1.6		1.0	1.4	0.9	0.8	2.1	1.8	10.5
	Var-F9 Combined Mag Prod.	36	1.7	0.73	1.57	4952	62.5	18.3	2.20	2.90	0.59	0.05	3.49	2.6		1.4	2.0	1.4	1.2	3.3	3.1	14.2
	Head (calc.)	2095	100	0.48	1.03		74.7	15.4	2.79	4.28	0.31	0.03	0.42	100		100	100	100	100	100	100	100
	Head (Dir.)			0.48	1.03		75.1	15.1	2.70	4.36	0.19	0.03	0.33									

Source: SGS Canada, Project 14120-008 Flotation Tests-Variability August, 2017

14 MINERAL RESOURCE ESTIMATE

The 2022 Project Mineral Resource Estimate presented herein (the 2022 MRE) was prepared by Carl Pelletier, P.Geo. using all available information. The 202 MRE was prepared as part of a mandate assigned by Critical Elements in 2022. The 2022 MRE is primarily based on changes made to the net smelter return (NSR) parameters, supported by new assumptions concerning metal prices and the creation of potentially mineable shape to constrain the MRE for the potential underground extraction scenario. No changes to the interpretation and interpolation parameters were deemed necessary. The mineral resource model for the current MRE is based largely upon the model generated for the 2017 Feasibility Study.

The 2022 main resource area measures 1,600 m along strike, 1,300 m wide and 300 m deep. The resource estimate is based on a compilation of all recent diamond drillholes and wireframed mineralized zones largely inspired by previous work. The final model was constructed by InnovExplo of Val-d'Or, QC.

The mineral resources herein are not mineral reserves as they have no demonstrable economic viability. The result of this study is a single Mineral Resource Estimate for 23 mineralized zones. The estimate includes Indicated and Inferred resources for open pit and underground scenarios. The effective date of the resource estimate is May 27, 2022, based on compilation status.

14.1 Drillhole Database

The GEMS diamond drillhole database (the GEMS database) contains 255 surface drillholes (29,135.5 m; Figure 14.1) including the condemnation holes for which there are no samples. A subset of 202 holes cut across the mineralized zones of the Project (this total includes holes from the zones formerly known as the JR and Hydro showings). All 255 holes in the GEMS database were compiled and validated for the resource estimate.

The information for the 202 diamond drillholes includes lithological descriptions taken from drill core logs, as well as 4,631 sampled intervals amounting to 4,145 m of core. The holes cover the strike-length of the Project at a drill spacing of 30 to 70 m (mostly less than 50 m).

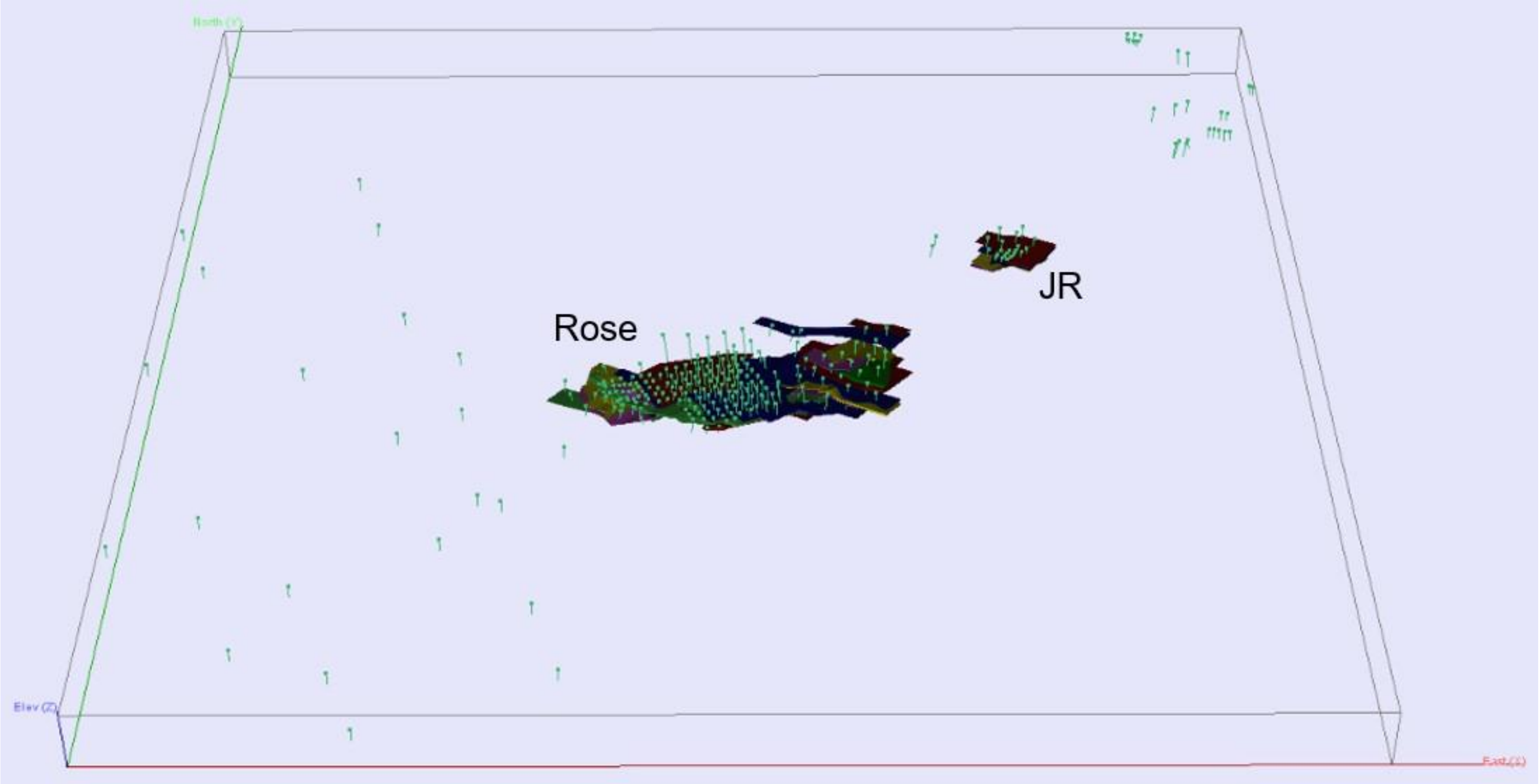
In addition to basic tables of raw data, the GEMS database also includes several tables of calculated drillhole composites and wireframe solid intersections, which were used for the statistical evaluation and resource block modelling.

Data verification by the QP comprised the following and is summarized in Item 12:

- A review of QA/QC protocols and downhole surveys;
- A review of assays and the descriptions of lithologies, alterations and structures in the database; and
- Confirmation that there are no mined-out areas.

Twelve drill core quarter-splits were collected during the 2011 site visit and sent them to the laboratory for an independent review.

Figure 14.1: Surface Plan View of the Drillholes in the GEMS Database



Note: Perspective view looking north - image not to scale

14.2 Interpretation of Mineralized Zones

In order to conduct accurate resource modelling, the mineralized-zone wireframe model was based on the GEMS database and the author's knowledge of the Project and similar deposits.

The interpretation of the Project was based on geological and grade continuity using transverse sections spaced 50 m apart.

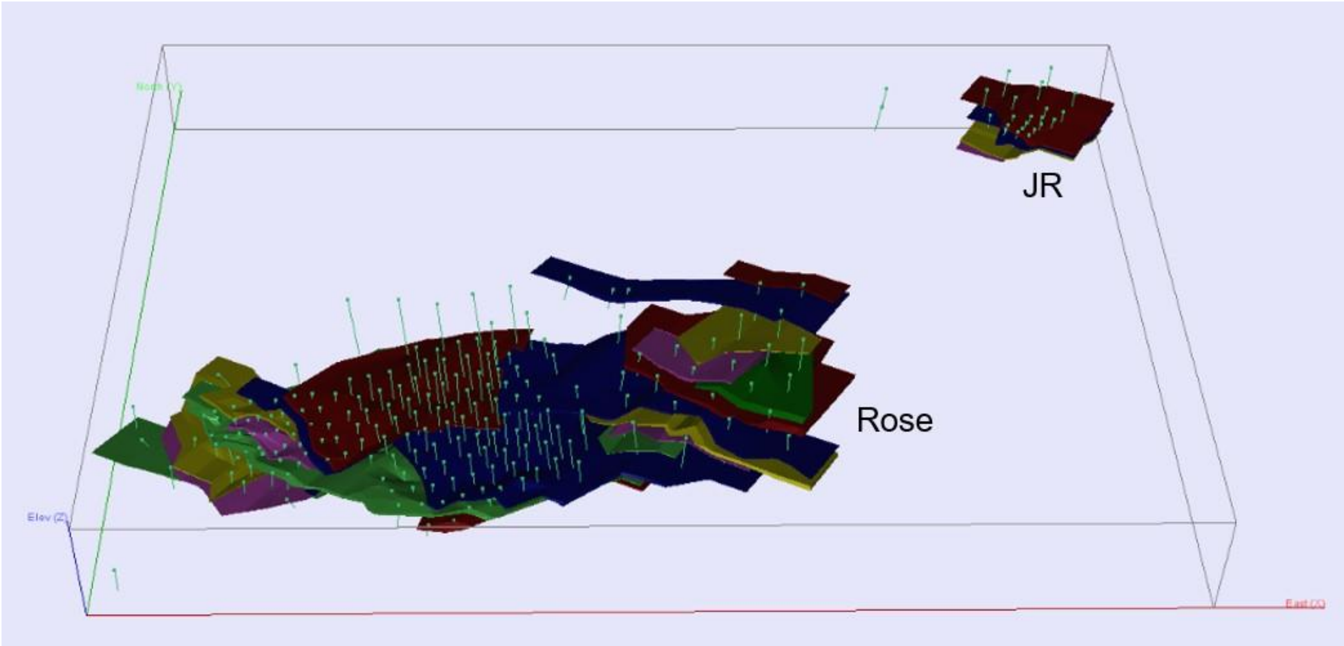
The model comprises 23 mineralized solids that honour the drillhole database. A total of 1,084 construction lines were created (233 3D rings and 851 tie lines), all of which were snapped to drillhole intercepts to produce valid solids.

The mineralized zones were defined solely on lithium and tantalum grades and did not take into account other elements (Rb, Cs, Ga, Be). However, these other elements were interpolated inside the mineralized zones.

Two surfaces were also created to define topography and overburden. These surfaces were generated from drillhole descriptions and survey information provided by CELC.

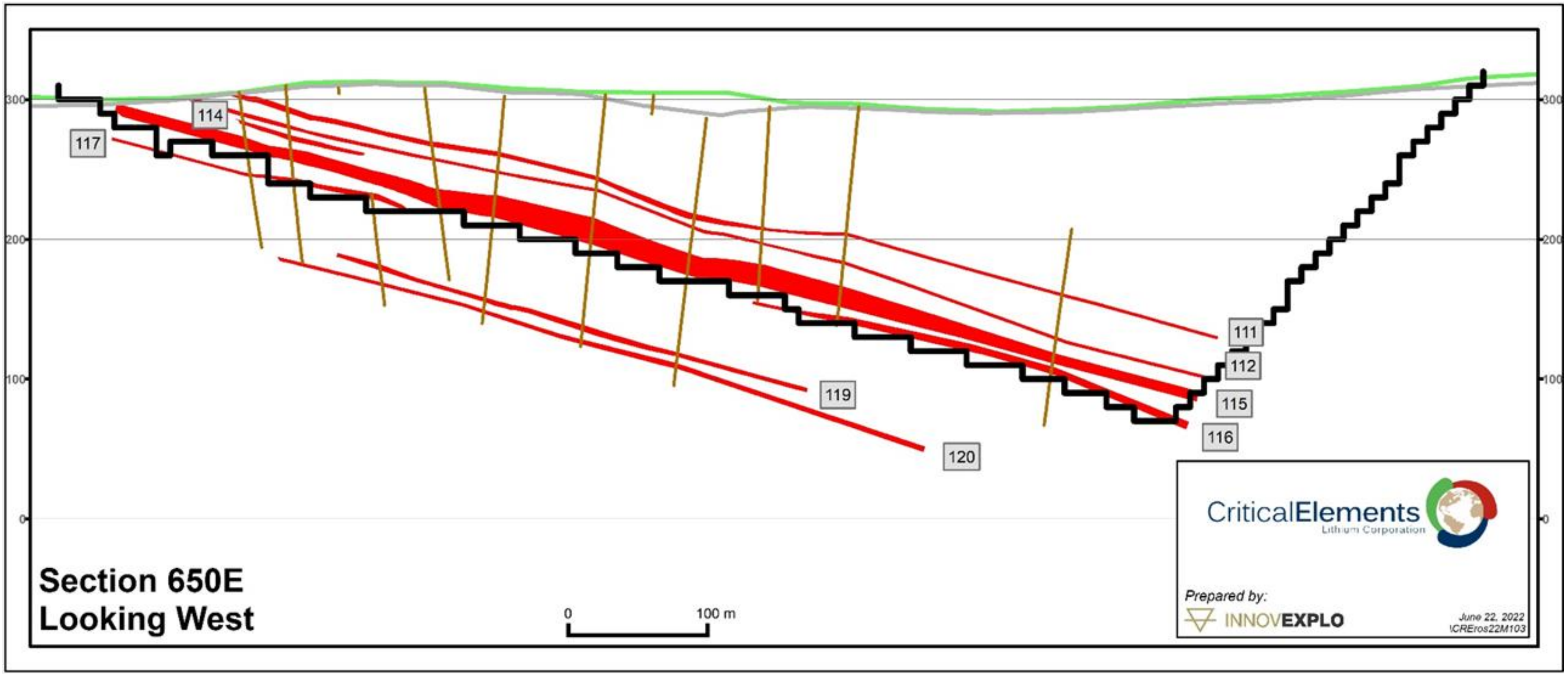
Figure 14.2 presents a 3D view of the mineralized solids with drillholes used for the resource estimate. Figure 14.3 presents a typical cross-section through the Project.

Figure 14.2: 3D View of the Mineralized Model for the Project



Note: Perspective view looking north - image not to scale

Figure 14.3: Section View Looking West of the Mineralized Model for the Project and Resource Pit Shell



14.3 Voids Model

The Project was never the subject of underground or surface excavation work.

14.4 High-Grade Capping

Codes were automatically attributed to all drillhole assay intervals that intersect the mineralized zones using the name of the 3D solids, and these coded intercepts were used to analyze sample lengths and generate statistics for high-grade capping and composites.

Basic univariate statistics were performed on the raw assay dataset.

- The following criteria were used to decide whether capping was warranted or not (inspired by Parrish, 1997), and to determine the threshold when warranted:
- If the quantity of metal contained in the last decile is above 40%, capping is warranted; if below 40%, the uncapped dataset may be used.
- No more than 10% of the overall contained metal must be contained within the first 1% of the highest grade samples.
- The probability plot of grade distribution must not show abnormal breaks or scattered points outside of the main distribution curve.
- The log normal distribution of grades must not show any erratic grade bins nor distanced values from the main population.

Table 14.1 and Table 14.2 present a summary of the statistical analysis for each element. Figure 14.4 to Figure 14.9 show graphs supporting the capping threshold decisions.

Table 14.1: Summary Statistics for the Raw Lithium Assays

Dataset	Rockcode	Count	Lithium (ppm)						
			Max	Uncut Mean	High-Grade Capping	Cut mean	# of samples cut	% of samples cut	COV
Mineralized Zone RO_01	101	4	97	69	15 000	69	0	0.00%	0.36
Mineralized Zone RO_02	102	19	5 670	422	15 000	422	0	0.00%	2.96
Mineralized Zone RO_03	103	6	2 490	556	15 000	556	0	0.00%	1.56
Mineralized Zone RO_04	104	25	12 300	2 972	15 000	2 972	0	0.00%	1.14
Mineralized Zone RO_05	105	46	10 750	3 494	15 000	3 494	0	0.00%	0.88
Mineralized Zone RO_06	106	50	9 000	1 349	15 000	1 349	0	0.00%	1.58
Mineralized Zone RO_07	107	46	14 350	981	15 000	981	0	0.00%	2.42
Mineralized Zone RO_08	108	103	12 800	3 759	15 000	3 759	0	0.00%	0.98
Mineralized Zone RO_09	109	23	9 010	894	15 000	894	0	0.00%	2.29
Mineralized Zone RO_10	110	10	135	51	15 000	51	0	0.00%	0.60
Mineralized Zone RO_11	111	79	6 720	365	15 000	365	0	0.00%	2.65
Mineralized Zone RO_12	112	380	17 400	3 230	15 000	3 223	1	0.26%	1.14
Mineralized Zone RO_13	113	9	8 110	1 632	15 000	1 632	0	0.00%	1.73
Mineralized Zone RO_14	114	43	7 860	880	15 000	880	0	0.00%	1.76
Mineralized Zone RO_15	115	1 705	19 300	5 242	15 000	5 234	5	0.29%	0.71
Mineralized Zone RO_16	116	159	14 050	2 530	15 000	2 530	0	0.00%	1.25
Mineralized Zone RO_17	117	24	9 800	3 336	15 000	3 336	0	0.00%	0.98
Mineralized Zone RO_18	118	60	16 100	629	15 000	611	1	1.67%	3.26
Mineralized Zone RO_19	119	179	13 500	2 706	15 000	2 706	0	0.00%	1.26
Mineralized Zone RO_20	120	57	9 380	874	15 000	874	0	0.00%	2.15
Mineralized Zone JR_01	201	139	13 000	4 432	15 000	4 432	0	0.00%	0.81
Mineralized Zone JR_02	202	82	12 700	3 290	15 000	3 290	0	0.00%	0.91
Mineralized Zone JR_03	203	20	5 050	1 287	15 000	1 287	0	0.00%	1.32
Mineralized Zone JR_04	204	11	1 380	417	15 000	417	0	0.00%	0.90

Table 14.2: Summary Statistics for the Raw Tantalum Assays

Dataset	Rockcode	Count	Tantalum (ppm)						
			Max	Uncut Mean	High-Grade Capping	Cut Mean	# of samples cut	% of samples cut	COV
Mineralized Zone RO_01	101	4	200	183	1 000	183	0	0.00%	0.08
Mineralized Zone RO_02	102	19	470	300	1 000	300	0	0.00%	0.32
Mineralized Zone RO_03	103	6	860	276	1 000	276	0	0.00%	0.96
Mineralized Zone RO_04	104	25	550	190	1 000	190	0	0.00%	0.73
Mineralized Zone RO_05	105	46	520	192	1 000	192	0	0.00%	0.51
Mineralized Zone RO_06	106	50	760	182	1 000	182	0	0.00%	0.77
Mineralized Zone RO_07	107	46	450	165	1 000	165	0	0.00%	0.82
Mineralized Zone RO_08	108	103	680	163	1 000	163	0	0.00%	0.85
Mineralized Zone RO_09	109	23	620	232	1 000	232	0	0.00%	0.85
Mineralized Zone RO_10	110	10	450	111	1 000	111	0	0.00%	1.13
Mineralized Zone RO_11	111	79	520	183	1 000	183	0	0.00%	0.64
Mineralized Zone RO_12	112	380	10 000	154	1 000	131	1	0.26%	0.87
Mineralized Zone RO_13	113	9	553	308	1 000	308	0	0.00%	0.57
Mineralized Zone RO_14	114	43	630	210	1 000	210	0	0.00%	0.78
Mineralized Zone RO_15	115	1 705	2 030	138	1 000	137	1	0.06%	0.68
Mineralized Zone RO_16	116	159	600	123	1 000	123	0	0.00%	0.73
Mineralized Zone RO_17	117	24	270	118	1 000	118	0	0.00%	0.67
Mineralized Zone RO_18	118	60	1 140	197	1 000	194	1	1.67%	1.09
Mineralized Zone RO_19	119	179	750	183	1 000	183	0	0.00%	0.63
Mineralized Zone RO_20	120	57	450	145	1 000	145	0	0.00%	0.73
Mineralized Zone JR_01	201	139	940	126	1 000	126	0	0.00%	0.82
Mineralized Zone JR_02	202	82	420	121	1 000	121	0	0.00%	0.69
Mineralized Zone JR_03	203	20	190	104	1 000	104	0	0.00%	0.50
Mineralized Zone JR_04	204	11	170	69	1 000	69	0	0.00%	0.77

Figure 14.4: Graphs Supporting a Capping Grade of 15,000 ppm Li for Mineralized Zones

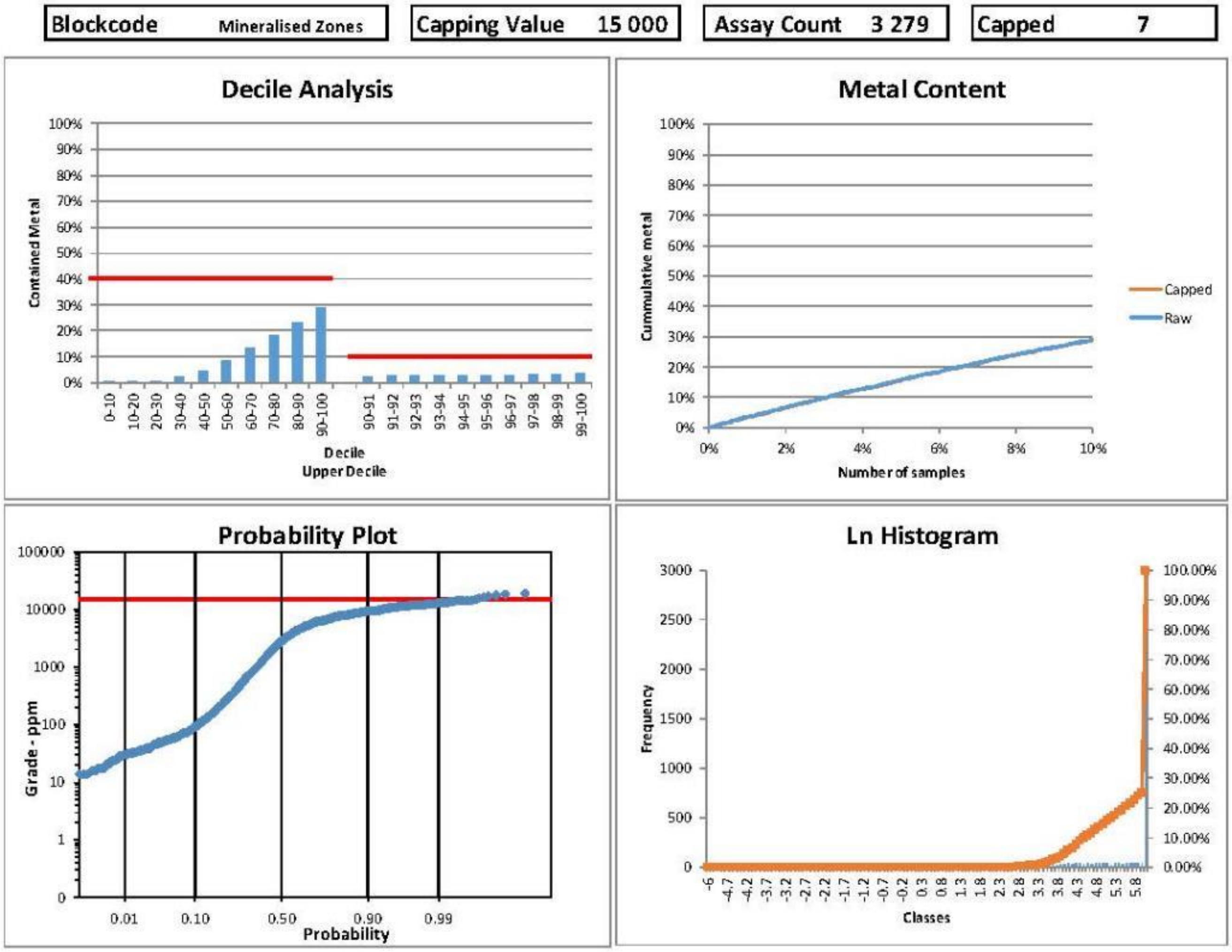


Figure 14.5: Graphs Supporting a Capping Grade of 1,000 ppm Ta for Mineralized Zones

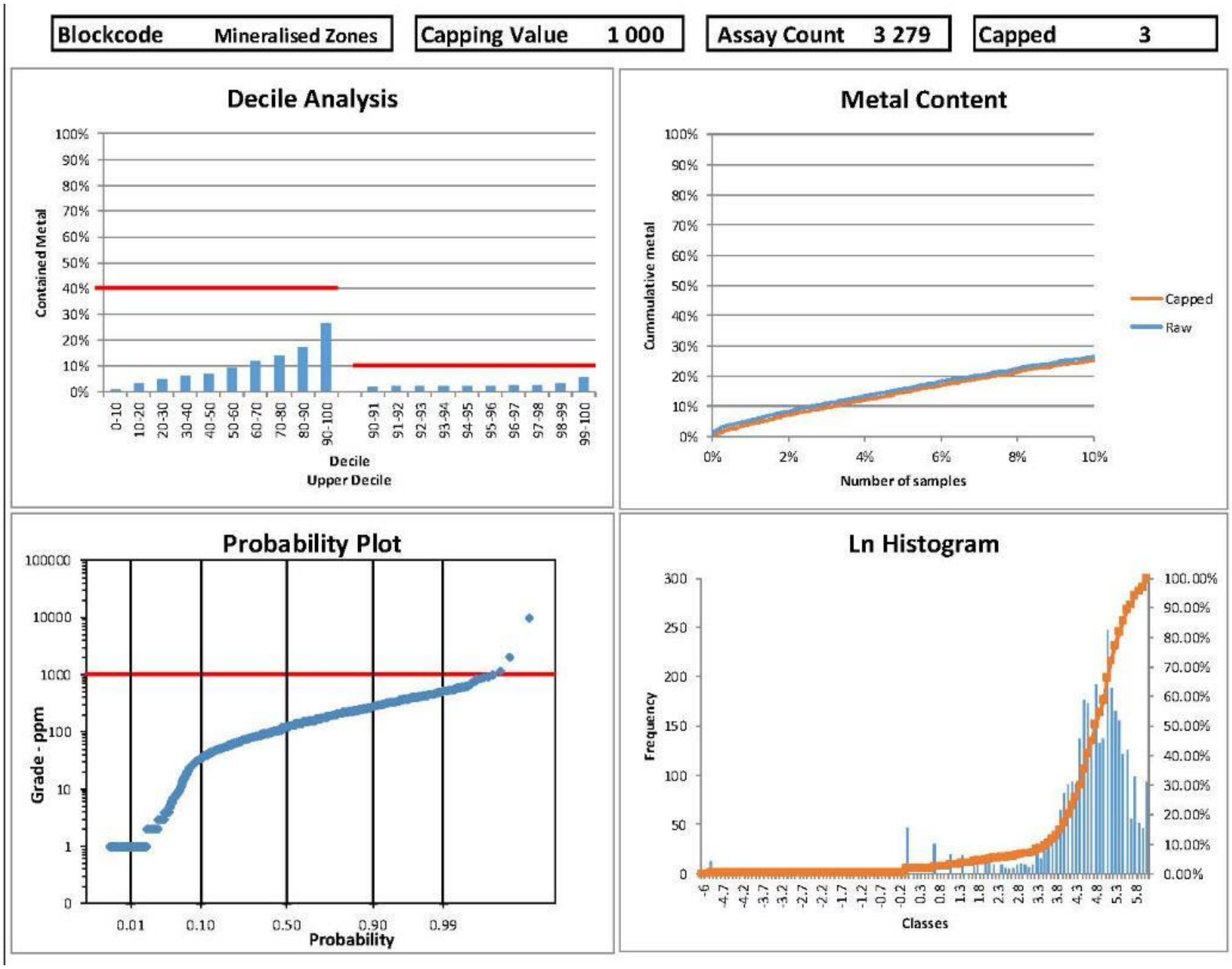


Figure 14.6: Graphs Supporting a Capping Grade of 10,000 ppm Rb for Mineralized Zones

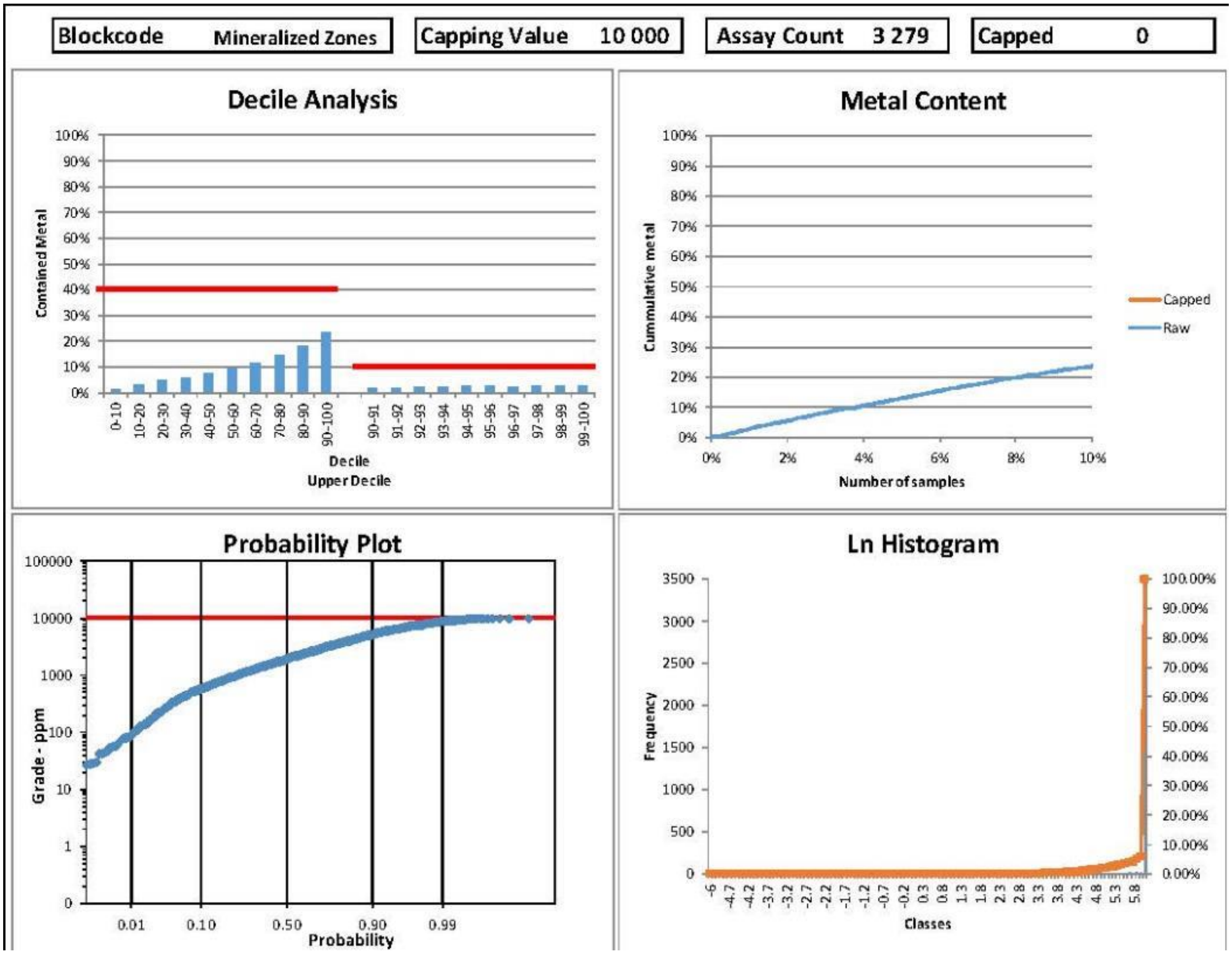


Figure 14.7: Graphs Supporting a Capping Grade of 2,000 ppm Cs for Mineralized Zones

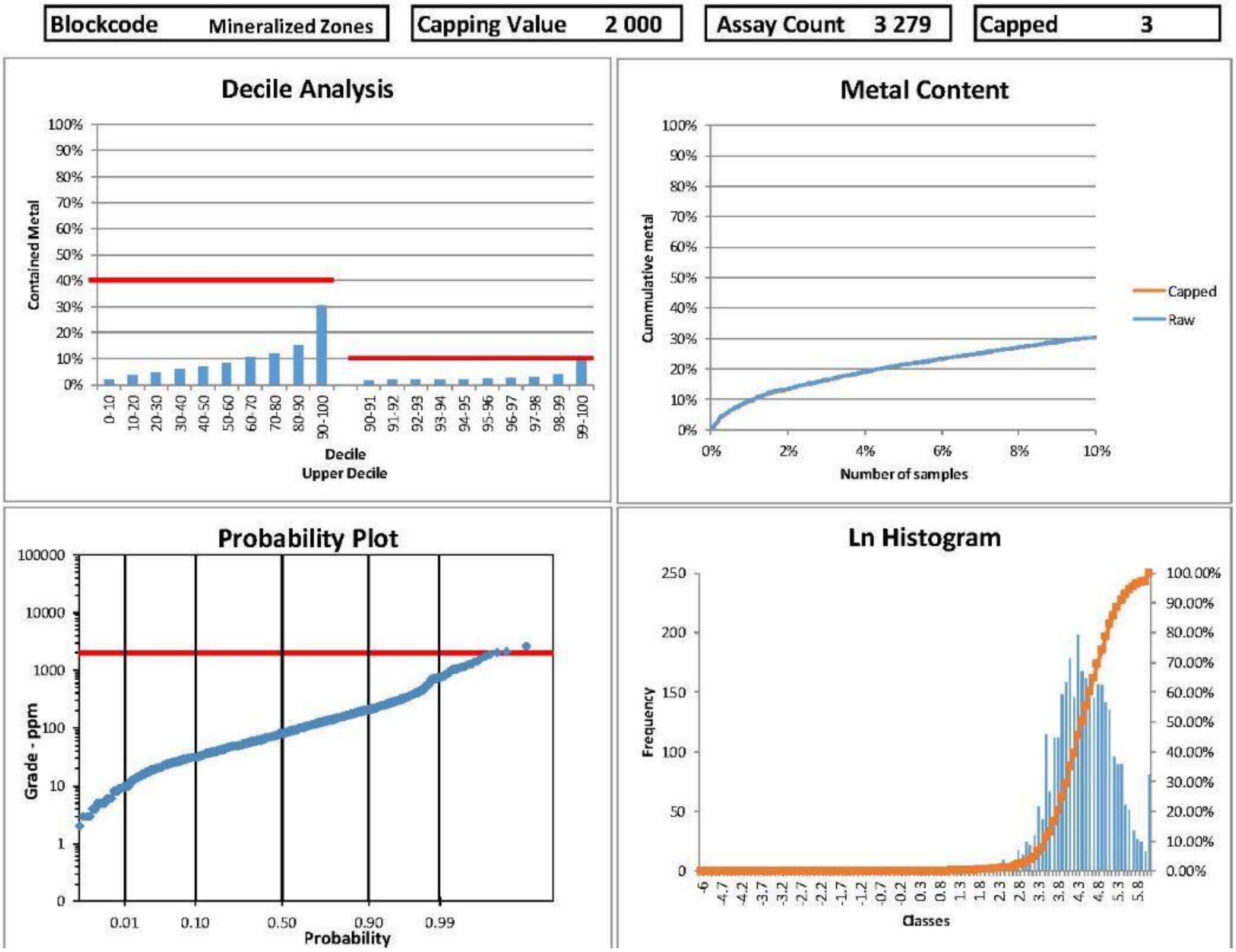


Figure 14.8: Graphs Supporting a Capping Grade of 150 ppm Ga for Mineralized Zones

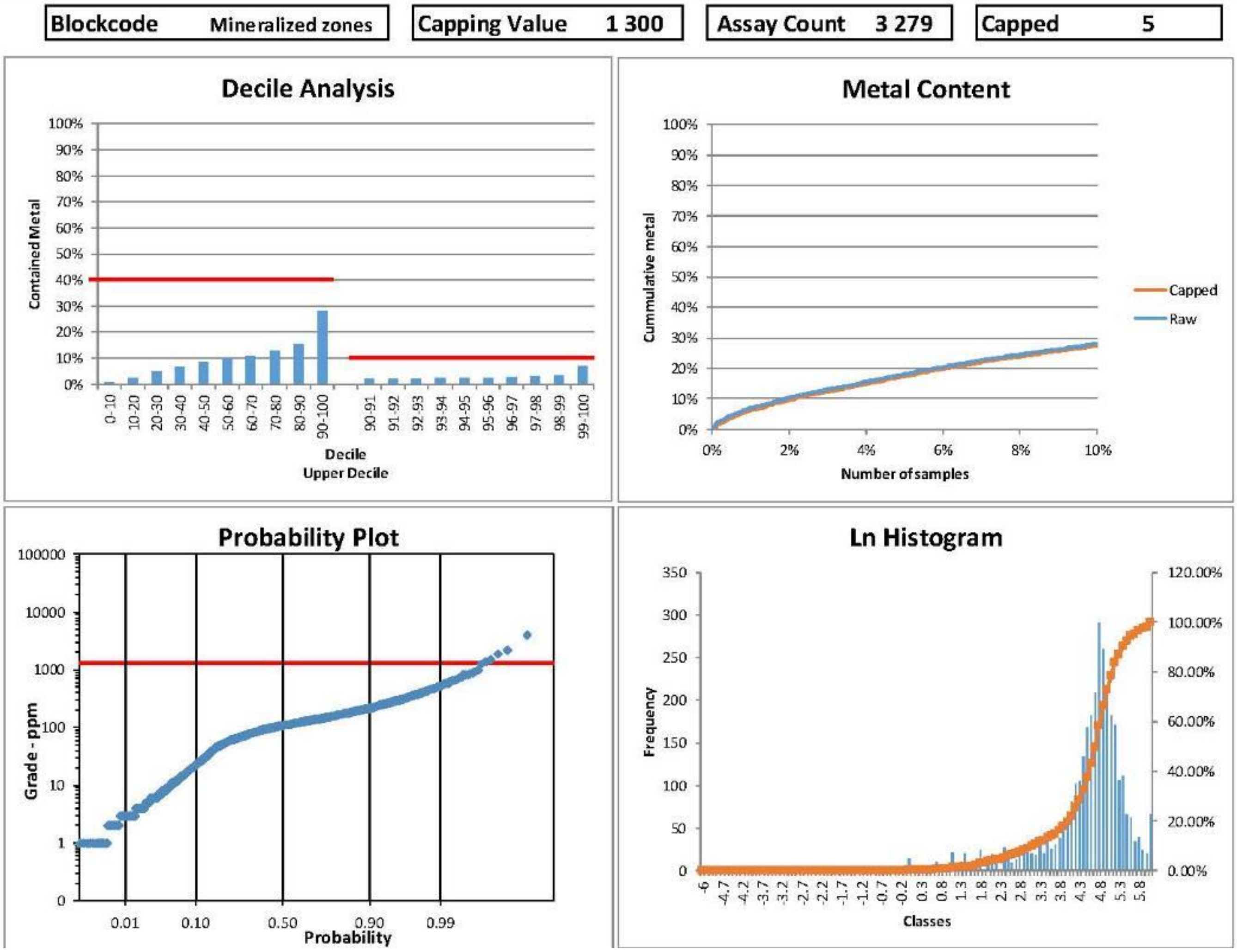
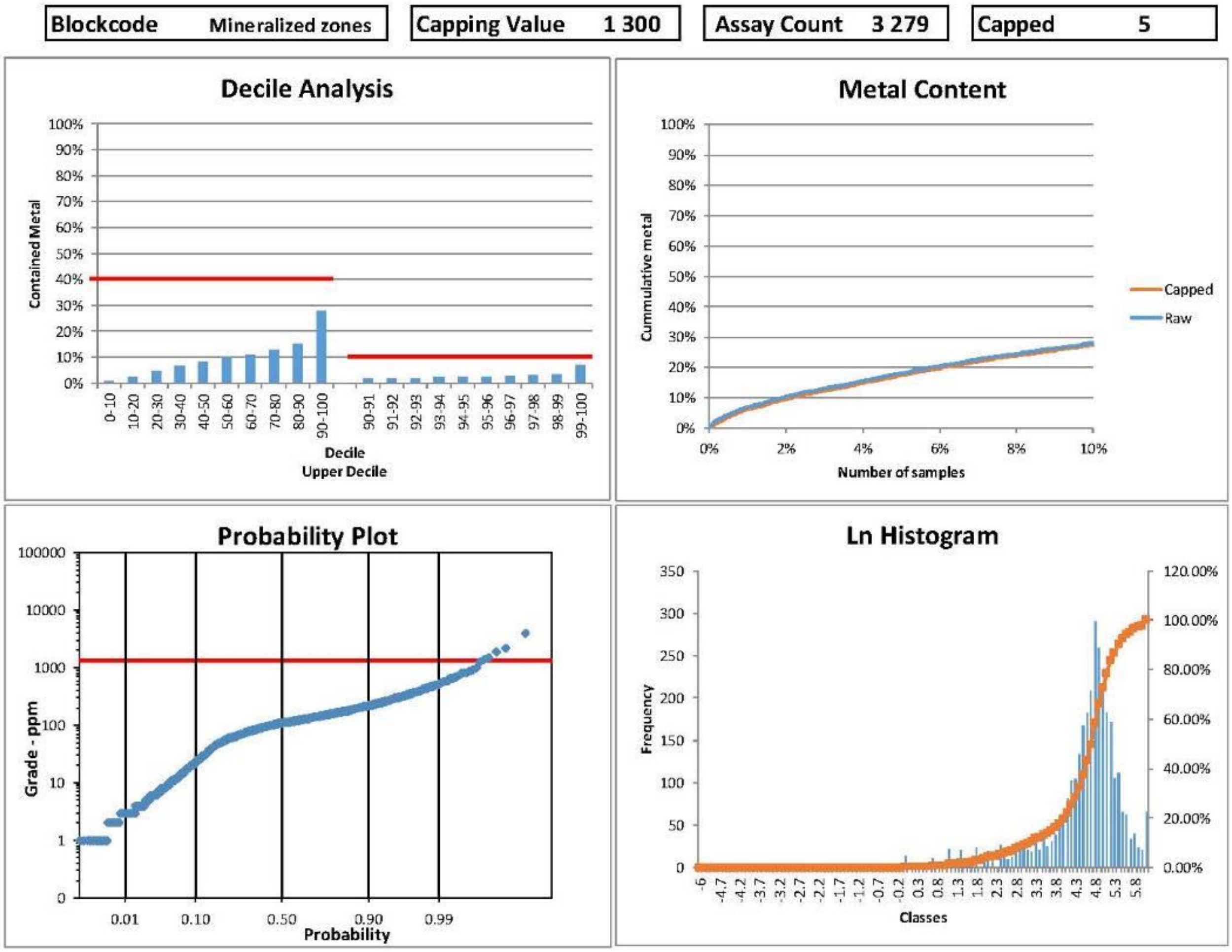


Figure 14.9: Graphs Supporting a Capping Grade of 1,300 ppm Be for Mineralized Zones



14.5 Compositing

In order to minimize any bias introduced by the variable sample lengths, capped DDH assays were composited.

For geological and statistical reasons, a 2-m composite, with an allowable spread of 1.5 to 3 m was selected as the logical option for the Project. The total number of composites used in the DDH dataset is 1,830. A grade of 0.00 ppm was assigned to missing sample intervals. Table 14.3 shows the basic statistics for composites by zone.

Table 14.3: Summary Statistics for Composites

Dataset	Rockcode	Count	Lithium			Tantalum		
			Max (ppm)	Mean (ppm)	COV	Max (ppm)	Mean (ppm)	COV
Mineralized Zone RO_01	101	2	72	59	0.22	171	162	0.06
Mineralized Zone RO_02	102	10	2 515	351	2.08	383	233	0.42
Mineralized Zone RO_03	103	5	1 765	421	1.60	329	146	0.65
Mineralized Zone RO_04	104	12	6 864	3 298	0.71	354	177	0.46
Mineralized Zone RO_05	105	31	8 202	2 789	0.91	389	157	0.66
Mineralized Zone RO_06	106	28	5 877	1 250	1.34	347	151	0.62
Mineralized Zone RO_07	107	46	7 337	467	2.79	345	58	1.25
Mineralized Zone RO_08	108	50	10 346	3 893	0.81	601	151	0.73
Mineralized Zone RO_09	109	13	4 586	796	1.93	347	139	0.81
Mineralized Zone RO_10	110	7	65	25	0.85	234	63	1.24
Mineralized Zone RO_11	111	56	3 592	217	2.85	275	83	0.86
Mineralized Zone RO_12	112	238	14 662	2 690	1.09	2 546	100	1.73
Mineralized Zone RO_13	113	6	5 410	1 527	1.43	266	172	0.34
Mineralized Zone RO_14	114	34	2 503	316	2.00	367	80	1.04
Mineralized Zone RO_15	115	827	14 034	5 415	0.52	564	134	0.55
Mineralized Zone RO_16	116	111	10 407	1 561	1.46	286	71	0.93
Mineralized Zone RO_17	117	10	5 678	2 820	0.81	153	81	0.78
Mineralized Zone RO_18	118	73	7 757	271	3.98	627	75	1.78
Mineralized Zone RO_19	119	115	9 077	2 077	1.22	498	136	0.74
Mineralized Zone RO_20	120	55	5 432	510	2.35	264	70	1.04
Mineralized Zone JR_01	201	53	10 999	4 323	0.66	262	114	0.45
Mineralized Zone JR_02	202	30	7 244	2 957	0.68	246	103	0.54
Mineralized Zone JR_03	203	14	2 657	536	1.56	98	44	0.83
Mineralized Zone JR_04	204	4	603	287	0.77	68	51	0.20

14.6 Density

Densities were used to calculate tonnages from the volume estimates in the resource-grade block model.

The author examined all available data to establish which values could be used for the Project resource estimate. A total of 475 density values were judged adequate for the current study, 296 of which are in mineralized zones and 179 in barren country rocks. The average density value of each individual zone was used in the block model. Although values are considered realistic, additional sampling is recommended in order to improve confidence in the density model.

Based on this information, the QP used the density values presented in Table 14.4.

Table 14.4: Summary Statistics for the Density Database

Unit	Rockcode	Blockcode	Count	Min	Max	Average	Median	COV	Density Used
Mineralized Zones	RO_01	101	2	2.62	2.64	2.63	2.63	0.00	2.63
	RO_02	102	1	2.61	2.61	2.61	2.61	0.00	2.61
	RO_03	103	2	2.62	2.63	2.63	2.63	0.00	2.63
	RO_04	104	4	2.63	2.80	2.70	2.69	0.03	2.70
	RO_05	105	5	2.63	2.77	2.69	2.66	0.02	2.69
	RO_06	106	5	2.62	2.75	2.68	2.65	0.02	2.68
	RO_07	107	6	2.62	2.70	2.66	2.65	0.01	2.66
	RO_08	108	10	2.63	2.79	2.70	2.69	0.02	2.70
	RO_09	109	5	2.61	2.73	2.65	2.63	0.02	2.65
	RO_10	110	3	2.61	2.64	2.63	2.63	0.00	2.63
	RO_11	111	9	2.57	2.67	2.63	2.63	0.01	2.63
	RO_12	112	27	2.53	2.85	2.71	2.73	0.03	2.71
	RO_13	113	3	2.63	2.64	2.64	2.64	0.00	2.64
	RO_14	114	7	2.61	2.79	2.66	2.65	0.02	2.66
	RO_15	115	125	2.33	3.00	2.72	2.73	0.03	2.72
	RO_16	116	12	2.60	2.85	2.69	2.66	0.03	2.69
	RO_17	117	2	2.64	2.80	2.72	2.72	0.03	2.72
	RO_18	118	8	2.63	2.75	2.68	2.67	0.02	2.68
	RO_19	119	24	2.53	2.81	2.67	2.67	0.02	2.67
	RO_20	120	10	2.62	3.15	2.73	2.66	0.06	2.73
	JR_01	201	10	2.62	2.82	2.70	2.68	0.03	2.70
	JR_02	202	10	2.61	2.76	2.69	2.68	0.02	2.69
	JR_03	203	3	2.61	2.67	2.65	2.66	0.01	2.65
	JR_04	204	3	2.62	2.65	2.63	2.63	0.00	2.63
Lithologies	Amphibolite	510	41	2.68	3.18	2.96	3.02	0.05	2.96
	Gneiss	520	108	2.56	3.10	2.78	2.75	0.04	2.78
	Metasediment	530	4	2.73	3.05	2.84	2.80	0.04	2.84
	Porphyry	540	26	2.65	3.05	2.76	2.73	0.03	2.76

14.7 Block Model

The block model covers an area sufficient to host an open pit and has been pushed down to a depth of approximately 300 m below surface. The block model was rotated. Block dimensions reflect the sizes of the mineralized zones and plausible mining methods. Table 14.5 provides the properties of the block model.

Table 14.5: Block Model Properties

Properties	X (Columns)	Y (Rows)	Z (Levels)
Origin coordinates (UTM NAD83)	418 875	5 763 460	350
Block size (m)	5	5	5
Number of blocks	530	550	88
Block model extent (m)	2 650	2 750	440
Rotation		-26	

All blocks with more than 0.001% of their volume falling within a selected solid were assigned the corresponding solid block code in their respective folder. A percent block model was generated, reflecting the proportion of each block inside every solid (i.e. individual mineralized zones, individual lithological domains, overburden, and country rock).

Table 14.6 provides details about the naming convention for the corresponding GEMS solids, as well as the rock codes and block codes assigned to each individual solid. The multi-folder percent block model thus generated was used for the mineral resource estimation.

Table 14.6: Block Model Naming Convention and Codes

Workspace	Description	Rockcode	GEMS Triangulation Name			Precedence
			Name 1	Name 2	Name 3	
Group_A	Mineralized Zone RO_01	101	RO_01	Clip	F161215	101
	Mineralized Zone RO_03	103	RO_03	Clip	F161215	103
	Mineralized Zone RO_05	105	RO_05	Clip	F161215	105
	Mineralized Zone RO_07	107	RO_07	Clip	F161215	107
	Mineralized Zone RO_09	109	RO_09	Clip	F161215	109
	Mineralized Zone RO_12	112	RO_12	Clip	F161215	112
	Mineralized Zone RO_14	114	RO_14	Clip	F161215	114
	Mineralized Zone RO_16	116	RO_16	Clip	F161215	116
	Mineralized Zone RO_17	117	RO_17	Clip	F161215	117
	Mineralized Zone RO_19	119	RO_19	Clip	F161215	119
	Mineralized Zone JR_01	201	JR_01	Clip	F161215	201
	Mineralized Zone JR_03	203	JR_03	Clip	F161215	203
Group_B	Mineralized Zone RO_02	102	RO_02	Clip	F161215	102
	Mineralized Zone RO_04	104	RO_04	Clip	F161215	104
	Mineralized Zone RO_06	106	RO_06	Clip	F161215	106
	Mineralized Zone RO_08	108	RO_08	Clip	F161215	108
	Mineralized Zone RO_10	110	RO_10	Clip	F161215	110
	Mineralized Zone RO_11	111	RO_11	Clip	F161215	111

Workspace	Description	Rockcode	GEMS Triangulation Name			Precedence
			Name 1	Name 2	Name 3	
	Mineralized Zone RO_13	113	RO_13	Clip	F161215	113
	Mineralized Zone RO_15	115	RO_15	Clip	F161215	115
	Mineralized Zone RO_18	118	RO_18	Clip	F161215	118
	Mineralized Zone RO_20	120	RO_20	Clip	F161215	120
	Mineralized Zone JR_02	202	JR_02	Clip	F161215	202
	Mineralized Zone JR_04	204	JR_04	Clip	F161215	204
CR	Predominantly Amphibolite	510	Amphibolites block1	Clip	F161215	510
		510	Amphibolites block2	Clip	F161215	510
		510	Amphibolites block3	Clip	F161215	510
		510	Amphibolites block4	Clip	F161215	510
	Predominantly Gneiss	520	Gneiss block1	Clip	F161215	520
		520	Gneiss block2	Clip	F161215	520
		520	Gneiss block3	Clip	F161215	520
		520	Gneiss block4	Clip	F161215	520
	Predominantly Metasediment	530	Metasediments block1	Clip	F161215	530
		530	Metasediments block2	Clip	F161215	530
		530	Metasediments block3	Clip	F161215	530
		530	Metasediments block4	Clip	F161215	530
	Predominantly Porphyry	540	Porphyry block1	Clip	F161215	540
		540	Porphyry block2	Clip	F161215	540
		540	Porphyry block3	Clip	F161215	540
		540	Porphyry block4	Clip	F161215	540
OB	Overburden	50	OB	Solid	F161215	50

14.8 Variography and Search Ellipsoids

Three-dimensional directional variography was completed for the main mineralized zone using DDH composites of capped assay data. The study was carried out in Supervisor software. The directional-specific investigations yielded the best-fit model along an orientation that corresponds to the strike and dip of the mineralized zones. Lithium and tantalum, but also other elements such as rubidium, cesium, gallium, and beryllium, were investigated.

Figure 14.10 and Figure 14.11 show examples of the main zone variography results for lithium and tantalum, respectively.

Two ellipsoids were built from the results of the variography study. These correspond to: a) one quarter (1/4x) of the variography ranges; and b) whole (1x) variography ranges. Figure 14.12 shows the Pass 1 ellipsoid for the main zone on a 3D view.

Figure 14.10: Example of Variography Study for Lithium in the Main Zone

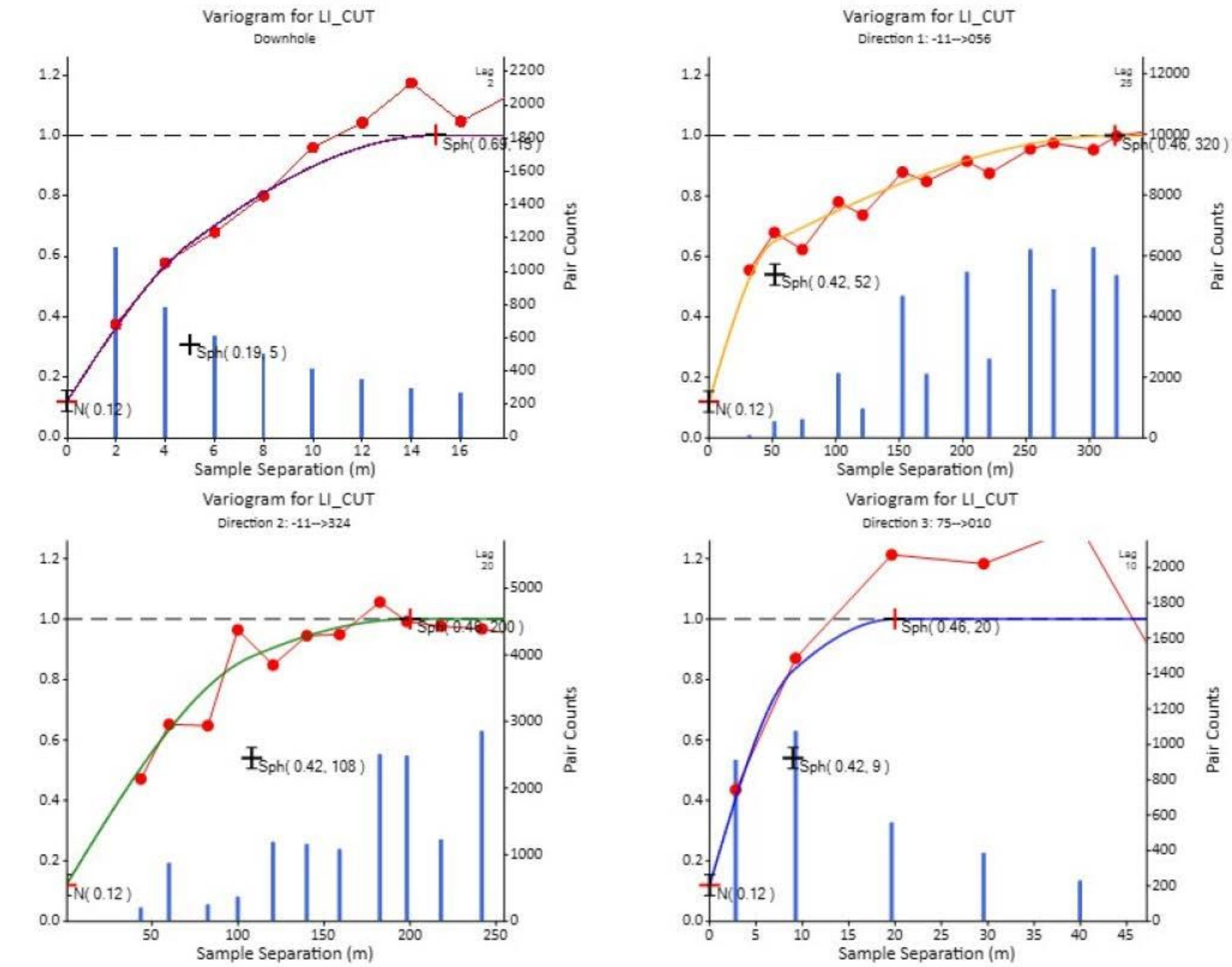


Figure 14.11: Example of Variography Study for Tantalum in the Main Zone

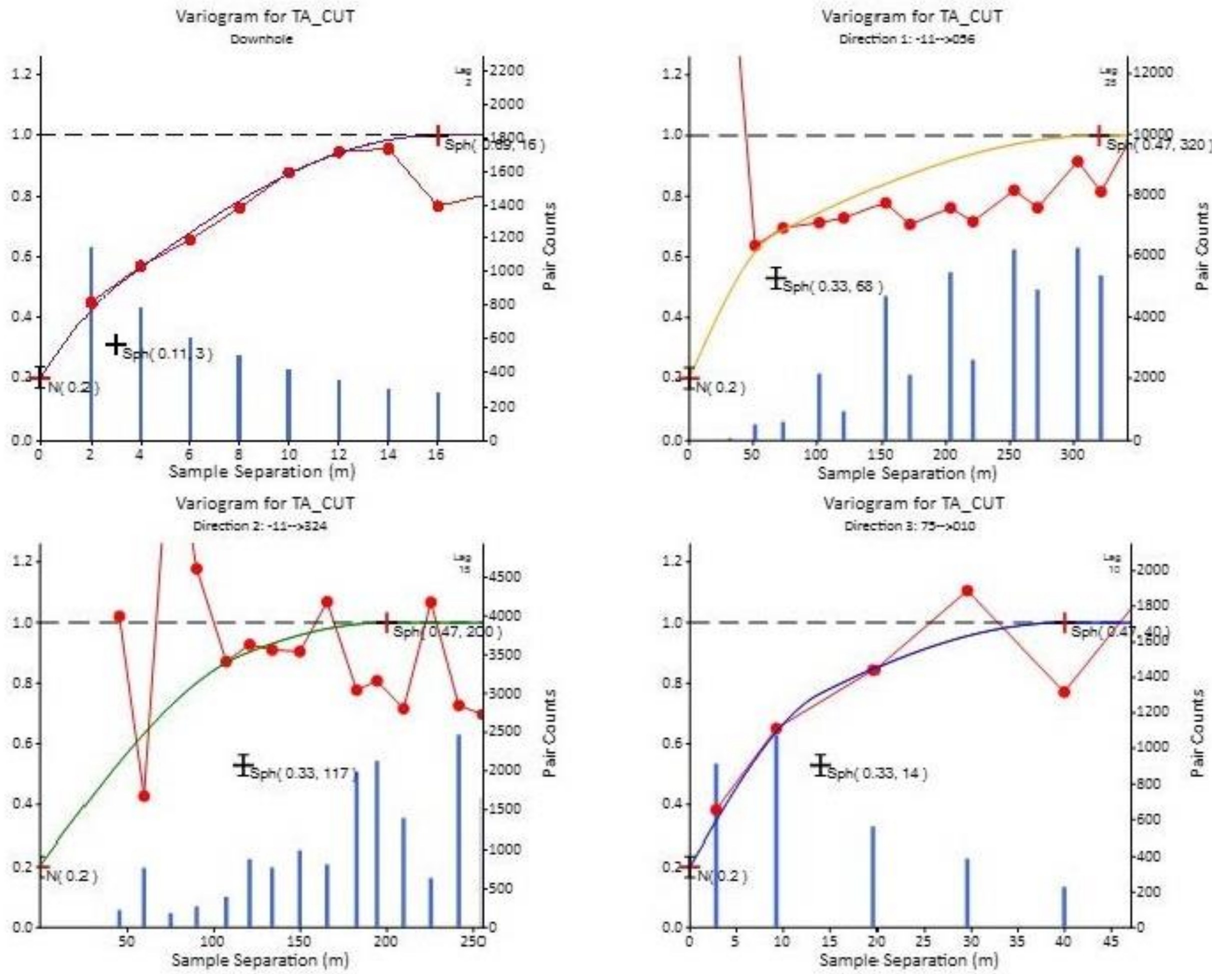
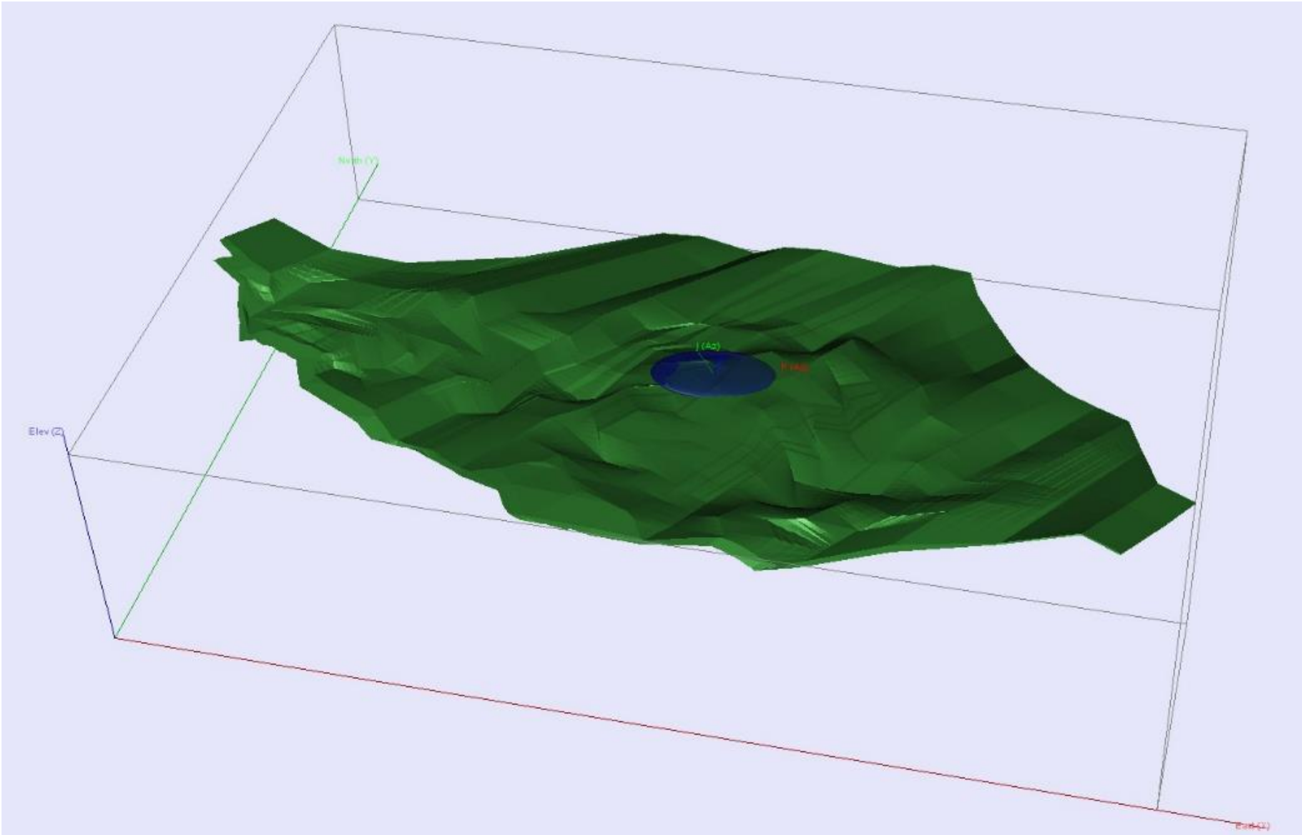


Figure 14.12: 3D View of the Main Zone, Looking North-Northwest, Showing the Ellipsoid used for Pass 1



14.9 Grade Interpolation

The variography study provided the parameters to interpolate the grade model using composites of capped grade data in order to produce the best possible grade estimate for the defined resource. The interpolation was run on a point area workspace extracted from the DDH dataset.

The composite points were assigned block codes corresponding to the mineralized zone in which they occur. The interpolation profiles specify a single composite block code for each mineralized-zone solid, thus establishing hard boundaries between the mineralized zones and preventing block grades from being estimated using sample points with different block codes than the block being estimated.

The interpolation profiles were customized to estimate grades separately for each of the mineralized zones. After multiple methods were considered (ID^2, ID^3, OK, NN), the ordinary kriging (OK) method was selected for the final resource estimation as it better honour the grade distribution of the Project.

Two passes were defined. The ellipsoid radiuses from Pass 1 were established using one quarter of the variography ranges. Ellipsoid radiuses from Pass 2 used the full ranges. Pass 2 interpolated only those blocks that were not interpolated during Pass 1.

Parameters used to interpolate Lithium and Tantalum during Pass 1 were as follows:

- ¼ variography range results;
- Minimum 2 holes;
- Minimum 6 composites;
- Maximum 18 composites.

Parameters used to interpolate Lithium and Tantalum during Pass 2 were as follows:

- 1x variography range results;
- Minimum 4 composites;
- Maximum 18 composites.

14.10 Resource Categories

14.10.1 Mineral Resource Classification Definition

The resource classification definitions used for this report are those published by the Canadian Institute of Mining, Metallurgy and Petroleum in their document 'CIM Definition Standards for Mineral Resources and Reserves' (CIM, 2014).

Measured Mineral Resource: that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are so well established that they can be estimated with confidence sufficient to allow the appropriate application of technical and economic parameters, to support production planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough to confirm both geological and grade continuity.

Indicated Mineral Resource: that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

Inferred Mineral Resource: that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drillholes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies.

14.10.2 Mineral Resource Classification

All interpolated blocks were assigned to the Inferred category during the creation of the grade block model, ensuring that sufficient continuity was observed in order to avoid isolated blocks being interpolated by only one hole. Moreover, the average maximum distance to any composite was set at approximately 100 m.

The reclassification to an Indicated category was done for blocks meeting all the conditions below:

- Blocks showing geological and grade continuity
- Blocks from well-defined mineralized zones only
- Blocks from Pass 1
- Blocks interpolated by a minimum of two holes
- Blocks for which the distance to the closest composite is less than 40 m

A series of outline rings (clipping boundaries) were created in long views using the criteria described above, while keeping in mind that a significant cluster of blocks is necessary to obtain a resource. Within the Indicated resource outlines, some Inferred blocks were upgraded to the Indicated category, whereas outside these outlines, some Indicated blocks were downgraded to the Inferred category. The author is of the opinion that this was a necessary step to homogenize (smooth out) the resource volumes in each category, and to avoid isolated blocks from being included in the Indicated category.

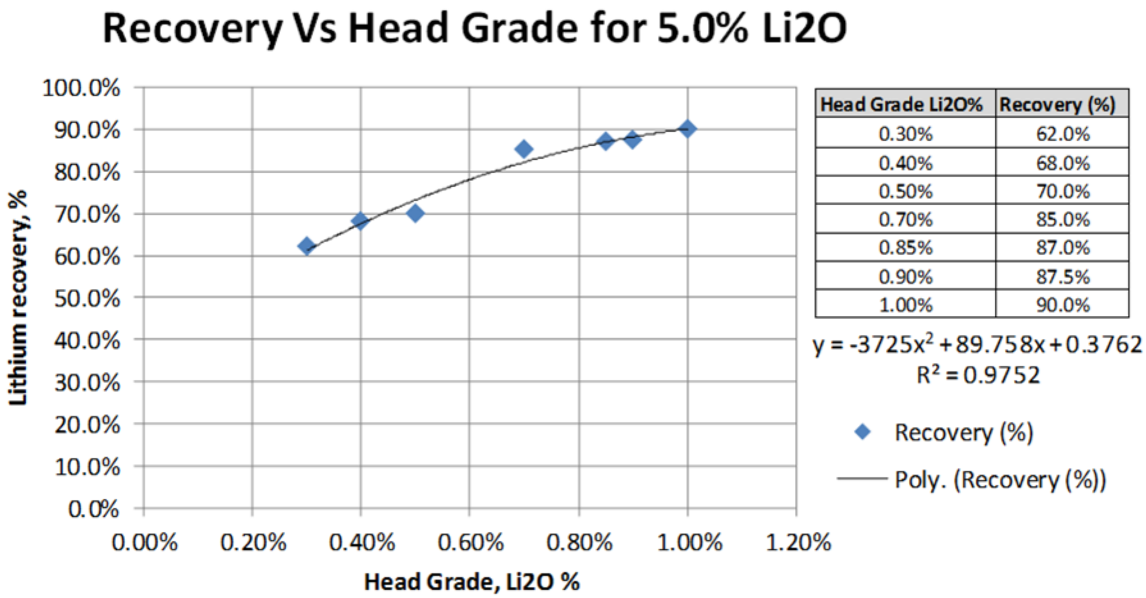
14.11 Metallurgical Recovery and NSR Calculation

Given the polymetallic (Li and Ta) nature of the mineralization comprising the Project, the author created an NSR block model by calculating the value of each mineralized block.

A lithium recovery formula was provided by Paul Bonneville, a representative of CELC. The formula applied a top-cut recovery value of 91.6905% for any lithium grade above 5,595 ppm. Furthermore, a lithium recovery of 0% was applied to Zone 119 as requested by CELC.

Figure 14.13 shows the seven tests results and the metallurgical recovery formula derived from them. InnovExplo has not seen the study supporting these values.

Figure 14.13: Lithium Recovery based on Lithium Grade



Note: Figure compiled from data provided by Paul Bonneville.

A fixed recovery of 64% was applied to tantalum throughout the deposit. This recovery value was provided by Paul Bonneville, a representative of CELC. The author has not seen the study supporting this value.

No penalty was applied to the NSR calculation as no supporting information was provided to the author. The resultant is Lithium and Tantalum being payable where all other elements (Rb, Cs, Ga, Be) do not contribute to the economics of the deposit.

The NSR calculation used a USD/CAD exchange rate of 1.30, a lithium price of US$20,000 per tonne Li_2O, and a tantalum price of US$130 per kilogram Ta_2O_5. These exchange rate and metal prices were provided by Paul Bonneville, a representative of CELC.

Using the information provided to the author mentioned above, the NSR value is given by the following formula:

NSR Value = [(Li_2OGrade (%) x LiRecovery (%) x LiPrice ($) x Exchange Rate) – (Concentrate Transport Cost x Exchange Rate x Li_2OGrade (%) / AverageMillFeedGrade (%))] + (Ta_2O_5Grade (%) x TaRecovery (%) x TaPrice ($) x Exchange Rate).

Metallurgical Recoveries: The resource model recovery information was provided to Mr. Bonneville, P.Eng., by Sunil Koppalkar, Senior Metallurgist for Bumigeme Inc., via email on August 29, 2017. Mr. Koppalkar mentioned in his email that the grade recovery curve was developed based on recent metallurgical test work on low-grade composites at SGS Minerals Lakefield.

Metal Prices: Although the author was not provided with confidential contract terms held by CELC, an online review allowed him to confirm that the lithium and tantalum prices submitted by Mr. Bonneville for the resource model (20,000 US$/t Li_2O and 130 US$/kg Ta_2O_5) are in line with recent contract pricing terms in the industry.

Transport Costs: Transport costs used for the resource estimate cut-off grades calculation are identical to what has been used elsewhere in the Report (Item 15). The author reviewed this cost and found it adequate for this study.

14.12 Cut-Off Parameters

Mineral Resources were compiled using a minimum NSR cut-off of CAN$121.12 for the underground potential and CAN$31.40 for the open-pit potential. Parameters used to determine such cut-offs are presented below.

The NSR cut-offs must be re-evaluated continually according to prevailing market conditions and other factors, such as lithium and tantalum prices, exchange rate, mining method, related costs, etc.

14.12.1 Parameters for Determination of In-Pit Resource Cut-Off

The final selected Whittle input parameters for the in-pit Mineral Resource Estimate are defined in Table 14.7.

Table 14.7: Whittle Input Parameter

Input Parameter	Value	Note
Exchange rate[1]	US$ 1.00 : CAN$ 1.30	
Li_2O price[1]	20,000 US$/t	
Ta_2O_5 price[1]	130 US$/kg	
Li_2O recovery[1]	85%	
Ta_2O_5 recovery[1]	64%	
Transport costs[1] (6% Li_2O concentrate)	9.71 CAN$/$Li_2O$%	
Mining Dilution	0%	
Mining Recovery	100%	
Overburden Removal costs	3.10 CAN$/t mined	
Mining costs	4.00 CAN$/t mined	applied to Ore and Waste
Rehabilitation costs	0.12 CAN$/t mined	applied to Ore, Waste and Overburden
Ore Processing costs[2]	18.10 CAN$/t milled	
General and Administration[2]	13.30 CAN$/t milled	
Whittle Processing costs	31.40 CAN$/t milled	
Pit slope	21°	Overburden
	50°	North area
	55°	All other areas
NSR Marginal cut-off	31.40 CAN$	

Notes:
1. Parameters used in the Block Value calculation, not directly inputted in Whittle
2. Parameters used in the Whittle Processing costs, not directly inputted in Whittle

The two commodity prices considered for the economic pit are lithium oxide (Li_2O) at US$20,000 per tonne and tantalum oxide (Ta_2O_5) at US$130 per kg. No commodity selling costs were considered for the Whittle run.

The design of the in-pit mineral resource shell was based on geotechnical study provided by Mine Design Engineering in their report, titled “Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment”, issued on March 1, 2017. An overall slope angle of 55° was applied to all pit areas except for the North area where a 50° overall slope angle is suggested. The pit walls in overburden will have a 21° overall slope angle. Operating costs are based on Feasibility study, dated October 20, 2017.

The marginal NSR cut-off (MNSR) used in Whittle was calculated using the input parameters of Table 14.7, according to the following equation:

$$M_{NSR} = \frac{Whittle\ Processing\ costs \cdot (\text{Mining Dilution} + 1)}{Mining\ Recovery} = 31.40\ CAN\$$$

The in-pit Resource Estimate presented herein used 31.40 CAN$ as the marginal NSR cut-off.

Two exclusions to the block model were considered:

- The Eastmain Reservoir of the public utility Hydro-Québec, adjacent to the east side of the Project, and a 30 m buffer zone around its perimeter.
- Lake #3, next to the north area of the pit outline, and a buffer zone of 30 m around the lake.

The blocks falling into these zones were discarded from the optimization in Whittle.

14.12.2 Underground Resource Cut-Off Parameters

The underground cut-off value was determined using the parameters presented in Table 14.8.

Table 14.8: Underground Cut-Off Parameters

Input Parameter	Value
Ore processing costs	18.10 CAN$/t milled
General and Administration	13.30 CAN$/t milled
Global mining costs	89.60 CAN$/t mined
Rehabilitation	0.12 CAN$/t/mined
Sustaining capital	1
Transport	9.71 CAN$/$Li_2O$%
Total cost by metric tonne	121.12 CAN$
Cut-off value	121.12 CAN$

The variable used for the selection of mineable areas is the NSR (in Canadian dollars).

The ore processing costs, the general and administration costs, and the sustaining capital are based on Feasibility study, dated October 20, 2022. The mining costs are based on hands-on knowledge with comparable projects.

The underground NSR cut-off is calculated using the parameters of Table 14.8, according to the following equation:

$$UG\_NSR = Mining + Processing + G\&A = CAN\$121.12$$

The Underground Resource Estimate presented herein uses a value of $CAN121.12 for the underground NSR cut-off.

To ensure potentially mineable shapes were used as resource, stope optimization was completed using the Deswik program and the Deswik Stope Optimizer (DSO) for the underground part of the deposit. The main mining method used for the optimization is cut & fill mining, due to the low dip of the lenses. This mining method ensure flexibility during the optimization process. Anneal parameters add an additional layer of the flexibility to maximize resource conversion to DSO. The economic pit shell was removed from the optimization and no pillars were considered for the resources. The parameters used for the optimization process are summarized in Table 14.9.

Table 14.9: DSO Parameters

Input Parameter	Value
Cut-Off Grade	121.12 CAN$
Level (height)	4 m
Section (length)	10 m
Stope Width (min)	3.5 m
Side Ratio	1.5
Dip (min/max)	85°/95°

Regarding resource classification of the resulting DSO, the dominant system is used to ensure all resources are associated with one of the evaluated categories (indicated or inferred). The category of each DSO is dictated by the most prominent category by volume included in each solid.

14.13 Mineral Resource Estimate

All amounts are reported in Canadian dollars.

Given the density of the processed data, the search ellipse criteria, the drillhole density, and the specific interpolation parameters, the QP is of the opinion that the current mineral resource estimate can be classified as Indicated and Inferred resources. The estimate was prepared in accordance with CIM's standards and guidelines for reporting mineral resources and reserves. The QP is of the opinion that the reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open-pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades.

Table 14.10 displays the results of the in situ Mineral Resource estimate for the Project at the official $31.4 NSR cut-off for the potential open-pit extraction scenario and at the official $ 121.12 NSR cut-off for the potential underground extraction scenario. Table 14.11 to Table 14.14 display the in-situ resource and sensitivity at other NSR values scenarios. The reader should be cautioned that values listed in Table 14.11 to Table 14.14 should not be misinterpreted as a mineral resource statement. The reported quantities and grade estimates at different NSR values are provided for the sole purpose of demonstrating the sensitivity of the resource model to the variation of commodity price. .

Figure 14.14 and Figure 14.15 show the grade distribution and classification, respectively, for the open-pit scenario. Figure 14.16 and Figure 14.17 show different views of the above.

Sensitivity charts are presented on Figure 14.18 to Figure 14.21.

Table 14.10: Project Mineral Resource Estimate

Category		Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Indicated	Pit-constrained	30,4	216	0.99	0.91	150
	Underground	1,1	200	0.92	0.86	100
	Total Indicated	31,5	215	0.99	0.91	148
Inferred	Pit-constrained	2.0	181	0.85	0.76	157
	Underground	0.7	179	0.83	0.78	100
	Total Inferred	2,7	180	0.85	0.77	141

Notes:

- The Independent and Qualified Person for the Mineral Resource Estimate, as defined by NI 43101, is Carl Pelletier, P.Geo., of InnovExplo Inc. The effective date of the estimate is May 27, 2022. The MRE follow 2014 CIM Definition Standards and the 2019 CIM MRMR Best Practice Guidelines.
- These Mineral Resources are not Mineral Reserves as they do not have demonstrated economic viability.
- The model includes 23 mineralized zones.
- The reasonable prospect for eventual economic extraction is met by having constraining volumes applied to any blocks (potential open -pit or underground extraction scenario) using Whittle and the Deswik Stope Optimizer (DSO) and by the application of cut-off grades. The mineral resource is reported at a cut-off of $31.4 NSR for the open-pit potential; and of $121.12 NSR for the underground potential based on market conditions (metal price, exchange rate and production cost).
- A range of densities was used on a per-zone basis based on statistical analysis of all available data.
- A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.
- High grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.
- Compositing was done on drill hole intercepts falling within mineralized zones (composite lengths vary from 1.5 m to 3 m in order to distribute the tails adequately).
- Resources were evaluated from drill holes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).
- The inferred category is only defined within the areas where blocks were interpolated during pass 1 or pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drill hole. The indicated category is only defined by blocks interpolated by a minimum of two drill holes in areas where the maximum distance to the closest drill hole composite is less than 40 m for blocks interpolated in pass 1.
- Results are presented in-situ. The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43101.
- The qualified persons are not aware of any known environmental, permitting, legal, title-related, taxation, socio-political or marketing issues, or any other relevant issue, that could materially affect the potential development of mineral resources other than those discussed in the MRE.

A range of densities was used on a per-zone basis based on statistical analysis of all available data.

A minimum true thickness of 2.0 m was applied, using the grade of the adjacent material when assayed or a value of zero when not assayed.

High-grade capping was done on raw assay data based on the statistical analyses of individual mineralized zones.

Compositing was done on drillhole intercepts falling within mineralized zones (composite lengths range from 1.5 m to 3 m in order to adequately distribute the tails).

Resources were evaluated from drillholes using a 2-pass OK interpolation method in a block model (block size = 5 m x 5 m x 5 m).

The Inferred category is only defined within the areas where blocks were interpolated during Pass 1 or Pass 2 where continuity is sufficient to avoid isolated blocks being interpolated by only one drillhole. The Indicated category is defined only by blocks interpolated by a minimum of two drillholes in areas where the maximum distance to the closest drillhole composite is less than 40 m for blocks interpolated in Pass 1.

The number of metric tons was rounded to the nearest hundred. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.

InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the Mineral Resource Estimate.

Table 14.11: Project Mineral Resource Estimate NSR Sensitivity for the Indicated In-Pit Scenario

Variation of NSR value	Indicated resource										
	Tonnage (000s)	BV $	LI_CUT	TA_CUT	RB_CUT	CS_CUT	BE_CUT	GA_CUT	LI2OEQ	LI2O	Ta2O5
-20%	28 632	179.49	4386.99	123.50	2265.28	92.41	122.32	63.05	1.02	0.94	0.02
-10%	29 589	197.76	4299.65	123.01	2239.05	91.37	121.14	62.50	1.01	0.93	0.02
Base case	30 384	215.85	4226.34	122.55	2218.68	90.57	120.15	62.03	0.99	0.91	0.01
+10%	31 257	233.22	4154.78	121.80	2193.45	89.58	119.10	61.52	0.98	0.89	0.01
+20%	31 840	250.78	4095.54	121.66	2176.09	89.07	118.27	61.14	0.96	0.88	0.01

Note: The pit shell optimization was re-run for every scenario

Table 14.12: Project Mineral Resource Estimate NSR Sensitivity for the Indicated Underground Scenario

Variation of NSR value	Indicated resource										
	Tonnage (000s)	NSR $	LI_CUT	TA_CUT	RB_CUT	CS_CUT	BE_CUT	GA_CUT	LI2OEQ	LI2O	Ta2O5
-20%	762.71	184.54	4 601.56	72.60	1 745.06	54.63	124.77	67.11	1.03	0.99	0.01
-10%	938.15	192.76	4 288.85	76.82	1 751.27	55.05	120.82	65.93	0.97	0.92	0.01
Base case	1 086.00	199.93	4 016.44	81.52	1 761.25	55.46	117.21	65.04	0.92	0.86	0.01
+10%	1 036.62	214.17	3 902.00	85.99	1 819.80	57.17	116.95	65.59	0.90	0.84	0.01
+20%	1 103.31	225.81	3 775.05	87.49	1 827.01	57.58	115.59	64.79	0.87	0.81	0.01

The DSO were re-run for every scenario in accordance with the pit shell sensitivity.

Table 14.13: Project Mineral Resource Estimate Cut-Off Sensitivity for the Inferred In-pit Scenario

Variation of NSR value	Inferred resource										
	Tonnage (000s)	BV $	LI_CUT	TA_CUT	RB_CUT	CS_CUT	BE_CUT	GA_CUT	LI2OEQ	LI2O	Ta2O5
-20%	1 723	153.07	3742.07	131.80	1984.93	92.14	110.89	61.02	0.89	0.81	0.02
-10%	1 876	166.29	3626.55	129.37	1960.04	89.45	109.55	60.32	0.87	0.78	0.02
Base case	2 001	180.66	3551.03	128.30	1951.38	88.29	109.12	59.93	0.85	0.76	0.02
+10%	2 175	190.80	3416.44	127.61	1932.54	86.19	108.37	59.23	0.82	0.74	0.02
+20%	2 228	205.78	3376.13	127.52	1919.35	85.63	107.86	59.00	0.82	0.73	0.02

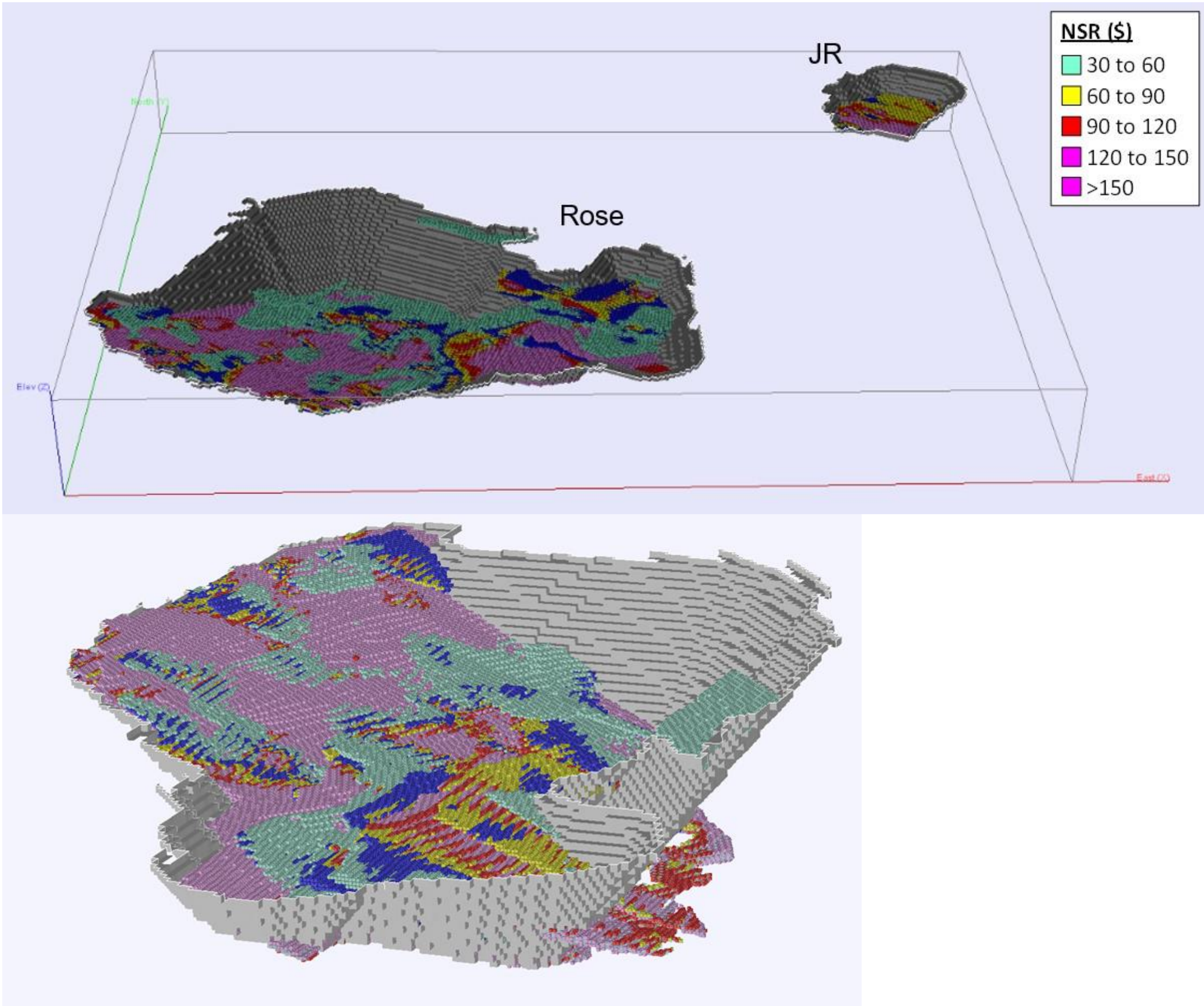
The pit shell optimization was re-run for every scenario.

Table 14.14: Project Mineral Resource Estimate NSR Sensitivity for the Inferred Underground Scenario

Variation of NSR value	Inferred resource										
	Tonnage (000s)	NSR $	LI_CUT	TA_CUT	RB_CUT	CS_CUT	BE_CUT	GA_CUT	LI2OEQ	LI2O	Ta2O5
-20%	453.48	164.48	4 095.89	78.87	1 725.94	54.16	129.20	62.67	0.93	0.88	0.01
-10%	596.07	169.90	3 793.61	80.83	1 765.37	54.49	130.19	61.42	0.87	0.82	0.01
Base case	725.98	178.59	3 609.91	81.52	1 776.50	54.57	128.83	60.16	0.83	0.78	0.01
10%	816.16	187.05	3 454.77	82.02	1 780.44	54.11	126.53	59.00	0.80	0.74	0.01
20%	903.12	191.97	3 265.77	83.11	1 785.66	53.70	123.79	57.67	0.76	0.70	0.01

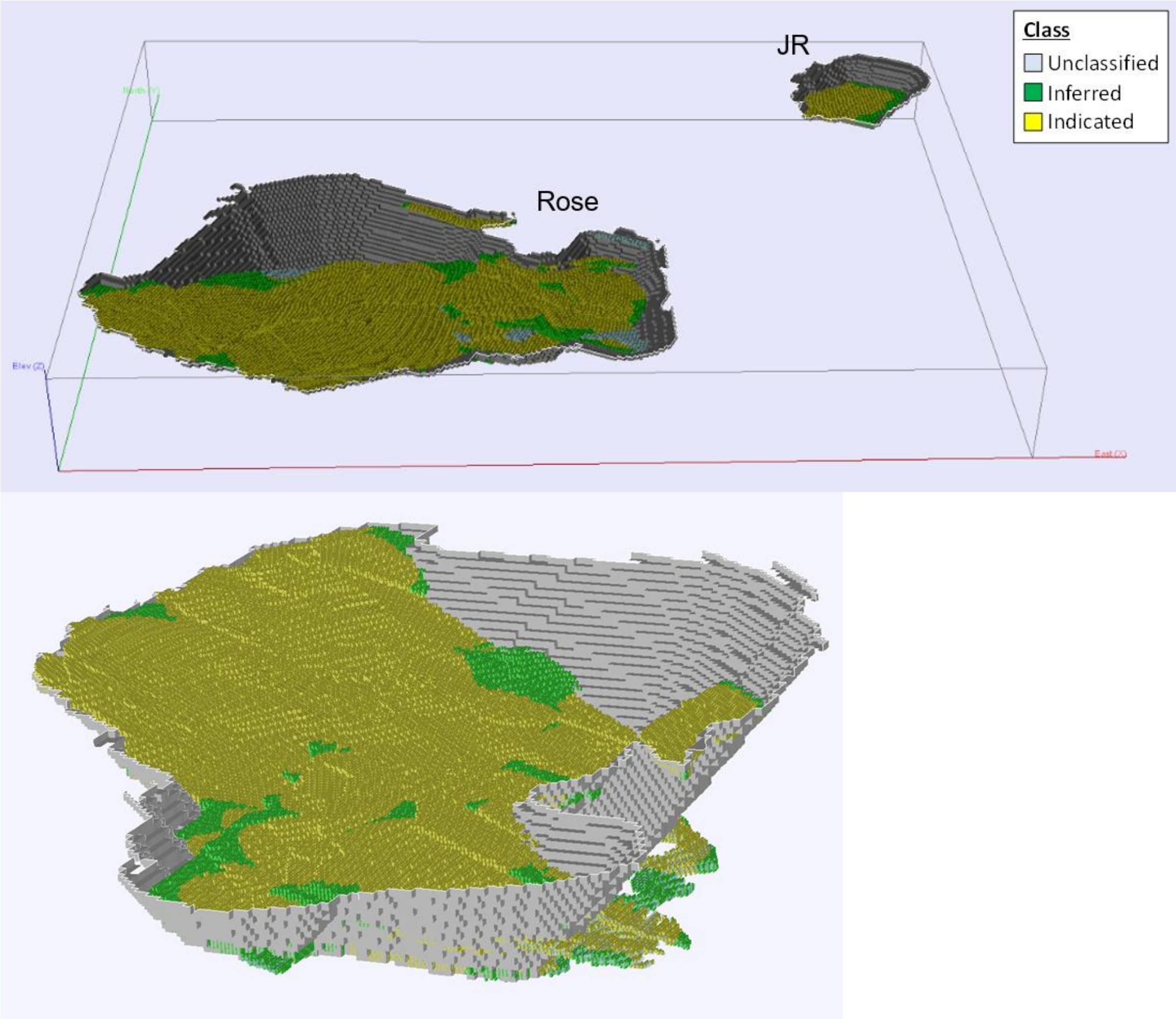
The DSO were re-run for every scenario in accordance with the pit shell sensitivity.

Figure 14.14: NSR Distribution above the Selected Official $31.40NSR Cut-Off for the Open-Pit Scenario



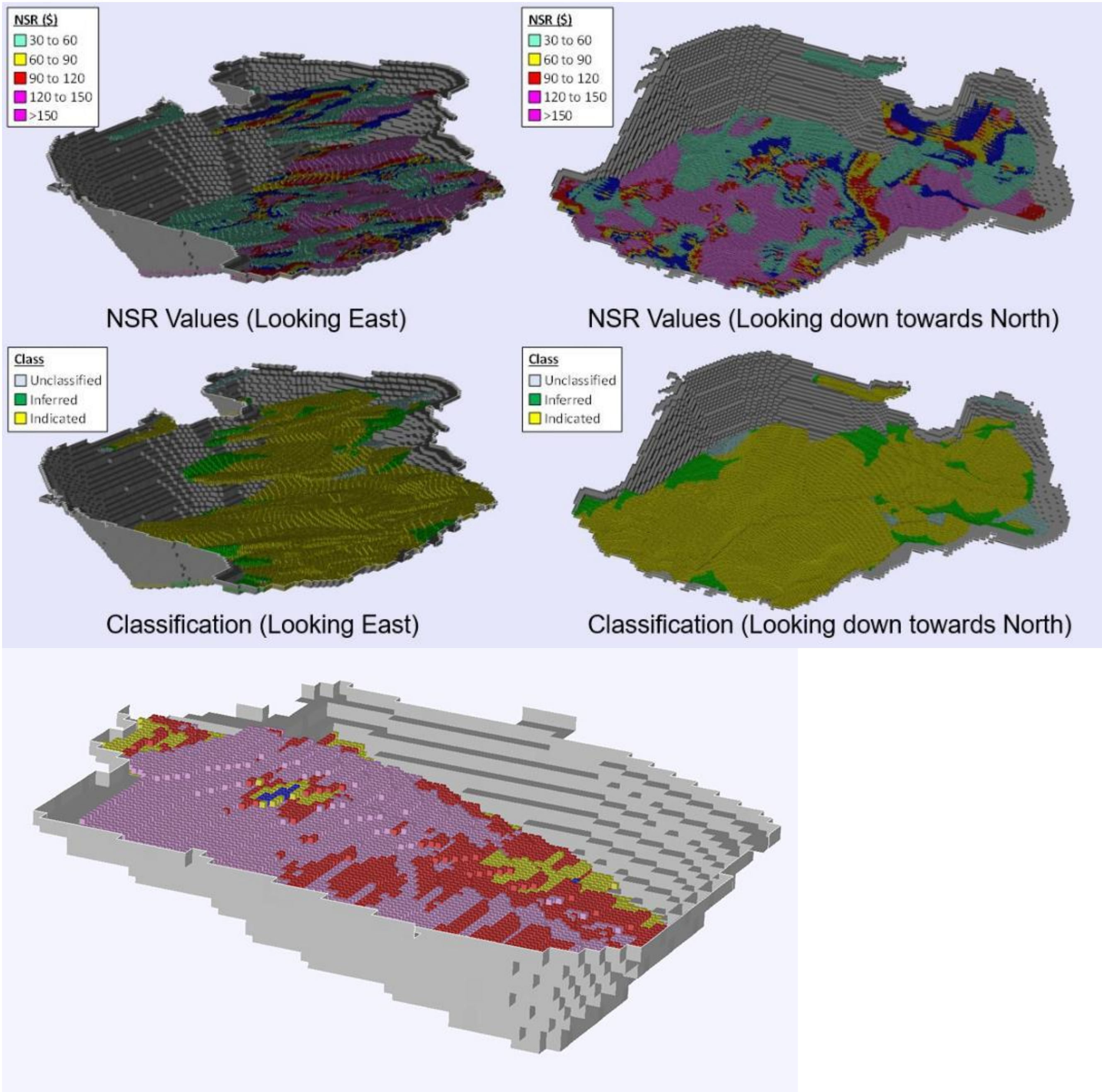
Note: Looking down toward west – perspective view - not to scale.

Figure 14.15: Classification Distribution for the Open-Pit Scenario



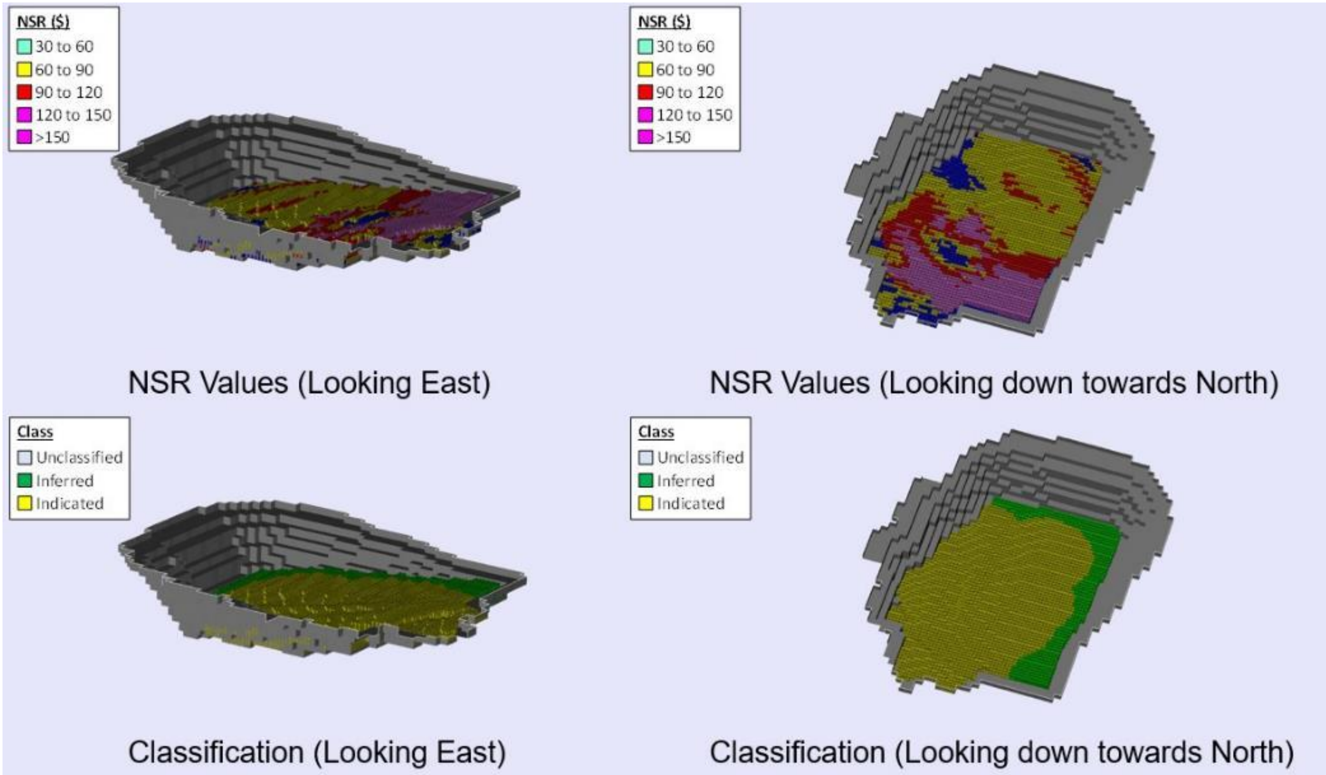
Note: Looking down toward west– perspective view - not to scale.

Figure 14.16: NSR Distribution for the Project Open-Pit Scenario

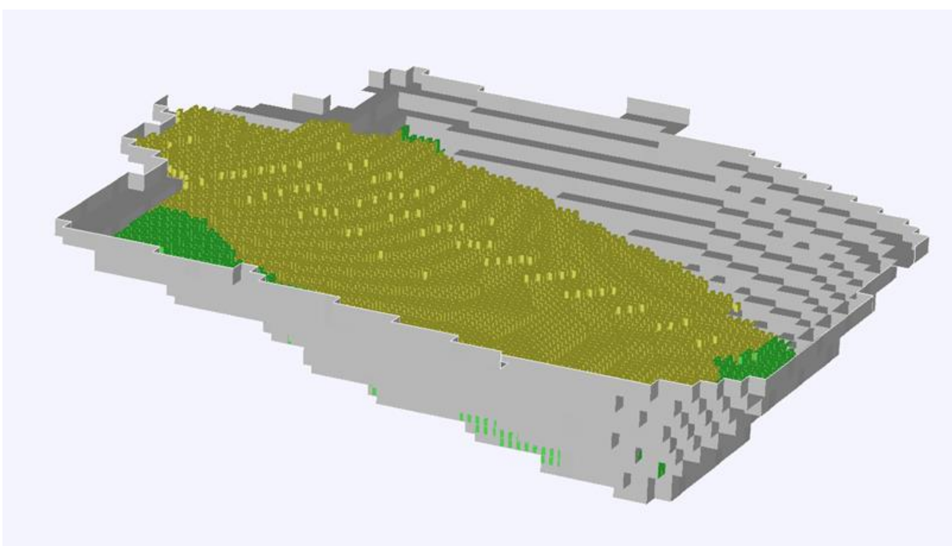


Note: NSR value looking down toward

Figure 14.17: Classification Distribution for the JR Open-Pit Scenario



West– perspective view - not to scale.



Note: Classification value looking down toward west– perspective view - not to scale.

Figure 14.18: NSR In-Pit Sensitivity Chart

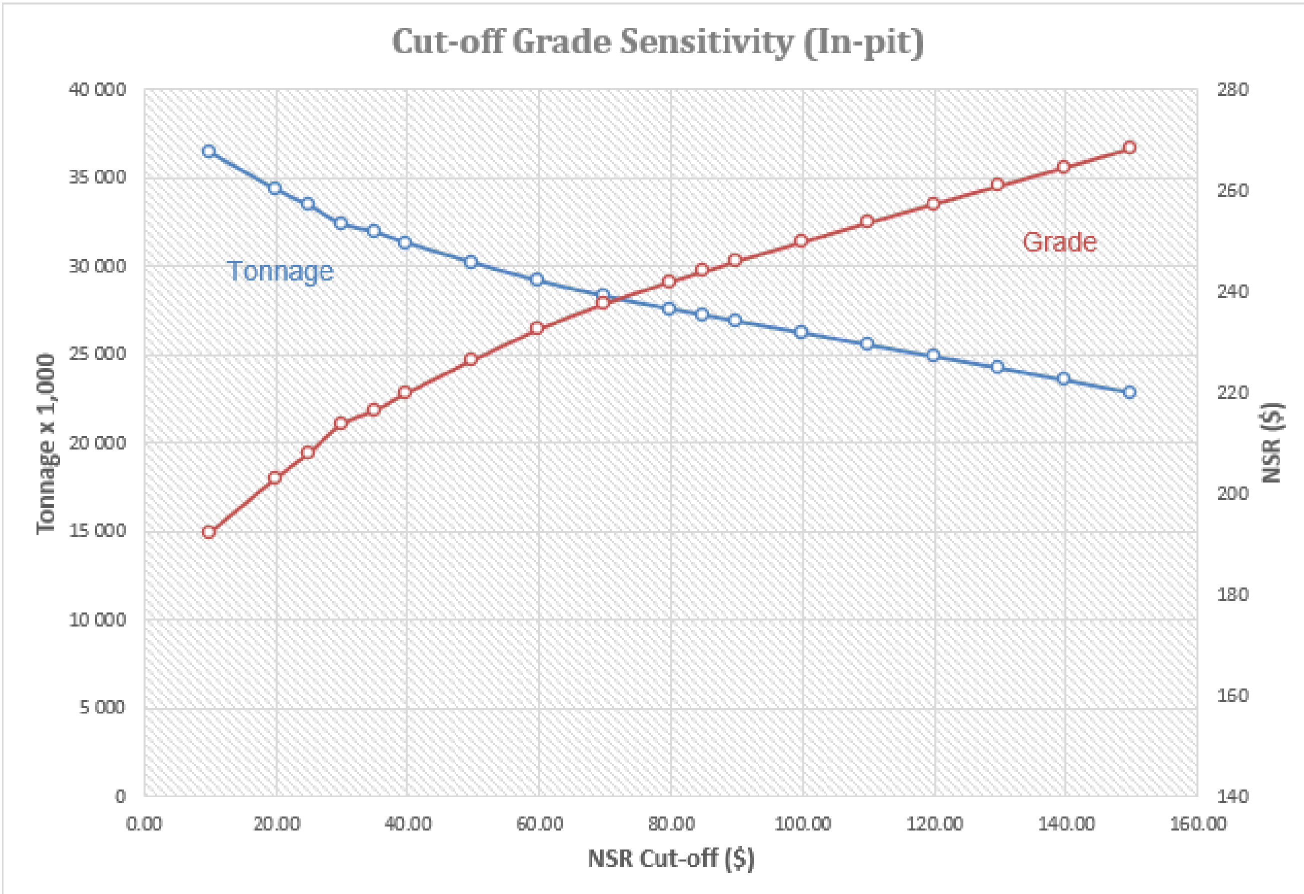
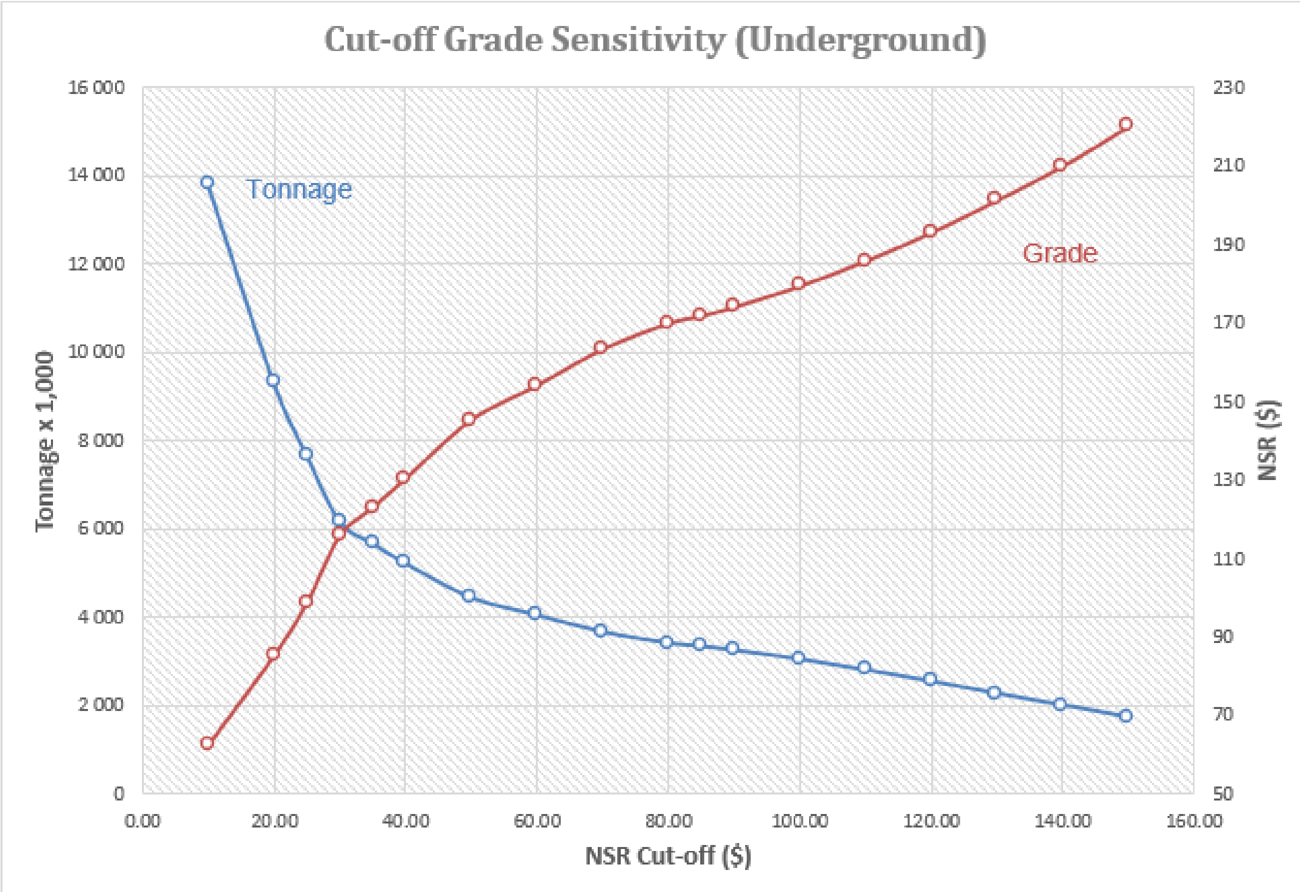


Figure 14.19: NSR Underground Sensitivity Chart*



Note: *Using the official resource pit shell

Figure 14.20: Li_2Oeq In-Pit Grade Tonnage Chart

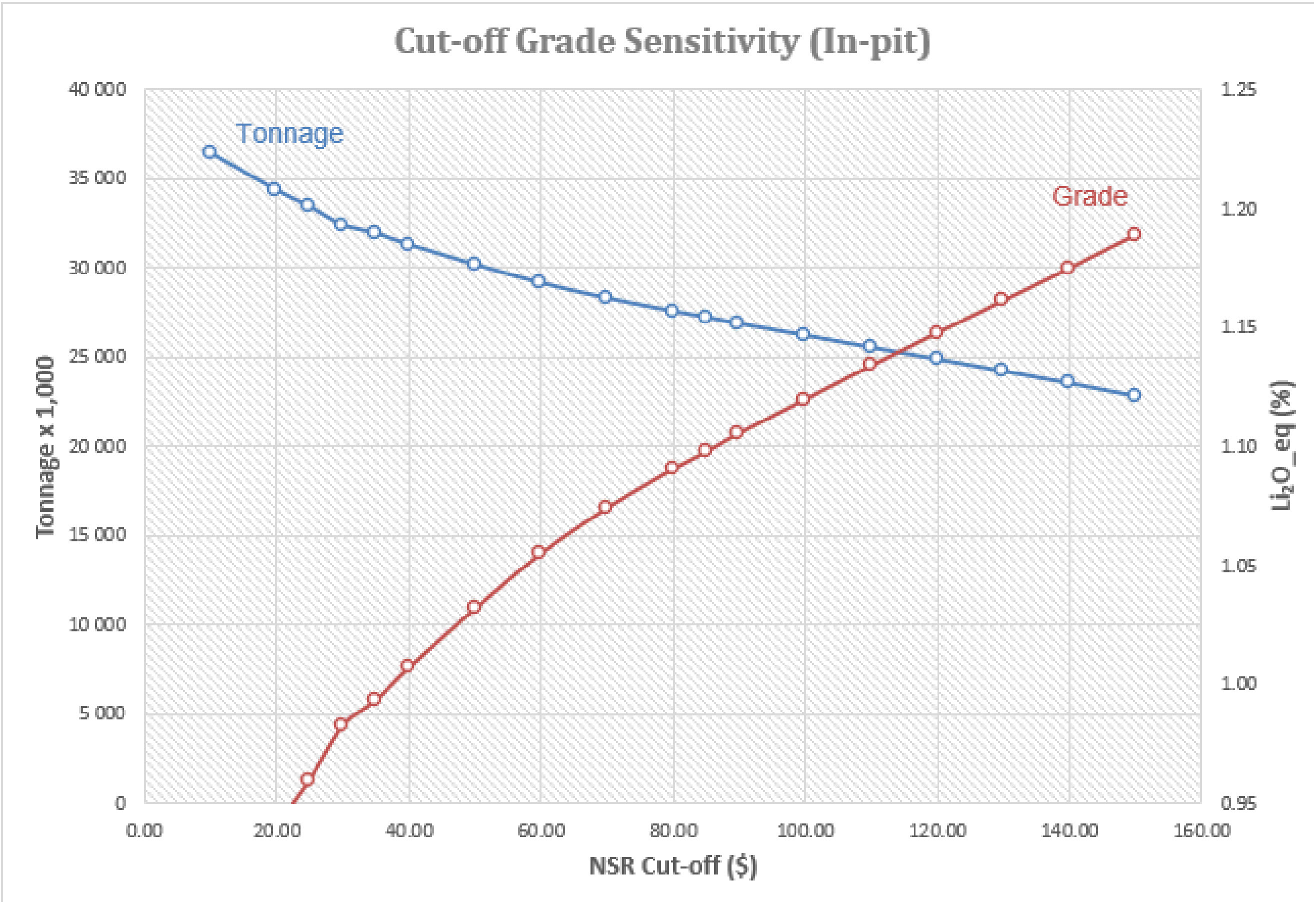
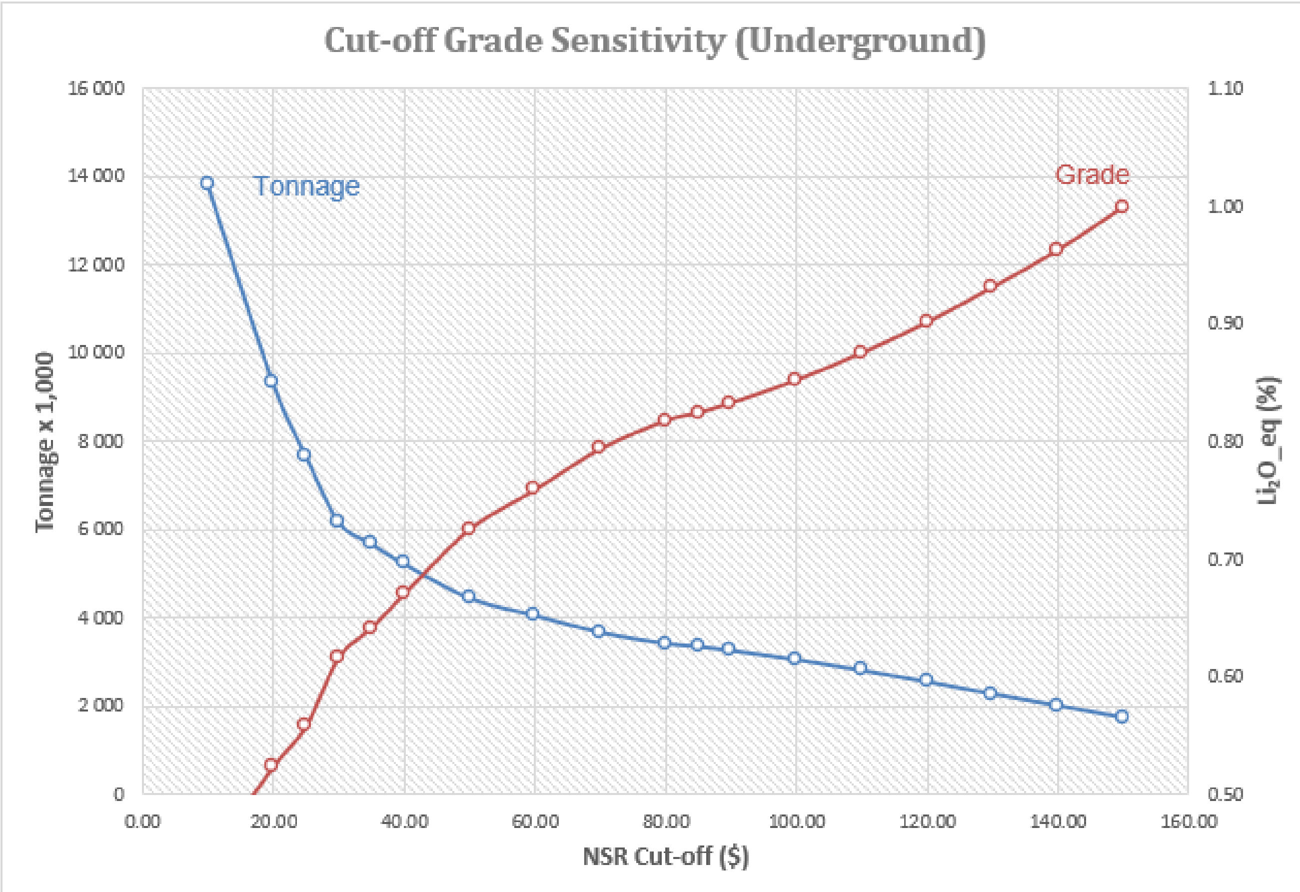


Figure 14.21: Li_2Oeq Underground Grade Tonnage Chart*

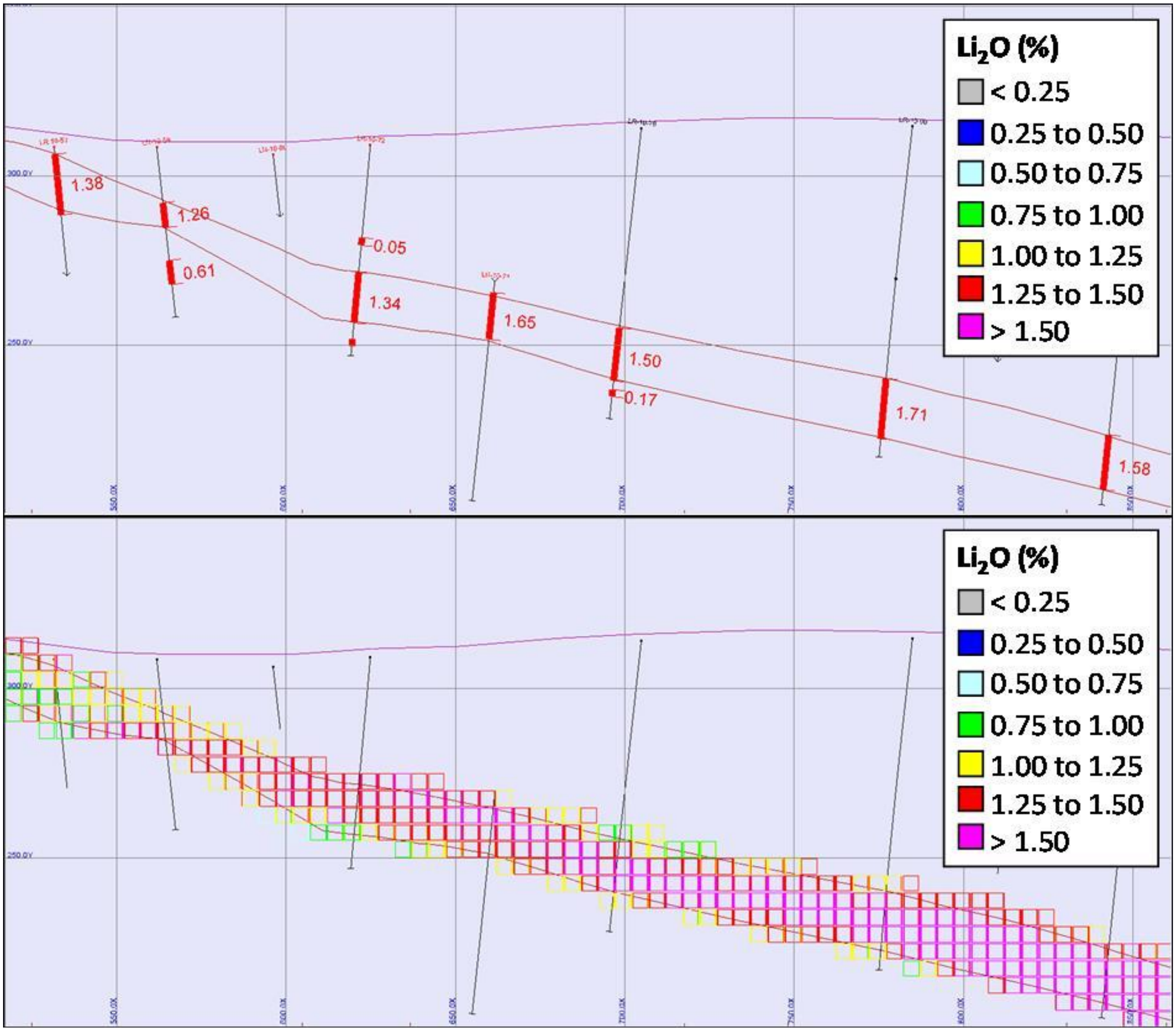


Note: *Using the official resource pit shell

14.14 Block Model Validation

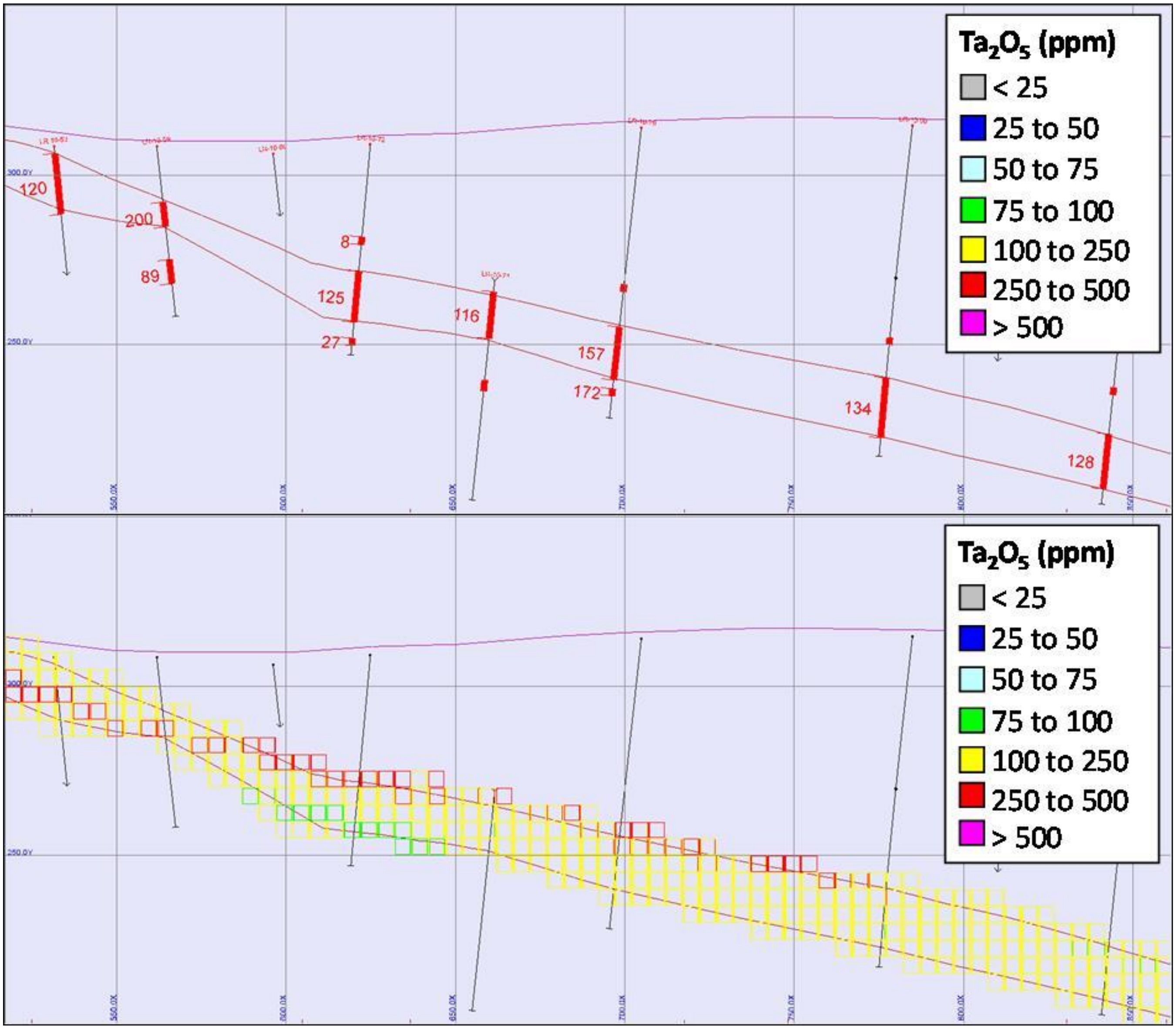
Block model grades and composite grades were visually compared on sections, plans and in 3D. No significant differences were observed during the comparison. Typical cross-section views are on Figure 14.22 and Figure 14.23.

Figure 14.22: Typical Cross Section showing Drillhole Intercepts (above) and Interpolated Blocks (below) for Li_2O



Note: For clarity, only Zone 115 is shown interpolated. This is a projected view; despite any appearance to the contrary, topography and interpretation are perfectly snapped to drillholes.

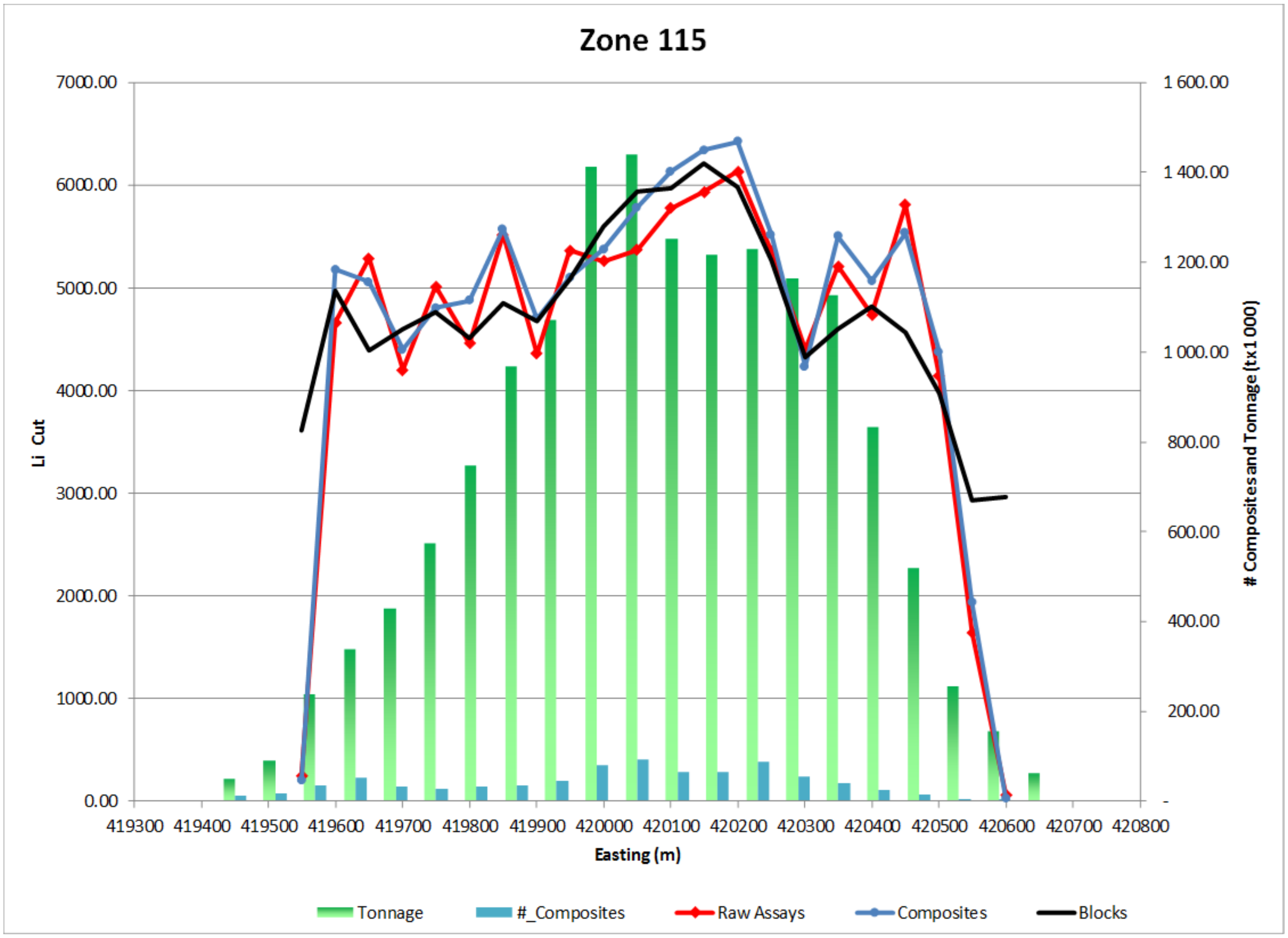
Figure 14.23: Typical Cross Section showing Drillhole Intercepts (above) and Interpolated Blocks (below) for Ta_2O_5



Note: For clarity, only Zone 115 is shown interpolated. This is a projected view; despite any appearance to the contrary, topography and interpretation are perfectly snapped to drillholes.

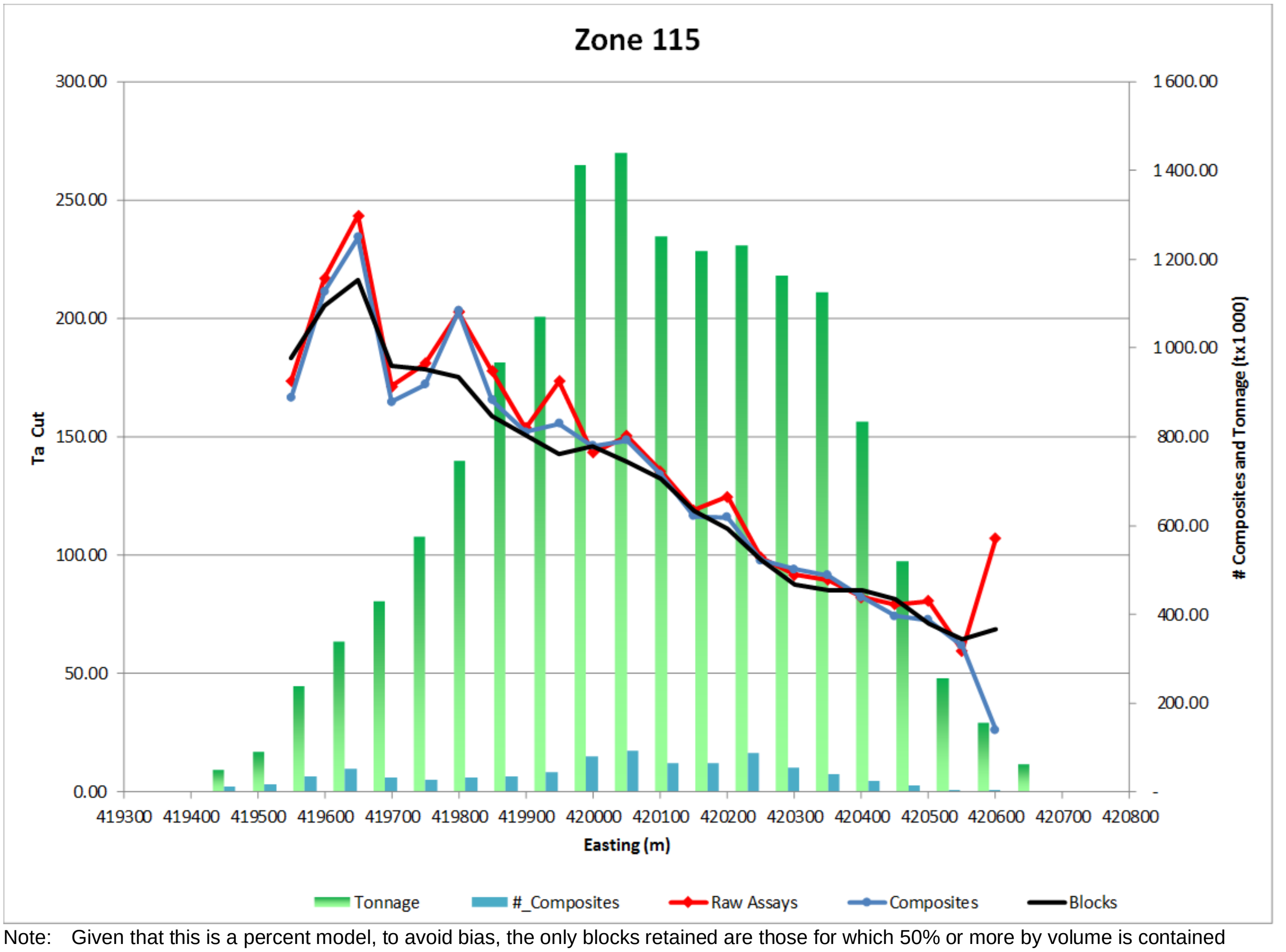
Swath plots for Li and Ta were constructed at 50-m E-W intervals for the principal mineralized zone, Zone 115 (Figure 14.24 and Figure 14.25). The Li plot demonstrates that variability is generally greater to the east where there are fewer composites but stays within an acceptable range.

Figure 14.24: Li Swath Plot (50-m eastings) for Zone 115



Note: Given that this is a percent model, to avoid bias, the only blocks retained are those for which 50% or more by volume is contained within the zone.

Figure 14.25: Ta Swath Plot (50-m eastings) of Zone 115



Note: Given that this is a percent model, to avoid bias, the only blocks retained are those for which 50% or more by volume is contained within the zone.

15 MINERALS RESERVE ESTIMATE

15.1 Introduction

The Mineral Reserve estimate is based on the geological block model prepared by InnovExplo and presented in Item14.0, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS.

Other Items of this FS address mining, processing, metallurgic, economic, and other relevant factors that allow the classification of the Probable Mineral Reserve. These figures were estimated by selecting an optimal pit. The methodology to achieve the optimal pit shell is explained below.

15.2 Open Pit Optimization Methodology

The objective of pit optimization is to generate an ultimate pit contour that maximizes the value of a deposit and to use this contour as a basis for mine design, scheduling, and economic analysis. Design parameters, such as operating costs, mining and metallurgical recoveries, dilution, and NSR were used to generate an optimal pit shell.

15.2.1 Resource Block Model

From the grade category block model created for the mineral resource, an NSR attribute was populated using the grades from the indicated resources. The NSR value was calculated using preliminary production and processing parameters and commodity metal prices, as follows:

$$NSR_{(CAN\$)} = \left\{ \frac{(Li_{ppm} \cdot \text{Li recovery} \cdot Li_2O \text{ price}) - \text{Transport costs } Li_2O}{(\% \text{ Li in } Li_2O) \cdot 100\,000} + \frac{Ta_{ppm} \cdot \text{Ta recovery} \cdot Ta_2O_5 \text{ price}}{(\% \text{ Ta in } Ta_2O_5) \cdot 1\,000} \right\} \cdot \text{Exchange rate}$$

Where:

- Exchange rate = USD:CAD = 1:1.3
- % Li in Li_2O = 46.45%
- % Ta in Ta_2O_5 = 81.90%
- Li recovery = 85%
- Ta recovery = 64%
- Li_2O price = US$20,000 per tonne of metal contained
- Ta_2O_5 price = US$130 per kilogram of metal contained
- Transport costs of Li_2O concentrate = CAN$9.71 per Li_2O%

This calculation was applied to all mineralized rock types except Rock Type 119. The lithium recovery drops dramatically in Rock Type 119, so it was considered to be 0% in the NSR calculation.

The resulting model contained the NSR variable used in the Lerchs-Grossman algorithm for pit optimization. The original block size of 5 x 5 x 5 (in metres) was reblocked to 10 x 10 x 10. The reblocking was done by merging blocks together while preserving the ore percent of each block. This action adds minimal in-pit dilution due to the support effect (Chilès and Delfiner, 1999) but maintains the amount of ore inside the pit.

The block value of three rock codes were imported into Whittle™ v.4.7.1 software from Dassault Systems GEOVIA to perform the pit optimization:

- The overburden, coded OB.
- The waste host rock, coded WAST, which included the meta-sediment, amphibolite, porphyry and gneiss rock types.
- The ore rock from the Rose deposit, coded ORE, which included the 20 pegmatite mineralized zones, 101 to 120.

These three rock codes were imported separately and were assigned different production and processing parameters during the optimization. The specific density of each rock type was used in the optimization process.

15.2.2 Physical Constraints on Block Model

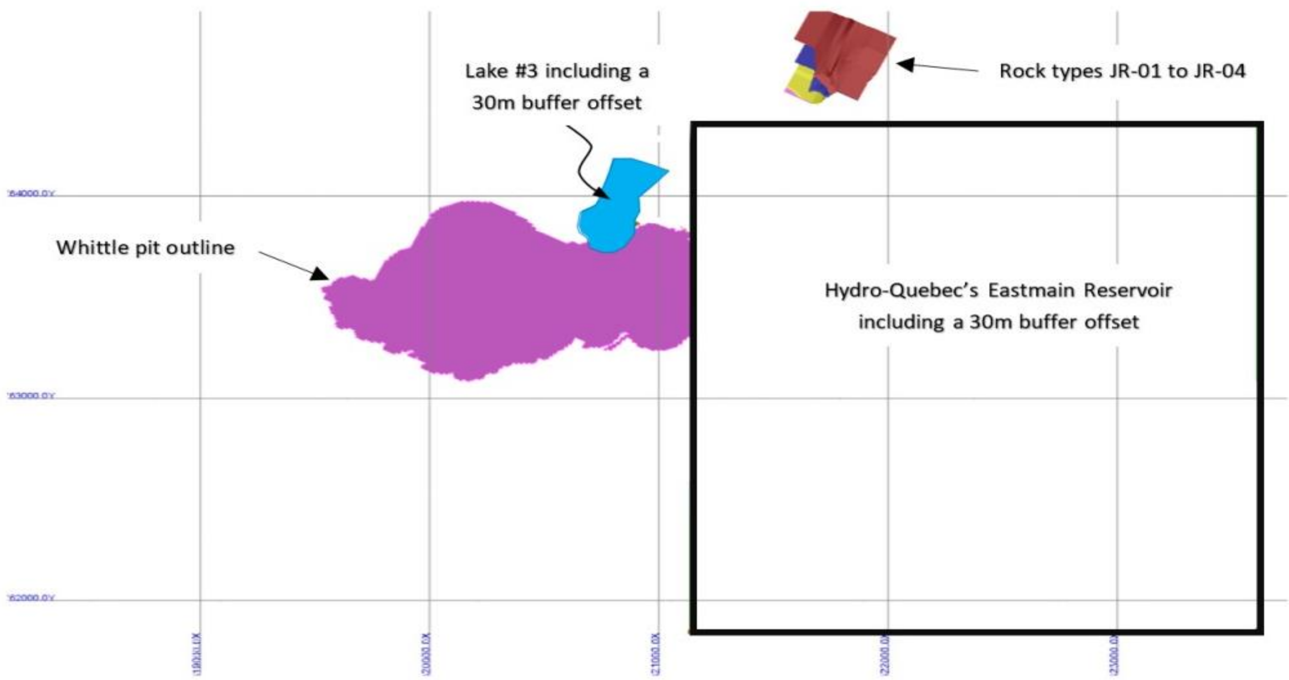
The Eastmain hydroelectric reservoir is located to the east of the Property. Hydro-Québec has an exclusion zone east of the Project which constitutes a physical constraint for the east side of the pit (Figure 15.1). The pit excavation was limited to a distance not closer than 30 m from the exclusion zone.

As per Critical Element's request, two additional exclusion zones were considered:

- Rock types JR-01 to JR-04 representing mineralized zones 750 m to the northeast of the eastern limit of the main Rose deposit;
- Lake #3, in the northern area of the pit outline (a 30 m buffer zone around the lake was considered).

Blocks in these three zones were discarded from the optimization.

Figure 15.1: Restriction Zones on the Project



15.2.3 Determination of Open Pit Optimization Parameters

OPERATING COSTS

The pit optimization is based on operating costs from the Feasibility Study, dated October 20, 2017. These costs were used as the required inputs in Whittle to obtain an optimal pit shell reflecting the economic profile of the Project. The costs are presented in Table 15.1.

Table 15.1: Summary of Operating Costs

Preliminary Costs	
Mining costs (CAN$/t mined)	4.00
Overburden removal costs (CAN$/t mined)	3.10
Processing costs (CAN$/t milled) (spodumene concentrator)	18.10
Site rehabilitation costs (CAN$/t mined)	0.12
General & Administration costs (CAN$/t milled)	13.30

COMMODITY METAL PRICES

The two commodity metal prices considered for the economic pit are lithium oxide (Li_2O) at US$20,000 per tonne, and tantalum oxide (Ta_2O_5) at US$130 per kilogram. No prices were directly input in Whittle as the NSR calculations in the model already included them.

PROCESS RECOVERY

A constant processing recovery of 85% Li and 64% Ta was used in the NSR calculation. The latest data provided by CELC shows that lithium recovery varies by grade. As this information was received late in the FS process, the effects of this variable recovery were assessed, and the results showed that it would not materially affect the results of the FS.

MINING DILUTION AND MINING RECOVERY

An excavation precision of 0.5 m was assumed for the mining of mineralized zones with hydraulic shovels. A diluted tonnage, initially calculated for each zone, led to an average mining dilution of 11.7% on total ore tonnage. Given that ore and waste are easily distinguishable, a 95% mining recovery was judged acceptable the selected mining equipment, and this value was applied to the ore.

OVERALL SLOPE ANGLE

The economic pit was designed based on the latest geotechnical study provided by Mine Design Engineering Inc. (MDE), titled "Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment", issued in July 2017. An overall slope angle of 50° was used on the block on the north wall of the pit, while a steeper angle of 55° was used for the rest of the pit. The pit walls in overburden will have an overall slope angle of 21°.

ANNUAL DISCOUNT RATE

The annual discount rate used for the NPV calculation in Whittle is set at 8%. The NPV and discounted NPV values calculated in Whittle are not final values, but they are preliminary comparative tools to guide the optimization process toward the most lucrative scenario.

15.3 Determination of Cut-Off Value

The NSR cut-off value (M_{NSR}) was calculated using the input parameters in Table 15.2, according to the following equation:

$$M_{NSR} = \frac{\text{Whittle Processing costs} \cdot (\text{Mining Dilution} + 1)}{\text{Mining Recovery}} = CAN\$36.92$$

This cut-off value applies to a modified NSR value, which only considers the Li; i.e.:

$$NSR_{(CAN\$)} = \frac{(Li_{ppm} \cdot \text{Li recovery} \cdot Li_2O \text{ price}) - \text{Transport costs } Li_2O}{(\% \text{ Li in } Li_2O) \cdot 100\,000} \cdot \text{Exchange rate}$$

This modified NSR value has the effect of privileging blocks with NSR values attributable to Li, therefore, increasing the in-pit average grade of Li. The Whittle input parameters are summarized in Table 15.2.

Table 15.2: Summary of Whittle Input Optimization Parameters

Input Parameter	Value	Comment
Mining dilution	11.71%	
Mining recovery	95%	
Overburden removal costs	CAN$3.10/ t mined	
Mining costs	CAN$4.00/ t mined	applied to Ore and Waste
Rehabilitation costs	CAN $0.12/ t mined	applied to Ore and Waste
Ore processing costs[1]	CAN $18.10/ t milled	
General and Administration[1]	CAN $13.30/ t milled	
Whittle processing costs	CAN $31.40/ t milled	
Pit slope	21°	Overburden
	50°	North area
	55°	All other areas
NSR marginal cut-off	CAN$36.92	

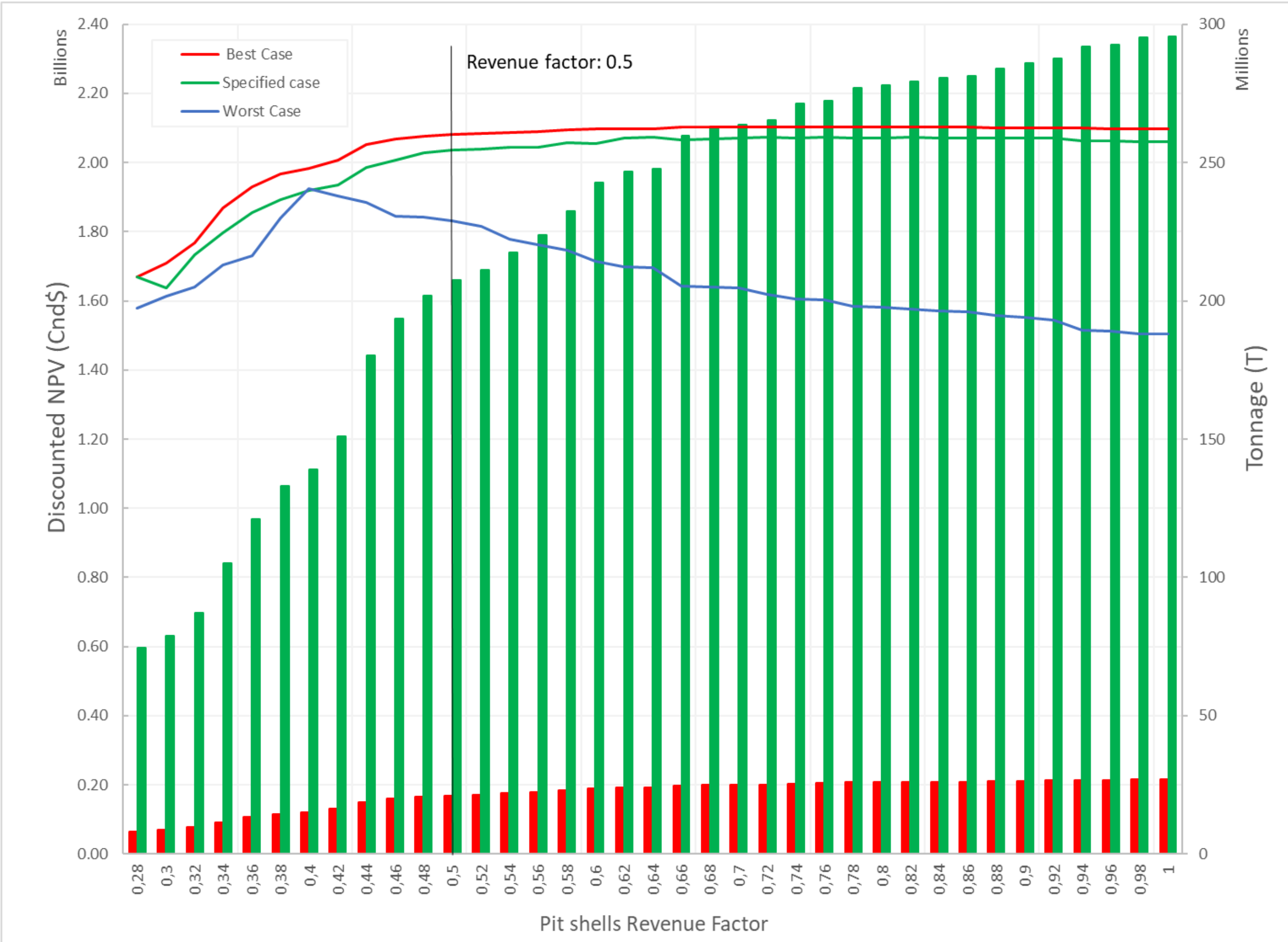
Note:

1. Parameters used in the Whittle Processing costs, not directly input in Whittle

15.4 Final Pit Shell Selection

The pit shell with a 0.5 revenue factor (RF) was selected. This pit shell was selected as the base case pit shell for further phasing and scheduling work for the Project. Mining additional resources by open pit beyond the limits of this pit shell increases the strip ratio and the footprint but does not increase significantly the NPV of the Project. This pit shell ensures an average Li_2O grade above 0.85%, as requested by CELC. The chosen pit shell has an average grade of 0.88% Li_2O. Figure 15.2 compares the pit shells with different revenue factors.

Figure 15.2: Best, Specified, or Worst Discounted NPV and Tonnage of Pit Shells



Based on a cut-off of CAN$36.92 NSR, the selected Whittle pit shell contains 26.3 Mt of diluted and recovered ore, of which 100% are Indicated Resources, 182.4 Mt of waste rock, and 10.9 Mt of overburden. The selected final pit shell average diluted grade is 0.88 Li_2O% and 138 Ta_2O_5 ppm. Table 15.3 presents the pit optimization results.

Figure 15.3 to Figure 15.5 show the optimal pit in orthogonal, plan and section views. The pit is approximately 1,600 m long x 900 m wide x 220 m deep.

Table 15.3: Pit Optimization Results with Revenue Factor Equal to 0.5

Pit Optimization Results	Value
Total tonnage (Mt)	207.6
Diluted recovered ore tonnage (Mt)	25.1
Diluted Li_2O average grade (%)	0.88%
Li_2O tonnage (t)	187,800
Ta_2O_5 average grade (ppm)	138
Ta_2O_5 tonnage (t)	2,217
Waste tonnage incl. overburden (Mt)	182.6
Mining dilution (%)	11.7%
Strip ratio	7.28
Life-of-mine (years)	17.2

From this Whittle shell, the final pit was designed to include ramps and catch berms. The final pit design is presented in Item 16 and was used to create a mining plan that serves as the basis for the amount of ore material in the mineral reserve estimate. Dilution was re-evaluated within the engineered pit with the same basis as for the Whittle shell and found to be 9.6% on average.

Figure 15.3: Isometric View of Selected Pit Shell (RF=0.5) with Li Assay Distribution (%)

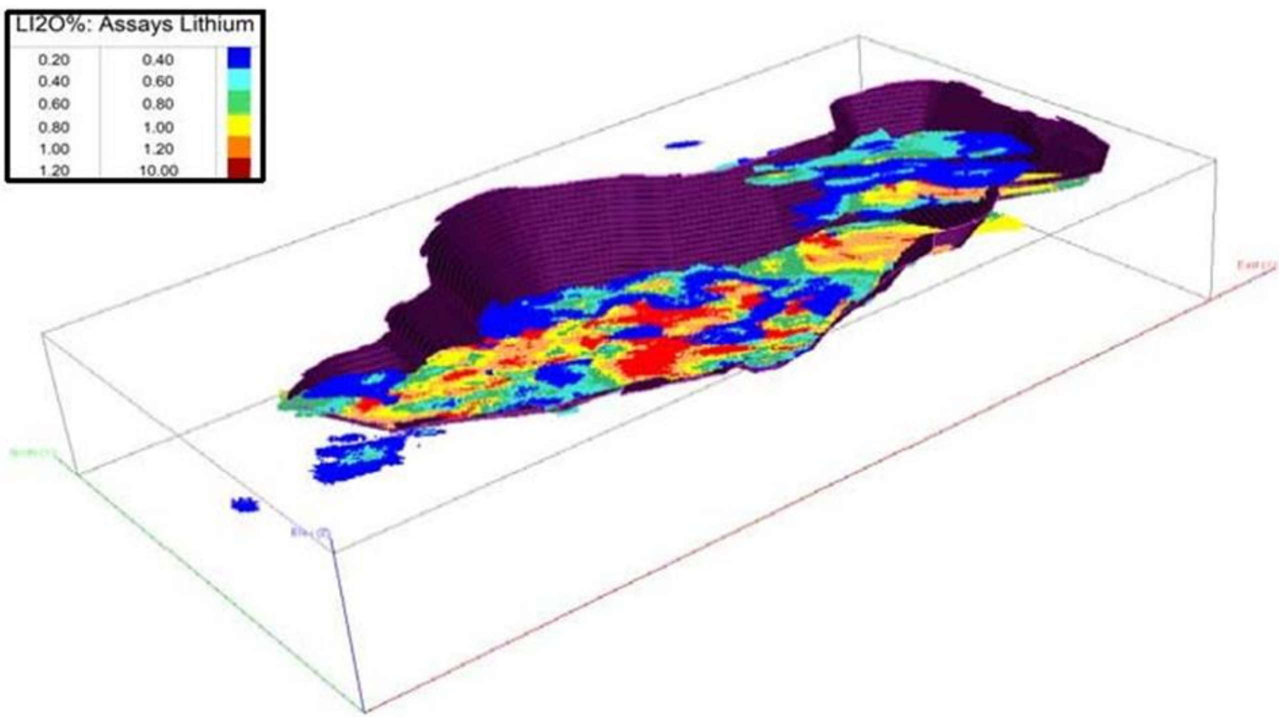


Figure 15.4: Plan View of Selected Pit Shell (RF=0.5) with Li Assay Distribution (%)

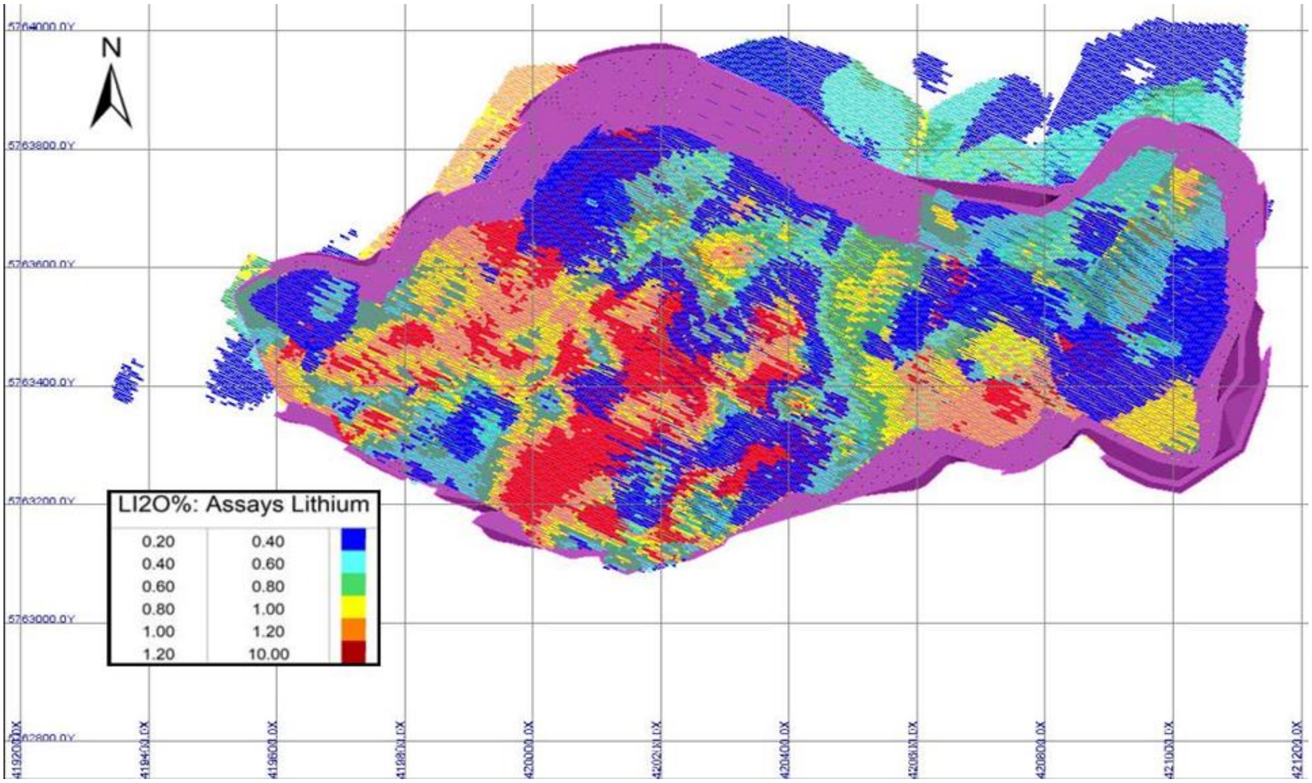
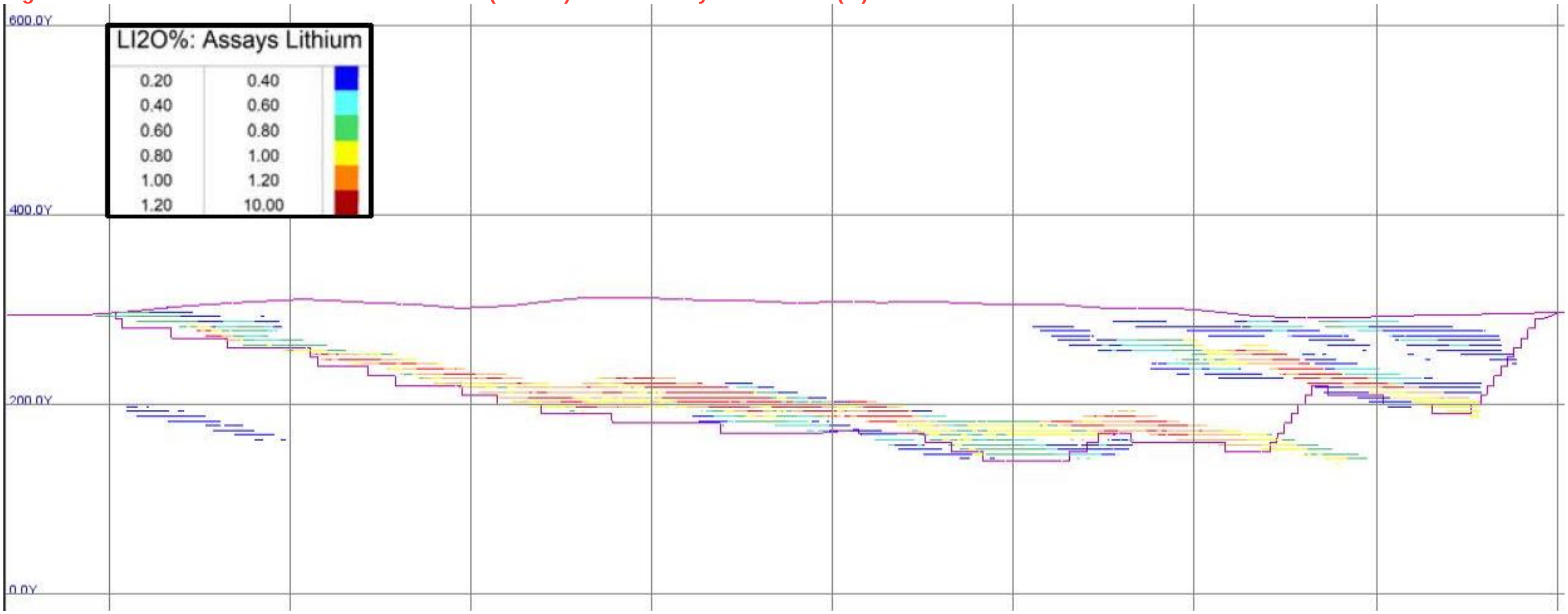


Figure 15.5: Vertical Section of Selected Pit Shell (RF=0.5) with Li Assay Distribution (%)



15.5 Mineral Reserves

15.5.1 Mineral Reserve Classification, Category, and Definition

MINERAL RESERVE

The Mineral Reserve estimates presented herein conform to CIM Definition Standards (2014) and include Measured and Indicated Mineral Resources but do not include Inferred Mineral Resources. According to CIM Definitions Standards, a Mineral Reserve is the economically mineable part of a Measured or Indicated Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified. A Mineral Reserve includes diluting materials and allowances for losses that may occur when the material is mined.

Mineral Reserves are sub-divided in order of increasing confidence into Probable Mineral Reserves and Proven Mineral Reserves. A Probable Mineral Reserve has a lower level of confidence than a Proven Mineral Reserve.

PROBABLE MINERAL RESERVE

A Probable Mineral Reserve is the economically mineable part of an Indicated and, in some circumstances, a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction can be justified.

PROVEN MINERAL RESERVE

A Proven Mineral Reserve is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

Application of the Proven Mineral Reserve category implies that the Qualified Person has the highest degree of confidence in the estimate with the consequent expectation in the minds of the readers of the report. The term should be restricted to that part of the deposit where production planning is taking place and for which any variation in the estimate would not significantly affect potential economic viability.

15.5.2 Mineral Reserve Estimate

The mineral resource block model contains only Indicated resources. Indicated resources were converted into Mineral Reserves. Following the detailed design of the final pit and detailed production scheduling with the cut-off NSR value, a total of 26.3 Mt of diluted ore exists inside the mine design. The detailed pit design and production plan are discussed in Item 16. Table 15.4 presents the reserves inside the engineered pit.

Table 15.4: Mineral Reserve Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_Eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	204	0.92	0.87	138
Total	26.3	204	0.92	0.87	138

Notes:

- CIM Definition Standards for Mineral Resources and Mineral Reserves (2014) were used for reporting of Mineral Reserves.
- The independent and qualified person for the mineral reserve estimate, as defined by NI 43-101, is Simon Boudreau, P.Eng, of InnovExplo Inc. The effective date of the mineral reserves estimate is May 27, 2022.
- The reserve estimate is based the current resource estimate with a constant recovery of 85% Li2O. Metal prices are set at US$20,000/t Li2O and US$130/kg Ta2O5 using an exchange rate of 1.3 CAD:USD. Metallurgical recoveries are set at constant values of 85% for Li2O and 64% for Ta2O5. The cut-off NSR value is CAN$36.92/t.
- The reserve estimate includes 9.6% dilution and 5% ore loss.
- The model includes 20 mineralized zones, of which 17 are included in the mining plan.
- Calculations used metric units (metres, tonnes and ppm).
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing, or other relevant issue that could materially affect the mineral reserve estimate.

16 MINING METHODS

This Item describes the results of the technical work undertaken by InnovExplo to produce a mine plan for this Feasibility Study (FS) for the Project.

The Project deposit is made of stacked mineralized lenses oriented north 296° having an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface; and therefore, the FS was based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprised of 26.3 Mt of ore, 182.4 Mt of waste, and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 1,610,000 t per year. To achieve these milling production targets, the mining operation yearly production rate will vary accordingly between 11 and 16 Mt of rock material and decrease towards the end of the mine life. All overburden material will be mined by a contractor. An open pit mining schedule was planned and resulted in a LOM of approximately 19 years, starting with 19 months of pre-production, just over 16 years of production and ending with 5 months of stockpile processing. Table 16.1 presents the LOM mining production plan and Table 16.2 presents the resulting milling production plan.

Table 16.1: Mining Production Plan

Period	Pre-Production		Production																	LOM
Year	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Total material mined (kt)	1,514	2,813	11,279	16,259	15,524	15,830	16,640	15,884	15,254	15,733	15,310	12,921	14,253	14,421	16,349	13,028	5,442	1,159	0	219,614
Overburden mined (kt)	1,004	367	697	1,098	1,076	924	2,340	566	0	1,192	1,435	235	0	0	0	0	0	0	0	10,934
Waste mined (kt)	460	2,378	9,066	13,378	12,597	13,148	12,569	13,483	13,615	12,923	12,204	11,031	12,456	12,784	14,710	11,241	3,674	675	0	182,393
Ore mined (kt)	50	68	1,516	1,783	1,851	1,758	1,730	1,836	1,639	1,618	1,670	1,656	1,797	1,637	1,639	1,787	1,768	483	0	26,287
Dilution (%)	8.9%	10.3%	9.8%	9.8%	9.2%	9.5%	9.6%	9.3%	8.9%	9.9%	9.7%	9.5%	9.3%	9.9%	10.1%	10.2%	10.0%	9.7%	0.0%	9.6%
Grade mined (ppm Li)	4,085	2,445	3,674	4,067	5,112	4,467	4,350	4,480	4,434	3,940	3,830	3,982	2,891	3,286	4,091	3,531	4,105	4,485	0	4,029
Grade mined (% Li2O)	0.88%	0.53%	0.79%	0.88%	1.10%	0.96%	0.94%	0.96%	0.95%	0.85%	0.82%	0.86%	0.62%	0.71%	0.88%	0.76%	0.88%	0.97%	0.00%	0.87%
Grade mined (ppm Ta)	187	137	137	140	129	117	123	113	133	85	93	119	129	133	87	82	85	79	0	113
Grade mined (ppm Ta2O5)	229	168	167	171	158	143	150	138	163	104	113	145	158	162	106	100	104	96	0	138
Ore stockpile size (kt)	50	118	226	399	639	787	907	1,133	1,162	1,170	1,230	1,276	1,463	1,490	1,519	1,696	1,855	728	0	0
Material re-handled (kt)	0	0	70	81	81	81	81	81	81	81	81	81	81	81	81	81	504	1,151	0	2,771
Material transported (kt)	1,514	2,813	11,349	16,340	15,605	15,910	16,720	15,965	15,334	15,814	15,391	13,002	14,334	14,502	16,430	13,109	5,945	2,310	0	222,385

Table 16.2: Milling Production Plan

Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	LOM
Total material processed (kt)	1,409	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	728	26,287
Mined from pit (kt)	1,409	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,610	1,165	483	0	23,987
Reclaimed from stockpile (kt)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	445	1,127	728	2,300
Lithium head grade (ppm Li)	3,880	4,329	5,607	4,766	4,560	4,944	4,494	3,955	3,934	4,064	3,103	3,324	4,146	3,742	3,346	2,811	2,783	4,029
Lithium head grade (% Li_2O)	0.84%	0.93%	1.21%	1.03%	0.98%	1.06%	0.97%	0.85%	0.85%	0.87%	0.67%	0.72%	0.89%	0.81%	0.72%	0.61%	0.60%	0.87%
Tantalum head grade (ppm Ta)	137	144	132	122	125	117	134	85	93	119	132	133	87	82	88	91	99	113
Tantalum head grade (ppm Ta_2O_5)	167	175	162	149	153	143	163	104	113	145	161	163	106	100	107	111	121	138

16.1 Pit Design

16.1.1 Geotechnical Study and Pit Design Parameters

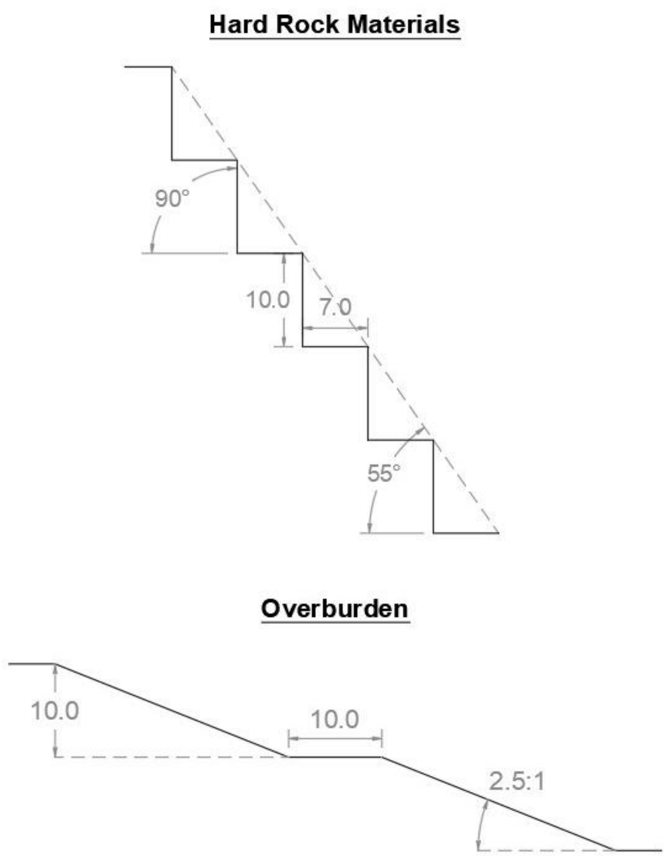
Mine Design Engineering Inc. conducted the geotechnical analysis for the Rose Lithium-Tantalum Project and supplied their recommendations in their report titled 'Update to Rose Pit Geotechnical Model and Open Pit Stability Assessment' for the hard rock materials of the proposed pit.

The Project pit design is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°. A 90° face angle was considered so a minimum berm width of 6.5 m was recommended to respect the inter-ramp angle. However, a berm width of 7.0 m corresponding to the recommended overall slope angle was used, as ramps were only designed on moderately sloped pit walls (i.e. intermediate pit walls and the ultimate south wall).

The pit slopes in overburden respect a face ratio of 2.5:1 with a 10 m berm width, resulting in an overall slope of 3.5:1, as per the design of the overburden stockpile. The pit slope requirements in overburden for the pit walls should be analyzed in further studies. This configuration could be steepened during the mining phase to reduce overburden waste mining.

Figure 16.1 shows the pit slope design parameters used for the ultimate pit walls.

Figure 16.1: Pit Slope Design Parameters



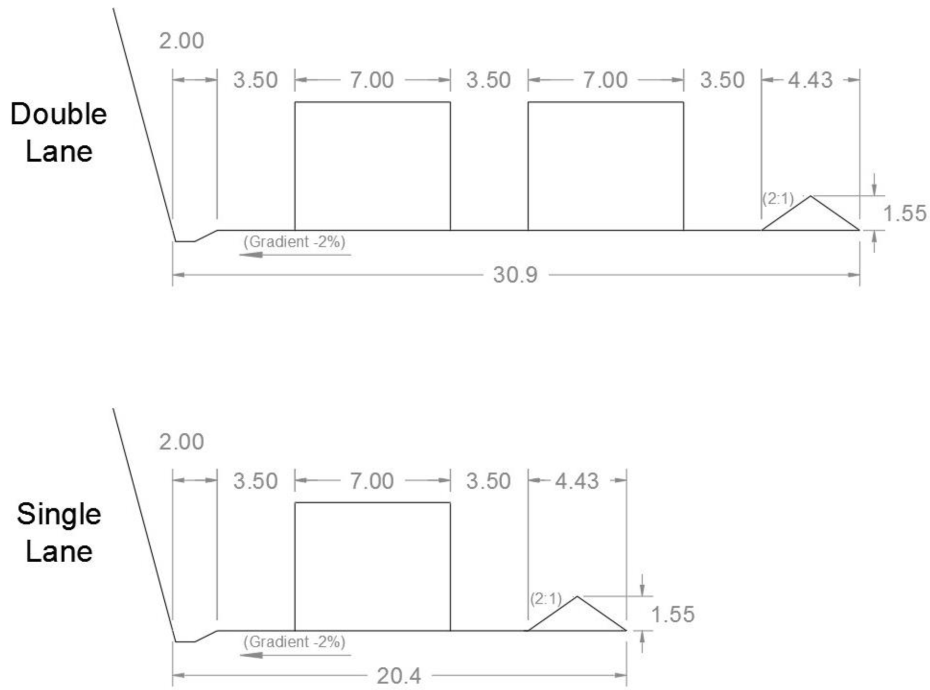
For intermediate pit walls, an overall slope angle of 45° was respected. This reduction in the wall angle will improve slope stability and allow time for the operation to better assess the pit wall characteristics and optimize the final pit design. Also, less work will be required to maintain the walls in good condition.

Several risks were identified in the geotechnical study. The analyses conducted by Mine Design Engineering Inc. consider only dry pit slope conditions. Once a hydrogeological model for the site is completed, these results should be sent to Mine Design Engineering Inc. for re-analysis. Furthermore, joint persistence should be further investigated when excavating the mine.

16.2 Haul Road Design

The haulage ramps are based on the largest haulage truck and are designed for double lane traffic, except for the last benches of each phase which are designed for single lane traffic. The pit ramp designs are presented on Figure 16.2.

Figure 16.2: Pit Ramp Design Parameters



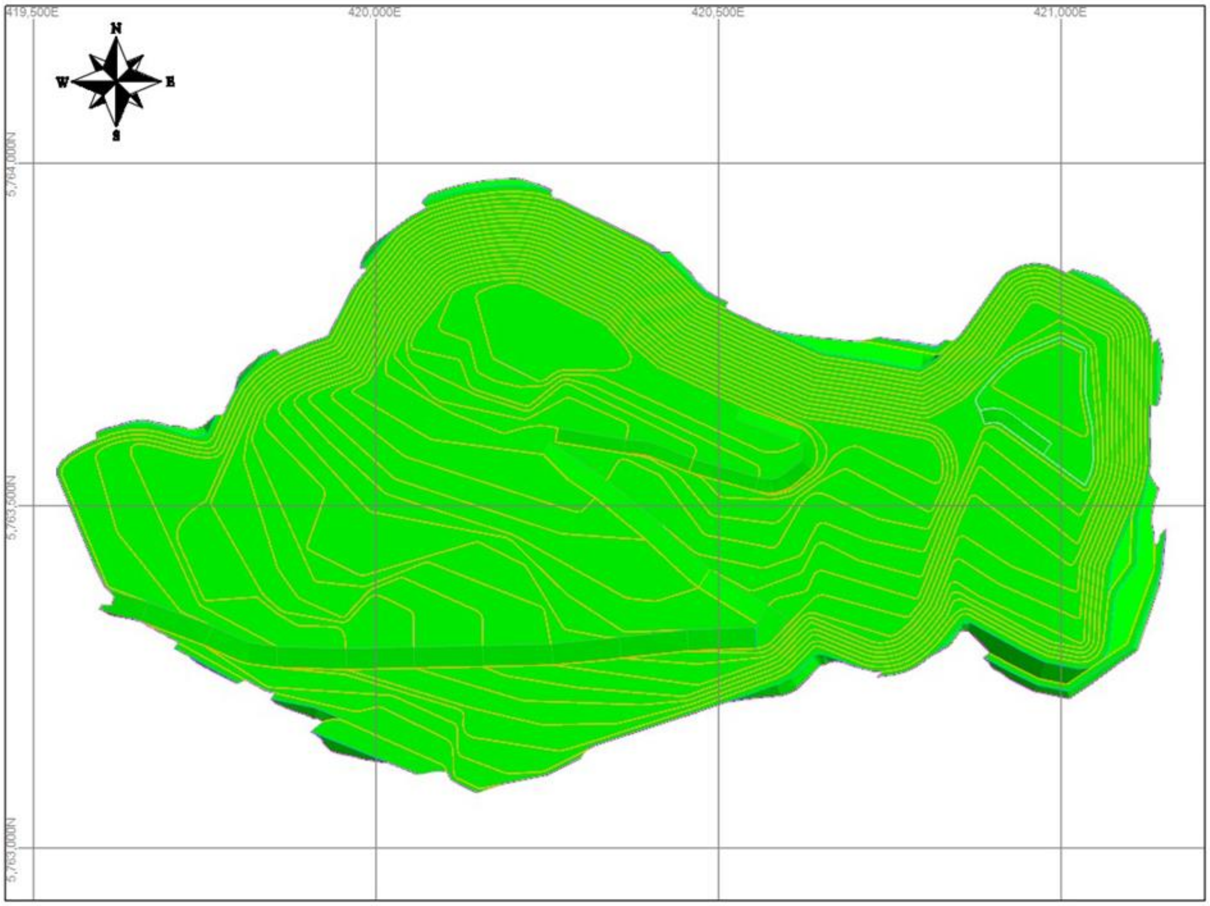
For both ramp designs, a half-truck width is considered as buffer space. A safety ridge is designed considering a height equivalent to the radius of a haul truck tire and with a 2:1 slope. Lastly, a 2 m wide ditch is included to allow for water drainage and pipe installation.

The maximum gradient of the inner curvature of all ramp segments is 10%. All switchbacks are designed with a flat rolling surface.

16.3 Final Pit Design

Based on the selected optimized pit shell and the geotechnical parameters, a final pit design was created (Figure 16.3). The mine design process is iterative and aims to convert the optimal pit shell into an operational open pit mine design. Once completed, the total contents of the designed pit do not differ considerably from the contents of the optimized shell. The detailed pit design was created using the Deswik 2017.1 mining software. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

Figure 16.3: Final Pit Design



The final pit design is approximately 1 620 m long, 900 m wide, and 200 m deep.

It should be noted that the pit design respects the geotechnical slope recommendations with the material classification from the block model. Further site investigations and test pits were conducted following the generation of the block model and found varying depths of overburden in certain areas. The pit design will need to be reviewed as mining progresses to account for changes in the depth of overburden.

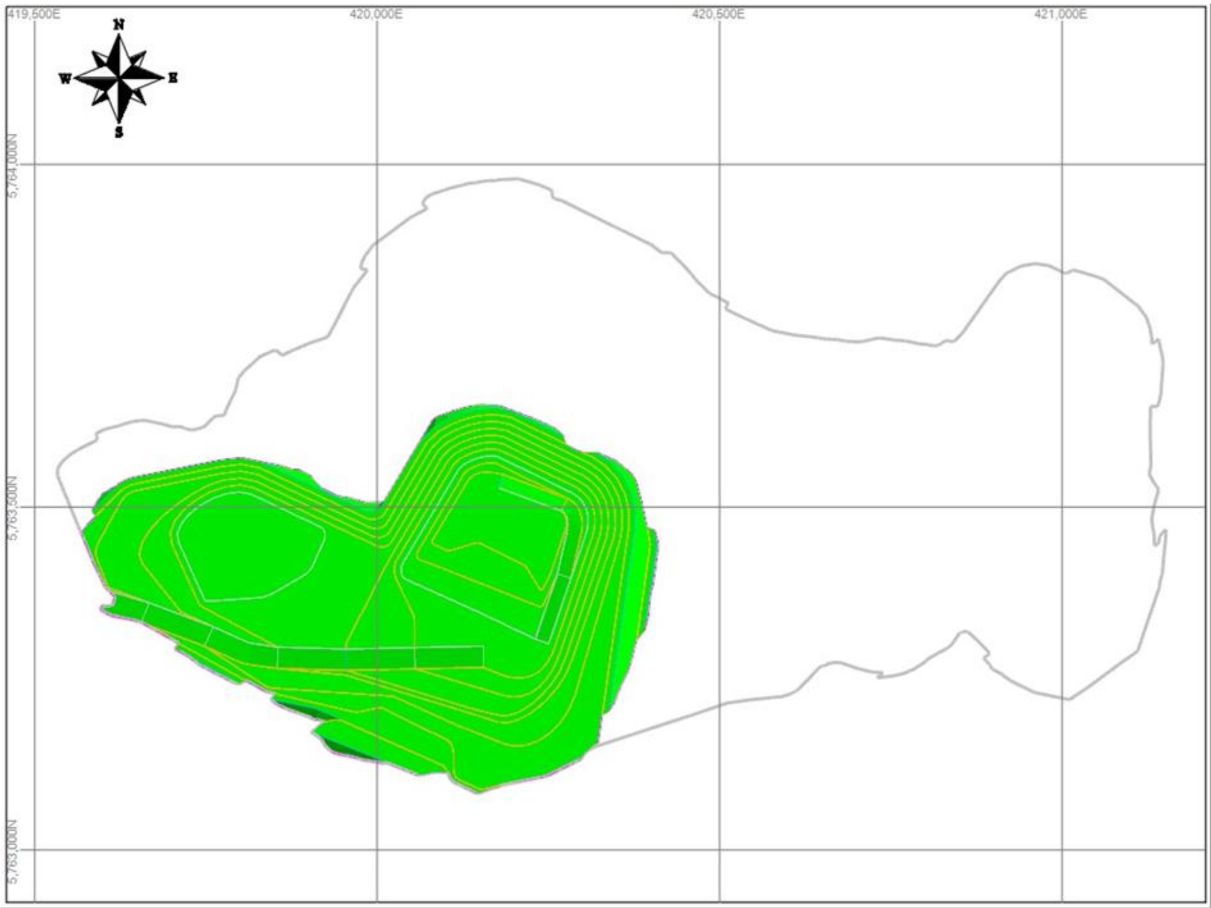
Lastly, a 30 m perimeter around Lake 3 was maintained to avoid water infiltration in the pit. However, this perimeter is estimated and not based on a hydrogeological study with a corresponding geotechnical analysis. This perimeter should be reviewed in further studies when more information is available. A limit to the east of the pit corresponding to Hydro-Québec's Eastmain reservoir was also respected.

16.4 Mining Phase Designs

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By sub-dividing the ultimate pit into these four separate phases, the mining rate of ore is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

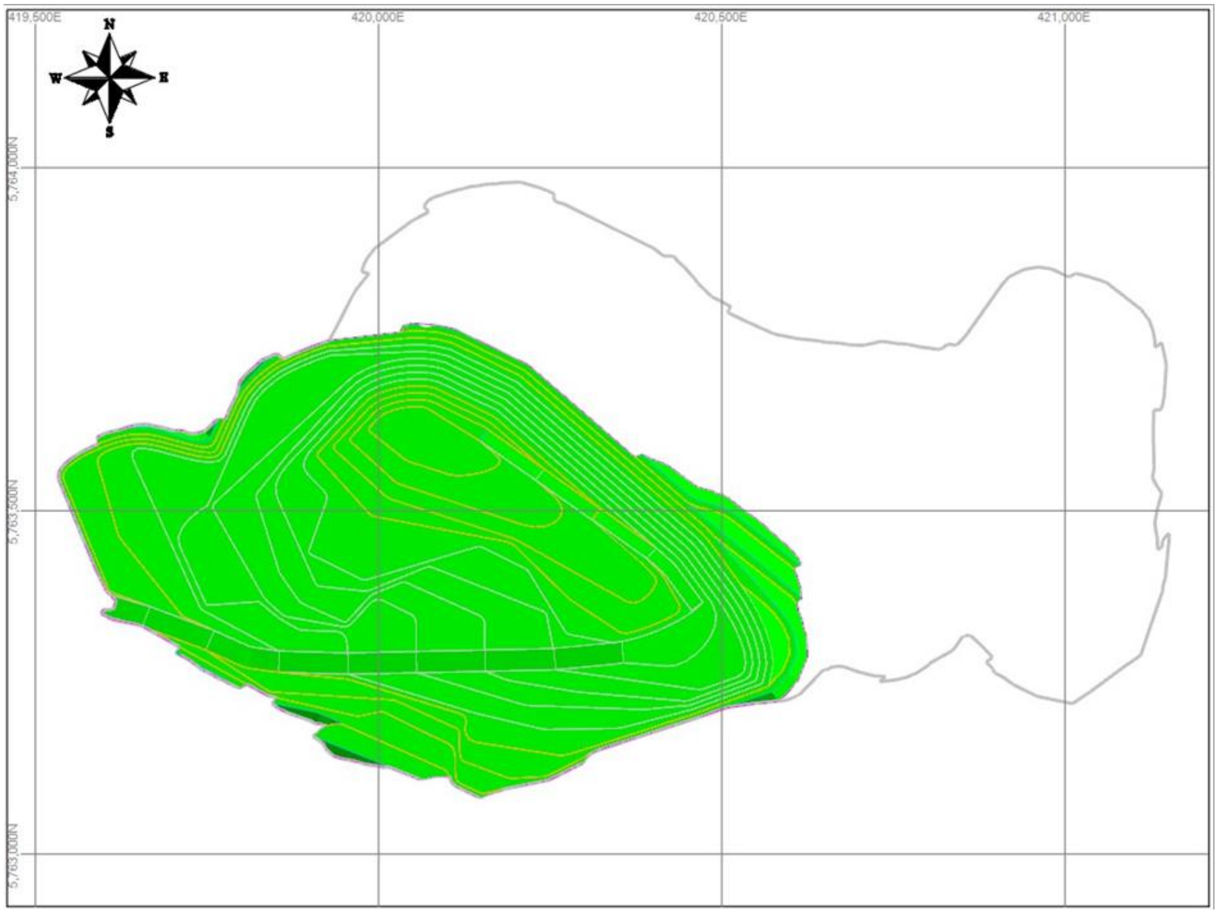
Phase 1 is the first intermediate and smallest of the mining phases. It is approximately 840 m long, 570 m wide, and 90 m deep. It is in the south-east corner of the final pit. The first five ramp segments of the final pit ramp are developed. The design is presented on Figure 16.4.

Figure 16.4: Phase 1 Design



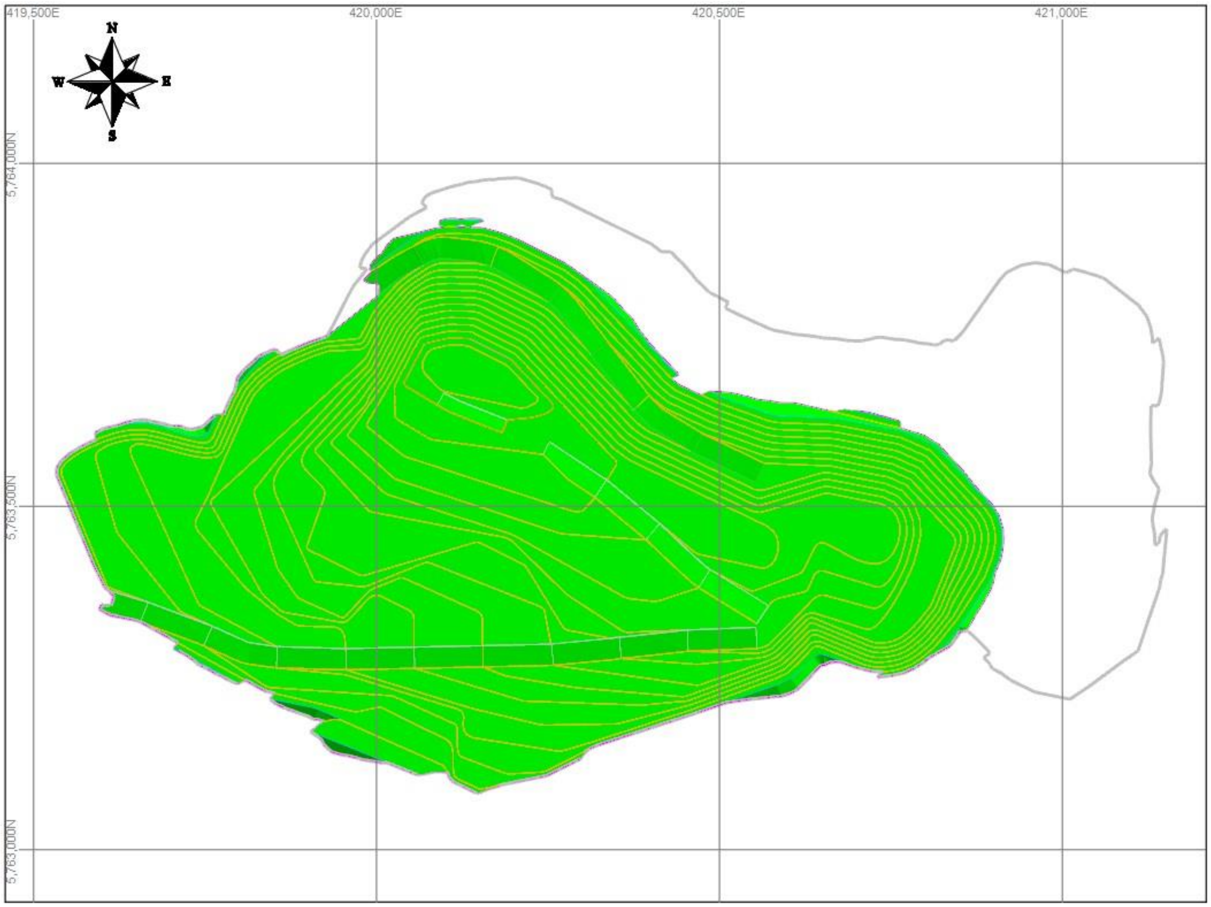
Phase 2 is the second intermediate phase. It is approximately 1,100m long, 700 m wide, and 130 m deep. The design is presented on Figure 16.5. The upper benches will be mined either directly from the surface or by returning on some of the final south wall benches.

Figure 16.5: Phase 2 Design



Phase 3 is the third intermediate phase. It is approximately 1,400m long, 840 m wide, and 160 m deep. The design is presented on Figure 16.6. A double-lane ramp was included in the northern wall for mining the upper benches. When the phase reaches the depth to continue the main ramp on the south wall, access will be switched to this ramp and continued to be driven down.

Figure 16.6: Phase 3 Design



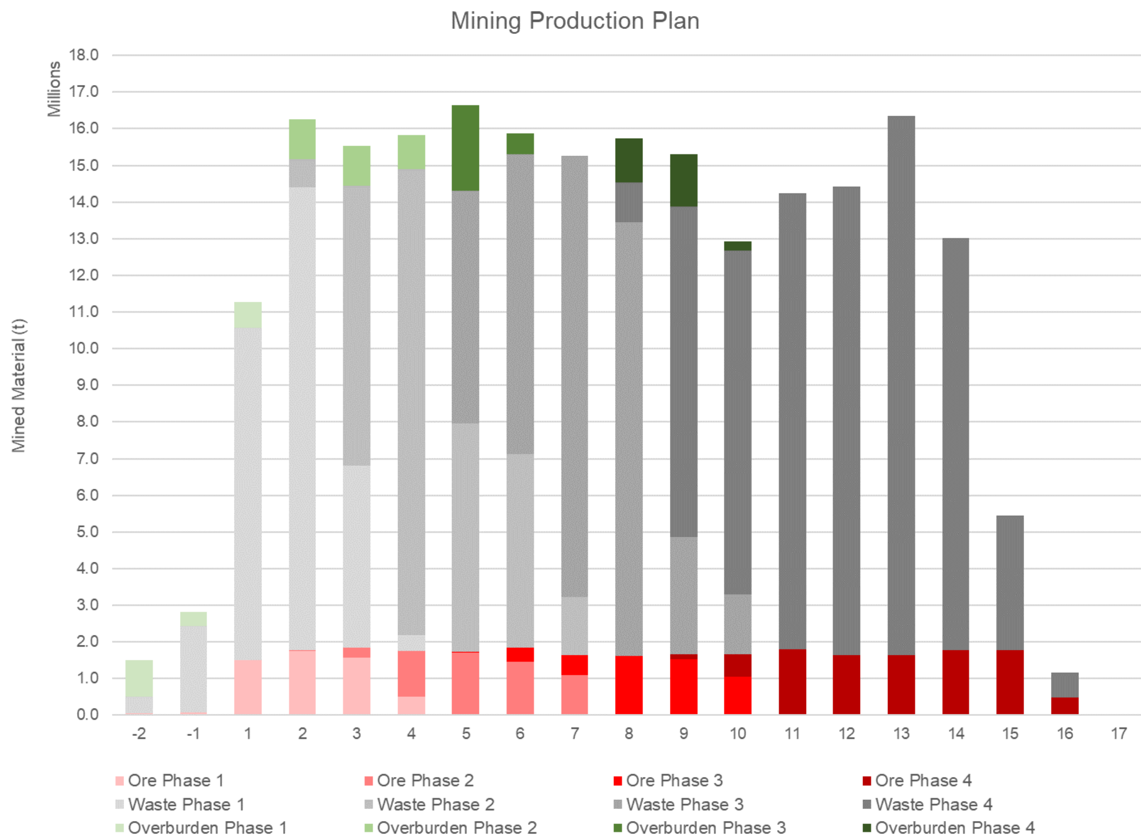
Phase 4 is the ultimate pit phase design and was previously presented on Figure 16.3. The upper benches of this phase will also be mined either directly from surface or by returning on some of the south wall benches.

16.5 Mine Production Schedule

The LOM for the Project is based on an ore processing rate of 4,600 tpd and 350 operating days per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined and to send higher grading ore to the mill in the first years of operation. Year 1 represents the start of the production period as the mill begins to process ore. CELC will undertake the mining of all hard rock material with its own equipment fleet and operators, while a mining contractor will undertake all overburden mining and stockpiling work.

Figure 16.7 presents a graph of the mining production plan.

Figure 16.7: Mining Production Plan Graph



For the pre-production period, mining will occur only in Phase 1. This period will last 19 months. During this period, the mining contractor will begin overburden removal work and a single backhoe excavator will have sufficient capacity to load all the hard rock material in the mine plan. All ore will be stockpiled to prepare for the start-up of the mill. A total of 4.3Mt of material will be mined, including 1.4Mt of overburden, 2.8Mt of waste, and 0.1Mt of ore.

In Year 1, the production rate increases to mine just enough ore material to feed the mill. As of Year 2, Phase 2 overburden removal is started, and Phase 3 is started in Year 4. The final phase, Phase 4, is started in Year 8. A hard rock mining rate between 11.0 and 16.0 Mt is maintained until Year 14, followed by a gradual reduction to the end of mine life, as sufficient ore material is accessible.

Strip ratios in the first nine years range between 6.4 and 8.7 and then decrease until the end of the mine life, with the exception of Year 13. The overall strip ratio for the Project is 7.35.

This production plan produces enough ore material to supply the mill, except for Year 13 and the two final years of operation, where a significant portion of the ore feed will come from the ore stockpile.

16.6 Ore Stockpile Management

A stockpile capable of storing up to 3.9 Mt of ore was designed by WSP. The design criteria for this stockpile are elaborated in Item 18.2.

The ore stockpile area is located directly to the east of the crusher and just to the south-west of the main ramp exit and will store any surplus ore that is mined at any given time. An area capable of storing some ore on the Run-of-Mine pad is also available to manage spontaneous issues with the crusher.

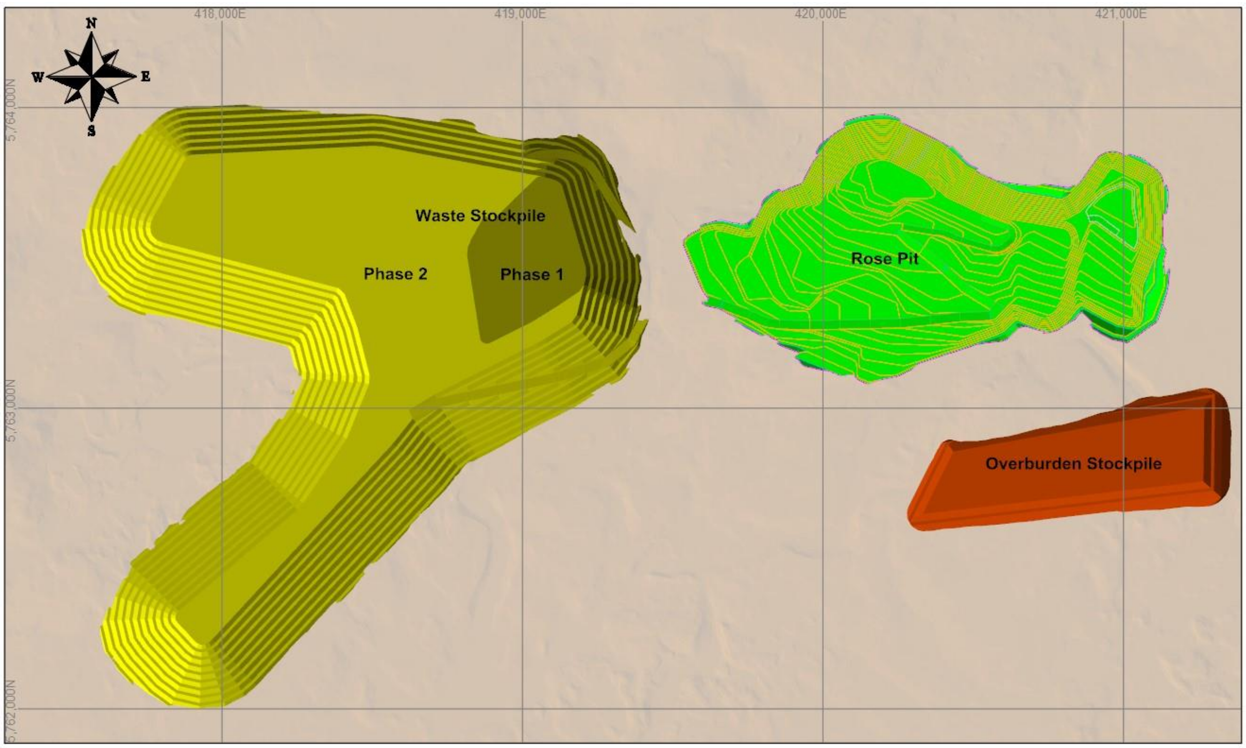
During the pre-production period, all ore material mined from the pit is stockpiled. During the production period, ore exiting the mine is sent to the crusher, as this material has precedence over material from the ore stockpile. This process will reduce the quantity of material to be re-handled. During production periods where more ore material is mined than can be processed, lower grading ore is sent to the stockpile to ensure that higher grading ore is processed earlier. Only during production periods where insufficient ore is mined will ore be reclaimed from the stockpile.

16.7 Waste and Tailings Management

Two piles have been designed for the storage of waste material. One large waste rock pile is located directly to the west of the pit and near the main ramp exit, and one overburden pile is located to the south of the pit, as presented on Figure 16.8.

The waste stockpile will be constructed in two phases. A co-deposition strategy will be used to store both the dry tailings produced by the mill and the mined waste rock material on the waste stockpile. However, the strategy should be reviewed for both operational efficiency and geotechnical stability (Item 18).

Figure 16.8: Stockpile Map



Some waste material will be needed for mining the upper benches of Phase 2 and 4. As previously described, the upper benches of Phase 2 and 4 will be mined by returning on some of the south wall benches via temporary ramps. As such, waste material will be used to create temporary ramps from the main ramp and to backfill some narrow benches to allow for haulage trucks to travel safely. These quantities were not considered in the deposition plan as they are not significant and could be re-handled throughout the final years.

16.8 Mining Operation

The mining operation will run 24 hours per day and all year round, based on a 350-day year. The equipment performance indexes were estimated to properly evaluate the number of each type of main production equipment needed.

The mechanical availability of an equipment is defined as the percentage of time that the equipment is mechanically functional. For the haulage and loading equipment, an initial mechanical availability of 90% was used in the beginning of the Project, with a gradual reduction to 82% at the end of the mine life. For the drills, a constant 82% mechanical availability was used, as this equipment tends to work in more difficult conditions. All other equipment were considered to have a constant 85% mechanical availability.

The use of availability of equipment is defined as the percentage of time that the equipment is running when mechanically available. This factor accounts for all delays such as lunch breaks and shift changes. The use of availability, for the haul trucks, the production backhoe excavator and the production wheel loader, was 82.5%, and the electric shovel was 83.9%. Table 16.3 and Table 16.4 present the delays considered. The electric shovel does not need to be re-fueled, so this delay does not apply. The production drills were assigned a use of availability of 75%. All other equipment were given various rates depending on the needs of the operation. For example, while the water trucks are necessary, they will not be constantly in operation, so a lower rate was considered to reflect the need.

Table 16.3: Delays Attributed to the Haul Trucks, Backhoe Excavator, and Production Wheel Loader

Non-Operating Periods	Daily (min)	Daily (hr)
Tool box meeting and dispatch	20.0	0.33
Beginning of day (mobilize)	20.0	0.33
Start-up checks (walk-around)	30.0	0.50
Fueling	20.0	0.33
Lunch (including stop/start)	120.0	2.00
Shift change	0.0	0.00
End of day (demobilize)	20.0	0.33
Blast (applied per day)	0.1	0.00
Security meeting	4.3	0.07
Delays due to rotation change	17.1	0.29
TOTAL	251.5	4.19

Table 16.4: Delays Attributed to the Electric Front Shovel

Non-Operating Periods	Daily (min)	Daily (hr)
Tool box meeting and dispatch	20.0	0.33
Beginning of day (mobilize)	20.0	0.33
Start-up checks (walk around)	30.0	0.50
Fueling	0.0	0.00
Lunch (including stop/start)	120.0	2.00
Shift change	0.0	0.00
End of day (demobilize)	20.0	0.33
Blast (applied per day)	0.1	0.00
Security meeting	4.3	0.07
Delays due to rotation change	17.1	0.29
TOTAL	231.5	3.86

The efficiency of the equipment is defined as the percentage of time that the equipment is used for actual production work when running. For example, when a shovel operator cleans his bench and moves to better position the shovel with regards to the excavation face, the shovel is mechanically available, and it is running. However, the shovel is not loading any material into a truck, so it is not producing. The efficiency index considers this unproductive time. A proportion of 55 efficient work minutes per 60-minute hour was used for the Project.

The product of all these indexes is the overall equipment efficiency (OEE). These factors were used to determine the quantity of equipment needed and the production rates. Furthermore, these rates were used to evaluate the consumables costs (i.e. tires, wear parts, fuel, etc.) and the manpower needs for each equipment.

16.9 Loading

Several factors contributed to the selection of the type of loading equipment for the mining operation. First, as the mineralized pegmatite dykes are narrow and dip sub-horizontally (between 5° and 25°), a small backhoe excavator was evaluated for ore mining purposes. Furthermore, to reduce dilution, it is planned for mineralized areas to be mined in 5 m flitches. Based on the production targets and these operational constraints, a 7.4 m^3 backhoe excavator was selected.

Second, as the pit has a relatively high strip ratio, an equipment capable of loading greater quantities of waste rock was desired, therefore, a 15 m^3 hydraulic front shovel was selected. Given that the operation is connected to Hydro-Québec's hydroelectric grid, this equipment will be electrically driven, thus reducing power costs and gas emissions.

Third, a 13.8 m^3 production wheel loader was added to the loading fleet, as it will provide operational flexibility. This equipment can quickly be dispatched to anywhere in the pit or to the ore stockpile.

Given the varying thickness of the mineralized zones, some instances where the ore zone is thick enough to be mined by the front shovel or the wheel loader should be evaluated during the operation.

16.10 Hauling

As there are two different sized loading shovels, two different types of trucks will be used. The ±65 t payload trucks will be paired with the backhoe excavator and the ±135 t payload trucks will be paired with the hydraulic front shovel and the production wheel loader. The ±65 t payload trucks will be used for transporting both ore and waste material out of the pit, while the ±135 t payload trucks will be used to transport mined waste material out of the pit, reclaimed ore from the ore stockpile to the crusher, and the dry tailings to the waste stockpile.

The ±135 t haul trucks will haul all the stockpiled ore to the crusher and the tailings from the tailings plant to the waste stockpile. To consider crusher down times (both expected and unexpected), 5% of all ore from the pit that should have been sent directly to the crusher was considered to be sent to the ore stockpile and re-handled within the same period. Furthermore, as the tailings will be stockpiled in the same area as the waste from the pit, the mine operation haul trucks will also transport this material.

The haul fleet requirements meet the production objectives of the LOM and were adjusted to optimize the purchase and replacement plan. The requirements are based on haul cycles times for each year of mining by material type, by phase, and by truck type. Conservative average truck speeds per segment type (i.e. loaded/unloaded, uphill/flat/downhill, etc.) were used to calculate the haul cycle times.

16.11 Drilling

Most production drilling will occur in waste as the strip ratio for the Project is high. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls. During the pre-production period, this drill will also perform all drilling in waste panels.

Table 16.5 presents the drilling patterns for the ore and waste blasts and the pre-split holes.

Table 16.5: Ore, Waste, and Pre-Split Drilling Patterns

Parameters		Ore	Waste		Pre-Split
Drillhole diameter	(mm)	152.4	228.6	152.4	101.6
Burden	(m)	4.5	7.0	5.3	
Spacing	(m)	3.0	5.0	3.0	1.3
Bench height	(m)	10.0	10.0	10.0	10.0
Sub-drilling	(m)	0.8	0.8	0.8	0.0%
Total length	(m)	10.8	10.8	10.8	10.0
Stemming	(m)	4.3	4.3	4.3	
Charge length	(m)	6.5	6.5	6.5	8.8
Powder factor	(kg/t)	0.37	0.32	0.32	

The spacing and burden dimensions of drilling patterns were designed primarily to reach a targeted powder factor for optimal blasting. This geometry was also chosen to allow a decent working area for the blasthole drills in the waste pattern and for the down-the-hole drill rig in all patterns. Pre-split holes will only be drilled for ultimate pit walls with 10 m holes at 1.25 m apart.

16.12 Blasting

The blast designs were optimized to reach a targeted powder factor (PF) for optimal blasting in each rock domain. The ore domain, mainly constituted of pegmatite and gneiss, was attributed a PF of 0.37. The waste domain was attributed a PF of 0.32.

The ore and waste blast patterns were also planned to reduce the charge density, while achieving the targeted PF, to reduce explosives costs. The designs are presented in Table 16.5.

These parameters will need to be re-evaluated with the experience gained during the mining operation. Further analyses should be performed to evaluate the particle size distribution needed for the crusher's operation. The ore blast pattern could potentially be widened and consequently reduce the PF.

16.12.1 Explosives and Accessories

A bulk emulsion, composed of ammonium nitrate pearls in an emulsion matrix, was selected as the explosive for the Project. The two components are transported and stored separately on site. These components are combined in a mobile manufacturing unit (MMU) truck on the blast panel to create the emulsion.

This type of bulk emulsion is recommended for multiple reasons:

- The product's matrix is conceived to resist the multiple transfers during the transportation to site. A total of four transfers will be required from the manufacturing plant to the blast panel (plant, transport tank truck, ISO container on site, MMU truck, blast panel).
- The addition of ammonium nitrate pearls in the emulsion increases the quality of the fragmentation and the rock heave during the blast.
- The emulsion performs well in summer and in winter.
- The emulsion is very resistant to water.

The MMU trucks will be used to pump the explosive emulsion in the blastholes. The Project will require two trucks: one operating and one as a backup.

The explosive that was selected for pre-splitting needs is a packaged emulsion in a continuous cartridge, traced with 10g/m detonating cord. The continuous explosive column provides a consistent blast pressure along the entire loaded hole resulting in a uniform tensile shearing effect, much needed for pre-splitting.

Only electronic detonators are considered for this Project, as they allow for more precise blasts and consequently provide better control on rock projection and vibrations. Their high precision leads to more stable highwalls, fewer misfires, reduced oversize and undersize rock fragments, and a better rock heave.

All the equipment and consumables will be provided by the explosive supplier, except for the stemming material which will be provided by the mine.

16.12.2 Site-Mixed Emulsion Facility

A site-mixed emulsion facility will be built for the Project. All the civil and earth works for the plant will be managed by the mine during pre-production. A geotechnical study, site preparation, foundations, sanitary systems, electricity, potable water, process water, and the required lifting equipment will be provided by the mine.

The explosive supplier will oversee the construction of the facility. For the magnitude of the Project, a storage capacity of 40,000 kg of bulk emulsion, 52,000 kg of ANP, 20,000 kg of package emulsion, and 15,000 detonator units are required. Also, a heated truck shop for the MMU truck maintenance and office space are necessary. The site selection meets the minimum distance requirements as specified by Natural Resources Canada Explosives Regulatory Division.

16.12.3 Blast Monitoring

As dilution control and mining recovery will be important factors for the mining operation, it will be essential to monitor the movement of each blast in mineralized areas. As such, a monitoring system has been considered for the Project. Beacons will be placed strategically in holes throughout the ore blast patterns. The position of these beacons will be surveyed before and after each blast. The geology department will then be able to re-interpret the location of the ore after each blast.

By monitoring the movement of each blast, the drill and blast technicians will be able to adjust the patterns and blast sequences in order to improve the heave of the ore blasts and, consequently, dilution and recovery.

16.13 Stockpile and Road Maintenance and Mine Services

Several other equipment will be needed to operate the mine to support the main production fleet. A wheel dozer and some motor graders will be required to maintain cleared roads and pit floors. Several bulldozers will be needed to maintain the waste and ore stockpiles. An auxiliary excavator will be required for scaling and general work around the pit and will also have a hammer attachment to break oversize rocks. A smaller wheel loader will be required also for general work around the pit and to move the electrical equipment required to power the electric hydraulic shovel (i.e. cables and substation). Some trucks will be required to spray the pit roads with water in the warmer months to suppress dust and to spread sand in the winter for better traction. A fuel and lube truck will be needed to replenish all track-mounted and stationary equipment.

16.14 Equipment Summary

A detailed list of all the main production mining equipment required per year throughout the mine life is presented in Table 16.6. Other smaller equipment, such as transport vehicles and tower lights, are also required for the operation of the mine.

Table 16.6: Mining Equipment Fleet

Mining Fleet	Year																			Max.
	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
Backhoe excavator	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
Electric front shovel	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Production wheel loader	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Haul trucks (65 t)	3	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	7
Haul trucks (135 t)	0	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Rotary drills	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
DTH drills	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Bulldozers	1	0	1	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	6
Wheel dozer	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	2
Motor graders	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	4
Auxiliary excavator	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
Auxiliary wheel loader	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
Water/sand trucks	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

16.15 Mine Dewatering

Shallow lakes and rivers characterize the area around the pit. In fact, two lakes are within the pit limits and will be pumped during the pre-production period. As previously explained in Item 15, an exclusion zone surrounding a third lake to the north of the pit was included in the pit optimization simulations, as per the request of CELC. Also, the reservoir for Hydro-Québec's Eastmain complex is located directly to the east of the pit.

The precipitation and weather values considered are the 30-year average values measured at the 'La Grande Rivière A' station between 1971 and 2000. The groundwater measurements have indicated high flow rates in the pit. As this quantity would be too great to handle with an in-pit dewatering network, dewatering wells will be drilled around the pit to prevent inflow to the mine (see Item 18.13.4 for further details on the dewatering wells). This strategy is also conservative as the geotechnical analysis was evaluated only under dry conditions. As such, mine dewatering needs in the pit are limited to precipitation and an estimated 100 m^3/hr of inflow.

During the pre-production period, all dewatering work will be executed by the mining contractor. During the production period, a combination of diesel-powered pumps will be used to dewater the pit. Diesel powered pumps were considered as they can be easily moved anywhere in the pit, however the use of electric pumps should be considered in future studies.

A complete review of mine dewatering needs is necessary once a hydrogeological model of the site is completed.

16.16 Maintenance

The maintenance department will consist mainly of mechanics, mechanic helpers, welders, and electricians. The ratio used to estimate the personnel needs for this department is 60% of the total operators of the main production mining departments. Furthermore, maintenance planners will coordinate all maintenance work.

While the Project is remotely located, it is still easily accessible year-round by road. As such, damaged parts can easily be sent out to the equipment suppliers for repairs or be replaced with new ones, and specialized personnel can be sent to the site for special repairs.

16.17 Engineering Department

The engineering department will be responsible for providing all production and technical support to the mining operations. The department will consist of a chief engineer, a senior engineer, planning engineers, drill and blast technicians, geotechnical and hydrogeological technicians, and surveyors.

16.18 Geology Department

The geology department will be responsible for updating all the geological information and following the mineralized zones. The department will consist of a chief geologist, a senior geologist, production geologists, and grade control technicians.

16.19 General and Administration Department

The general and administration department will be responsible for all supervision and administrative work. This department consists of the mine and technical services superintendents, the mine, pit, and maintenance foremen, a mine trainer, an administrative assistant, and some clerks.

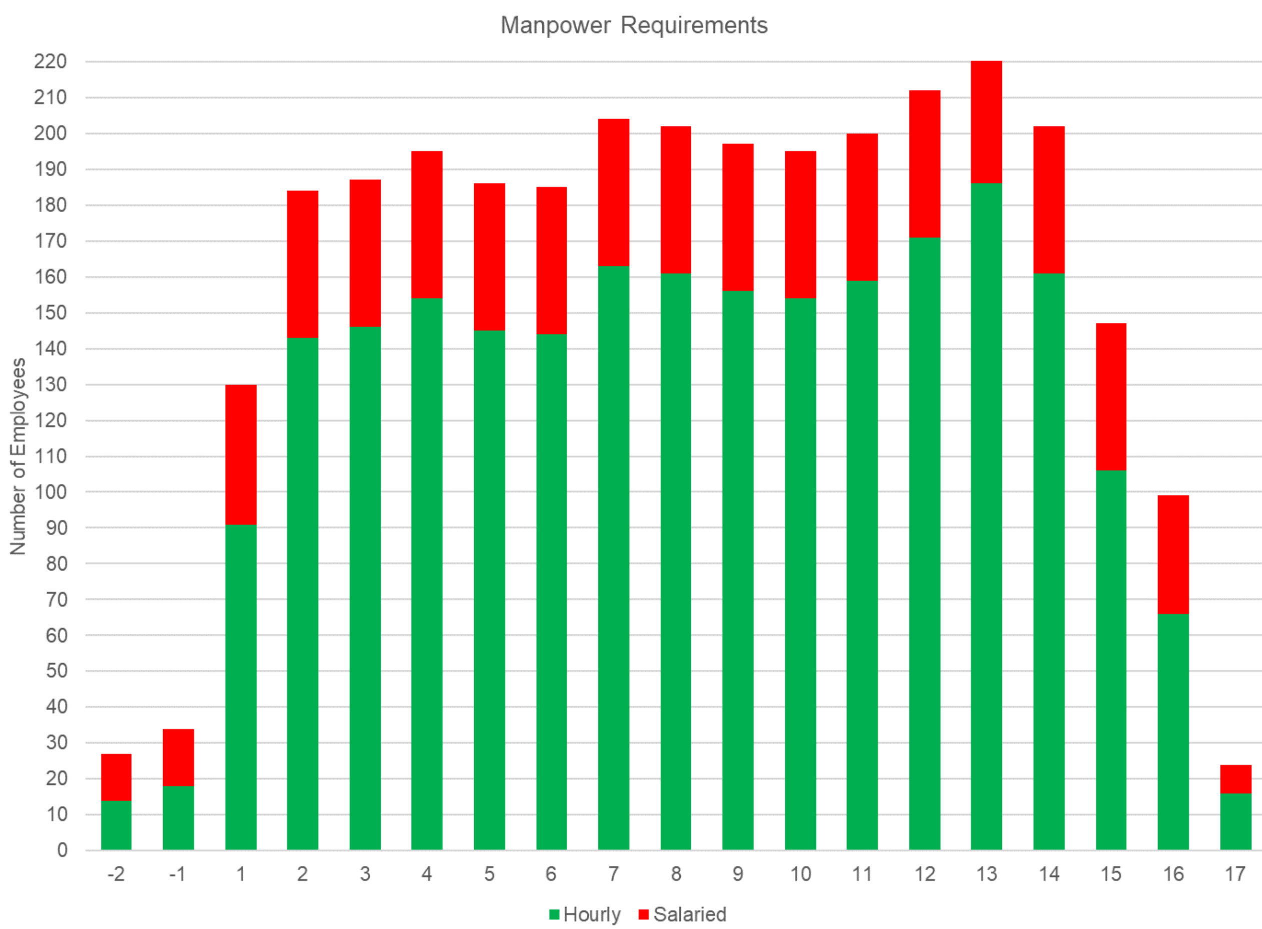
16.20 Manpower

A total of 220 employees will be needed at the peak of mining operations, excluding contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

Manpower requirements for the Project will vary over time, as presented on Figure 16.9. Some personnel, such as surveyors and maintenance teams, will be needed even after mining operations are completed for ore stockpile reclaiming purposes and other general activities.

Figure 16.9: Manpower Requirements



17 RECOVERY METHODS

17.1 Spodumene Plant

The spodumene concentrate will be recovered by froth flotation. The spodumene plant or concentrator consists of a crushing area, beneficiation and dewatering areas.

The concentrator will be designed to produce a spodumene concentrate grading 6.0% Li_2O (technical grade) or higher. However, spodumene concentrate grading 5.5% (chemical grade) could also be produced.

To achieve this concentration, the beneficiation processes include crushing, grinding, magnetic separation, and flotation. The spodumene concentrate, tantalum concentrate, and tailings will undergo further steps of thickening, filtration, drying, and material handling, including storage and loading. Dried spodumene concentrate will be loaded on trucks and the tantalum concentrate will be bagged prior shipping. Tailings will be dry stacked in the waste rock facility.

17.1.1 Process Design Criteria

All throughput rates were based on milling of 1,610,000 dry tonnes. The spodumene process flowsheet retained is capable of producing a spodumene concentrate grading +6.0% Li_2O or higher. Tantalum concentrate grading 2% Ta_2O_5 will be produced. Further, 20% Ta_2O_5 could be produced by adding gravity concentration equipment as demonstrated by the ongoing test work at SGS.

Based on the feed variability simulations developed by Outotec Finland, '*Feed Variability Simulation of Critical Elements Spodumene Concentrator*', Outotec Report 17015-MP-R Confidential September 2017 the spodumene plant will be able to produce a spodumene concentrate, grading 6.0% Li_2O with a lithium recovery of 87% at feed grade of 0.85% Li_2O.

The spodumene plant will operate 24 hours per day, 7 days per week, and 52 weeks per year. The concentrator operating availability will be 90%, and the crushing plant will be operated at 50% availability. The concentrator capacity has been established at a nominal throughput rate of 4,900 dry tonnes per day. The process design criteria is presented in Table 17.1.

Table 17.1: Process Design Basis

Parameter	Units	Value
Total ore processing rate	dry tonnes per year	1,610,000
Nominal ore processing rate	dry tonnes per day	4,900
Ore moisture	percentage	5.0
Spodumene ore feed grade (Li_2O)	percentage	0.85
Tantalum ore feed grade (Ta_2O_5)	percentage	0.0133
Crusher operating time	percentage	50.0
Nominal ore crushing rate	dry tonnes per hour	408.3
Concentrator operating time	percentage	90.0
Nominal ore processing rate	dry tonnes per hour	226.9
Tantalum concentrate grade (Ta_2O_5)	percentage	20.0
Tantalite concentrate recovery	percentage	40.0
Spodumene concentrate grade	percentage	5.5
Spodumene concentrate recovery	percentage	90
Spodumene concentrate production	dry tonnes per year	199,117

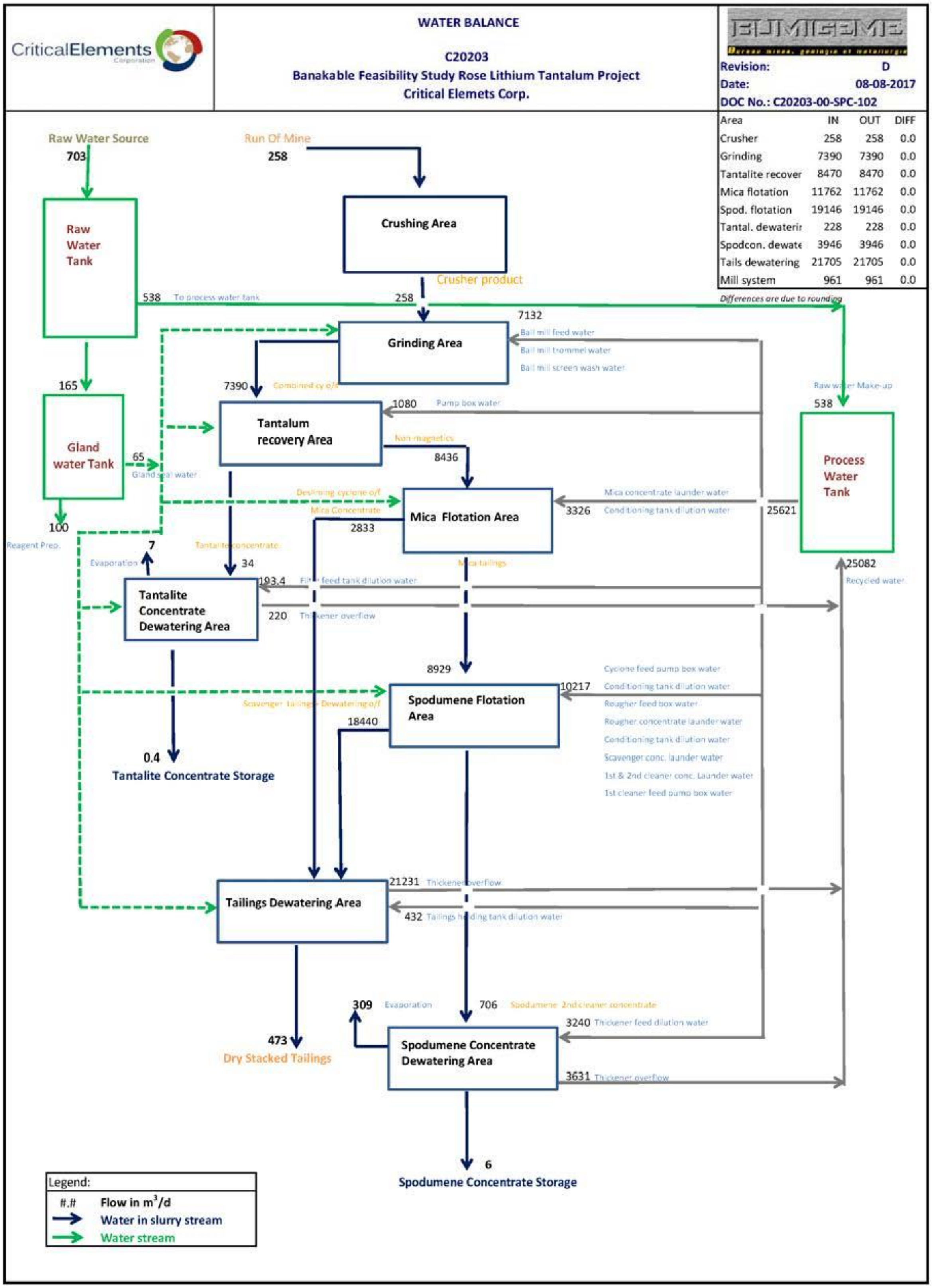
17.1.2 Mass Balance and Water Balance

Table 17.2 shows the summary of the mass balance and Figure 17.1 shows the water balance for the spodumene plant. See Appendix 17-A for design criteria, detailed mass balance and water balance.

Table 17.2: Summary Spodumene plant Process Mass Balance

Mass Entering System				Mass Exiting System			
Streams	**Dry Solids (t/d)**	**Water (m^3/d)**	**Total Mass (t/d)**	**Streams**	**Dry Solids (t/d)**	**Water (m^3/d)**	**Total Mass (t/d)**
Fresh water from lake	—	538	538				
Spodumene ore to plant	4,900	258	5,158	**Evaporation from T-dryer**	—	7	7
				Evaporation from S-dryer	—	309	309
				Tantalite concentrate	43	0.4	43
				Spodumene concentrate	598	6	604
				Final tailings	4,259	473	4,732
Total In	4,900	796	5,696	**Total Out**	4,900	795	5,696

Figure 17.1: Water Balance



17.1.3 Flowsheets and Process Description

Simplified flowsheet indicating the process is presented on -. Detailed process flowsheets have been developed and are presented in Appendix 17-B. The crushing facility can operate independent of the concentrator. The concentrator has three distinct areas, magnetic separation for tantalum recovery, flotation for mica, and spodumene concentrates and thickening, filtration, drying and bagging.

The detailed description of the process areas is given below.

CRUSHING

The crushing section can be divided into in two areas, primary crushing including jaw crusher and the secondary crushing includes secondary and tertiary cone crushers and screens.

The ROM ore will be dumped onto a feed ore hopper by the mine haul trucks. The grizzly feeder installed under the hopper feeds the oversize to the jaw crusher. The jaw crusher breaks the ore and the broken material along with the grizzly feeder undersize will be transported via conveyor to secondary crusher building. The jaw crusher discharge will have a particle size distribution of 80 % less than (P_{80}) 150 mm.

The secondary crushing section consists of a secondary double deck vibrating screen and a secondary cone crusher and a tertiary double deck screen and a tertiary cone crusher. The oversize from the top deck and the bottom deck reports to the secondary crusher, while the undersize bypass the secondary crusher. The tertiary cone crusher operated in closed circuit with a tertiary double deck vibrating screen receives the crushed ore from the secondary crushing. The oversize from the tertiary vibrating screen feeds the tertiary cone crusher. The undersize from the tertiary screen reports to the crushed ore storage dome.

The secondary cone crusher crushes the oversize to a (P_{80}) of 39 mm and the tertiary crusher crushes the oversize to a (P_{80}) of 13 mm. Both crusher discharges will be re-directed to the tertiary double deck vibrating screen via three belt conveyors.

CRUSHED ORE STORAGE DOME

Crushed ore will be stored in a storage dome having 9,200 tonnes stockpile capacity. The stockpile has been designed to hold ore stock for two (2) days of uninterrupted milling capacity.

Ore will be withdrawn from the crushed ore stockpile using four (4) belt feeders, two (2) operating and two (2) in standby mode. The operating belt feeders transfer the crushed ore via a conveyor to the grinding mill.

GRINDING

The grinding circuit consists of a ball mill operated in closed circuit with two-stage hydrocyclones clusters. The two-stage cyclone classification system minimizes overgrinding of spodumene ore and helps minimize spodumene losses as slimes.

The undersize from the 1st stage cyclone cluster will be pumped to the second stage cyclone cluster, while the underflow from the 2nd stage cyclone cluster will be returned to the mill for grinding. The overflows from the two stages will be combined and sent to a wet magnetic separation circuit.

TANTALUM RECOVERY

Wet magnetic separation will be performed in two stages, rougher and scavenger magnetic separation for recovering magnetic tantalum minerals from the flotation feed.

The magnetic tantalum concentrates recovered will be sent to a thickener and vacuum filtration for dewatering. Further, a dryer will remove residual moisture down to 1% by weight to bag the tantalum concentrate in bulk bags for shipment.

MICA FLOTATION

The removal of slimes is done prior to mica flotation to improve flotation performance and reduce the reagent dosage, as slimes have a tendency to increase the reagent consumption. The cyclone underflow will be conditioned with AERO 3030C and Soda ash (Na_2CO_3) for floating mica.

In mica flotation, the floated mica will be considered as tailings. There will be two (2) stages of mica flotation. The first stage is the rougher mica flotation stage to remove as much liberated mica as possible and the second stage is a cleaner flotation stage, which releases the entrained spodumene particles back into the beneficiation process. The mica cleaner concentrate goes to the tailings thickener. The rougher and cleaner tailings go to the attrition circuit for further processing.

ATTRITION

A dewatering cyclone step prepares the feed for attrition. The attrition scrubbing circuit will remove deleterious slimes prior to spodumene flotation. Caustic soda (NaOH) and F220 dispersant will be added to facilitate scrubbing. The attrition step has to be performed at a higher pulp density (60% solids) to be effective.

A desliming cyclones cluster will remove slimes generated from attrition prior to spodumene flotation and provides the high slurry density required for spodumene ore conditioning.

SPODUMENE FLOTATION

The spodumene flotation circuit starts with high density conditioning. High density conditioning is a process requirement to obtain proper flotation results. F220 dispersant, soda ash (Na_2CO_3) and Fatty acid-2 collector will be added to high density conditioning (60%) tank.

Spodumene flotation will be a standard rougher–scavenger and cleaner flotation process. The spodumene will be floated to produce a rougher concentrate. To minimize spodumene losses during flotation, the rougher tailings will be further floated in a scavenger flotation circuit. The rougher concentrate undergoes two-stage cleaning to produce a high grade spodumene concentrate (>6.0% Li_2O or chemical grade at 5.5% Li_2O depending on the market conditions). F220 dispersant and Fatty acid-2 collector will be added to the cleaner flotation to improve performance. The second cleaner flotation concentrate will be pumped to the concentrate thickener. The cleaner tailings and the scavenger concentrates return to the attrition circuit.

SPODUMENE CONCENTRATE DEWATERING AND STORAGE

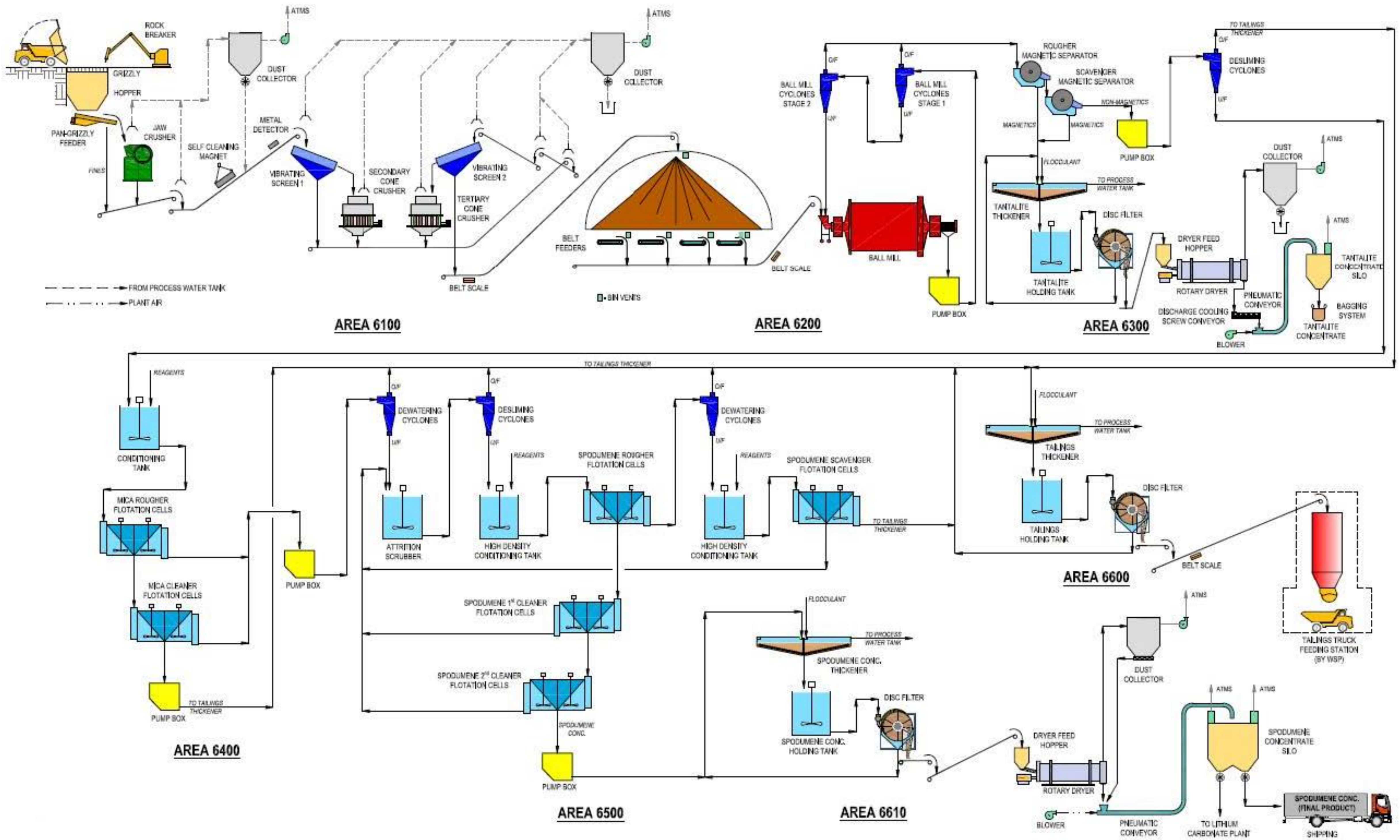
Spodumene cleaner flotation concentrate from second cleaner will be thickened to 65% solids in a high-rate thickener. The thickened concentrate will then be filtered to 15% moisture in a vacuum disc filter. The filtered concentrate will be dried on a rotary dryer to remove residual moisture to around 5% by weight to store in 1,500 tonnes spodumene concentrate storage bins. Trucks will be used to ship the concentrate.

TAILINGS DEWATERING AND STORAGE

Tailings from several locations in the plant will be collected and thickened to 60% solids in a high-rate thickener. The thickened tailings will be filtered to 15% moisture using a vacuum disc filter. The filtered tailings will be discharged on a conveyor that brings the dried tailings to a truck loading hopper.

Mine haul trucks transport the tailings to the waste rock facility.

Figure 17.2: Simplified Process Flowsheet



17.1.4 Spodumene Plant – Equipment Sizing and Selection

The equipment selection was based on the design criteria developed from the metallurgical test work. The equipment list was prepared and the equipment was sized according to the developed design criteria, the flowsheet drawings, and the mass balance. An equipment list showing electrical power is presented in Appendix 17-C. The crushing equipment was designed with 22% overdesign, the processing equipment was designed with 11% overdesign, and the slurry pumps were designed with 10% overdesign.

Crushing of the ROM takes place in two crusher buildings.

PRIMARY CRUSHING

The primary crushing building houses the ore hopper, stationary grizzly, rock breaker, the vibrating grizzly feeder, and the jaw crusher. ROM ore will be hauled from the open pit mine. The mine haul trucks dump directly into the ore hopper. A stationary grizzly installed on the hopper prevents oversized rocks reporting to the jaw crusher. A rock breaker breaks the oversize boulders. A vibrating grizzly feeder (1.6 m wide x 6.1 m long) extracts the ore from the hopper and feeds the oversize to a 224 kW jaw crusher. The undersize, less than (P_{80}) 150 mm in size bypass jaw crusher. The crushed ore and the fines will be conveyed to the secondary crushing building that contains two vibrating screens and the secondary and tertiary cone crushers.

A 15-tonne overhead crane installed in the jaw crusher building will be used for maintenance. A dust collector with various pickup points collects dust generated at conveyor discharges and transfer points.

SECONDARY AND TERTIARY CRUSHING

The crushed ore from the jaw crusher will be screened on the secondary vibrating screen consisting of one 1.80 m wide × 4.80 m long doubledeck screen with top deck screen aperture of 100 mm and the bottom deck screen aperture of 35 mm.

The oversize from the two decks will be crushed in the secondary cone crusher of 300 kW producing crushed ore, at a P_{80} of 39 mm. The discharge from the secondary crusher and the screen undersize will be sent to the tertiary doubledeck vibrating screen, 2.4 m wide x 8.5 m long, with top deck screen aperture of 32 mm and bottom deck screen aperture of 19 mm. The tertiary screen will be operated in closed circuit with the tertiary cone crusher.

The oversize from the tertiary screen will be crushed in the tertiary cone crusher of 375 kW and will produce crushed ore at a P_{80} of 16 mm. The discharge from this crusher will be sent back to the tertiary double vibrating screen. The undersize from the tertiary vibrating screen will have a P_{80} of 12.5 mm and will be transported by a conveyor to a crushed ore storage dome.

The cone crusher building has a 5-tonne overhead crane for maintenance purposes. A dust collector installed in this building collects dust emissions from various conveyor discharge points and transfer tower.

CRUSHED ORE STORAGE DOME

The crushed ore stockpile is covered by a storage dome and is located outside the crushing building, close to the mill. The crushed ore storage dome is 42 m diameter x 20 m high and will have a storage capacity of 9,200 tonnes.

Four variable speed belt feeders are installed under the storage dome. Two belt feeders are capable of supplying the rated tonnage to the ball mill. The feeders discharge the ore on to the mill feed conveyor.

Bin vent type dust collectors control dust emissions from the storage dome and the belt feeders.

GRINDING

Grinding will be performed in an overflow discharge ball mill. The ball mill, 5.0 m diameter x 8.2 m long, with 3550 kW motor will be operated in closed circuit with a two-stage hydrocyclones classification system. Grinding is performed using 75 mm dia. grinding balls at a ball load of ~285 tonnes. Mill discharge will be pumped to the 1st cyclone cluster (6 x 380 mm) and the underflow will be pumped to the 2nd cyclone cluster. The underflow from the 2nd cyclone cluster (4 x 380 mm) will be returned to the mill for grinding, while the overflow from the two stages will be combined and sent to the magnetic separation circuit for tantalum recovery.

A pulp sampler installed on the combined overflow collects samples at regular interval for determining the head assays.

A 30-tonne overhead crane will be used for mill maintenance.

The ball mill sizing was based on the bond ball mill work index test. Two-stage classification ensures that overgrinding of the liberated spodumene ore is minimum and helps minimize generation of slimes.

TANTALUM RECOVERY

The combined overflow from the two-stage cyclone clusters will be sent to a wet magnetic separation circuit to recover tantalum bearing minerals. Tantalum concentrate will be recovered in two stages. In the first stage, two 5.8 m L x 5.0 m W x 5.4 m H single drum wet magnetic separators operated at 5,000 Gauss will be used as roughers. The non-magnetics from the roughers will be sent to the second stage magnetic separation that will use two 5.8 m L x 5.0 m W x 5.4 m H single-drum magnetic separators operated at 15,000 Gauss as scavengers to recover the remaining magnetic tantalite minerals from that stream. The magnetics concentrate from both roughers and scavengers will be combined and sent to the tantalite thickener, while the non-magnetics product will be further deslimed in a desliming cyclone cluster No.1. The cyclone cluster ensures slimes removal before mica flotation. The desliming cyclone cluster consists of four, 380 mm diameter cyclones.

A pulp sampler installed on the magnetic product stream determines the tantalum concentrate grade.

Flocculant FlominTM 905(MC) will be added to the thickener. Tantalum concentrate from the thickener underflow will be sent to a vacuum disc filter. A rotary dryer further removes the residual moisture down to 1% by weight. The dried tantalum concentrate will be stored in a 100-tonne silo and will be bagged in a 1-tonne big bag filling system and shipped.

The magnetic separators were sized using bench scale test work results. The cyclones sizing was based on optimal slimes removal.

MICA FLOTATION

The desliming cyclone cluster underflow slurry will feed the conditioning tank by gravity, where reagents will be added for mica flotation.

The conditioned slurry will be pumped from the conditioning tank into the dilution tank to reduce the pulp density prior to mica rougher flotation.

The mica flotation circuit consists of a conditioning tank, 3.0 m diameter x 3.2 m high, equipped with 11.0 kW agitator and a dilution tank, 3.0 m diameter x 3.2 m high, equipped with 11.0 kW agitator. Mica rougher flotation consists of five mechanical cells in series, 14.2 m^3 each. The rougher concentrate will be pumped to the mica cleaner flotation circuit consisting of two mechanical cells in series, 2.8 m^3 each. The mica cleaner concentrate will be pumped to the tailings thickener.

In the mica flotation, undesired mica will be removed as flotation concentrate from the spodumene ore prior to spodumene flotation.

The flotation circuit was designed based on the 5 kg spodumene concentrate production test results and other bench scale tests.

DEWATERING, ATTRITION, AND DESLIMING

The combined mica rougher tailings and cleaner tailings will be pumped to a dewatering cyclone cluster for increasing the percent solids of the underflow stream prior to attrition scrubbing. The dewatering cyclone cluster No.1 consists of fourteen (14), 150 mm diameter cyclones.

Attrition scrubbing is carried out to clean the mineral surfaces and remove slimes from the spodumene mineral surface. The dewatering cyclone cluster No.1 underflow will discharge into the attrition circuit with four (4) attrition scrubber cells, 19.3 m^3 each. The attrition scrubber cells residence time was derived from the bench scale test work.

The scrubber discharge will be further deslimed in a desliming cyclone No.2 cluster. This cyclone cluster is required to ensure thickening before high density conditioning. The desliming cyclone cluster No.2 consists of twelve (12), 150 mm diameter cyclones.

The cyclones sizing was based on optimal slime removal.

SPODUMENE FLOTATION

The spodumene flotation circuit is designed to produce good quality spodumene concentrate grading 5.5% Li_2O or higher. The flotation circuit was designed based on the metallurgical test work performed at SGS Lakefield.

The desliming cyclone cluster No.2 underflow slurry will feed the high density spodumene conditioning tank #1 by gravity. The high-density conditioning is a requirement for optimal performance of spodumene flotation.

The conditioned slurry will be pumped to a dilution conditioning tank #2 where the slurry is diluted with process water to obtain the correct flotation pulp density for maximum performance in the spodumene rougher flotation cells. The two high density spodumene conditioning tanks will be 4.1 m diameter x 4.3 m high, each equipped with a 22.4 kW agitator.

Spodumene rougher flotation will consist of seven mechanical cells in series, 14.2 m^3 each and the scavenger flotation consisting of four mechanical cells in series, 14.2 m^3 each. The spodumene cleaner flotation consists of two stages of cleaning. The spodumene first cleaner flotation cells will consist of six mechanical cells in series, 2.8 m^3 each, while the spodumene second cleaner flotation cells will be five mechanical cells in series, 2.8 m^3 each. The second cleaner concentrate will be pumped to the spodumene concentrate thickener. The cleaner tails from both cleaners return to the attrition scrubber.

A pulp sampler installed on the second cleaner concentrate will be used to assay the lithium content of the spodumene concentrate.

The spodumene rougher tailings will be sent a dewatering cyclone cluster No.2 for increasing pulp density for high density conditioning prior to scavenger flotation. The dewatering cyclone No.2 cluster consists of eighteen 150 mm diameter cyclones. The cyclone underflow flows by gravity to a high-density conditioning, 4.1 m dia. x 4.3 m tank with a 22.4 kW agitator. The conditioned slurry is then pumped to another conditioning tank for diluting the slurry density prior to scavenger flotation. The dilution tank will be 4.1 m dia. x 4.3 m tank with a 22.4 kW agitator. Scavenger flotation consists of four mechanical cells in series, each 14.2 m^3. Scavenger concentrate will be pumped to the attrition scrubber, while the tailings will be pumped to the tailings thickener.

A pulp sampler installed on the tailings line determines the lithium reporting to the tailings stream.

A 5-tonne overhead crane installed in the flotation area will be used for the maintenance of all flotation equipment.

SPODUMENE CONCENTRATE DEWATERING AND STORAGE

The spodumene cleaner concentrate will be pumped to the 6.1 m diameter concentrate thickener. The thickener overflow will be pumped to the process water tank for recirculation of process water, while the concentrate thickener underflow at 65% solids will be pumped to spodumene concentrate holding tank 7.0 m diameter x 8.0 m high. The solids will be kept in suspension with a 45 kW agitator. From the holding tank the concentrate will be pumped to the concentrate vacuum disc filter (4'.0 dia. x 3 discs). The filtrate will be re-circulated to the spodumene concentrate thickener by a filtrate pump.

The high-rate concentrate thickener was sized based on the results of sedimentation test work conducted at SGS. FlominTM 905(MC) will be added to the thickener as the flocculant. The vacuum disc filter was sized by filtration test work results as well.

The filter cake at 14% moisture will be dried in a rotary dryer (1.8 m dia. x 10.7 m long) and stored in a 1,500-tonne capacity spodumene concentrate storage silo before being transported by trucks.

TAILINGS DEWATERING AND STORAGE

Various streams from the plant, including mica concentrate from mica flotation, overflows from desliming cyclone clusters, and dewatering cyclone clusters, scavenger tailings from spodumene flotation circuit will be directed to the 19.8 m diameter thickener. The high-rate tailings thickener size was selected based on dynamic settling tests. FlominTM 905(MC) will be the flocculant that will be added to the tailings thickener.

The thickener overflow will be pumped to the process water tank, while the tailings thickener underflow at 60% solids will be pumped to the tailings holding tank 12.0 m diameter × 14.0 m high agitated with a 112 kW agitator.

From the holding tank, the tailings will be pumped to the tailings disc filter (6'.0 dia. x 5 discs). The disc filter was sized based on filtration tests results. The filtrate will be re-circulated to the tailings thickener by a filtrate pump.

The filter cake at 15% moisture will be stored in a truck loading hopper. Mine haul trucks will be used to transport the tailings to the waste rock facility.

17.1.5 Spodumene Plant – Utilities

CONCENTRATOR WATER SERVICES

The water consumption is based on concentrator plant nominal water consumption per hour.

1 Fresh (Raw) Water

Water wells will be the main water source of fresh water to the concentrator. The fresh water will be stored in a 6 m diameter × 7 m high water tank.

Fresh water from the wells was not tested during metallurgical test work.

2 Process Water

Reclaim water will be recycled back, at a nominal rate of 1,045 m^3/h, from the tailings thickener and concentrate thickeners. The process water tank will be stored in a 12 m diameter × 14 m tank.

The effect of process water on flotation was not tested during metallurgical test work.

3 Gland Water

The gland water system has a separate 5.0 m diameter by 6.0 m high gland water tank, which will also be used for reagents preparation. A special water filtration produces filtered water for gland seal and reagent preparation.

CONCENTRATOR COMPRESSED AIR

1 High-Pressure Air

The plant will have two (2) air compressors. An air dryer and receiver tank will be used for instrument air only. One compressor is on standby.

2 Low-Pressure Air

The flotation cells will receive low-pressure air about 4.0 Psig from two (2) air blowers. One blower is on standby.

17.1.6 Power Requirements

The total electrical connected load for the spodumene plant is estimated at 12.5 MW including running and standby loads. The operating demand load is estimated at 8.5 MW. The plant will be hooked up to the Hydro Québec Grid. All power consumed will be hydroelectric.

The consumption was estimated at 39.36 kWh/tonne.

18 PROJECT INFRASTRUCTURE

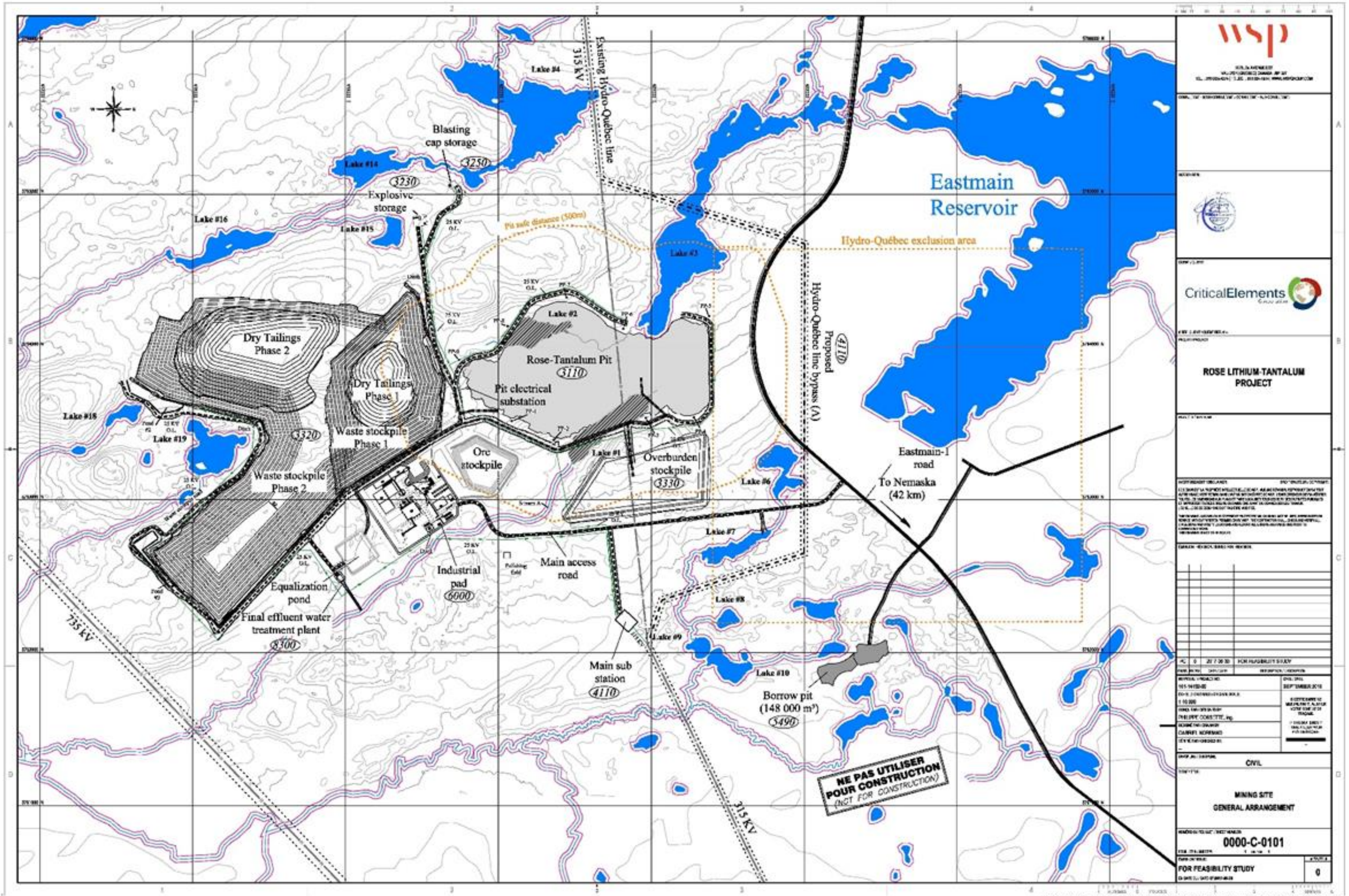
The following Item details the site infrastructures of the Project.

The project infrastructure considered in this Item includes:

- Waste rock and dry tailings co-deposit stockpile;
- Ore stockpile pad;
- Industrial pad;
- Main access, service and haulage roads;
- Overburden stockpile;
- Surface water management ponds, ditches, pumping stations and piping;
- Pads for other infrastructures;
- Liquid Natural Gas (LNG) storage and distribution;
- Diesel and gasoline storage and distribution;
- Truckshop and warehouse;
- Administrative building and gatehouse;
- Spodumene process plant;
- Main electrical substation and distribution;
- Communication system;
- Explosive and cap magazine storage
- Fresh and potable water supply;
- Sewage system;
- Final effluent treatment plant.

Figure 18.1 shows the mine site layout.

Figure 18.1: Site Layout



18.1 Waste Rock and Dry Tailings Co-Deposit Pile

A combined waste and dry tailings co-deposit is proposed. The total capacity of the pile is 107M m^3, which is sufficient to contain the waste rock and the dry tailing, including a toe berm for the dry tailing pile. The volume was assessed based on the optimized pit shell.

The pile design was completed in accordance with Québec government's Directive 019 related to the mining industry. It is understood that materials used for the stockpile are considered as 'low-risk mining waste'. No waterproofing measure is expected for the ground water protection. In addition, no accumulation on surfaces is located less than 20 m from nearby watercourses.

The co-deposit pile has an approximate capacity of 182 MT (91M m^3) for mine waste and 24 MT (16 M m^3) for the dry tailings. Two distinct zones are identified for stockpiling waste material, thus reducing the water management infrastructure required in the first years. The detailed co-deposition plan will be implemented during the operations. Figure 18.2 shows the section view of the waste rock and dry tailings co-deposit pile.

The particle size of waste materials was determined using information provided by InnovExplo.

The waste section covers the dry tailing piles in accordance with the following design criteria:

- First bench slope 2H: 1V;
- First bench maximum height: 20 m;
- First bench maximum width: 40 m;
- Subsequent bench slopes 1.5H: 1V;
- Maximum subsequent bench offsets: 10 m;
- Maximum subsequent bench heights: 10 m;
- Overall slope of the dump: 2.5H: 1V;
- Maximum number of benches: 10.

Both zones (Phase 1 and Phase 2) have sufficient clearance from other infrastructures to allow for an extension, if necessary.

The same design criteria and geometry that were proposed by Amec Foster Wheeler (TX16017703-01000-RGE-0001-0, 2017) were used to define the dry tailings piles within the co-deposit pile. Additional stability analyses were undertaken by WSP to reflect the co-disposal concept and possible filling sequence.

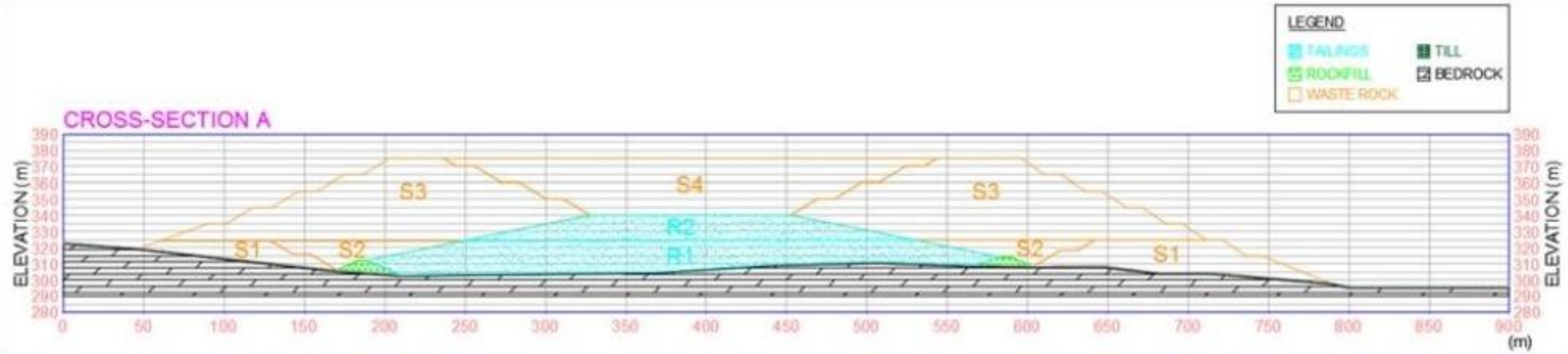
Soil parameters from geotechnical data collected from four test wells (T-25, T-26, T71, and T-75) and surface deposit maps were used in the design. The proposed design respects all required regulations.

The dry tailings pile will be placed on the cleared and stripped natural soil. Waste sections will be placed on the cleared, but not stripped, natural soil to allow an effective management of sediments when work is completed.

The subsoil (natural soil) of the pile is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of WSP.

A service road will be built around the waste rock pile to allow for maintenance of the ditches, the ponds, and the pumps. No service road is added on the north side of the pile since no infrastructure that requires maintenance is located on this side of the pile.

Figure 18.2: Waste Rock and Dry Tailings Co-Deposit Pile Section View



18.1.1 Proposed Filling Sequence

The filling sequence is proposed to reduce the run-off water management requirements throughout the life of the mine. For Years 2 to 4 (Phase 1), only the south-west section of the co-deposit will be used. Doing so, Ponds 2 and 3 will not be required at construction. Since the waste stockpile toe limit will remain within the catchment area of the final peripheral ditch, no temporary ditches will be required. At no time will the run-off water be in contact with the stockpile flow without being caught through ditches and treated at the Equalization Pond.

A second phase is proposed covering Years 5 to 17. Prior to this phase, peripheral ditches will be dug so the whole catchment area of Pond 2 and Pond 3 is directed towards those two ponds. Since the co-deposit pile toe limit will remain within the catchment area of Pond 2, no ditches will be built on the north side of the co-deposit pile. At no time will the run-off water be in contact with the stockpile flow without being caught through ditches and treated at the Equalization Pond.

A detailed sequence of filling should be developed in detailed engineering.

18.1.2 Run-Off Water Management

Run-off water coming from the waste rock pile will be directed in the surrounding ditches. It is assumed that the north side of the pile does not require ditches, since the co-deposit toe limit will remain within the catching area of the final peripheral ditch. The ditches will collect run-off water and bring it towards three ponds (Pond 2, Pond 3, and the Equalization Pond). Run-off water will then be pumped into the retention pond for characterization and processing before being discharged into the effluent.

Ditch design flows were calculated according to the rational method. The overburden stockpile was divided into three sub-catchment areas. For each catchment area, a 100-year rainfall, with a duration equal to the time of concentration of the catchment area, was considered to determine the design flow.

A run-off coefficient (Cp) of 0.5 was selected for the waste pile surfaces. A Cp of 1 was considered for the dry tailings pile surfaces. The Intensity-Duration-Frequency curves of Station A, La Grande Rivière, were used. The water velocity and height in the ditches were determined using the Manning's equation.

This Cp of 0.5 was considered conservative for predominantly coarse soil in mountain areas, such as defined in the culvert design manual of the *Ministère des Transports du Québec*. The Cp of 1.0 for the dry tailings is also considered conservative.

The depth of the specified ditches is appropriate to maintain at least a gross freeboard of 1 m while keeping a maximum flow velocity below 3 m/s. To protect ditches against erosion, broken stones of 0-400 mm in size are expected on the walls and the bottom of the ditches. A Manning's coefficient of 0.036 was selected for the ditch protection.

Water retention ponds #2 and #3 are also expected in order to hold a 24-hour duration, 100-year flood (3.45 mm/h) in addition to snow melting over a period of 30 days (0.4 mm/h). The Equalization pond is designed for a 24-hour duration, 1000-year flood (5.77 mm/h), in addition to snow melting over a period of 30 days (0.4 mm/h).

These ponds have a minimum freeboard of 1 m. Pumping is evaluated to collect water, but neglected for drainage. Rainfall over the ponds was also considered. Table 18.1 presents surface water management ponds required and designed volumes.

Table 18.1: Surface Water Management Ponds Volume

Area	Total Volume Designed (m^3)
Pond 2 – Waste Stockpile	76,215
Pond 3 – Waste Stockpile	52,519
Pond 4 - Equalization pond	321,400
Pond B1 – Access road and overburden stockpile	15,000
Pond B2 – Access road and overburden stockpile	9,100
Pond B3 – Explosive storage road stockpile	2,840

Discharge flow rates of water were determined so that rainfalls of 25 mm (90% of rainfalls are below 20 mm) are discharged within 72 hours.

According to rainfall statistics from Environment Canada, La Grande Rivière Station A, there are 27.3 days with rainfall over 5 mm during the months of April to October (210 days), or a significant rainfall per 8 days. This 72-hour delay appears to be adequate and safe to drain the pond. The additional volume is considered to reduce pumping requirements.

18.2 Ore Stockpile Pad

An ore pad with an approximate capacity of 3,900,000 T (1.6M m^3) is expected to hold the ore stockpile.

The design of the ore pad complies with Directive 019 related to the mining industry. It is understood that materials used for the ore pad are considered as ‘low risk mining waste’. No waterproofing measure is expected for the ground water protection.

The following design criteria were selected. These criteria were validated with the Geotechnical Stability Analysis of overburden stockpile prepared by WSP in 2017. Since native soil in both the waste stockpile area and the ore stockpile area are the same, applying the same design criteria is safe since the ore pile height is significantly lower than the waste pile.

- Slope for each level: 1.5H :1V;
- Maximum bench height: 10 m;
- Maximum bench offset: 10 m;
- Maximum number of benches: 4.

The proposed ore pad will be placed on a surface cleared, stripped, and levelled with waste materials. All stored material will be processed at the plant at the end of the Project.

The subsoil (natural soil) of the pile is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samples collected under the supervision of WSP.

18.2.1 Run-Off Water Management

Run-off water coming from the ore pad will be directed in the surrounding ditches and redirected towards the Equalization Pond using gravity.

Ditch design flows were calculated according to the rational method. A 100-year rainfall, with a duration equal to the pond concentration-time, was considered to determine design flows. A Cp of 0.6 was selected for the design of these works. The Intensity-Duration-Frequency curves of Station A, La Grande Rivière, were used. The water speed and height in ditches were determined using the Manning's equation.

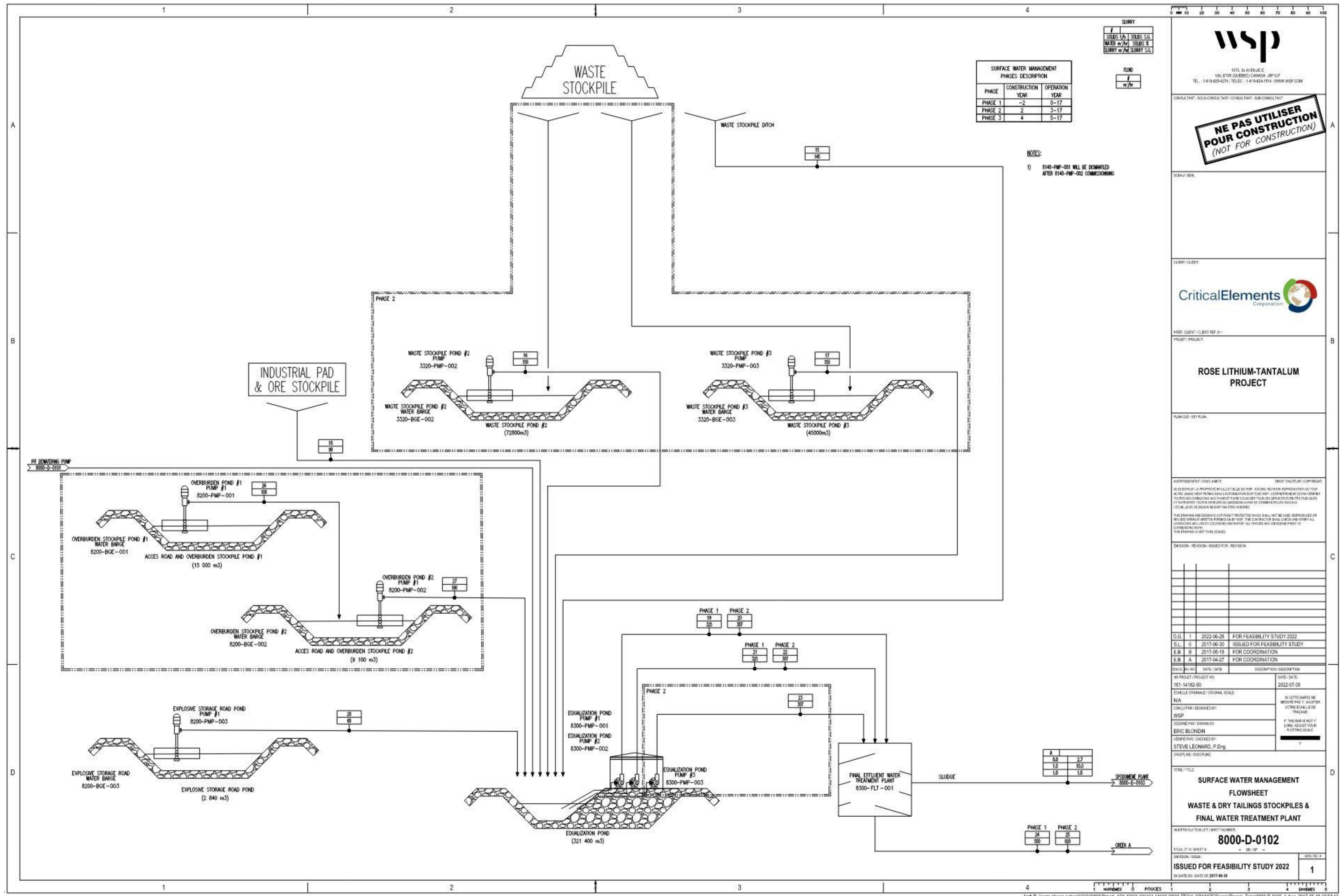
This Cp of 0.6 was considered conservative for predominantly coarse soil in mountain areas, such as defined in the culvert design manual of the ministère des Transports du Québec.

The depth of the specified ditches is appropriate to maintain at least a gross freeboard of 1 m while keeping a maximum flow velocity below 3 m/s. To protect ditches against erosion, broken stones made of 0-400 mm stones are expected on the walls and the bottom of the ditches. A Manning's coefficient of 0.036 was selected for the ditch protection.

The Equalization Pond will have to contain a 100-year rainfall during 24 hours (3.45 mm/h) in addition to snow melting for a period of 30 days (0.4 mm/h) on the ore pad surface. This volume represents 5,530 m^3.

Figure 18.3 shows the surface water management calculated flows for the waste & dry tailing stockpile, industrial pad and ore stockpile going to the equalization pond and final effluent treatment plant.

Figure 18.3: Surface Water Management Flowsheet



18.3 Industrial Pad

A 296,175 m² industrial pad, over which most of the industrial infrastructures are located, is included in the Project. This proposed industrial pad is on two levels in order to match the natural ground.

The industrial pad is built over the natural soil which is cleared and stripped of organic materials. The organic materials will be stocked in a distinct pile in order to be used when the site is restored.

The subsoil (natural soil) of the pad is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of WSP.

Embankments, up to 1.1 m below the finished ground, are made with materials coming from Class-2 excavated materials or raw muck. The last 1.1 m is filled with crushed material from the pit's waste material.

Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the underground water protection.

Figure 18.4 shows the industrial pad detailed layout and Figure 18.5 shows the industrial pad cross-section.

Figure 18.4: Industrial Pad Layout

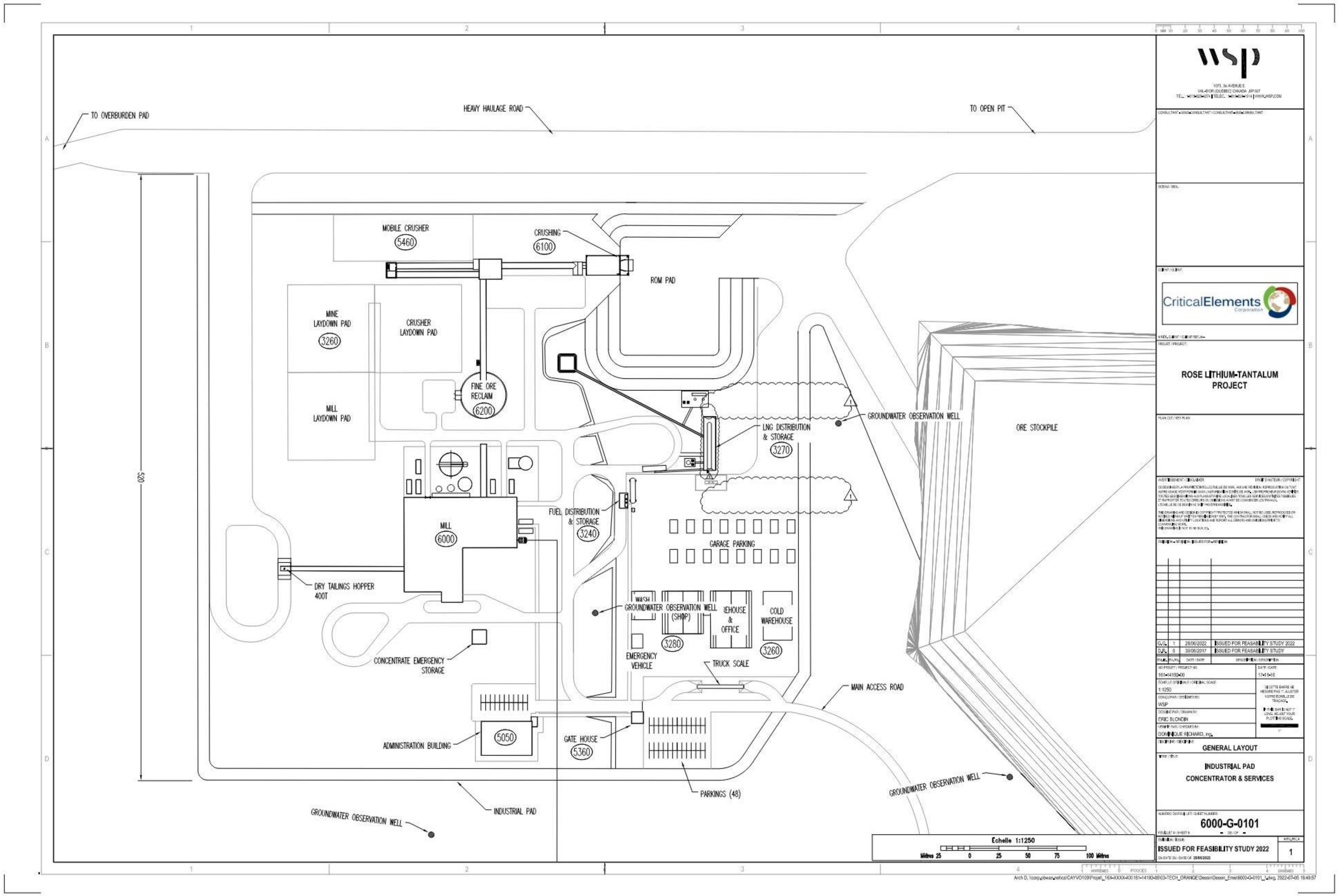
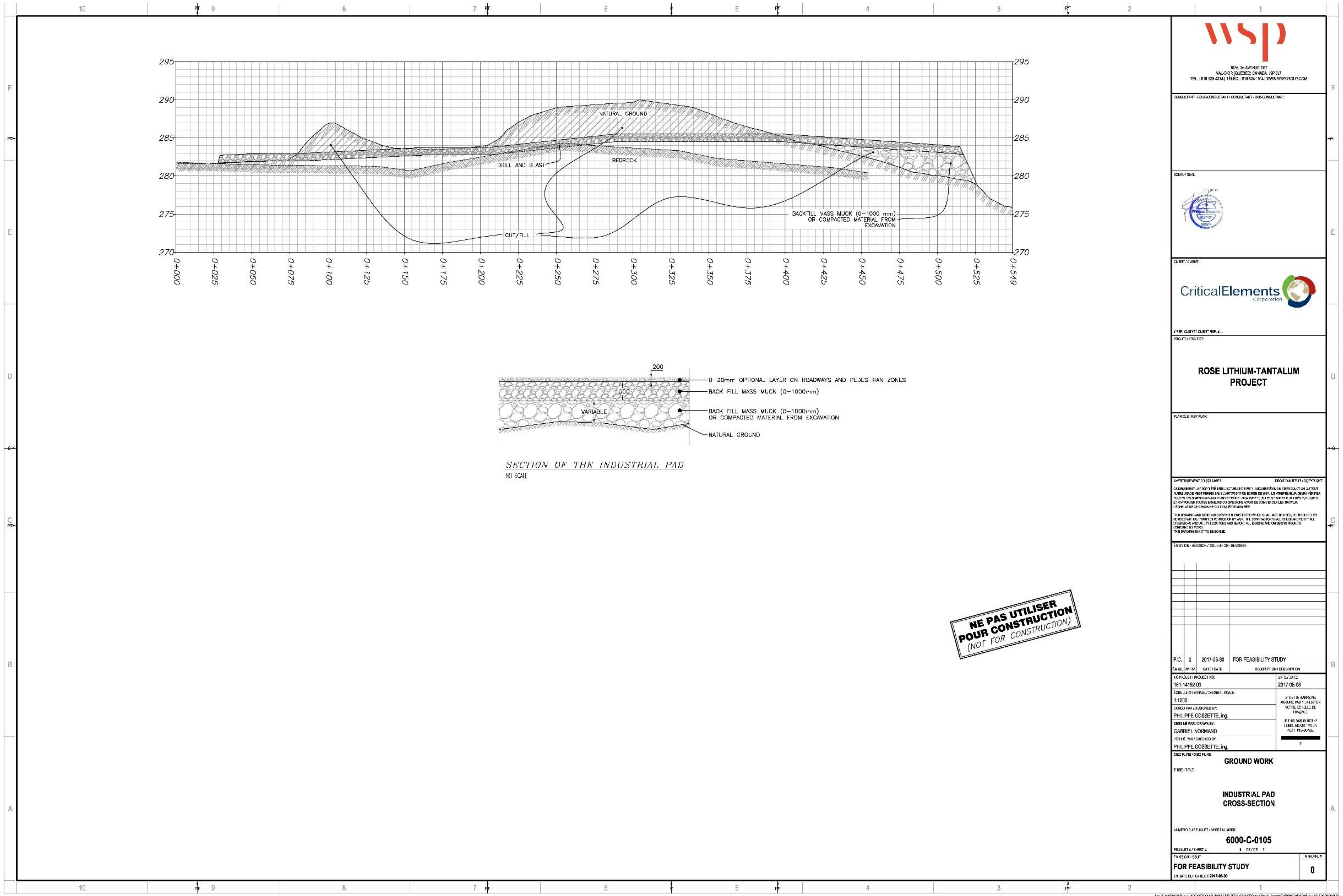


Figure 18.5: Industrial Pad Cross-Section



18.3.1 Run-Off Water Management

Run-off water coming from the industrial pad will be directed in the surrounding ditches and redirected towards the balancing pond using gravity.

Ditch design flows were calculated according to the rational method. A 100-year rainfall, with a length equal to the pond concentration-time, was considered to determine design flows. A Cp of 0.65 was selected for the design of these works. The Intensity-Duration-Frequency curves of Station A, La Grande Rivière, were used. The water speed and height in ditches were determined using the Manning's equation.

This Cp of 0.65 was considered conservative for predominantly coarse soil in mountain areas, such as defined in the culvert design manual of the ministère des Transports du Québec.

The depth of the specified ditches is appropriate to maintain at least a gross freeboard of 1 m while keeping a maximum flow velocity below 2.5 m/s. To protect ditches against erosion, broken stones made of 0-400 mm stones are expected on the walls and the bottom of the ditches. A Manning's coefficient of 0.036 was selected for the ditch protection.

The Equalization Pond will have to contain a 100-year rainfall during 24 hours (3.45 mm/h) in addition to snow melting for a period of 30 days (0.4 mm/h) on the industrial pad surface. This volume represents 17,727 m^3.

18.3.2 Buried Services

Piping sizing used for buried services are shown in Table 18.2.

Table 18.2: Buried Piping Sizing

Service	D_{min}	Material
Sanitary waste water	200 mm	HDPE
Fresh water mains	100 mm	HDPE
Fresh water supply	100 mm	HDPE
Fire protection water supply	200 mm	HDPE
Drinking water supply	100 mm	HDPE
Natural gas supply	75 mm	HDPE

Piping is designed to comply with the following standard: BNQ 1809-300 , "Construction Work - General Technical Specifications - Drinking Water and Sewer Lines". The freezing depth, which is considered, is such as described in Table 2 of standard BNQ 1809-300. For the municipality of Chapais, it is 3.51 m. To reduce excavation and to allow easier maintenance, a minimum burial of 2.1 m is expected. To prevent pipes from freezing, sheets of isolating material (100 mm) will be installed to increase protection against freezing at the required level. Isolation material will be placed in a reversed 'U' shape.

For productivity reasons during the installation, high-density polyethylene (HDPE) conducts are recommended.

These conducts will be installed in trenches and backfilled in accordance with the cross-section and alignment shown on drawings.

18.4 Service and Haulage Roads

Two types of roads, service and haulage, are included in this Project. The key characteristics of these two types of roads are defined in the Table 18.3 and typical cross-sections are shown on Figure 18.6.

Table 18.3: Key Characteristics of Service and Haulage Roads

Characteristics	Service Road	Haulage Road
Displayed speed	60 km/h	60 km/h
Vehicle used in design	Legal load truck	135 T mining truck
Platform width	8.6 m	21.0 m
Material and thickness of sub-foundation	Crushed stones 0-200 (450 mm)	Blasted rocks (1,800 mm) + Crushed stones 0-200 mm (600 mm)
Material and thickness of foundation	Crushed stones 0-20 mm (200 mm)	Crushed stones 0-56 mm (300 mm)
Minimum radius of curves	135 m (Reduction to 55 m was accepted) Speed will be reduced in those sectors	135 m (Reduction to 55 m was accepted) Speed will be reduced in those sectors
Convex / concave curves Kmin	13 / 13 m	13 / 13m
Distance of visibility	85 m	85 m
Berm	No	Yes if h > 3 m
Maximum vertical slope	7%	10%

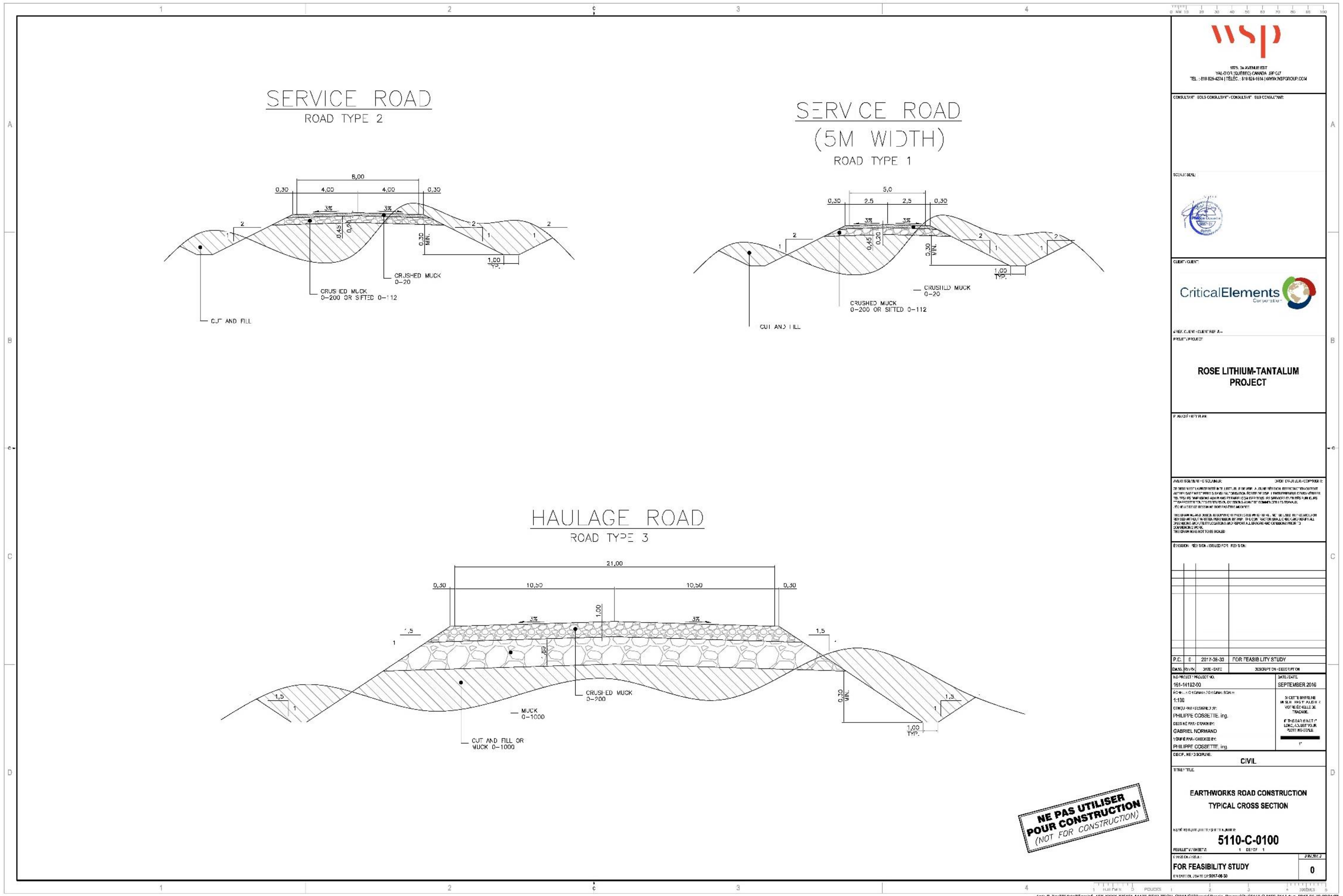
The roads are settled on the natural soil which is cleared and stripped from organic materials. The organic materials will be stocked in a distinct pile in order to be used when the site is restored.

The subsoil (natural soil) of the roads is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samplings collected under the supervision of the geotechnical engineer.

Embankments, up to the infrastructure line, are made with materials coming from natural soil Class-2 excavated materials. Materials used over the infrastructure line will be made of crushed pit waste to a 0-200 mm calibre.

Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the underground water protection.

Figure 18.6: Service and Haulage Roads Typical Cross-Sections



18.4.1 Run-Off Water Management

Run-off coming from roads will be directed in the lateral ditches and redirected to collecting ponds by gravity. The collected water will then be pumped to the equalization pond for treatment before being released to the effluent.

Ponds B1 and B2 will collect water from the main access road and overburden stockpile, while pond B3 will collect the north section of the explosive storage road. The south section of the explosive storage road contact water will be collected by waste stockpile ditches.

Galvanized corrugated steel culverts installed in compliance with the *Guide d'aménagement des ponts et ponceaux dans le milieu forestier* are required to direct water towards the effluent and ensure an adequate drainage of the road.

18.5 Overburden Stockpile

An overburden stockpile with a capacity of 11M T (6M m^3) is expected to contain materials coming from the pit excavation required to reach bedrock.

Test pits T-65 to T-69 indicated that the overburden stockpile would be made of coarse-grained soil (sand with gravel, stones, and erratic blocks). Organic materials (topsoil) will be disposed of in a distinct stockpile so they are used for rehabilitation work. This temporary organic material stockpile will be located within the footprint of the proposed waste stockpile.

The overburden stockpile design will be produced in accordance with Directive 019 related to the mining industry. It is expected that materials used for the overburden stockpile will be considered as 'low risk tailings'. No specific measures to protect ground water, such as a membrane, is expected. In addition, the stockpile will be located at least 60 m from the surrounding watercourses.

The following design criteria were selected. These criteria were validated with Geotechnical Stability Analysis Co-disposal of tailings and waste rock performed by WSP (2017) and based on geotechnical data collected from four test wells (T-71 to T-74). However, a slope of 3H: 1V, instead of the calculated 2.5H: 1V was used to ease revegetation.

- Slope for each level: 3 H :1V;
- Height of benches: 10 m;
- Space between benches: 10 m;
- Maximum number of benches: 3.

The proposed overburden stockpile will be placed on the cleared, but not stripped, natural soil to allow an effective management of sediment.

18.5.1 Stormwater Management

Stormwater coming from the overburden stockpile will be collected in the lateral ditches and redirected to ponds B1 and B2 by gravity. The collected water will then be pumped the equalization pond for treatment before being released to the effluent.

During operation, the top of the piles will be levelled so the water flow is split throughout the whole surface of the overburden stockpile to avoid significant changes in the natural flow pattern.

18.6 Pads for other Infrastructures

Pads used for other buildings are settled over the natural soil which is cleared and stripped of organic materials. The organic materials will be stocked in a distinct pile in order to be used when the site is rehabilitated.

The subsoil (natural soil) of all pads is assumed to be made of materials with variable grain size and property ranging from silty sand to coarse sand with rocks, such as defined by samples collected under the supervision of WSP.

Embankments, up to 1.1 m below the finished ground, are made with materials coming from Class-2 excavated materials or raw muck. The last 1.1 m is filled with crushed material coming from the pit's waste material.

Materials used for the industrial pad are considered as 'low-risk mining waste'. No waterproofing measure is expected for the ground water protection.

18.7 Liquid Natural Gas Storage and Distribution

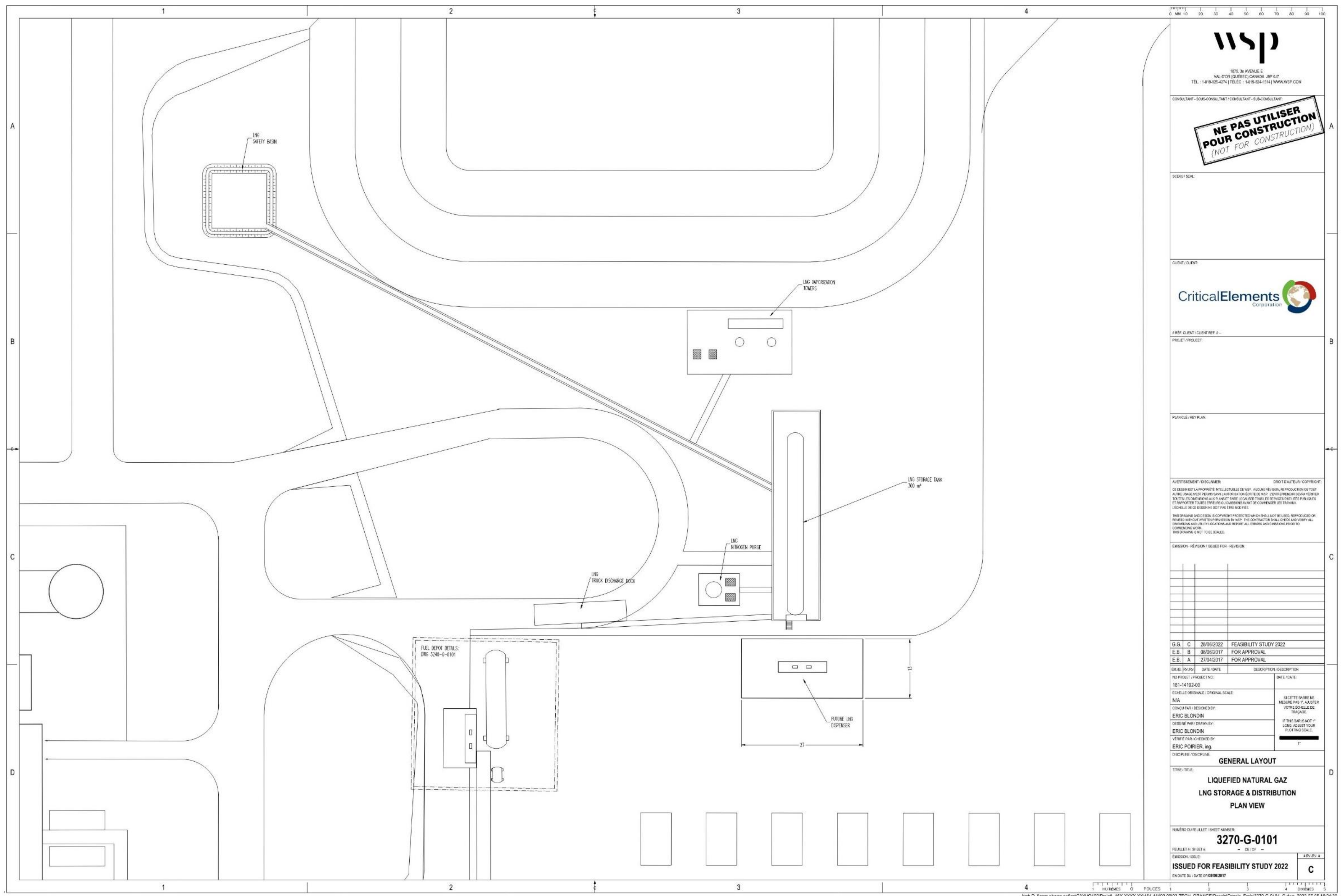
Natural gas used for building heating and concentrate drying will be trucked to site in its liquid state (LNG) from Energir terminal. The LNG storage and distribution system will be installed on the industrial pad. One 330 m³ double-wall reservoir will be installed and a secure procedure will have to be developed to allow bottom filling while operating.

The LNG system will also include the following items:

- Electric vaporizers (one per reservoir and one spare);
- Pumps for LNG transfer to vaporizers;
- A flare for emergency release;
- A compressor to return gas to the system;
- A Mercaptan gas odorization system;
- A nitrogen tank for LNG system flush;
- LNG stainless steel piping and valves;
- A fire protection and leak detection system with strobe and buzzer; and
- An emergency leakage retention basin and trench.

Figure 18.7 presents the LNG storage and distribution layout.

Figure 18.7: LNG Storage and Distribution Layout



A trade-off was prepared for the use of propane gas, but the required volumes showed LNG to be more economically viable, even with higher capital costs for infrastructure. Table 18.4 shows the LNG consumption.

Table 18.4: LNG Consumption

Area	Buildings / Equipment	Production Start	Hours per Year	Natural Gas Flow (m^3/h)	Natural Gas Flow (m^3/y)
6300	Tantalum concentrate dryer	1	8,000	47	376,800
6200	Spodumene concentrate dryer	1	8,000	651	5,207,200
6200	Spodumene plant heating	1	2,400	668	1,603,200
6100	Dome ore reclaim heating	1	2,400	48	115,200
3280	Garage heating	1	2,400	362	868,800
6100	Crushing heating	1	2,400	233	559,200
5050	Administration building heating	-1	2,400	111	266,400
				TOTAL	**8,996,800**

18.7.1 LNG Infrastructure Requirements

The capacity of the retention pond must be 110% of the biggest tank, (363 m^3 in this case). The emergency retention pond, its canal and containment area under the ponds must possess an electrical heat tracing system to melt the snow made of reinforced concrete and resistant to temperatures of -160°C.

A pump controlled with level switches will keep the retention pond empty. The canal will consist in a slope of 3% so that LNG flows under gravity, from the tanks towards the retention pond for the canal. The LNG delivery path has been designed to prevent the trucks to travel in reverse direction

The production, storage, and handling of LNG are regulated by the CSA Z276-22 standard (LNG Production, storage, and handling). In Québec, the standard has been integrated into the Building Act, more precisely the Construction Code and the Safety Code Article 2.01. According to applicable standard, the following distances were considered for the LNG layout design:

— Distance between the retention pond and the diesel tank: 20 m;
— Distance between the areas where personnel is often present: 20 m;
— Distance between process equipment and any source of ignition: 15 m;
— Distance between each piece of process equipment: 15 m;
— Distance between the compressor and any source of ignition: 4.5 m;
— Distance between each LNG tank: 2 m; and
— Distance between the LNG tank and the diesel or gasoline tanks: 6 m.

18.8 Diesel and Gasoline Storage

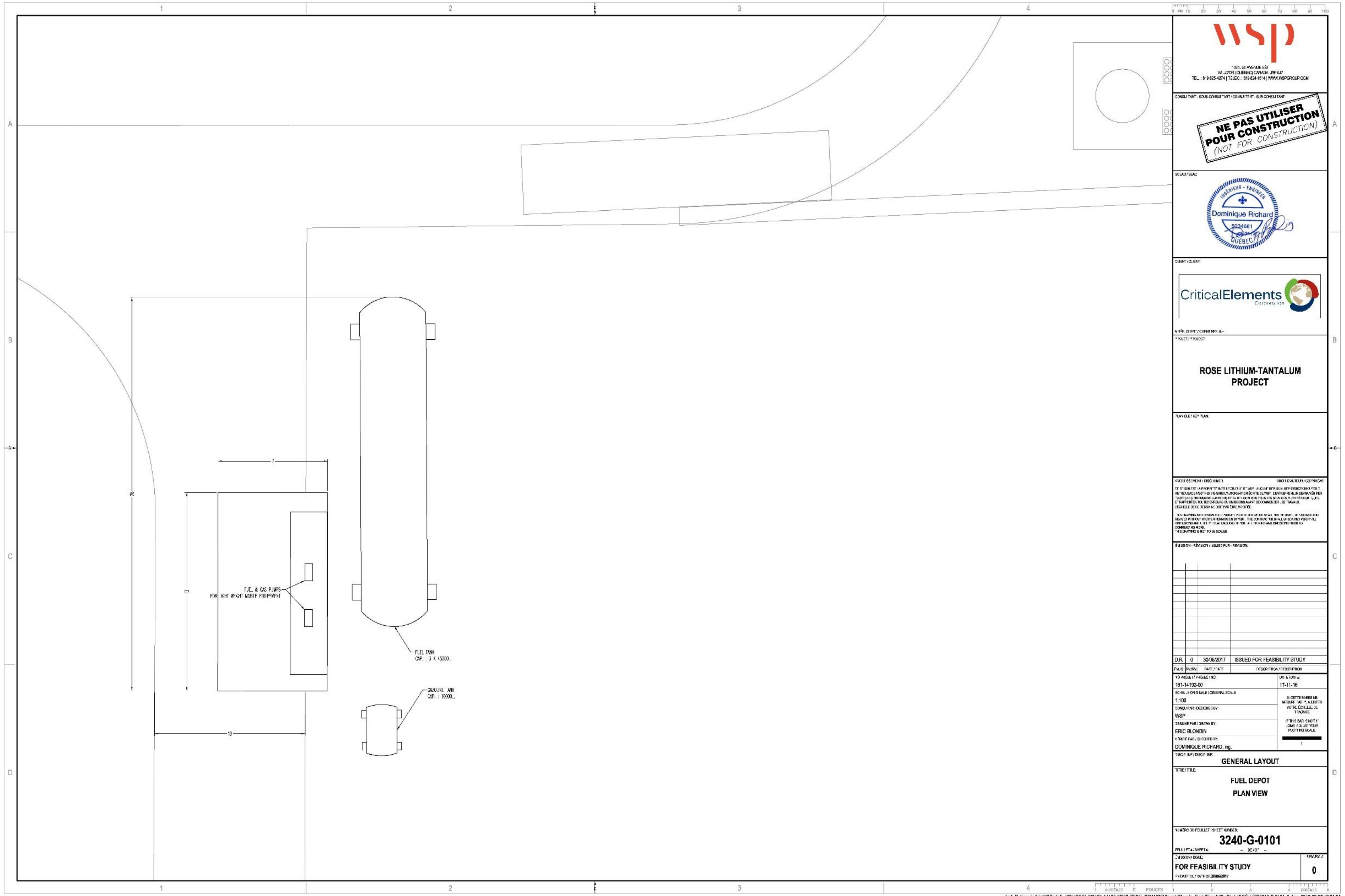
The diesel and gasoline storage and distribution system will also be installed on the industrial pad. In order to reduce the equipment required on site, it is planned that a diesel tanker truck will directly fill the mobile and mining fleet. This tanker truck will be operated by a company having installations in the area, such as Petronor with their Eastmain fuel depot.

A 45,000-L double-wall tank with a low flow delivery system (gas boy) for diesel will be installed on site for the supply of vehicles. A concrete slab will be erected in the delivery area to ease leak recuperation.

A 10,000-L double-wall tank and delivery system for gasoline will be installed near the diesel tank for the supply of vehicles. Both systems will share the same concrete slab.

Figure 18.8 shows the diesel and gasoline layout.

Figure 18.8: Diesel and Gasoline Layout



18.9 Truckshop and Warehouse

The truckshop, wash bay, and warehouse will be installed side by side on the industrial pad. They will be structural steel arch-type fabric buildings which use sea containers as foundation, all mounted on a concrete slab and equipped with HVAC systems, lighting, and services. Containers will be designed to provide offices, restrooms, and storage area.

The truckshop will offer four repair bays, a lube unit room, a tool crib, and offices and will be equipped with an overhead crane. The wash bay will be a dedicated building considering its special needs in terms of HVAC and water supply.

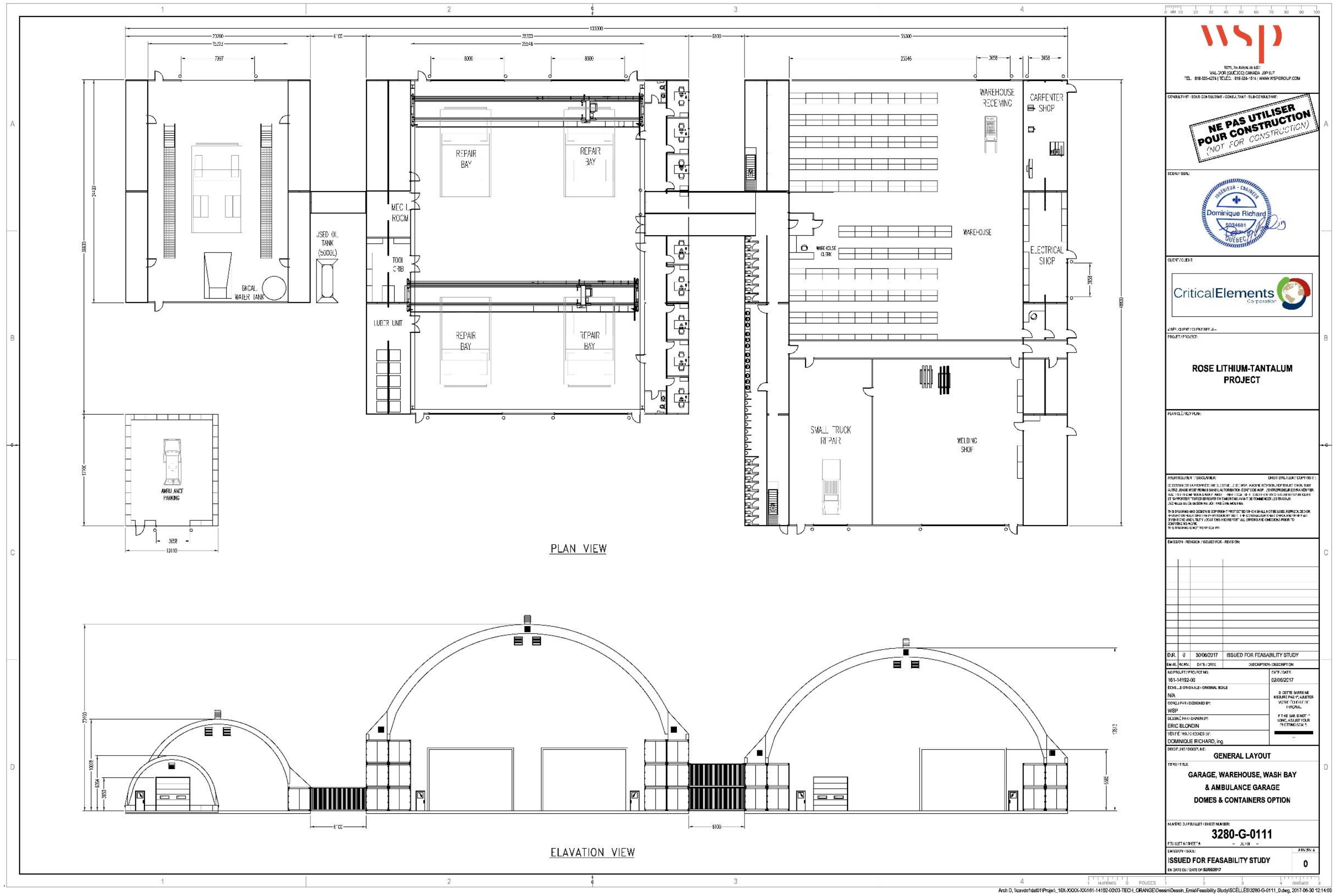
All truckshop buildings will have pits connected to an oil separator used to collect oil and lubricant transported by washouts. The oil separator installation will be preceded by a sand trap. The oil separator will be designed to process an estimated flow of 150 US gpm while respecting the hydrocarbon C_{10}-C_{50} discharge standard of 15 ppm in the garage's industrial sewer system. Oil recovered in the oil separator will be periodically transferred into a waste oil storage tank before being disposed of at an authorized site.

The warehouse will have a storage capacity of 750 m^2 and will also contain a small truck repair bay and a welding bay. The container foundation will allow extra storage area and specialized shops.

There will also be a smaller heated fabric building to park the emergency vehicle (not mounted on containers).

Figure 18.9 shows the truckshop and warehouse layout.

Figure 18.9: Truckshop and Warehouse Layout



18.10 Administrative Building and Gatehouse

The administrative building is planned to be a two-storey modular construction mounted on wood blocks with a skirt to allow heating of the piping installed underneath. The 26 modules connected together include offices, restrooms, an infirmary, a mine rescue meeting room, a dry area, a lunchroom, and two conference rooms. Modular construction allows for a faster installation on site, thus reducing costs and construction crew lodging requirements. The dry area will include 340 lockers and 63 baskets for men, and 36 lockers and 36 hooks for women.

Figure 18.10 shows the administrative building layout.

The gatehouse will be an independent module also mounted on wood blocks. This module will include a desk with screens for the security cameras and process monitoring, a main fire alarm panel and a restroom. A parking lot (capacity of 48) is planned for visitors and staff, considering most of the employees will commute by bus from the camp. A 80,000-tonne truck scale will be installed near the gatehouse with a remote monitoring system to keep a record of weightings.

Figure 18.11 shows the gatehouse layout.

Figure 18.10: Administrative Building Layout

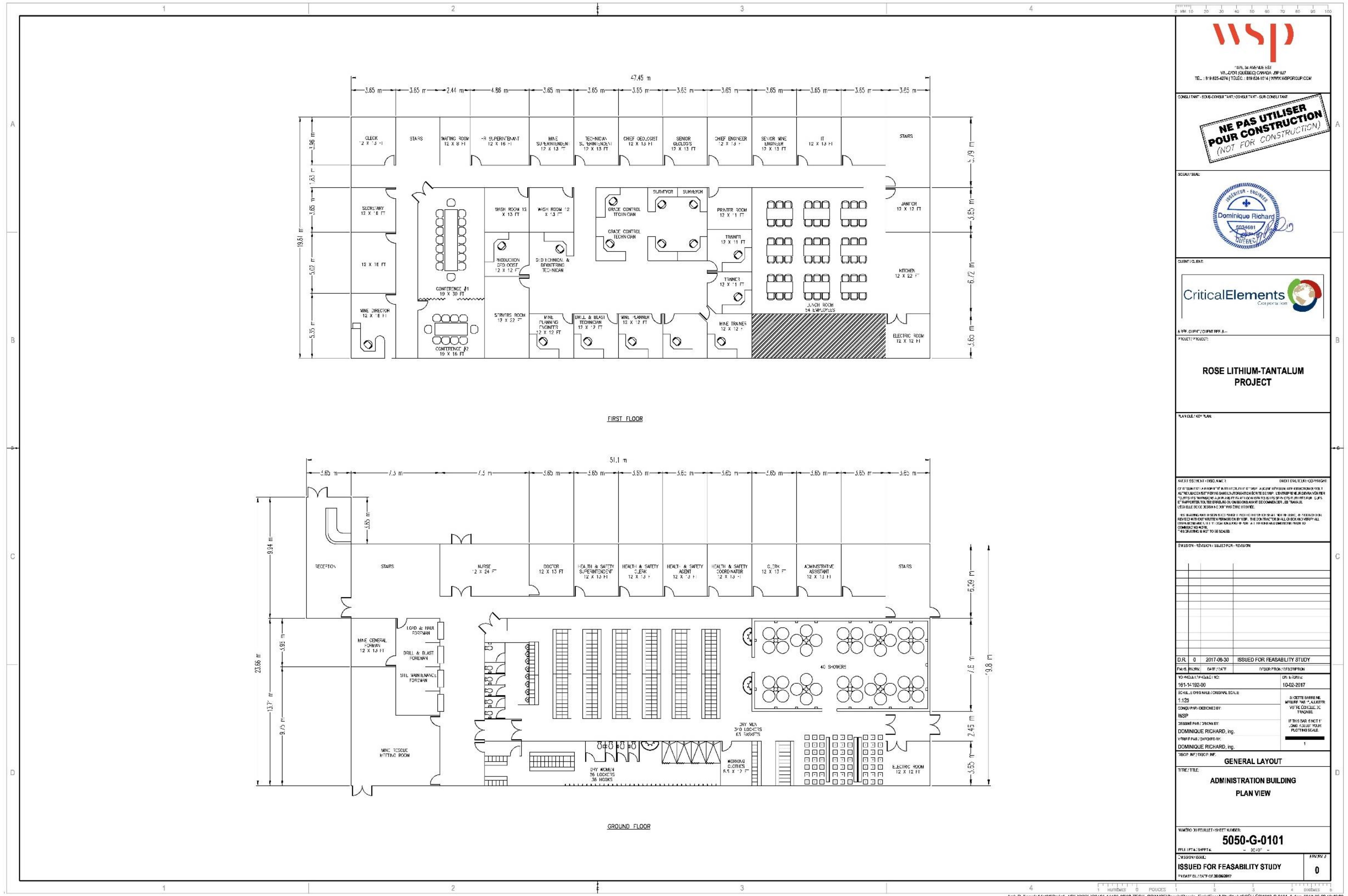
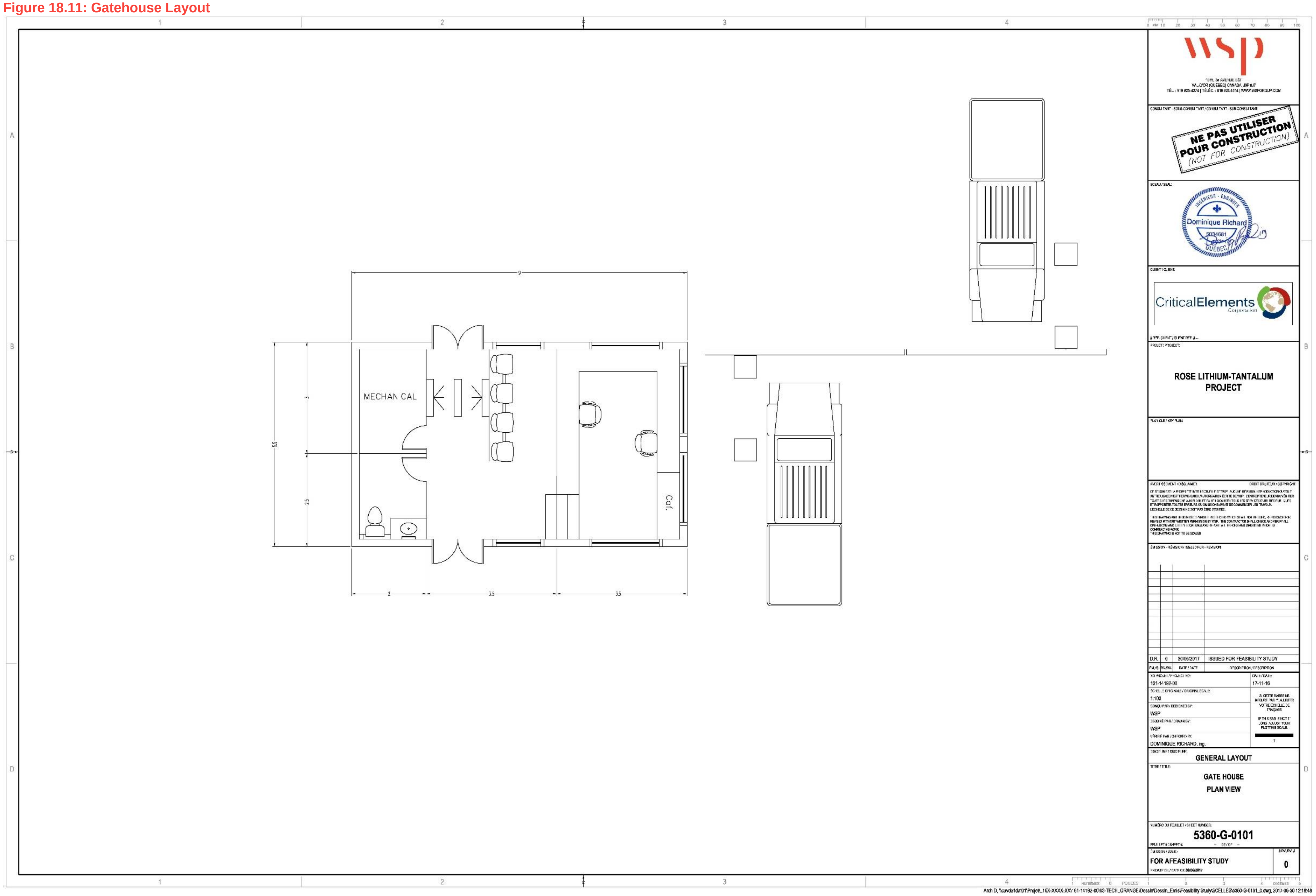


Figure 18.11: Gatehouse Layout



18.11 Main Electrical Substation and Distribution

A 315-kV electrical transmission line (L3176), owned by Hydro-Québec, runs north-south over the eastern side of the Project. The transmission line will need to be relocated approximately 500 m east of the mining pit. The transmission line relocation technical study was completed by Hydro-Québec in 2018. The power demand for the Project has been estimated at about 13,486 kW (15,615 kVA) and a reserve of up to 20 MVA has been accepted by Hydro-Québec.

To meet the anticipated electrical power needs of the Project, the installation of two 15 MVA (20 MVA with one ventilation stage) electrical transformers (315 to 25 kV) feeding off Hydro-Québec's 315 kV main power line is proposed. The two 15 MW transformers will operate at the same time to feed the site and the process plant. A sole 15 MW transformer will be able to withstand all loads in case of failure of one of the two transformers. Each transformer will be protected by a circuit breaker fitted with isolating switches located upstream and downstream of the transformers. A 315 kV measuring device will be installed upstream of each transformer and the readings from both transformers will be combined. Hydro-Québec needs a differential protection and communication between the new protection relays and their existing installations to coordinate the protection.

Figure 18.12 shows the electrical distribution on site.

The transformers will feed a 25 kV structure equipped with two series of four 25 kV exterior breakers connected with a tie circuit breaker to ensure continuous supply in the event of a breakdown of either of the two main transformers. Two banks of capacitors will be installed to correct the power factor. Three 25 kV transmission lines will be installed on site: one dedicated to the process plant and the other two to the supply of the rest of the site. Various transformers will be installed to supply 4.16 kV or 600 V to the buildings and equipment according to the power requirements of that sector. A substation will be installed near the mining pit to supply the electrical mining equipment and the pumping stations around the pit.

Figure 18.13 shows the main power station layout.

Figure 18.12: Electrical Distribution on Site

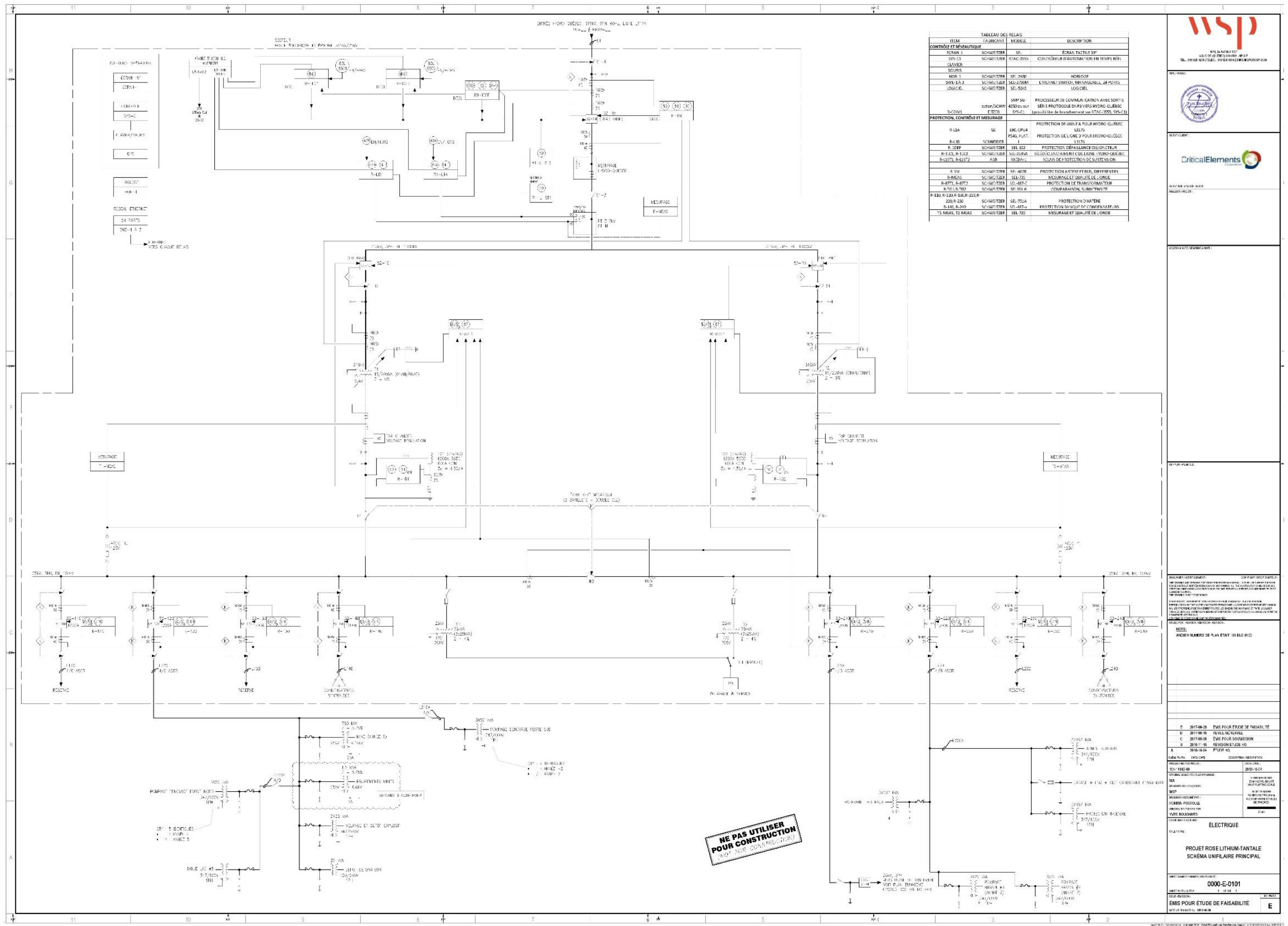
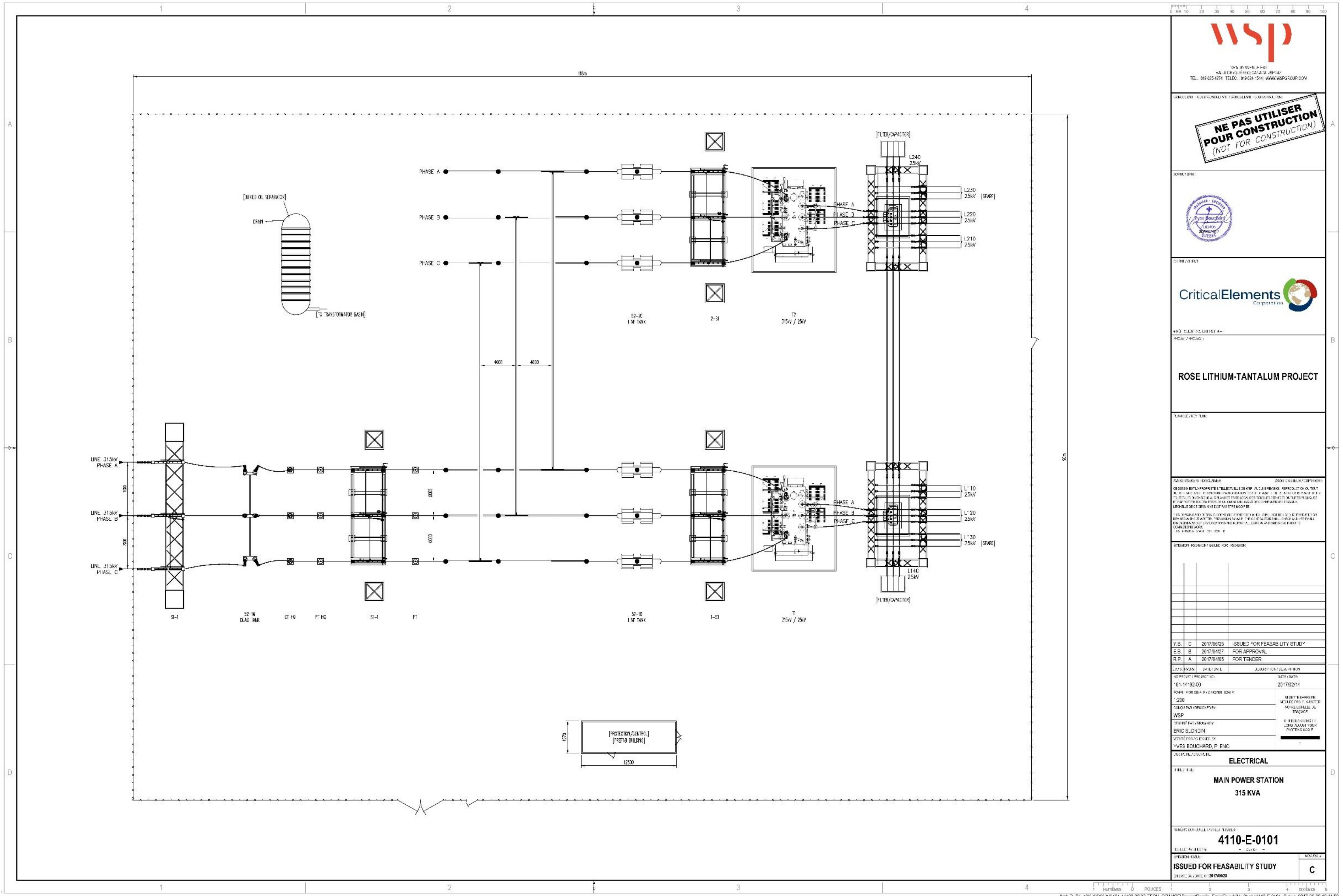


Figure 18.13: Main Power Station Layout



18.12 Communication System

The main network is composed of fibre optic cables connecting the various buildings together. These include the administrative building, the truckshop, the warehouse, the gatehouse, the process plant, the crushing plant, the explosive storage area, the blasting cap storage area, the water treatment plant, and various pumping stations.

The fibre count will remain the same across the network. That way, every subnetwork will be available from all locations. This will be useful in the future if, for example, a camera is necessary in an area that was initially deemed unimportant. The network will use 24-fibre cables. Table 18.5 shows the fibre distribution.

Table 18.5: Fibre Distribution

Number of Fibres	Description of Network
6	Automation network (ring topology + 2 dedicated spares)
4	Administrative network (internet, printers, file servers, etc.)
2	Security camera network
2	Fire alarm system
8	Spare fibres

While it would be possible to reduce the number of fibres, using a non-standard fibre count increases the cost.

The network will be as linear as possible, meaning that a location will receive a cable from the previous location and send a cable to one other location. There are some exceptions that cannot be avoided at this point, mostly at the pumping stations. Usually, administrative networks are designed in a star configuration, but the site layout makes it difficult to do so without increasing the cost. One option would be to use the spare fibres.

Each location will include a network cabinet. This cabinet will include fibre optics patch panels to receive the various networks and redistribute them to the next location, cat6 patch panels for the various end users (cameras, phones, computers, etc.), one or more switches depending on the needs at that specific location, and an uninterruptible power system (UPS) to maintain the network integrity in case of a power failure. The UPS is particularly important for the security camera and the fire alarm system networks. Some cabinets will be installed outside and will require necessary protection rating and heating system.

The server room in the administrative building will include two general purpose servers to handle the files, printers, emails, user accounts, etc., and one special server for the voice over IP (VoIP) phone system. A hardware firewall will also be used to protect the network from intrusions.

The workers will mostly communicate using the phone system or portable radios. Fifty radios and two repeater stations are included to cover most of the site. Radios will also be installed in the cabin of heavy machinery.

The Internet will be supplied bythe locally implanted supplier Eeyou Communication Networks. The mine will be connected to the network using microwave towers, which is simpler and less expensive than installing fibre optics along the road. An existing tower already connected to the Eeyou network should be used as a base connection point, like at CCDC in Nemaska. To complete the network, a new microwave emitter will be installed on the CCDC tower and two similar towers will be built: one at the mine site and one at the camp. The towers will be built and maintained by the supplier with a monthly based fee.

This internet connection should be sufficient for voice over IP and general use (emails, browsing, etc.). However, this is not a dedicated connection and, therefore, cannot be used for remote operations of trucks, for example. This would require a direct fibre optics connection to the mine.

18.13 Surface Water Management

18.13.1 Process Water Supply

The process water supply for the industrial pad buildings, including the process plant, the administrative building, and the truckshop, will be drawn from the first submersible pump installed in the de-watering wells around the open pit.

18.13.2 Potable Water Supply

Some of the water pumped to the industrial pad will be treated for potable water usage. The planned treatment includes anionic exchanger, activated carbon filter and UV sterilization. The final treatment system will have to be optimized according to underground quality water. Water bottles will also be supplied in various buildings for drinking.

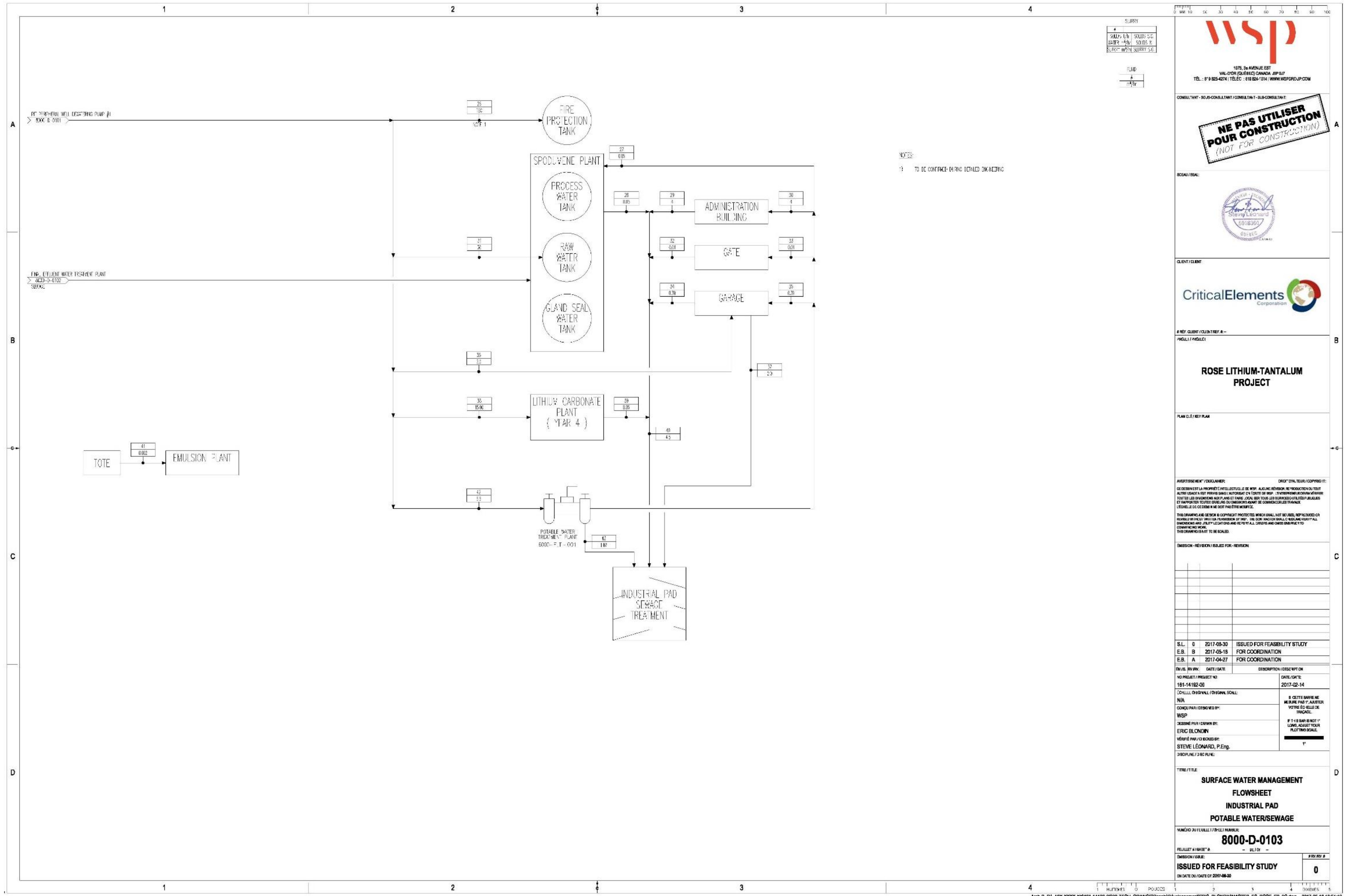
18.13.3 Sewage

The selection criteria for a domestic wastewater treatment technology mostly depends on the natural soil conditions and on the presence of waterbodies. Natural soils at the industrial site seem to be favorable for a soil infiltration technology while available areas could allow the compliance with the minimum distance of 200 m from waterbodies.

A conventional leach field (modified element) is planned, but a geotechnical survey is needed to confirm soil quality and performance. This option represents the lowest cost for installation and maintenance but requires a larger footprint.

Figure 18.14 shows the calculated flows for the water consumption and sewage for the industrial pad.

Figure 18.14: Industrial Pad Water Management and Sewage Flowsheet



18.13.4 Run-Off Water Management

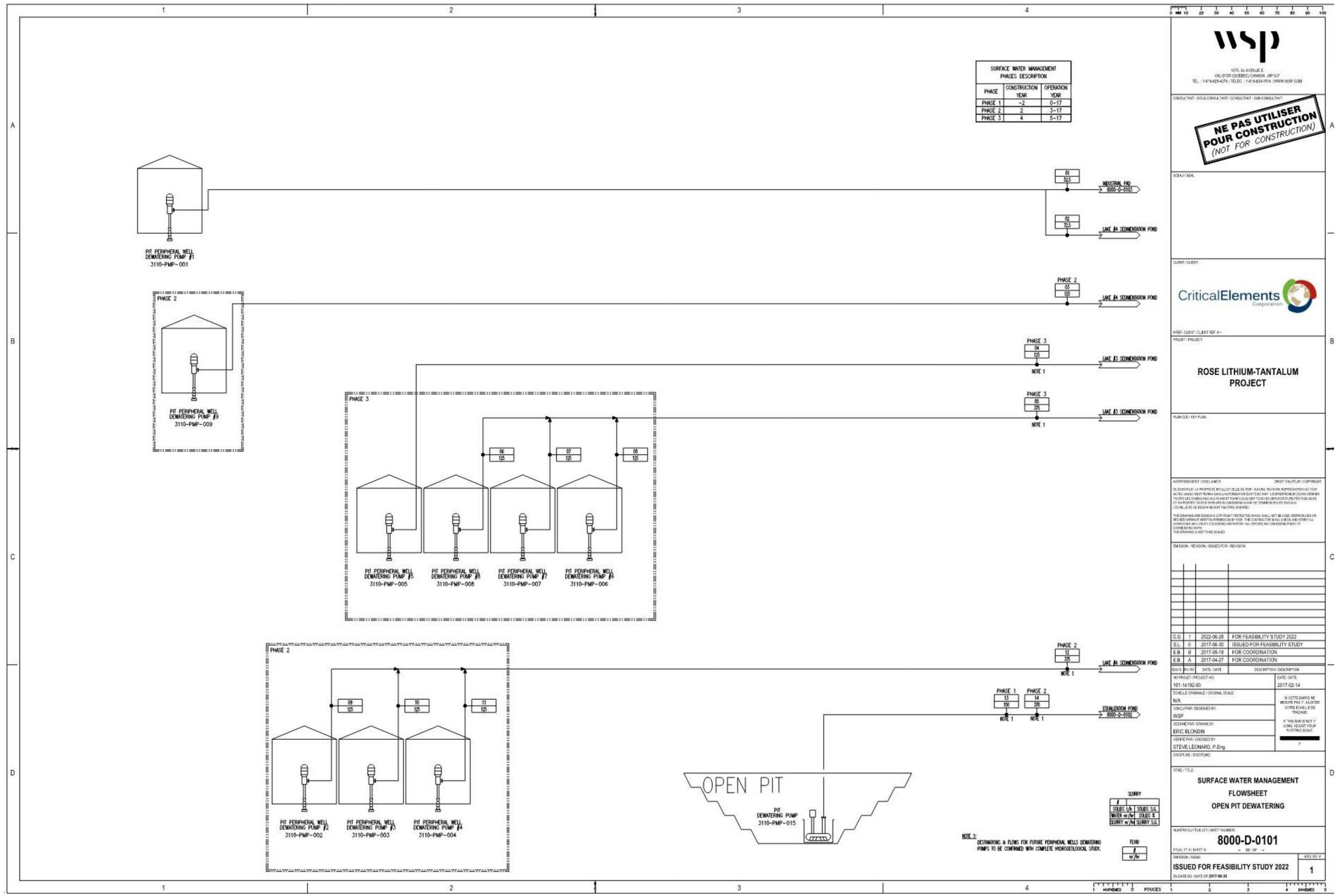
The run-off water management network includes the underground and surface water. The construction of the water management network has been divided in phases to follow mine development and reduce initial costs. Phase 1 starts at pre-production, Phase 2 starts at Year 3, and Phase 3 starts at Year 5. The water management Process Flow Diagrams 8000-D-0101 (Figure 18.15), 8000-D-0102 (Figure 18.3), and 8000-D-0103 (Figure 18.14) show the water management network.

OPEN PIT DEWATERING

In order to lower the ground water level around the pit, submersible pumps will be installed in 250 m deep boreholes. During Phase 1, one pit peripheral well dewatering pump will be installed near the open pit main ramp. During the subsequent years, and over the LOM, eight additional submersible pumps will be installed and spread out around the open pit. Four pit peripheral well dewatering pumps will be installed during Phase 2, and four will be installed during Phase 3. The dewatering water will be directed to Lake 3, Lake 4 and Lake 7 intermediate ponds to allow sediment settlement and temperature acclimatation. If required, water treatment system will be added prior to the discharge to the lake. The Industrial Pad daily operational freshwater requirements will be supplied from the first pit peripheral well dewatering pump. The submersible pumps for the pit dewatering will be installed in containers (one pump per container) and be operated 12 months per year.

Open pit dewatering is considered and discussed in Item 16.15.

Figure 18.15: Open Pit Peripheral Pumps Flowsheet



COMBINED WASTE AND TAILINGS STOCKPILE PONDS

The collected run-off water from the waste stockpile will be handled through submersible pumps installed on floating barges. The submersible pump and barge arrangement will be floating on the pond. These submersible pumps will be operated three seasons a year. During downtime (winter), the submersible pumps will be removed and stored, and the pipeline will be drained. The water collected in the waste stockpile ponds will be redirected to the Equalization Pond. Waste Stockpiles #2 and #3 will be installed during Phase 2 to collect west side part of the stockpile contact water. During Phase 1, a collection ditch will direct contact water to the Equalization Pond by gravity.

EQUALIZATION POND

The water in the Equalization Pond will be coming from the surface and the open pit dewatering. From the Equalization Pond, the water will be pumped with centrifugal pumps to the final effluent water treatment plant. The centrifugal pumps for the water management at the Equalization Pond will be installed in a container. This container will be installed on the shore of the Equalization Pond. The pumps will be operated 12 months per year. Pumps #1 and #2 of the Equalization Pond will be installed during Phase 1, while Pump #3 will be installed during Phase 2.

FINAL EFFLUENT TREATMENT PLANT

The final effluent treatment plant will be installed next to the Equalization Pond, on a concrete slab inside a fold-away or prefabricated wall panel building (1,200 m^2). The capacity for Phase 1 will be 650 m^3/h and will be upgraded to 920 m^3/h in Phase 2.

The design criteria were based on the requirements of the Minister of Fisheries and

Oceans Canada Metal Mining Effluent Regulations (MMER 2017). Further studies on water to be treated will be required to optimize the design. The proposed plant presents three treatment steps to achieve effluent requirements, which include different reagents (hydrated lime, coagulant, polymer, microsand, and sulphuric acid):

1 Metal precipitation and sludge recirculation;

2 High rate clarifier; and

3 pH correction.

Reagents will be used in different steps.

The system will be automated and controlled by a PLC. Effluent water quality monitoring and alarming will include pH and turbidity before discharging to Stream A through a ditch.

18.14 Spodumene Plant

18.14.1 Plant Buildings

The spodumene plant area is located on the south-west side of the open pit. The spodumene plant layout has been developed considering future spodumene plant expansion and future carbonate plant.

JAW CRUSHER BUILDING

The jaw crusher building is 16 m x 28 m in size and 28 m high. The jaw crusher building houses the coarse ore bin, a rock breaker, a dust collector, a vibrating grizzly feeder, and a jaw crusher and belt conveyors.

CONE CRUSHER BUILDING

The cone crusher building is 19 m x 16 m in size and 26 m high. This building houses two cone crushers, two vibrating screens, belt conveyors, and a dust collector.

CRUSHED ORE STORAGE DOME

The crushed ore from the cone crushing building will be stockpiled in a storage dome. The dome has a base diameter of 40 m and overall height of 20 m. The total covered surface area will be approximately 2,514 m^2.

PROCESS BUILDING

The process building houses grinding, beneficiation equipment, dewatering and drying equipment, and emergency storage areas for tantalite concentrate and spodumene concentrates. The tantalum silo is installed inside the building. The spodumene silos are located outside the process building. Laboratory and office building will be inside the process building. The laboratory is on the first floor and the offices are located on the second floor. The change rooms and lockers for employees are located near the laboratory area on the first floor.

The concentrator building is 6,530 m^2 in size and 24 m high.

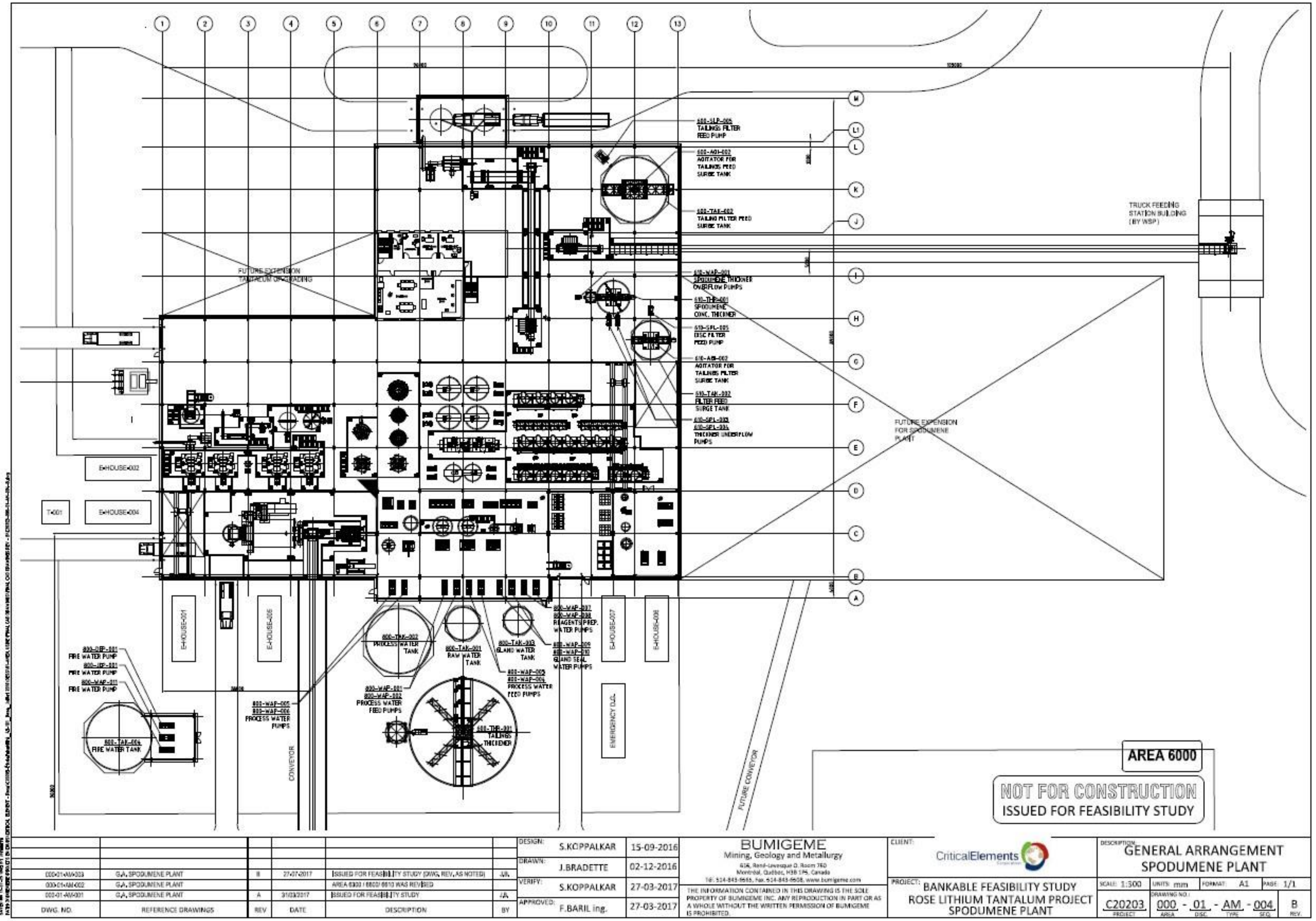
TAILINGS TRUCK FEEDING STATION

Tailings from the filtration equipment will be conveyed to a tailings truck feeding station consisting of a 400 m tonne hopper. Trucks will be employed for dispatching the tailings to the waste rock facility.

The general arrangement drawing for the spodumene plant is shown on Figure 18.16.

The layout drawings and sectional drawings are presented in Appendix 18-A.

Figure 18.16: Spodumene Plant General Arrangement Drawing



18.14.2 Spodumene Plant Water Management

Most of the water required for the spodumene plant will be recycled from the three thickeners. Fresh water will be required for make-up water for process, pumps gland seal water system, and reagents preparation. Fresh water will also be required to fill the fire protection tank at the beginning of the operation and for the potable water system.

18.14.3 Spodumene Plant Power Supply and Distribution

Power demand for the Spodumene process plant was estimated at 8.55 MW. The estimation was based on data from the mechanical equipment list prepared for the Project, on the connected load, running load and load factors. A breakdown by area is presented in Table 18.6.

Table 18.6: Estimated Total Power Demand

Area	Power Demand (MW)
Crushing and crushed ore storage	1.16
Grinding and desliming	4.00
Tantalum recovery	0.30
Mica flotation	0.38
Spodumene flotation	1.38
Tailings dewatering, drying, and storage	0.41
Concentrate dewatering, drying, and storage	0.24
Reagents preparation and distribution	0.05
Services	0.63
TOTAL POWER DEMAND	**8.55**

The electrical installation prepared for the spodumene plant is presented on the single line diagram (Appendix 18-B).

The spodumene process plant will be powered from the main substation 315/25 kV. The power will be transported to the spodumene plant through a 25 kV overhead power line from this substation to an outdoor 12/15 MVA oil filled transformer.

The transformer will step down the voltage from 25 kV to 4.16 kV. Using a 5kV switchgear installed in the spodumene process plant main substation (E-House-001), this voltage will be used as a distribution voltage to feed the other six (6) prefabricated substations. The prefabricated substations (E-House-003; E-House-004; E-House-005; E-House-006, and E-House-007) will be 4.16 kV supplied with buried cable from the E-House-001 to the concentrator building and then in cable trays. The cable supplying the crusher buildings (E-House-003) will be partially installed on the conveyor.

All the electrical equipment will be installed in the prefabricated substation including dry type transformers 4.16/0.6 kV to step-down the voltage to 600 V to feed the low-voltage loads.

MV AND LV DISTRIBUTION LEVELS, SYSTEMS GROUNDING, AND LOAD RANGES

The proposed distribution voltage levels for equipment and the type of motors are defined as indicated in Table 18.7.

Table 18.7: Voltage and Loads

Voltage	Loads	Grounding
4.16 kV, 3 Ph,3 W	MV distribution	HRG
600 V, 3 Ph,3 W	Fixed speed and variable speed motors 575V	Solidly grounded
600V/347 V, 3 Ph,4 W	Large HVAC lighting in process area and welding receptacles	Solidly grounded
208 V/120 V, 3 Ph,4 W or 12 0V, 1 Ph	Lighting in buildings and small HVAC	Solidly grounded

EMERGENCY POWER

A 500 kVA emergency diesel generator will be provided as a standby source of power and installed in an outdoor prefabricated building to feed the critical loads at 600 V. It will mainly feed fire-fighting pump, communication and control equipment, thickeners racks and lighting.

MOTORS AND STARTING METHODS

All the LV motors will be Totally Enclosed, Fan Cooled (TEFC) induction motors. The starting methods retained are:

- Direct-on-line (DOL) starting used for all low voltage motors below 100 HP with fixed speed applications,
- Soft-Start (SS) starting used for all low-voltage motors over 100 HP with fixed speed applications;
- Variable Frequency Drives (VFD) for variable speed applications.

The ball-mill drive motor will be a 4.16 kV wound rotor induction motor started with an electrolytic starter (LRS). The auxiliary motors will be 600V.

SYSTEM GROUNDING

The neutral of the main spodumene process plant transformer 25/4.16 kV will be grounded through a resistance to limit damage due to arcing faults and provide a better protection to personnel and equipment.

The distribution transformers 4.16 kV/600 V will have a neutral directly grounded.

The grounding system will consist mainly of a network of copper conductors, provided for each process building and substation, and will be buried externally around each building with taps thermo-welded to every other column. The individual ground grids (substations, crushing building) will be tied together with interconnecting ground cables.

CABLES AND TRAYS

The power cables will consist of three conductors (a single conductor when needed) 1000 and 5000 V, copper, XLPE insulated, aluminum armour, PVC sheathed 90°C.

For cables with different voltage ratings, separate trays will be provided.

Cable trays will be ladder type, galvanized steel. Cable trays for instrument cables will have a separated section.

18.14.4 Spodumene Plant Control System

CONTROL SYSTEM PHILOSOPHY

Following industry practice for similar size plants, all process equipment installed in the concentrator and crushing buildings, as well as the electrical prefabricated substations, are controlled and supervised from a central control room equipped with a Supervisory Control and Data Acquisition (SCADA) control system and Programmable Logic Controller (PLC) system located in the ore processing plant. This architecture was selected for the plant-wide process control system (Appendix 18-C). It is a reliable and low-cost approach.

Five process Human Machine Interface (HMI) stations will be installed throughout the plant and will be located in the following areas: crusher, grinding, flotation, dewatering, and drying.

For redundancy, in the control room, the SCADA system will include two SCADA servers, two SCADA operator stations, and one engineering station.

Integrated control systems solution to the major equipment will be privileged. Mostly all the major equipment will be provided with their own control PLC which will locally control start/stop sequences, operation parameters, and alarms of the equipment.

The plant process control system's PLC will act as a master controller and will control and coordinate the operations of the major equipment with other equipment of the process. Operation and alarm data will also be collected and archived. Where vendor packaged process control systems are not available, logic will be developed at plant PLC level for process control and monitoring.

FIBRE OPTIC NETWORK

A fibre optic ring type topology configuration will be implemented for the process control system and the Ethernet backbone network will be used throughout the plant. In ring topology, all the nodes are connected to each other in such a way that they make a closed loop. Each node is connected to two other components on either side, and it communicates with these two adjacent neighbours. This topology will insure a second route to transfer the data to the control room in case of a communication outage on one segment (Appendix 18-C).

The fibre optic ring will link all the main areas of the plant such as SCADA, HMI, remote I/O cabinets, E-Houses, laboratory, and concentrator offices. It will also be used to connect the IP phone system, the camera and security video system, and the fire detection system. The different systems will use different fibres from the same cable.

SPODUMENE PLANT PIPING AND INSTRUMENTATION DIAGRAM

P&IDs were developed for the Project (Appendix 18-D). The major equipment will be provided by supplier as integrated packages including the necessary instruments, valves, and local control systems. The remaining necessary instruments and valves to be installed are shown on the drawing.

LOCAL CONTROL SYSTEM AND INSTRUMENTS

Local push button stations for all motors are included in the proposed control system.

The push button stations include a local start/stop station for all motor with selector switch manual/automatic in the field. Emergency stop buttons will be provided in each area and will be installed to be easily reachable.

All field switches and instruments (digital and analog) will be wired to local well located remote I/O cabinets with multi-conductor cables. Analog instruments will use 4-20 mA signals with Hart protocol as standard. They will be wired to analog inputs/outputs installed in the remote I/O cabinets using 4-20 mA loops.

Equipment embedded PLCs will be connected with Ethernet cables. The fibre optic ring will be used as a support for the communication between the local cabinets and the control room.

TELECOMMUNICATION SYSTEM AND RADIO SYSTEM

The spodumene process plant telecommunication systems will include mainly:

- IP (VoIP) phone system;
- Internet network;
- Radio communication system;
- Camera and security system.

Internet and IP phone systems will use the fibre optic ring as communication support and will be linked to the service provider.

The spodumene plant radio system will be used in the construction phase and the operation phase and will be a part of the site-wide system.

A camera system, with recorder and six viewers will be installed in the control room. Four cameras will be installed in the concentrator building, and two cameras will be installed in the crushing buildings for metallurgical process supervision purposes.

18.15 Spodumene Plant Infrastructure and Services

18.15.1 Concrete and Structure

Concrete will be prepared on site by a contractor operating a mobile plant for the duration of the construction. A total quantity of 12,000 m^3 will be required for the Project. The steel structure will be prepared in a specialized shop and shipped to the site.

DESIGN CRITERIA

The following design criteria were used in the modelling of the concrete and structure:

- Slab on grade: 25 Mpa;
- Footings: 30 Mpa;
- Pilasters: 30 Mpa;
- Walls: 30 Mpa;
- Equipment bases: 30 Mpa;
- Lean concrete: 15 Mpa;
- Reinforcement steel: 400 Mpa;
- Anchor bolts: ASTM A325; and
- Formwork: Wood and Steel.

CRUSHING PLANT

The industrial steel structure of the primary crushing building is composed of heavy steel sections to support the following: crusher, equipment laydown, rock breaker support, ore hopper support, feeders, and overhead bridge crane. Each floor is comprised of a steel beam framing supporting a steel deck and concrete floor. The truck discharge level consists of a slab-on-grade for a section, and steel grating platform for the other region.

The general arrangement used to complete the estimate was the structure supported at the rock level with minimal drilling and blasting for outgoing conveyors trench. This is a conservative assumption, and it is recommended in the detailed design to optimize the layout with geotechnical and hydrogeological studies. The actual design includes a concrete wall and structure bracing the wall. There is a Mechanically Stabilized Earth (MSE) wall outside of the primary crusher structure that has been estimated to retain the fill and allow a horizontal slope from the ramp.

The secondary crusher building is comprised of a discharge conveyor level, crusher level, chute access platforms, conveyor access platforms, and a roof. The discharge conveyor and crusher floor consist of steel beam framing supporting steel deck and concrete floor. The tower support of the conveyor galleries has been modelled, including the steel tower and concrete foundations.

Drilling and blasting will be necessary to cast the concrete structure of the tunnel supporting the reclaim conveyors and crushed ore stockpile above it.

SPODUMENE PLANT AREA

The tunnel going to the ball mill area will require drilling and blasting in order to install the conveyor coming out of the reclaim tunnel and going to the ball mill area.

For the spodumene plant, engineered backfill is required for foundations and concrete slabs. For information, the concrete and structure models include:

- Excavation and backfill
- Concrete raft and monuments for the ball mill
- Bases for process equipment
- Spread footings on rock with pilasters supporting the equipment and operating floors
- Standard structural steel walkway and operating floors for operation and maintenance purposes
- Equipment structural steel supports
- Secondary steel structures
- Stairs
- Handrails
- Gratings
- Slab-on-grade
- Saw cuts
- Water stop
- Sump pits
- Wall and roof siding (insulated panels)
- Masonry walls
- Acoustic ceiling

- Man and garage doors
- Windows
- Floor finishes
- Dry walls
- Washroom facilities

18.15.2 Heating, Ventilation, and Air Conditioning

Using the LNG systems already needed on site, all buildings will be heated with natural gas unit heaters with sealed combustion. The inside design temperature for all building is 15°C. The gas distribution between all buildings will be PVC underground piping. For the administrative building, gatehouse and truck shop/warehouse, the natural gas option was requested to suppliers.

BALL MILL AREA

According to health and safety regulations, the work areas of the process plant building must be ventilated considering a fresh air intake of three air changes per hour. To meet this standard, a make-up air unit with a capacity of 24,000 cfm will be installed for the area. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the ball mill building work areas.

The make-up air unit will also regulate the ball mill building temperature to 15°C. Four extraction fans each consisting of 25% of the total ventilation flow will evacuate the contaminated air outside. For heating, three natural gas unit heaters (400,000 btu/h each) will be installed.

REAGENTS

To meet fresh air intake standards (two air changes per hour), a make-up air unit with a capacity of 7,000 cfm will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Two extraction fans each consisting of 50% of the total ventilation flow will evacuate the contaminated air outside. Three separate combustion natural gas heaters (300,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

PROCESS PLANT AREA

According to health and safety regulations, the general work areas of the process plant building must be ventilated considering a fresh air intake of three air changes per hour and evacuation of 11,960 cfm with the dust collector. To meet this standard, four make-up air units, each of a capacity of 24,000 cfm, will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Eight extraction fans each consisting of 11% of the total ventilation flow and a dust collector of 12% will evacuate the contaminated air outside. Ten separate combustion natural gas heaters (400,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

SPODUMENE DRYER AREA

According to health and safety regulations, this work area of the building must be ventilated considering a fresh air intake of two air changes per hour and evacuation of 26,000 cfm with the dust collector. To meet this standard, two make-up air units with a capacity of 24,000 cfm and 18,000 cfm each will be installed for the area.

A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 15°C. Two extraction fans each consisting of 19% of the total ventilation flow and a dust collector of 62% will evacuate the contaminated air outside. Five separate combustion natural gas heaters (400 000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

OFFICES, LOCKER ROOM, AND CONTROL ROOM

According to health and safety regulations, these areas must be ventilated considering a fresh air quantity for each worker. A ventilation heat exchanger and a cooling/heating roof top unit will heat and cool all areas of this section.

COMPRESSOR ROOMS

The ventilation of the compressor rooms will be used to control the room temperature. An intake damper will allow air from the outside for cooling when required. To reduce the heating load, an extraction fan will evacuate the hot air inside the process plant building during winter and outside during the summer.

ORE STORAGE DOME TUNNEL

The ventilation of the ore storage dome tunnel will be done by existing bin vents for 12,000 cfm and a fresh air make-up air unit of 12,000 cfm. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 10°C. One separate combustion natural gas heater (400,000 btu/h) will also be installed.

CONE CRUSHER BUILDING

According to health and safety regulations, the work areas of the primary crusher building must be ventilated considering a fresh air intake of three air changes per hour and evacuation of 33,000 cfm with the dust collector. To meet this standard, two make-up air units with a capacity of 16,500 cfm each will be installed for the area. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regulate the building temperature to 10°C.

Three separated combustion natural gas heaters (300,000 btu/h each) will also be installed at strategic locations to allow the heating of the building envelope.

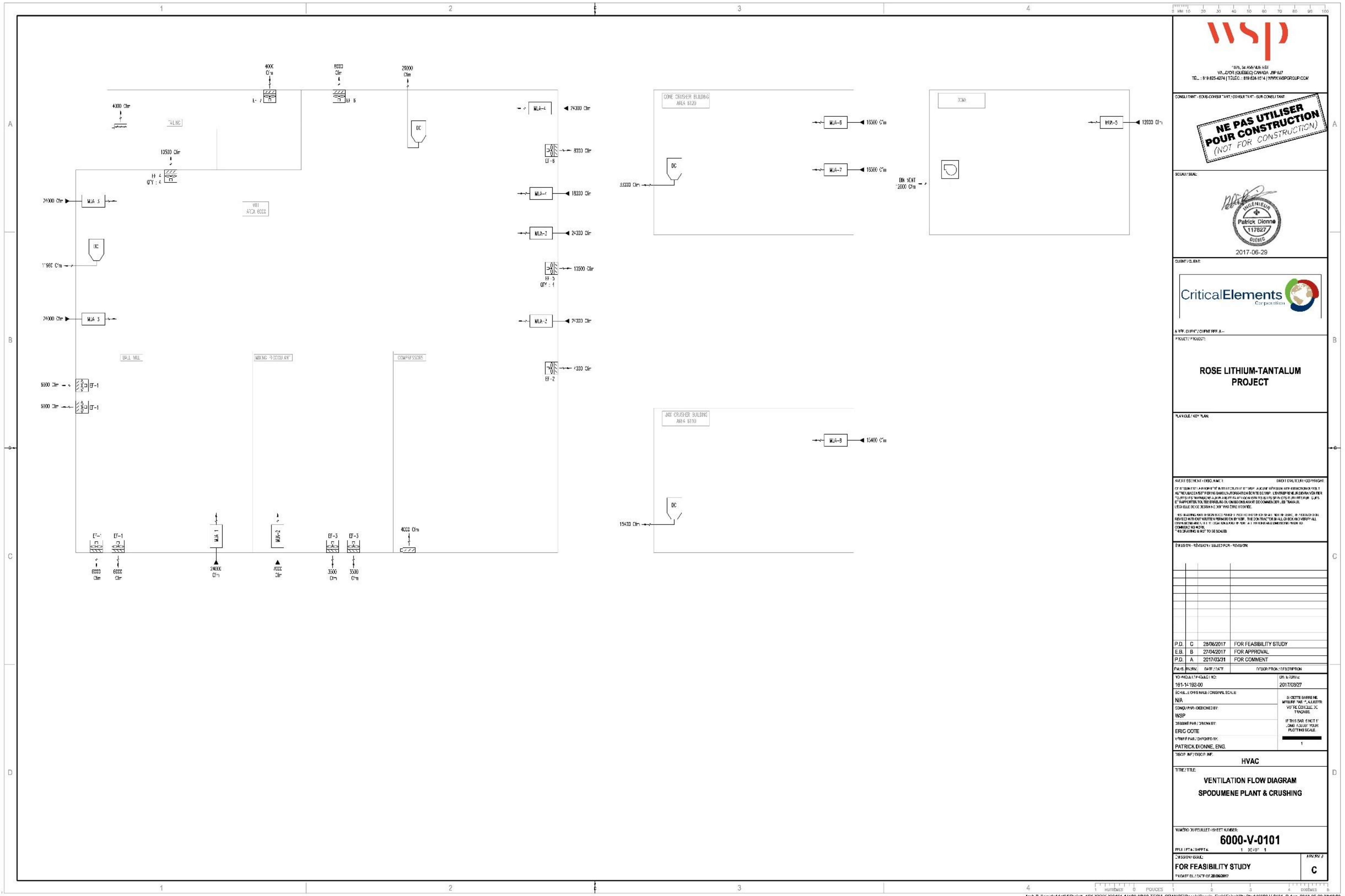
JAW CRUSHER BUILDING

According to health and safety regulations, the work areas of the secondary crusher building must be ventilated considering a fresh air intake of three air changes per hour and evacuation of 15,400 cfm with the dust collector. To meet this standard, one make-up air unit with a capacity of 15,400 cfm will be installed for the area. A ventilation ducting system will be connected to this unit and will deliver fresh air in each of the work areas. The make-up air unit will also regularize the building temperature to 10°C.

Six separate combustion natural gas heaters (2 x 300,000 btu/h each, and 4 x 400,000 btu/h each) will also be installed at strategic locations to allow the heating of the jaw crusher building envelope. One separate combustion natural gas heater of 100,000 btu/h will also be installed to allow the heating of the building envelope of the screening sector adjacent to the jaw crusher building.

Figure 18.17 shows the ventilation flow diagram.

Figure 18.17: Ventilation Flow Diagram



18.15.3 Fire Protection

For the process plant, the building was classified as Group F Division 3. No sprinklers are required according to the national building code, but fire protection is planned for conveyor belts, hydraulic units, and electrical rooms, as they are expected to be required by insurers. Fireproofing of the staircase and safety egress is also required.

For fire water distribution, a dedicated volume is reserved in the freshwater tank and fire water is pumped through a buried piping network (one electrical pump and one diesel pump in backup).

19 MARKET STUDIES AND CONTRACTS

19.1 Introduction

WSP has reviewed and found acceptable a June 2, 2022, lithium market analysis that was prepared for Critical Element by Gerrit Fuelling, an independent consultant. Mr. Fuelling is a specialist consultant from Taiwan with over 28 years of experience in the lithium industry and is an active consultant providing a variety of services such as sales and marketing, strategic management, and technical service. The analysis provided by Mr. Fuelling covers lithium market background, the forecast of demand and supply forecast, and the pricing of the lithium market. It mostly explains how the electric vehicle market affects the lithium industry and how it will keep growing in the future. The EV market is the major factor that will influence the demand of lithium in the future.

Considering the increasing demand for lithium as a component of EV batteries, the forecast prices provided by Critical Elements Lithium Corporation for use in the Economic Analysis of the Rose Lithium Project are deemed reasonable for the Rose Lithium Feasibility Study. The sensitivity analysis considered in the economic analysis provides sufficient variation to cover a conservative price while staying profitable.

19.2 Lithium Utilization History

Initial use of Lithium was for applications such as heat-resistant glass, enamel frits, greases, construction materials and organic lithium compounds. In the early 1990's, lithium became a fundamental component of high energy density batteries for portable electronics. Since approximately 2010, lithium became synonymous with the development of the electric vehicle (EV) making use of these high-energy-density-batteries. The EV market continues to grow with the government's drive to reduce air pollution, the greenhouse effect, and the high cost of fossil fuels. From now on, the demand for lithium batteries is seen to be directly related to the demand for EVs.

19.3 Chemical Grade Spodumene

19.3.1 Electric Vehicle Market Analysis

Sales of chemical grade spodumene at 5.5% Li_2O provide a major source of lithium for the battery industry. Spodumene accounts for approximately 45% of current lithium production. The alternative source of lithium production is from brines.

Demand forecasts for lithium are based on assumptions that bring a degree of uncertainty, but all sources agree on a significant increase in EV. There are many factors influencing this increase, but the desire to reduce the environmental footprint, government adaption of charging infrastructure, reduced battery costs, and rising gasoline prices are the primary drivers. The EV market has seen a massive growth in the last decade, particularly in the past two years, almost surpassing combustion engine sales during the COVID pandemic. EV market growth was 42% in 2020 and 108% in 2021, representing a total of 8.3% of the market share in 2021. The year 2022 began with record EV sales, with a 94% year-over-year increase. As of January 2022, the market share of electric vehicles was 10%, and is expected to reach 15% by the end of the year.

Recently, more than 20 countries have announced a future ban on conventional car sales, and manufacturers have openly declared their desire to reduce or eliminate conventional car production. As an example, Volkswagen has declared its goal of selling 70% EVs in Europe, and 50% in the United States. In addition to the need for batteries in personal EVs, some private sector companies (such as Amazon, DHL, and UPS) are aiming to convert their entire fleet of delivery vehicles to EVs. Also, numerous OEMs have publicly stated their ambition to have 50% to 100% of their sales be EVs by 2030 and many are no longer going to release new models of internal combustion engine vehicles.

19.3.2 Market Forecast Analysis, Lithium Use in EVs

Many scenarios have been developed to forecast the growth of the EV market, some very optimistic, others more conservative, but even the more conservative ones confirm that lithium raw material production will not be sufficient with the current investment intensity, resulting in a shortage. Because the establishment of raw material is time consuming, the result will likely be a supply deficit for the remainder of this decade. For example, lithium market demand growth has been 55% in 2021, and 30% in 2022 to date.

Different types of cathode active material (CAMs) exist depending on the use of the battery. For example, long-range models require high-nickel materials, while short-range EVs tend to use low-nickel materials, making it even more difficult to predict different raw material requirements. Regardless of the CAM chosen, both are lithium-based raw materials (lithium hydroxide [LiOH] and lithium carbonate [Li_2CO_3]). Although the share of these materials is unknown, it is certain that both materials will be in short supply. Although it is not known which type of CAM will prevail, high-grade nickel oxides require LiOH, so this appears to be the material that will prevail. Therefore, we can assume that demand for LiOH will grow faster than that of Li_2CO_3. This is based on the expectation that Europe and the United States will rely more on high nickel cathodes for long-range applications. LiOH cathode contains 29% lithium, while Li_2CO_3 contains 19% of lithium, creating a greater demand for lithium.

Based on the actual lithium demand forecasts, the increased production cost of incumbents and newcomers, rising quality requirements and more stringent ESG requirements leading to higher capital expenditures, a price of at least 22,000 USD/MT of LCE is a prerequisite for putting new projects into production. As the market faces a structural supply deficit for the remainder of this decade, prices are expected to exceed minimum price requirements. Benchmark Minerals and Fastmarkets both reported in Q2 2022 contractual prices exceeding 60 USD/kg for lithium carbonate and lithium hydroxide.

19.3.3 Battery Grade LiOH-H_2O Price Predictions

The market analysis as provided by Mr. Fuelling concludes that demand of lithium-based products will continue to grow in the coming years. This then leads to the price remaining high due to the increasing demand for electric vehicles and the already limited production of raw materials. Critical Elements Lithium Corporation considers a realistic price of the battery grade LiOH-H_2O product to be US$32,000/mt until 2030; US$27,000/mt in 2030; and US$22,000/mt after that.

19.3.4 Chemical Grade Spodumene, 5.5% Li_2O, Price Predictions

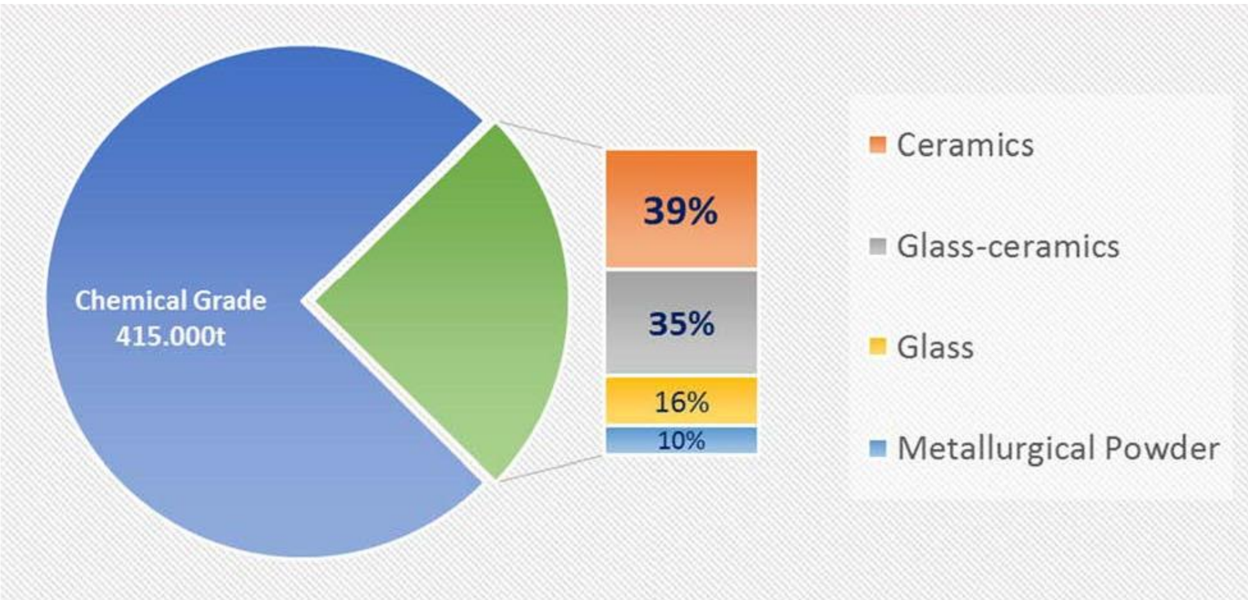
Similar to the relationship between Li_2CO_3 presented by Mr. Fuelling, Critical Elements Lithium Corporation relates the LiOH-H_2O price to the 5.5% Li_2O chemical grade spodumene concentrate price. They apply factors discussed by Mr. Fuelling in his market analysis, such as EBIT margin, processing plant cash costs and conversion of concentrate to LiOH ratio to arrive at the following chemical grade spodumene at 5.5% price predictions:

- US$2,292 / mt concentrate until 2030,
- US$1,862 / mt concentrate in 2030, and
- US$1,432 / mt concentrate thereafter.

19.4 Technical Grade Spodumene

Previous analysis by Mr. Fuelling provided the following observations, "There is a distinction between so-called chemical grade spodumene (CG) and technical grade spodumene (TG). The differentiation goes mainly by the iron content. The conversion from spodumene to chemical compounds like lithium carbonate (Li_2CO_3) or lithium hydroxide (LiOH) is done exclusively from the chemical grade spodumene while the low iron technical grade spodumene can be directly applied. Figure 19.1 illustrates the spodumene market size in 2016, estimated by Roskill Information Services Limited (Roskill), an international marketing research group."

Figure 19.1: Proportion of Spodumene Concentrate Consumption in 2016



Source: Roskill

His observations continued with "The lithium contained has a technical effect in and by its application in lowering melting points, enhancing thermal shock resistance, etc. This is important in production of special heat resistant glass, fibreglass, glass ceramics, frits, steel casting, foundry auxiliaries like fluxes, etc. (i.e., in most cases the lithium cannot be easily reduced let alone abolished without negative effects)… Most of the spodumene resources contain to some extend iron (Fe) and so far, Talison's Greenbushes mine has been for most of the time the only large source of the technical grade spodumene to the glass ceramics and glass market as the mine has an area of low iron spodumene."

In his market analysis, dated June 2, 2022, Gerrit Fuelling states "Technical non-battery applications are often overlooked with the current focus on the mobility electrification. However, they play a major role in many of our daily uses such as high-performance greases (LiOH), cook-top glasses (Li_2CO_3), enamels and frits, construction materials (fast setting floor screeds), etc. In some cases, technical grade ("TG") Spodumene, with low iron content, is used in special markets such as glass and frits which comprise a small and attractive market segment for the application of TG Spodumene. In these applications TG Spodumene can replace to a certain extent the use of Li-carbonate. With Lithium prices rising in many technical applications customers are looking for alternatives to Lithium. This is partly possible, however in many cases like in specialty glasses or frits Lithium cannot be replaced entirely. Pricing for TG Spodumene is related to the actual Li-carbonate market price, applying the following formula: price Li_2CO_3 / 6.6 = price TG

Spodumene 6.0 (6.0% Li_2O content), e.g., at an assumed long-term price of Li-carbonate of 22,000 USD/MT the TG Spodumene 6.0 price would be 3,333 USD/MT."

19.4.1 Technical Grade Spodumene, 6.0% Li_2O, Price Predictions

Similar to the relationship between Li_2CO_3 presented by Mr. Fuelling, Critical Elements Lithium Corporation relates the $LiOH\text{-}H_2O$ price to the 6.0% Li2O technical grade spodumene concentrate price. They apply the 6.6 factor discussed by Mr. Fuelling in his market analysis to arrive at the following technical grade spodumene at 6.0% price predictions.

— US$4,848 / mt concentrate until 2030
— US$4,091 / mt concentrate in 2030
— US$3,333 / mt concentrate thereafter

19.5 Tantalum Background

A prior analysis by Gerrit Fuelling in 2016 provided the following information on Tantalum use, sources of supply, and pricing. WSP researched current data provided by the United States Geological Survey group (USGS) to provide more current information to add to and thereby confirm Mr. Fuelling's prior analysis.

Tantalum is a rare, non-toxic, and dense blue-gray metal which is highly malleable and chemically inert. Its unique characteristics are stability at extreme temperatures and its anti-corrosion properties have permitted the element to gain prominence in many metal alloys and applications. Tantalum's primary use is in capacitors for consumer electronics. Table 19.1 provides an overview of industrial uses of tantalum.

Table 19.1: Major Uses of Tantalum by Industry

Industry	Usage	Characteristics	Product
Automotive	Anti-lock brake systems, airbag activation systems, and engine management modules	High strength, resistance to high temperatures	Tantalum powder
Ceramics & Coatings	Ceramic capacitors, glass coating, camera lenses, and X- ray films	High strength	Tantalum oxide and yttrium tantalate
Chemicals	Chemical processing	Ductile, resistance to corrosion	Tantalum metal
Construction	Cathode protection systems for large steel structures such as oil platforms and corrosion resistant fasteners such as screws, nuts and bolts	High strength, resistance to corrosion	Tantalum metal
Engineering	Cutting tools	Resistance to high temperatures (carbides)	Tantalum carbide
Electronics	Capacitors, surface acoustic wave filters for sensors and touch screen technologies, hard disk drivers and led lights	High and temperature insensitive volumetric capacitance, thermodynamic stability	Lithium tantalate, tantalum powder, ingots and nitride
Medicine	Pacemakers, hearing aids and prosthetic devices such as hip joints	Bio-inertness	Tantalum metal
Metallurgical	Furnace parts, super alloys for jet engines and rocket engine nozzles	Resistance to high temperatures	Tantalum metal and ingots
Military	Missile parts, night vision goggles, and Global Positioning Systems (GPS)	Resistance to high temperatures, High and temperature insensitive volumetric capacitance	Tantalum ingots and oxide

Source: British Geological Survey

Historically, tantalum supply and demand were relatively balanced. Demand grew at GDP levels based on the wide ranges of applications for the material with supply sourced primarily from artisanal mining operations in Central Africa and supplemented by major mines in Brazil and Australia. This resulted in a relatively stable pricing environment of approximately $80-90/kg. With the passing of the Dodd-Frank act in 2011 which included the designation of tantalum as a conflict mineral, the supply of tantalum became constrained and prices for tantalum became very volatile, peaking at over $270/Kg in 2012. In the years since 2012, the supply constraint for tantalum has diminished first by consumers sourcing their requirements from certified conflict-free sources in Central Africa and later by new supply originating as a by-product of lithium mining. With improved availability, prices for tantalum have fallen back to approximately $120-130/kg today.

19.5.1 Tantalum as a Mining Co-Product

Tantalum is rarely found in its elemental form and is instead mined as a mineral such as columbite, tantalite, and wodginite. These minerals are composed of a mixture of elements most commonly containing tantalum, niobium, thorium, and uranium. These minerals often occur in deposits with other commercially valuable materials such as lithium, cobalt, and tin. Consequently, these minerals are often recovered as a co-product of mining these materials. Current estimates suggest that co-product recovery of tantalum could represent as much as 20% of the supply of tantalum by 2026.

19.5.2 Artisanal Mining and Conflict Materials

Tantalum-bearing mineral deposits occur in Central Africa where they are often mined on a small scale by local individuals, so called artisanal mining. The proceeds from the mining of these materials are occasionally used to fund on-going civil conflicts in this region. The Dodd-Frank Act of 2011 and its companion legislation in the European Union requires all public companies to disclose the source of minerals used in their products and to certify that they have not been associated with human rights violation. Tantalum is defined as a conflict mineral under the act. Therefore, companies must perform due diligence in order to determine whether their sourced tantalum, or any of its derivatives, were sourced from the Democratic Republic of the Congo or its bordering countries. These and similar regulations in Canada and China constrain tantalum supply from the region, as it can be difficult for companies to file and prove the mineral to be conflict-free.

19.5.3 Tantalum Demand and Outlook

The total demand for tantalum in 2015 was estimated to be 1,700t. At that time, Roskill forecasted compound annual growth rates for tantalum of 3.3% through 2026 based on very rapid growth in super alloys for land based and aerospace gas turbines which offsets below trend line growth in the key capacitor segment. The growth in tantalum demand in the capacitor industry is challenged by its substitutes such as ceramic, aluminum, and niobium capacitors.

There are two major distributors in the tantalum supply chain: H.C. Starck and Global Advanced Metals. Other companies offering tantalum include PLANSEE, and Vascotube GmbH.

19.5.4 Tantalum Supply and Outlook

There are a number of sources of supply for tantalum such as mining, recycling, tin slags (by-products of tin smelting), and synthetic concentrates. Roskill estimates that more than half of the world's supply of tantalum comes from mining operations. According to the United States Geologic Survey (USGS), the total production of tantalum from mining operations was approximately 2,100 tons in 2020 and 2021, up from 1,200 tons reported by the USGS in 2015. The largest producing mines in 2021 are located in Brazil and the Democratic Republic of the Congo (DRC) in Central Africa with Rwanda and Nigeria effectively tied for third place. According to the USGS the top two from Brazil and DRC account for close to 56% of the total supply from global mining operations. (Rwanda is thought to only be a trader). Table 19.2 shows the global production for the last two years.

Table 19.2: Tantalum Global Mine Production 2020 and 2021

	Mine Production	
	2020	**2021**
United States	_	_
Australia	34	62
Bolivia	7	7
Brazil	470	470
Burundl	24	32
China	74	76
Congo (Kinshasa)	780	700
Ethiopia	69	52
Mozambique	43	43
Nigeria	260	260
Russia	49	39
Rwanda	254	270
Uganda	38	40
World Total (Rounded)	**2,100**	**2,100**

Source: USGS

It can be seen from Table 19.2 that there is no mine supplying Tantalum in North America at this time. Table 19.3 shows the import statistics for Tantalum for the United States from 2017 to 2021 representing a potential market for Rose Lithium's Tantalum concentrate.

Table 19.3: United States Reliance on Imports of Tantalum (tons)

Year	2017	2018	2019	2020	2021
Mined in USA	_	_	_	_	_
Other (scrap)	N.A.	N.A.	N.A.	N.A.	N.A.
Imports	1460	1660	1380	1230	1300
Exports	549	681	423	417	580
Stockpile	_	_	_	-16	-10
Consumption, Apparent	907	975	956	797	710
Price, $/kg Ta2O5 content	193	214	161	158	158

Source: USGS

The United States is 100% reliant on imports for its Tantalum uses.

19.5.5 Tantalum Pricing Forecast

In Gerrit Fuelling's prior analysis, he stated Roskill in 2016, indicated a price of at least $110-132/kg was seen as needed in order to sustain continued supply from artisanal and by-product sources. The information from the USGS can be seen to have prices throughout 2017 to 2021 that exceeded that 2016 forecast.

In that prior analysis, Roskill expected that in the long-term prices should increase to about $175/kg, driven mainly by the sustained growth of the end-markets, as well as by implementation of conflict minerals regulations.

For their tantalum selling price, Critical Elements Lithium Corporation has elected a more conservative $US130/kg of Ta_2O_3 contained in concentrate.

19.6 Market Analysis / Metal Pricing Use

WSP deems that the market analysis and prices provided by Critical Elements Lithium Corporation is acceptable to form the basis of an economic analysis for establishing whether a viable mining operation for Lithium and Tantalum products can be established in Northern Quebec. Sensitivity analysis presented as part of the economic analysis shows project viability is retained when a more conservative pricing structure is realized.

However, the market analysis and pricing information as presented does contain forward-looking information related to Lithium and Tantalum demand and price for the Project. The material factors that could cause actual results to differ materially from the conclusions, estimates, designs, forecasts or projections in the forward-looking information include any significant differences from one or more of the following material factors or assumptions that were applied in drawing the conclusions or making the estimates, designs, forecasts or projections set forth in this Market Analysis:

- Prevailing economic conditions.
- Demand for Lithium and Tantalum Concentrates; and
- Prices as forecast over the Study period.

19.7 Current Contracts

Critical Elements does not have any current contracts.

20 ENVIRONMENTAL STUDIES, PERMITTING, AND SOCIAL OR COMMUNITY IMPACT

The following Item details the regulatory environment of the Project. It presents the applicable laws and regulations and lists the permits that are needed in order to begin the mining operations. The final environmental impact assessment (EIA) was submitted to the governments of Canada and Québec in February 2019. Critical Elements has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, Critical Elements announced that the Federal Minister of Environment and Climate Change had rendered a favourable decision in respect of the proposed Rose Project. In a Decision Statement, which included the conditions to be complied with by the Company, the Minister confirmed that the Project is not likely to cause significant adverse environmental effects when mitigation measures are taken into account.

The final remaining step in the Rose Project's approval process is the completion of the provincial permitting process, which runs parallel to the federal process. Pursuant to the James Bay and Northern Quebec Agreement (JBNQA), the provincial environmental assessment is conducted jointly by the Cree Nation Government and the Government of Quebec under the Environmental and Social Impact Review Committee ("COMEX"). The provincial assessment is already well advanced and has undergone several rounds of questions from COMEX and answered by Critical Elements in the normal course of the assessment process. At this time, Critical Elements remains confident in a positive outcome given the stated support for lithium project development in the Province of Québec.

The mine rehabilitation and restoration plan was approved in May 2022 by the Québec Minister of Energy and Natural Resources. The approval of the rehabilitation and restoration plan is a prerequisite to the granting of the mining lease that will be necessary to move forward with the Project.

Critical Elements has been working since the beginning with the Eastmain Community, on whose lands the Project lies. The Corporation has also maintained good relations with the Grand Council of the Cree and with the neighbouring Nation of Nemaska. Consultations have been ongoing and are planned throughout the life of the Project. In 2019, Critical Elements entered into an impact and benefits agreement with the Cree Nation of Eastmain, the Grand Council of the Cree (Eeyou Istchee), and the Cree Nation Government called the Pihkuutaau Agreement.

The main results of the EIA and consultation process are documented in this Item.

20.1 Regulatory Context

The opening of a mine was subjected to the provincial environmental impact assessment and review procedure, under Section 153 of Chapter II of the Environment Quality Act (EQA; CQLR, chapter Q-2). It was also subjected to a federal environmental assessment, under the Canadian Environmental Assessment Act ("CEAA"), 2012 (S.C. 2012, c.19, s.52) in application of the Regulations Designating Physical Activities (DORS/2012-147), as the mine would produce about 4,500 tonnes of ore per day over a 17-year life span. The Project would last 26 years in total with the construction and restoration phases.

In conjunction to these legislations, the Project is located on the James Bay and Northern Québec Agreement ("JBNQA") territory. Chapter 22 of the JBNQA defines the environmental and social protection regime in relation to development activities affecting the territory. Appendix 1 of Chapter 22 (JBNQA) also lists projects submitted to the environmental assessment procedure, activities such as mine openings and relocation of power lines. As such, the environmental assessment process has been guided by the dispositions of this chapter and environmental evaluation committees (COMEX, COMEV, COFEX-South). These committees These committees have ensured that the Cree people have been represented and involved.

In 2019 an environmental impact (EI) statement was submitted to CEAA and COMEX.

Beyond the EIA, the Project design had to comply with the applicable provincial and federal regulations regarding planned equipment and infrastructure. Numerous laws, regulations, policies and directives are applicable to the Project, the most significant of which are detailed hereinafter.

20.1.1 Permitting Requirements

Throughout all stages of the Project (construction, operations, closure), activities conducted by CELC will be required to comply with provincial and federal acts and regulations. The detailed engineering and operations will consider the conditions, mitigation measures and monitoring requirements associated with the global Certificate of Authorization and the federal authorization. It shall also consider all applicable environmental standards included in other relevant provincial acts, regulations, guidelines, and policies. The most relevant ones are listed below. This list is non-exhaustive and is based on information known so far. Their applicability will have to be reviewed as the Project components are defined.

PROVINCIAL JURISDICTION

- Mining Act (M-13.1):
  - Regulation respecting mineral substances other than petroleum, natural gas and brine (M 13.1, r. 2)
- Environmental Quality Act (Q-2):
  - Regulation respecting the regulatory scheme applying to activities on the basis of their environmental impact (Q-2, r.17.1)
  - Regulation respecting activities in wetlands, bodies of water and sensitive areas (Q-2, r.01)
  - Clean Air Regulation (Q-2, r. 4.1)
  - Regulation respecting industrial depollution attestations (Q-2, r. 5)
  - Regulation respecting pits and quarries (Q-2, r. 7.1)
  - Regulation respecting compensation for adverse effects on wetlands and bodies of water (Q-2, r. 9.1)
  - Regulation respecting the declaration of water withdrawals (Q-2, r. 14)
  - Regulation respecting mandatory reporting of certain emissions of contaminants into the atmosphere (Q-2, r. 15)
  - Regulation respecting the burial of contaminated soils (Q-2, r. 18)
  - Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19);
  - Regulation respecting waste water disposal systems for isolated dwellings (Q-2, r. 22)
  - Regulation respecting halocarbons (Q-2, r. 29)
  - Regulation respecting hazardous materials (Q-2, r. 32)
  - Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains (Q-2, r.35)
  - Water Withdrawal and Protection Regulation (Q-2, r. 35.2)
  - Land Protection and Rehabilitation Regulation (Q-2, r. 37)
  - Regulation respecting the quality of the atmosphere (Q-2, r. 38)
  - Regulation respecting the quality of drinking water (Q-2, r. 40)
  - Regulation respecting the charges payable for the use of water (Q-2, r. 42.1)

- Threatened or Vulnerable Species Act (E-12.01):
  - Regulation respecting threatened or vulnerable wildlife species and their habitats (E 12.01, r.2)
  - Regulation respecting threatened or vulnerable plant species and their habitats (E-12.01, r.3)
- Watercourses Act (R-13):
  - Regulation respecting the water property in the domain of the State (R-13, r. 1)
- Sustainable Forest Development Act (A-18.1):
  - Regulation respecting the sustainable development of forests in the domain of the State (A-18.1, r. 0.01)
- Conservation and Development of Wildlife Act (C-61.1):
  - Regulation respecting wildlife habitats (C-61.1, r. 18)
- Lands in the Domain of the State Act (c. T-8.1)
- Building Act (c. B-1.1):
  - Construction Code (B-1.1, r. 2)
  - Safety Code (B-1.1, r. 3)
- Explosives Act (E-22):
  - Regulation under the Act respecting explosives (E-22, r. 1)
- Cultural Heritage Act (P-9.002)
- Highway Safety Code (C-24.2):
  - Transportation of Dangerous Substances Regulation (C-24.2, r. 43)
- Occupational Health and Safety Act (S-2.1):
  - Regulation respecting occupational health and safety in mines (S-2.1, r. 14)
- Dam Safety Act (S-3.1.01):
  - Dam Safety Regulation (S-3.1.01, r. 1)
- Directives and Guidelines:
  - Directive 019 sur l’industrie minière (2012)
  - Lignes directrices relatives à la valorisation des résidus miniers (2015)
  - Guidelines for preparing mine closure plans in Quebec (2017)
  - Guide d’intervention – Protection des sols et réhabilitation des terrains contaminés (2019)
  - Guide de caractérisation des résidus miniers et du minerai (2020)

FEDERAL JURISDICTION

- Fisheries Act (R.S.C., 1985, c. F-14):
  - Metal and Diamond Mining Effluent Regulations (SOR/2002-222)
- Canadian Environmental Protection Act (S.C. 1999, c. 33):
  - PCB Regulations (SOR/2008-273)
  - Environmental Emergency Regulations (SOR/2003-307)
  - Federal Halocarbon Regulations (SOR/2003-289)
  - National Pollutant Release Inventory
- Species at Risk Act (S.C. 2002, c. 29)

- Canada Wildlife Act (R.S.C., 1985, c. W-9):
  - Wildlife Area Regulations (C.R.C., c. 1609)
- Migratory Birds Convention Act, 1994 (S.C. 1994, c. 22):
  - Migratory Birds Regulations (C.R.C., c. 1035)
- Nuclear Safety and Control Act (S.C. 1997, c. 9):
  - General Nuclear Safety and Control Regulations (SOR/2000-202)
  - Nuclear Substances and Radiation Devices Regulations (SOR/2000-207)
- Hazardous Products Act (R.S.C., 1985, c. H-3)
- Explosives Act (R.S.C., 1985, c. E-17)
- Transportation of Dangerous Goods Act (1992):
  - Transportation of Dangerous Goods Regulations (SOR/2001-286)
- Directives and Guidelines:
  - Environment Canada Environmental Code of Practice for Metal Mines (2009)
  - Guidelines for the Assessment of Alternatives for Mine Waste Disposal (2016)
  - Strategic climate change assessment (2020)

20.1.2 Permits

Following receipt of the COMEX EIA approval, CELC will require several approvals, permits and authorizations to initiate the construction phase, operate and close the Project. In addition, CELC will be required to comply with any other terms and conditions associated by both provincial and federals global authorizations.

PROVINCIAL JURISDICTION

Certificates of authorization are prescribed under the EQA, Section 22 to allow construction and operation for certain activities of the Project (e.g., waste rock pile, dykes, roads, water treatment plant).

Specific permits will also be needed (non-exhaustive list):

- Rehabilitation plan (Mining Act, s. 232.1);
- Authorization for groundwater catchment, water supply and water treatment plant under (RRAQA, s. 32);
- Permit for explosives (Regulation under the Act respecting explosives, s.II);
- Permit for the use of high risks petroleum equipment (Safety Code, s.120 ; Construction Code, Chap. VIII, s.8.01);
- Industrial attestation under the Regulation respecting industrial depollution attestations (RRAEQA, s. 31.11);
- Land lease for mining waste (Mining Act, s. 239 and An Act respecting the lands in the domain of the State, s.47) (see 8.7.3);
- Authorization to deposit mining waste in the approved location (Mining Act, s. 241);
- Permit for tree clearing (Regulation respecting standards of forest management for forests in the domain of the State);
- Authorization for implementing dust collector (RRAEQA, s. 48).

Also, CELC must compensate for the loss of wetlands and fish habitats. Compensation programs will be developed in collaboration with the environmental authorities and Cree Nations.

FEDERAL JURISDICTION

The Project has been authorized by Environment and Climate Change Canada, but other authorizations are also required from:

- The Minister of Fisheries and Oceans may issue authorization(s) under paragraphs 34.4(2)(b) and 35(2)(b) of the *Fisheries Act*;
- The Minister of Natural Resources may issue a licence under subsection 7(1) of the *Explosives Act*; and
- The Minister of Transport may approve an application under subsection 10(1) of the *Canadian Navigable Waters Act*.

CELC will also need to complete a declaration to the National Pollutant Release Inventory. Also, CELC must compensate for the loss of wetlands and fish habitats. Compensation programs will be developed in collaboration with the environmental authorities and Cree Nations.

20.1.3 Land Leases

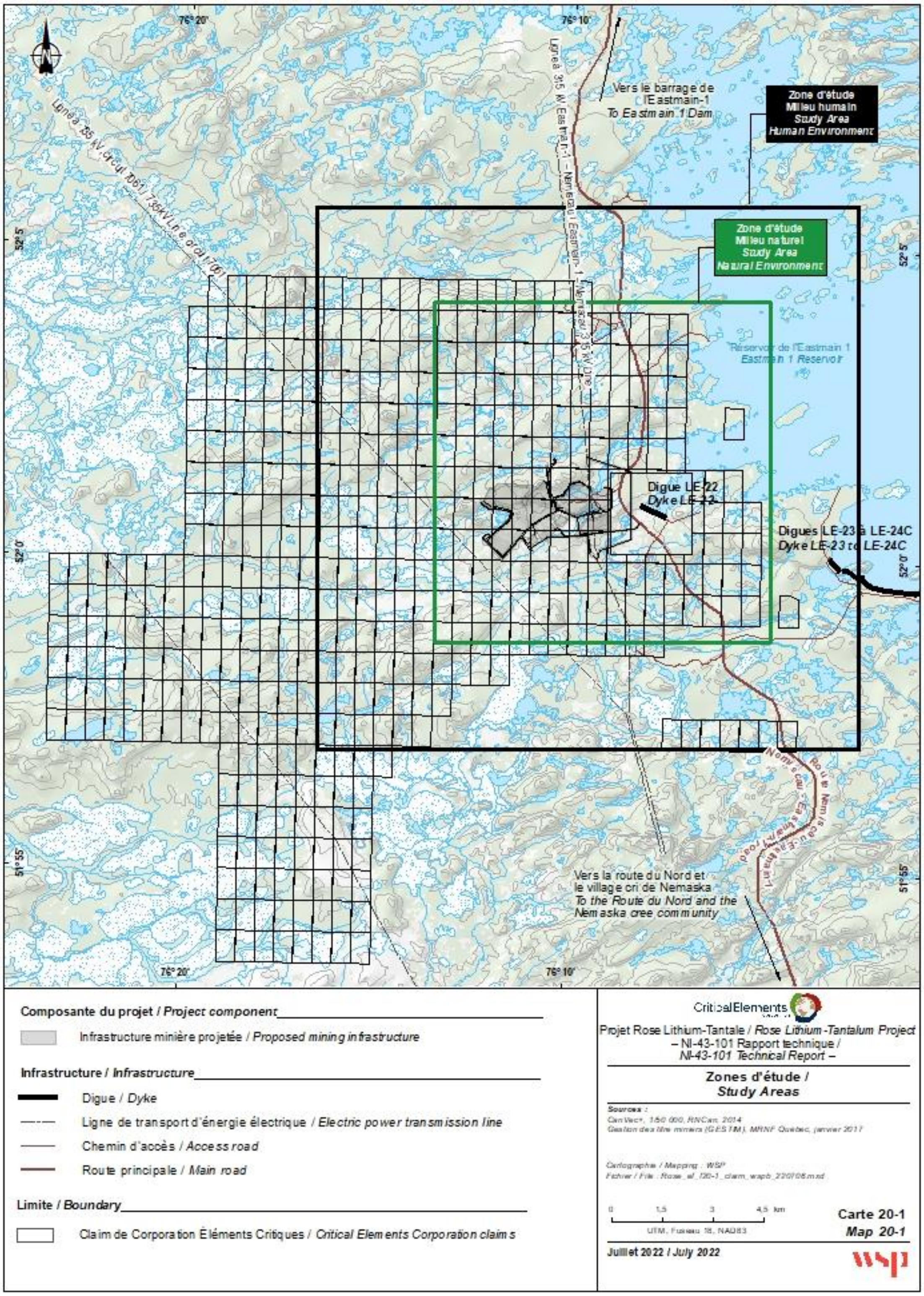
A land lease will need to be obtained from the the provincial government (the custodian of the State lands). This will be applicable to all lands where construction work is needed. This land lease will need to be acquired before permit requests. As such, a land lease request was prepared in 2018 and submitted to the MERN. The approval of the land lease request is still pending on the completion of the MELCC analysis of the project.

20.2 Description and Effects on Environment

The Rose Mine property consists of 473 active claims spread over approximately 246.5 km^2 (24,650 ha) (see Figure 20.1). The claims are grouped into two blocks located on Québec public domain lands. The mining property is in the territory of Eeyou Istchee James Bay, more specifically within the community of Eastmain, on Category III lands. About 40 km to the south is the Cree village of Nemaska, which is located about 300 km northwest of Chibougamau. The site is accessible via the Route du Nord, which is accessible in all seasons from Chibougamau, or via Matagami, via Route 109 and the Route du Nord.

Two studies areas have been identified for the EIA and the associated environmental and baseline studies (Figure 20.1). The ‘local study area’ includes all of the areas likely to be directly physically impacted by the mine development (in regard of the infrastructure locations). The ‘regional study area’ is a larger area extending out of the Property and to which is potentially associated cumulative effects with other projects or infrastructures.

Figure 20.1: Environmental Baseline Study Areas



The following descriptions outline the major components of the biophysical and social environments, in addition to the expected residual impacts.

20.2.1 Physical Environment

GEOLOGY AND SEDIMENTS

Bedrock Geology

The study area is located in the northeastern part of the Canadian Shield, in the Superior geological province. The study site straddles three subprovinces: La Grande, Opinaca at the eastern end and Nemiscau at the southwestern end. These subprovinces form the Eastmain Greenbelt, which consists of metamorphosed volcanic and sedimentary rocks (Moukhsil et al., 2007). The Rose property is located in the southern portion of this belt, dominated by the Anatacau-Pivert Formation. Refer to Item 7 for details of bedrock geology.

Geomorphology

Over 25% of the study area is covered by basal or ablation till. Thin till (< 1 m) covers 7% of the study area. It is present on the tops and slopes of rocky hills where bedrock outcrops at bedrock outcrops in several locations. Thin till deposits are located to the north and west of the proposed facilities. More than 18% of the study area is covered with till more than one meter thick. Thick till is located in smaller proportions on hilltops and slopes, but is more present in flat areas. To the north of the study area, the till is tapered, indicating that it is a bottom till, shaped by the last glacier flows. of the glacier. There are no marine deposits in the study area. However, the waters of the Tyrrell Sea invaded a large area to the east of the study area because of lower altitudes. These are now flooded by the Eastmain-1 reservoir waters. Finally, more contemporary, alluvial, aeolian deposit and organic, have been implemented during the Holocene.

GEOCHEMISTRY

CELC commissioned Lamont Inc. of Québec to compile and analyze the results of geochemical characterization tests performed on samples of rock waste taken from the projected footprint pit of the Project (Lamont Inc., 2017). The samples and the analytical test protocol were previously determined by CELC.

The Lamont Inc. (2017) report shows the following:

- The Project deposit is located in the Superior Geological Province. The mineralization is contained in spodumene pegmatite dykes that are encased in gneiss, amphibolite, porphyry and metasedimentary units. These four lithologies represent all of the future tailings that will be extracted from the open pit, planned to be exploited for the Project. The lithologies of gneiss and porphyry represent about 85 % of the future tailings.
- The characterization program was undertaken to characterize 21 samples of waste rock: 11 gneiss, 6 amphibolite, 2 porphyry, and 2 metasediments. All samples were taken from exploration drill cores, by CELC.
- The samples are mainly composed of SiO_2 and Al_2O_3. The amphibolite samples also show slightly higher concentrations in Fe_2O_3, MgO and CaO. The results obtained with the whole rock analysis clearly demonstrate the overall composition of the samples being silicates.
- The geochemical characterization tests were used to determine the potential of the samples to generate acidity. According to Directive 019 criterion, applicable in Québec, two samples out of 21 are considered to potentially be acid generators, with S_{total} concentrations of 0.314 % and 0.353 %. These values are very close to the 0.3 % S_{total} criterion. The majority of the samples have a S_{total}

concentration below 0.05 %. According to currently available information, either the majority of samples are NPAG, sulphur concentrations are low and that the presence of sulphides is marginal in the lithological units, it can be considered that all of the waste rock will be NPAG.

- The tests were also used to determine the leaching potential of metals. There are no samples with metal concentrations exceeding PPSRTC (P*olitique de protection des sols et de réhabilitation des terrains contaminés*) criterion C. Tailings are therefore not considered to be high-risk residues. Still, according to Directive 019 criterion, based on metal analysis and leachate test TCLP, 6 samples out of 21 are considered potentially leachable for copper. Copper exceedances are mainly observed in amphibolite samples. According to CELC, this lithology could represent only 10.6 % of the total amount of waste rock to be extracted.

Based on the information currently available, which is that: the majority of waste rock samples are NPAG, sulphur concentrations are low and sulphides are marginal in the lithological units, it can be considered that all waste rock will be the presence of sulphides is marginal in the lithological units, it can be considered that all the waste rock will be NPGA.

Based on the information currently available, that the tailings sample is that the sulphur concentration is very low, it can be considered that all the tailings will be NPAG.

There are no samples with metal concentrations in the TCLP leachate that exceed the PPSRTC RES criteria. The tailings are therefore considered to be the tailings are therefore considered to be non-leachable, and therefore will be low-risk tailings.

Kinetic tests in wet cells were subsequently performed (Lamont 2019, 2021). Kinetic tests were performed on 13 samples, to determine the geochemical behavior of the waste rock and ore from the Rose project. Kinetic wet cell tests have demonstrated that the tested samples contain very few metals that are not readily leachable. The concentrations obtained in the leachates are regularly below the detection limits of laboratory analyses. The waste rock and ore are not very reactive and can be considered as quasi-inert materials. The calculated leaching rates are low. There was no significant variation identified in the chemical composition of the of the samples before and after the kinetic test.

AIR QUALITY

A study of air quality was carried out as part of the Project and was incorporated into the EIA. In order to assess the impacts of air emissions from the mining work, modelling of the air dispersion covers the construction and operation and maintenance phases of the mine.

The Project could degrade air quality by emitting contaminants into the atmosphere: dust, metals and metalloids, and gaseous compounds from combustion (exhaust gases). The Project could affect air quality by emitting dust during road transportation and other mining activities or infrastructure, such as the operation of the ore processing plant, drilling, blasting, loading and unloading of mining materials and mining material storage sites. The transportation of mining materials on the unpaved roads of the future mine site would be the main source of dust.

However, in the construction and operation phases, all the standards and criteria considered are respected in the area of application, i.e., beyond 300 m from the infrastructures, and at sensitive receptors. Furthermore, with the application of mitigation measures, no significant exceedance of crystalline silica criteria is modeled at sensitive receptors. In addition to applicable mitigation measures, a dust management plan will be implemented.

GREENHOUSE GAS

Legally, CELC is annually required to report its air emissions, including EWGs, to the MELCC, in accordance with the Regulation respecting the mandatory reporting of certain emissions of contaminants into the atmosphere (RDOCÉCA).

The total annual emissions that would be generated by the maximum operating scenario of the mine would be in the range of 84.3 kilotonnes (84,300 tonnes) of carbon dioxide equivalent (CO_2 eq). This corresponds to approximately 0.12% of the total greenhouse gas emissions inventoried in Québec in 2017, and 0.012% of the total greenhouse gas emissions inventoried in Canada in 2018. The Project's total emissions would be in the order of 1,519 kilotonnes of CO_2 eq.

Various measures have been proposed to reduce the effects of the Project on GHG emissions, including: using electrical equipment wherever possible in mine operations; limiting engine idling; using the latest (Tier 4 certified) engine technology; using energy-efficient equipment, construction and design standards, procedures and operating practices; and providing eco-driving training to drivers of material hauling trucks.

NOISE

The study area to assess the effects on the noise environment is the footprint of the mine site and approximately 500 m around it. Since this zone is not very busy, its current noise level corresponds to that measured in the natural environment, which is less than 40 decibels. The increase in road traffic, the construction of the mine site's infrastructures and the use of explosives would cause an increase in ambient noise. truck traffic on off-site roads, such as the Nemiscau-Eastmain-1 road, would result in an average noise level of 40 decibels at 55 m from the road and 45 decibels at 37 m. During the operational phase, the average noise level would reach 40 decibels at 85 m from the road and 45 decibels at 55 m. The minimum distance that would be necessary to maintain between land users and the road to avoid an effect on speech and sleep disruption is 68 m in the operational phase. Currently, the camp closest to the road is located 80 m from the road. No campsites are therefore located within this critical health zone.

SOILS COMPOSITION AND QUALITY

No previous activity is likely to have affected the quality of the soil at the Project's site. Soil quality analysis was performed on samples taken from the trenches and boreholes. Thirty-five samples were analyzed by the laboratory. Chemical analysis results showed concentrations above the background levels established for the Upper Geological Province (generic "A" criteria) for three parameters: silver, cadmium and tin.

The Project could result in effects on soil quality, which could indirectly affect groundwater quality. The main source of effect on soil quality, namely the risk of contamination during accidental spills of hydrocarbons, solvents, or other hazardous liquids.

HYDROGEOLOGY AND GROUND WATER QUALITY

The analysis of the available data allowed the identification of two main hydrostratigraphic units: a horizon of unconsolidated deposits divided into two units (glaciofluvial sediments and till and basal till); a rocky horizon composed of granite and granodiorite, tholeiitic basalt and a diabase dyke. The thickness of the till and fluvioglacial sediments varies between 0 and 5 m and the thickness of the basal till varies between 5 and 38.4 m.

Based on the hydrogeological properties of the site, the assessed groundwater vulnerability indices are 127 (bedrock) and 162 (surficial deposits), which is equivalent to a medium DRASTIC This is equivalent to a medium level of vulnerability according to the DRASTIC index.

Steady-state numerical simulations have been completed for the period of maximum excavation. At this time, nine 250 m deep shafts will be installed at the periphery to reduce the volume of water to be managed in the pit. The model predicts that 12,350 m^3 of water will be discharged from the pit on a daily basis in addition to the 10,800 m^3/d pumped from the perimeter wells

The planned 1 m drawdown cone will reach lakes located on the periphery of the mine site and will extend over a radius of approximately 4 km around the pit. Under full excavation conditions, the regional piezometric surface will not change significantly, only the local piezometry will be affected by pit dewatering. The water pumped to the periphery and released to Lakes 3, 4 and 6 will provide the required volume of water (8,244 m^3/d) to reduce the impact to zero in Lakes 3, 4, 6, 7, 8, 9, 10, 11, 12, and 13. The water pumped from the periphery will also be sufficient to meet the drinking water needs (1,260 m^3/d).

In the majority of samples, exceedances of Québec's surface water resurgence criteria (SWR) were noted for the following metals: silver, copper, manganese, nickel, lead and zinc. CELC plans a groundwater monitoring program consisting of 18 observation wells located upstream and downstream of the mining infrastructure.

HYDROLOGY AND HYDRAULIC

The environment into which the Project will be inserted affects two water basins, the Eastmain River and the Pontax River watersheds. The proposed pit lies directly on the watershed limit of these two major river basins.

The Eastmain River basin originates in the Otish Mountains. Since 1980, its waters have been diverted to the Grande Rivière basin by means of dams located on the Eastmain River, on the Opinaca River and on the Petite Rivière Opinaca.

The Pontax River basin originates in Champion Lake on the outskirts of the Nemaska village. The Project is located at the head of the watershed, in a secondary branch that joins the Pontax River, 25 km east of the James Bay Road.

Given its topographic location, the study area is mainly composed of small lakes and low flow streams. All runoff from the site will be collected in a retention basin and discharged into Stream A after passing through a treatment unit, thereby increasing the quality of the water. The treatment unit discharge will increase the surface area of Stream A, and modifying the discharge pattern. The Project will result in the loss of approximately 12.3 ha of lakes (Lakes 1 and 2 will be dewatered) and 560 meters of watercourse (Stream B dewatered) and 560 m of watercourse (Watercourse B). Dewatering of the pit through nine perimeter wells will create a decrease in stream baseflows. However, the release of dewatering water into Lakes 3, 4, and 6 will partially reduce the effects.

SURFACE WATER AND SEDIMENTS QUALITY

Generally, water and sediments quality is very good with respect to the criteria for the protection of aquatic life. Water is limpid, low in productivity, dimly mineralized and has a low buffering capacity. Results show that, as a whole, the different sampled waterbodies have not been affected by contaminants spreading. Apart from dissolved oxygen concentration and bacteriological analysis, there is no significant difference in water quality between sampling periods. Due to the low activity level occurring in the sector, the presence of fecal coliforms is very likely of natural origin.

Cadmium and zinc are present at a concentration exceeding the threshold concentration effect level in Lake 4, and exceeding measurements for threshold effects level have been noted for cadmium and zinc at Lake 4, and for copper at Lakes. 2, 4, and 5.

The management of mine water could affect the quality of ground and surface water, the thermal regime and the dissolved oxygen concentration of water bodies and streams. The Project could emit suspended solids into the water that could clog spawning grounds.

During the operational phase, water accumulating in the pit (mine water), water from the ore concentrating process and runoff from the mine site could contain suspended solids, metals, nitrates or an acidity level (pH) in excess of applicable criteria. CELC plans to build a plant to treat this water before discharging it to Watercourse A. According to the geochemical characterizations carried out, the waste rock, ore and mine tailings would not be likely to generate acid mine drainage (AMD). For the groundwater captured by the pumping wells on the periphery of the pit and discharged into Lakes 3, 4, and 6, sedimentation basins will collect groundwater before its discharge. These basins would make it possible to temper and reoxygenate the water before its discharge, while limiting the transport of suspended matter.

ARTIFICIAL LIGHT AT NIGHT

The Project's site and nearby camps are located in an area where the clarity of the sky is almost optimal. A very much lesser clarity of the sky is present nearby the two main artificial light emitters: electrical substation Nemiscau, located south of the Project's site, and hydroelectric plant Eastman-1, located north of the site. However, this effect quickly fades after a few kilometres and gives place to a sky-clarity of very good quality. Regarding intrusive light, there is no such source in the study area. Only the Nemiscau electrical substation and the hydroelectric plant Eastman-1 are sources of nocturnal artificial light that affects nocturnal landscapes with a very visible luminous halo. This halo quickly fades and is no longer visible a few kilometres away from its source.

Project activities during the operation and maintenance phase represent ongoing sources of artificial nighttime light emissions that have the potential to locally alter sky clarity and disrupt nighttime landscapes.

20.2.2 Biological Environment

FLORA

The Project area is characterized by the presence of numerous hills and valleys. The mainly coniferous terrestrial stands, as well as peatlands, are the main vegetative groups of the territory. The density and composition of these stands vary mainly according to the fire regime (more or less recent slash and burning), the substrates, and drainages observed, as well as the exposure of these to the severity of the climate. Whether in wetlands or on land, heath plants dominate virtually all landscapes.

The Project would result in a total loss and direct disturbance of 427.4 ha of terrestrial stands and 173.55 ha of wetlands (0.08 ha of ponds, 11.96 ha of treed and shrub swamps, and 161.51 ha of ombrotrophic bog). ECCC is satisfied with the application of the "avoid-minimize-compensate" sequence that led CELC to choose the location of the Project components in such a way as to limit the permanent loss of wetlands and their functions. A "wetland or watercourse compensation plan" has been presented to Governments.

Vegetation Groups

Terrestrial vegetation represents 64.0% of the study zone. In general, the area under study is largely dominated by coniferous stands, more particularly, the jack pine forest (51.3%). Those are mainly observed on the slopes and hilltops in rather xeric conditions, whether on sandy deposits or directly on the rock.

Apart from pine forests, spruce-moss and spruce-lichens stands are also observed in the Project area. These groups, however, are less numerous and often cover smaller areas than jack pine forests. The muscinal strata on which these spruces (mosses and / or lichens) grow varies according to the drainage of the soil; lichens are rather observed in areas with excessive drainage, while mosses are more present in more mesic conditions. The soil is almost entirely covered with hypnaceous mosses, sphagnum mosses, and lichens.

Although the stands are mainly composed of coniferous species, several small deciduous stands are also observed on the southern slopes of the mountains or in some sheltered areas of the hills. White birch is the most frequently observed species.

Wetlands

Wetlands represent whereas represent 36.0% of the study zone. They are mainly composed of peatlands and some riparian environments. Peat bogs (bogs) are the largest and most frequent in the study area. In the insertion area of the Project, different types of ombrotrophic peatlands are present. These can be arborescent or shrubby. In all cases, they are characterized by a thick carpet of sphagnum sometimes accompanied by hypnaceous mosses and lichens.

Ecological Value

Among inventoried areas, four were attributed a high ecological value due to their ecological integrity, quality of their hydrological connections and their maturity: two emergent marsh, one treed marsh, and one open ombotrophic peatland. No plant of special status has been inventoried. However, an invasive exotic plant, the Reed Canarygrass, has been found at various places, although only on a few square metres for each observation. Thirty-two species of Cree’s medicinal interest have been identified: six species of trees, twenty species of shrubs, five herbaceous species, and one group of mosses species.

FAUNA

Terrestrial Wildlife

Three species of large mammals are likely to frequent the study area. These include moose, black bear, and caribou, both woodland and migratory ecotypes. Also several species of small terrestrial fauna are likely to frequent the study area of the natural environment according to their range. As for the micromammals, there are 14 species potentially present in the study area, the presence of six species has been confirmed during the inventory carried out. No species with a special status has been recorded.

Moose

In general, the density of moose in Hunting Zone 22, of which the study area is part, is one of the lowest in Québec. It was estimated at 0.50 moose / 10 km2 between 1991 and 2012. Signs of presence (faeces and traces) of moose were observed during inventories carried out.

Black Bear

The presence of the black bear was confirmed within the study area from observations of some black bear traces and feces (summers 2012 and 2016).

Caribou

The study area for the Project is located in the area of distribution of woodland caribou and migratory caribou. Thus, individuals from these two ecotypes are likely to frequent the study area of the Project; migratory caribou are likely to frequent the study area only in winter, whereas woodland caribou may frequent the area on an annual basis. Current knowledge therefore indicates that woodland caribou of the

Nottaway herd have scarcely used the study area over the past decade within a radius of approximately 25 km from the projected mine. The presence of migratory caribou in the area is considered to be marginal.

The habitat alteration caused by the Project would have no significant impact on woodland caribou. The current rate of disturbance (natural and anthropogenic) of caribou habitat is 60% in the study area and 99% within a 5-km radius. The Project would also have no significant effect on the connectivity between caribou habitats since the study area is already fragmented by roads and the power grid. The Project will not have a significant effect in terms of direct or functional loss of habitat for woodland caribou likely to frequent the area.

Chiropterans (bats)

Acoustic inventory of chiropterans (bats) confirmed the presence of five species within a 50-km radius of the future mine site. Among these species, the northern myotis and the little brown myotis are designated as endangered under SARA. Deforestation and the construction of mining infrastructures could destroy the chiropterans diurnal habitat or reduce its quality, causing the mortality of individuals or changes in their use of different types of habitats. No chiropteran maternity or hibernacula are known within a 10-km radius of the mining Project. The disappearance of wetlands would mean the loss of feeding sites, which would require the relocation of chiropterans to other sites. However, these wetlands are mainly bogs, which are not preferred feeding sites for chiropterans. During the construction phase, if the schedule permits, CELC plans to conduct deforestation outside the chiropteran breeding period.

Wolverine

The presence of wolverine is unlikely in the area. For these reasons, no adverse effects of the Project on wolverine are expected. It is justified by the low probability of presence of this species, the extent of the territory it occupies, the small size of the Project's zone of influence and the intensity of current human occupation.

Avifauna

For avian wildlife, the various field surveys and opportunistic observations confirmed the presence of 87 species, both migratory and non-migratory, belonging to 30 families in the study area during the inventories carried out. The distribution and abundance of avifauna in the area varies according to seasons, ecological preferences and habitat availability for each of the groups, namely waterfowl and other aquatic birds, shorebirds, forest birds, diurnal raptors, and nocturnal raptors. Nesting status was confirmed for 9 species, while probable nesting status was assigned to 21 species and possible for 38 others. Some waterfowl species, such as Canada geese and snow geese, are valued by the Cree Nations.

At least 24 species of waterfowl, 27 species of aquatic birds and 61 species of land birds are likely to frequent the study area. There are seven species at risk protected under Species at Risk Act that have been inventoried in the study area or that are likely to frequent the study area.

Habitat loss would be the main negative effect caused by the Project on birds, but lost wetlands will be replaced by compensation projects.

Herpetofauna

For herpetofauna, the various field surveys and opportunistic observations confirmed the presence of 11 species potentially present in the study area, seven were identified in the study area: american toad, northern spring peeper (mink frog, green frog, wood frog, the common garter snake and the northern two-lined salamander. No species at risk were observed.

The loss of habitat is the main effect caused by the Project and the other probable effects are related to the presence of infrastructures (noise and risk of collision) as well as the risks of accidental spills.

Aquatic Fauna

The study area covers a surface of approximately 102 km² and is shared between two watersheds, namely the La Grande Rivière watershed, which includes the Eastman 1 reservoir, and the Pontax river reservoir.

A total of fourteen species of fish were inventoried in this study area: white sucker, northern pike, yellow perch, lake whitefish, yellow walleye, brook trout, burbot, lake chub, pearl dace, longnose dace, mottled sculpin, slimy sculpin, brook stickleback and fallfish. No special-status fish species were captured during these inventories. According to the CBJNQ, lake sturgeon, white sucker, burbot and lake whitefish are strictly reserved to the First Nations use in this region.

The main effects of the Project on fish and their habitat are related to the loss of temporary and permanent habitat, the modification of the hydrological regime and the modification of the thermal regime. The modifications to the hydrological regime and the encroachment of mining infrastructure would be likely to deteriorate, destroy or disturb 42.3 ha of fish habitat, including 37.9 ha in a lake environment and 4.4 ha in a watercourse. Lost habitats will be replaced by compensation projects. Other potential effects may be caused by the risk of release of suspended solids into the water, the risk of spills and increased fishing pressure.

20.2.3 Social Environment

The Project is located within a trapline of the Cree Nation of Eastmain, near the Cree village of Nemaska, and also affecting a watershed on the Waskaganish First Nation's traplines. The Project could lead to environmental effects on health and socio-economic conditions, on the current use of land and resources for traditional purposes, on the natural and cultural heritage and on sites of archaeological significance for Cree Nations.

ARCHAEOLOGY

An archaeological potential study was conducted to identify areas of interest related to remains associated with ancient human presence. On a 83.4 km^2 study area, 12 archaeological sites corresponding to Native American occupation and prehistoric, modern and contemporary period are actually known following the research made as part of the Eastmain-1 hydroelectric project. Twenty-one archaeological potential sites have been identified. In the areas affected by the Project an archaeological inventory has been carried out to avoid archaeological and ethnological vestige destruction because of projected construction works. No archaeological remains have been found.

LANDSCAPE

The landscape appearance of the site is based on natural components. Anthropogenic changes to these components will compromise the integrity of the site's landscape. The planned remediation of the site will contribute to reshaping the site as much as possible with the surrounding landscape. The visual field of observers may be particularly modified by the presence of the TMF because of their size and geometry. However, the insertion landscape, which is a visually complex mosaic defined by an undulating topography and by vegetation that varies in height and density, favours the visual integration of the TMF and limits the effects on the visual fields of observers. There will be no significant effect on the landscape or on the visual fields of observers on the Nemiscau-Eastmain-1 road.

TRADITIONAL LAND USE

Land Use

The study area is located in the administrative region of Northern Québec, on the territory of the Regional Government of Eeyou Istchee James Bay. The legislative and legal context of Northern Québec is notably governed by the James Bay and Northern Québec Agreement (JBNQA), the Northeastern Québec Agreement and the Agreement Concerning a New Relationship between the Government of Québec and the Cree of Québec also called the "Peace of the braves". The territorial regime introduced by the JBNQA is a decisive element in the use of the territory. It provides for the division of the James Bay territory into Category I, II and III lands. The study area intersects Category II and III lands. On Category II lands, the Cree have exclusive rights to hunt, fish and trap, while on Category III lands they enjoy the exclusive right to trap fur animals and certain benefits in the field of outfitting, without having exclusive rights.

The Cree communities of Eastmain and Nemaska are the main involved in the Project. The study area overlaps four traplines linked to users of these communities: R10 (Waskaganish), RE1 (Eastmain), R19 and R16 (Nemaska). All of the Project's infrastructure and facilities are located on the RE1 site. The use of this territory is dominated by the hunting, fishing and trapping activities of tallymen and their families and other Cree users. No sacred or heritage sites, such as birthplaces or burial sites, were identified in the study area. However, many places remain culturally valued for traditional activities.

In terms of infrastructure, in addition to the road leading to the Eastmain-1 power plant and some secondary roads, the study area is crossed by two power transmission lines, one at 315 kV and the other at 735 kV. A technical study was conducted with Hydro-Québec for the relocation of some 315 kV tower pylons that would be required to operate the mine. This work will be conducted under the direction of Hydro-Québec.

The Project could result in residual effects on the current use of lands and resources for traditional purposes and, more specifically, on hunting, fishing and trapping activities practiced by the Cree Nations, by limiting access to the territory, and the use of resources for traditional purposes. However, these effects are not likely to be significant given the implementation of recommended mitigation measures.

In order to respond to the concerns of the Cree Nations, CELC undertakes to modify its blasting and heavy trucking of ore during the annual goose and moose hunting periods, for a period of at least 14 consecutive days each time. However certain habits related to travelling on the road to access the camps could be modified for the Cree Nations affected by the Project. The two camps on the mine site will be relocated to a location suitable for the users. With regard to the additional project-related traffic on the Nemiscau-Eastmain-1 Road, CELC will make workers and carriers aware of the need to comply with safety regulations and, if necessary, take steps with the competent authorities to ensure the safety of users of the Nemiscau-Eastmain-1 road.

ECONOMIC BENEFITS

The Project will have a positive impact on employment, training and the economy of the Cree communities, particularly Eastmain. Bonus measures will encourage the participation of Cree workers and businesses in the Project.

The Mining Project will have significant economic benefits for regional businesses and will maintain or create many jobs. During the construction phase, local purchases in Quebec could amount to approximately $218 million and annual operating expenses will be in the order of $100 million. The operation of the mine is expected to create 546 direct and indirect jobs, which could be filled by members of the regional communities. The proposed bonus measures will encourage the hiring of regional workers and the awarding of contracts to regional businesses. In addition, the governments of Quebec and Canada will receive

$27.4 million and $9.9 million respectively in tax revenues during the construction period and $10.7 million and $4.3 million per year during the operation of the mine.

HUMAN HEALTH

Several effects of the Project could affect the community well-being and human health of the Cree, including the integration of Cree workers into the mine work environment, increased social problems related to alcohol and drug use, feelings of loss and damage to their cultural identity, and concerns about health risks associated with possible environmental contamination. The proposed mitigation and enhancement measures and the firm commitment of CELC to implement them will limit the potential effects on the Cree population. As such, there will be no significant effects on the community well-being and human health of most of the Cree population.

LAND USE

The project will require the relocation of a section of the 315-kV Eastmain-1–Nemiscau transmission line. The environmental effects associated with this relocation will be the subject of a specific assessment by Hydro-Québec. The only apprehended effects on land use and infrastructure are associated with the increase in project-related heavy traffic on the Nemiscau-Eastmain-1 Road. CELC will make workers and carriers aware of the need to respect safety rules and, if necessary, take action with the competent authorities to ensure the safety of users of this road. In addition, big game sport hunters will have to adapt their practice to the new environmental conditions. However, the harvest potential will not be affected. No effect is foreseen for sport fishing.

20.2.4 Cumulative Effects

The analysis of the cumulative effects on the six valued components leads to the conclusion that the Project will have only insignificant cumulative effects on the Cree communities of Eastmain and Nemaska, and on woodland caribou, migratory birds, bird species at risk, and chiropterans in the study area (spatial scope) and for the time periods selected (temporal scope). Consequently, no additional mitigation measures or environmental follow-up program is required.

PUBLIC INFORMATION AND CONSULTATION

Cree Communities

A multitude of meetings were held with the various communities between 2011 and 2022 to present the Project and its impacts, as well as to establish relationships of trust and reach agreements. CELC signed an Impact and Benefits Agreement with the Cree Nation of Eastmain and the Cree Nation Government in July of 2019. Table 20.1 include the Cree stakeholders interviewed.

Table 20.1: Cree Stakeholders Interviewed (2011-2022)

Date	Location	Purpose
July 4, 2011	Val-d’Or	Presentation of the company
July 8, 2011	Val-d’Or	Presentation of the company
July 13 and 14, 2011	Eastmain	Presentation of the Project
July 20, 2011	Val-d’Or	Economic and social aspects related to the Project
September 13, 2011	Val-d’Or	Economic and social aspects related to the Project
November 12, 2012	Val-d’Or	Signature - Pre-Development Agreement
December 6, 2012	Montréal	IBA Negotiations

Date	Location	Purpose
February 13, 2013	Montréal	IBA Negotiations
March 27, 2013	Val-d'Or	IBA Negotiations
June 26, 2013	Val-d'Or	IBA Negotiations
September 23, 2013	Montréal	IBA Negotiations
October 29, 2013	Montréal	IBA Negotiations
January 24, 2014	Montréal	IBA Negotiations
November 4, 2016	Eastmain	Community consultation
March 10, 2017	Chibougamau	Impact on the community and hiring of a liaison agent
June 2017	Eastmain	Hiring of the liaison agent
November 8, 2017	Montréal	IBA Negotiations
November 16, 2017	Montréal	IBA Negotiations
February 2, 2018	Val d'Or	Impact of the Project on the tallyman
February 16, 2018	Waskaganish	Impact of the Project on the tallyman
February 21, 2018	Eastmain	Signing of the yellow sturgeon agreement
February 22, 2018	Eastmain	IBA Negotiations
April 23, 2018	Montréal	IBA Negotiations
June 20, 2018	Montréal	IBA Negotiations
July 9, 2018	Eastmain	Public consultation
July 20, 2018	Val d'Or	IBA Negotiations
August 1, 2018	Eastmain	Impact of the Project on the tallyman
August 29, 2018	Eastmain	Capacity study
September 19, 2018	Waskaganish	Capacity study
November 13, 2018	Montréal	Impact of the Project on communities
November 21, 2018	Montréal	Impact of the Project on the tallyman
November 26 to 28, 2018	Waskaganish	Public consultations
November 26, 2018	Waskaganish	Impact of the Project on the tallyman
November 27, 2018	Waskaganish	Impact of the Project on the community
November 28, 2018	Waskaganish	Impact of the Project on the community
November 30, 2018	Montréal	Collaboration with the CHRD
December 5, 2018	Nemaska	Impact of the Project on the tallyman
December 6, 2018	Nemaska	Collaboration with the CMC Nemaska
February 6, 2019	Eastmain	Presentation of the IBA to the community
February 15, 2019	Conference call	Collaboration with the CHRD
May 28, 2019	Eastmain	Resolution of the Council of the Cree Nation of Eastmain 2019-2020/05-28-002 - Approval of the Pihkuutaau Agreement.
July 2, 2019	Eastmain	Signing of the IBA
October 29, 2019	Waskaganish	Public consultations
December 3, 2019	Eastmain	Public consultations
January 28, 2020	Nemaska	Impact of the Project on the tallyman
January 28, 2020	Nemaska	Impact of the Project on the tallyman

Date	Location	Purpose
January 29, 2020	Eastmain	Impact of the Project on the tallyman
	COVID-19	
November 23, 2020	Conference call	Presentation of the IBA to the chief and council of Nemaska
July 6, 2021	Val d'Or	Impact of the Project on the tallyman
July 13, 2021	Gatineau	Impact of the Project on the community
August 24, 2021	Val d'Or	Impact of the Project on the communities
September 16, 2021	Nemaska	Presentation of the IBA to the community of Nemaska
March 25, 2022	Val-d'Or	Impact of the Project on the communities

20.2.4.1.1 Jamesian Community

CELC began its public consultation approach in 2011. It organized meetings with the Jamésie municipal and socio-economic representatives. Public presentations of information on the Project were organized in the city of Chapais. Interviews were conducted in the city of Matagami with stakeholders from the municipal administration, economic development, land development and management, and natural resources management sectors of James Bay.

In the Jamesian community, interviews were conducted in Matagami in May 2012, with stakeholders from certain sections of the municipal administration, economic development, land management and planning, and natural resources management. These interviews identified the concerns and expectations of the Jamesians, regarding the Project and overall mining development on the territory. Community stakeholders expressed support for mining developments in their region, but all stressed the importance of developing conditions to ensure and to maximize the positive socio-economic benefits for the region.

GOVERNMENT CONSULTATIONS

COMEX

The COMEX invited CELC to a public hearing to present the Project to the public. Hearings were held:

- Matagami, February 15, 2021;
- Eastmain, February 16, 2021;
- Nemaska, February 18, 2021.

The COMEX website includes recordings of the public sessions, as well as all documents filed as part of the impact assessment: https://comexqc.ca/en/fiches-de-projet/rose-lithium-tantalum-mining-project/

Impact Assessment Agency of Canada

IAAC invited the First Nations (Eastmain, Nemaska, Waskaganish and Waswanipi) to comment on the environmental assessment documents and also on its analysis of the Project:

- Summary of CELC impact statement and related documents. Electronic consultation March 6 to April 5 2019. Consultation in person: Waskaganish (October 25 to 30, 2019), Eastman (December 2 to 4, 2019), Nemaska (January 13 to 15, 2020), Waswanipi (by teleconference November 20, 2020 and January 29, 2021).

- Draft Environmental Assessment Report and Potential Conditions. Virtual and in person consultations (Eastmain, Nemaska, Waskaganish and Waswanipi, March 9, April 14 and April 15, 2021). Electronic consultation (March 17 to April 18, 2021; with extension to June 13 2021).

Project documents and stakeholder comments are available on the following website: https://iaac-aeic.gc.ca/050/evaluations/proj/80005?&culture=en-CA

20.3 Waste and Water Management

20.3.1 Waste Management

Activities on the mine site will produce some waste material to be handled and removed from site. It is planned for a specialized contractor to manage waste material on site, including the supply, handling, and transportation at periodic times of the containers to appropriate disposal and sorting center.

The Project is designed using the principle of reduce, reuse, recycle and recover ("3RV") in order to reduce resource use. It includes recycling of industrial water within the process, maximum use of mine waste rock as a construction material. All waste on site will be sorted at source as to separate domestic waste, recycling material (wood, metal, papers, plastic, copper, etc.) and hazardous waste (oils, lubricants, adhesives, paints, reagents, solvents, batteries, etc.). Dedicated containers will be installed to collect waste and recycling materials from office or working areas bins. Hazardous material will be collected in specific and clearly identified locations.

20.3.2 Waste Rock and Tailings Accumulation Area

Studies completed showed that the mining site's waste rock and tailings (filtered residues) would not be potentially acid generating, thus confirming the relevance of a filtered tailings disposal mode to the proponent. Finally, given the above-mentioned characteristics, CELC chose co-disposal of the waste rock and tailings in one and the same accumulation area, thus reducing the Project's overall footprint.

The co-disposal facility will have an approximate capacity of 182 Mt (91 Mm^3) of waste rock and 24 Mt (16 Mm^3) of filtered tailings, for a volume of approximately 107 Mm^3.

20.3.3 Overburden Management

An overburden pile with an approximate capacity of 11.31 Mt (6.0 Mm^3) is planned to contain the material from the pit clearance and other infrastructure.

20.3.4 Water Management

GENERAL

The water management plan includes minimizing the amount of water that comes in contact with mining infrastructure and the mixing of contact water with infrastructures with potential for contamination (pit, industrial area, sterile rock storage areas and of ore) with those that do not have contact with the same infrastructure.

The pit will in part be kept dry by means of underground water wells installed on its outer perimeter and partly by nine pumps installed at the bottom of it. These waters from the bottom of the pit will be conveyed to the mining site's contact pond and will be treated, if necessary, before being released to the environment. The groundwater pumped from the perimeter of the pit will be released to the environment, in Lakes 3, 4. and 6, in accordance with the capacities of the receiving environments.

Surface waters that come into contact with mining infrastructures but have no potential for contamination, such as overburden and service road ditches, will not be captured, but passive means of controlling materials will be implemented during construction and operation in order to comply with the TSS discharge standards.

The runoff water would be recovered by peripheral ditches and directed by gravity or pumping to sedimentation ponds, and then to an accumulation pond with a capacity of 70,000 m^3. This water then would be routed to a treatment plant in the industrial area. If the quality of the treated water proved unsatisfactory, it would be returned automatically to the accumulation pond. The final effluent would be discharged into Watercourse A, located southwest of the mining site. Moreover, a portion of the treated water could be reused as process water in the plant.

WATER TREATMENT PLANT

The treatment plant will operate 24 hours / day for 365 days / year. It can operate as well in temperature conditions ranging from -45° C to 30° C. The plant will be located near the Equalization Pond located some 100 m from the industrial pad. The water treatment plant is required to treat run-off from tailings stockpiles, dry tailings, and for the pit dewatering.

DISCHARGE POINTS

CELC has planned four water discharge points on the mining site: Lakes 3, 4, and 6, and Watercourse A. To reduce the quantity of water in the pit, the groundwater would be pumped using eight wells located on its periphery, and then ultimately discharged into Lakes 3, 4, and 6. The water accumulated at the pit bottom would be routed to the treatment plant and discharged into Watercourse A. The four-point discharge scenario chosen by the proponent is an attractive approach to maintaining water quantity in these water bodies and preserving fish habitat.

FINAL EFFLUENT

The final effluent will be directed to Creek A via a channel. This canal will display a width of 3 m at the base, a height of 2 m and a slope of 1.5H: 1V. To protect the canal from erosion and for the purpose of stabilizing it, a stonework of 0-400 mm stones is provided on the walls and the bottom of the ditch.

20.4 Closure Planning

The mine rehabilitation and restoration plan was approved in May 2022 by the Québec Minister of Energy and Natural Resources. The approval of the rehabilitation and restoration plan is a prerequisite to the granting of the mining lease that will be necessary to move forward with the Project.

The results of the geochemical characterizations demonstrate that the tailings and mine waste rock from the Rose Lithium-Tantalum Project are non-acid generating and non-leachable. The proposed program is based on the concept of progressive reclamation, as recommended in the “Guide de préparation du plan de réaménagement et de restauration des sites miniers au Québec” (MERN, 2017). The objective of progressive restoration is to ensure as quickly as possible the reintegration of the site into its environment and the reduction of the duration of impacts on the components of the environment. Progressive restoration is possible and even desirable, since the storage of tailings and mine waste rock will be done in a co-disposal manner, thus allowing the restoration of sectors that and reduce the footprint of the accumulation area.

At the end of operations, the buildings and infrastructure will be dismantled, unless a second use is identified. Machinery will be reused elsewhere, and most steel materials will be recovered or recycled off site. Foundation materials will be buried on site by covering them with soil (overburden) and then placed in vegetation. Demolition and waste materials will be disposed of in accordance with demolition materials and waste will be managed in accordance with Q-2, R.13 Solid Waste Regulation and the regulations in effect at the time of site closure. The pit will be secured, and the water level will rise to the static groundwater level. To facilitate the filling of the pit, the water management infrastructure will be re-profiled in the vicinity of the pit to direct some of the surface drainage into the pit. Also, a spillway will be installed.

The objectives of this restoration work are to return the site to a satisfactory state, that is to say:

- Eliminate unacceptable risks to health and ensure the safety of people;
- Limit the generation and spread of substances that may affect the receiving environment and, in the long term, aim to eliminate all forms of maintenance and monitoring;
- Restore the site to a visually acceptable condition for the community; and,
- Restore the infrastructure site to a condition compatible with future use.

The implementation of the environmental monitoring and follow-up program will verify and demonstrate the achievement of the and demonstrate the achievement of the remediation objectives and the return of the site to a state that is compatible with its and safe for users. Restoration work will continue for two years following the end of operations. The estimated cost of the work is $20,198,837.61, including indirect costs and contingency.

20.5 Ongoing Activities

CELC is awaiting approval from COMEX. Subsequently, applications for authorization will have to be made to provincial and municipal authorities. On the federal side, the IAAC has issued its decision statement, which includes various conditions, including monitoring and follow-up programs.

In addition to the IAAC, the following federal authorities will also be required to issue authorizations:

- The Minister of Fisheries and Oceans may issue authorization(s) under paragraphs 34.4(2)(b) and 35(2)(b) of the Fisheries Act;
- The Minister of Natural Resources may issue a licence under subsection 7(1) of the Explosives Act; and
- The Minister of Transport may approve an application under subsection 10(1) of the Canadian Navigable Waters Act.

It should be noted that no rivers or water bodies are required to be listed in Schedule 2 of the MMER.

21 CAPITAL AND OPERATING COSTS

The capital and operating costs Item of the report is based on design criteria and engineering performed by the various QPs. Each QP contributed the cost information that is pertinent to their work.

All capital works and the associated capital costs are at the project proper. No capital costs for upgrading infrastructure off site is included in this Feasibility Study.

Sources for the Capital costs include vendor quotations, historical data, similar projects, CostMine information, and empirical factors. Hourly rate costs for installation of equipment and for rental of construction equipment were based on local rates.

21.1 Capital Expenditures

21.1.1 Responsibility Matrix

Responsibility for the cost estimates has been divided amongst the study contributors as follows:

- WSP – General site infrastructures, including roads, earthworks, and buildings; power distribution; coordination with Hydro-Québec; surface water management Infrastructure; final effluent water treatment; process plant buildings and ancillary installations.
- Bumigeme – Spodumene process plant including crushing section, tantalum recovery section including bagging system, spodumene recovery section, spodumene concentrate thickening and filtration, final tailings thickening, filtration and dry tailings.
- InnovExplo – All pre-production mining related activities, such as overburden removal and the drilling, blasting, loading, and hauling of the rock material, as well as the purchase of the mining equipment.

21.1.2 Basis of Estimate

The purpose of the Basis of Estimate is to describe the methodology used in the development of the Capital Expenditures (CAPEX) estimate. The CAPEX estimate has been structured based on the Work Breakdown Structure (WBS). The CAPEX estimate has been designed to provide the details required to convert the estimate into a cost control budget for project control purposes upon an investment decision by the Project Owners. The Base Date of the CAPEX estimate is Q2 2022.

The accuracy of the estimate is ±15%, based on a global engineering completion of approximately 30% (Class 3 according to AACE 47r-11 recommended practice). Please refer to Table 21.1 for the maturity level of infrastructure deliverables.

The CAPEX estimate is assembled in Canadian dollars (CAN$) and all sales taxes are excluded from the estimate. No escalation factor was applied to equipment and material quotes received. For financial modelling purposes, estimates in local currencies have been time-phased separately for inclusion in the financial model, in order to be able to perform exchange rate sensitivities on the complete financial model.

Table 21.1: Maturity Level of Infrastructure Deliverables

Item	Suggested AACE Level	Actual Level
Work Breakdown Structure	Defined	Defined
Project Code of Accounts	Defined	Preliminary
Contracting Strategy	Preliminary	Preliminary
Mine (production equipment, pre-stripping, etc.)	Defined	Defined
Non-process Facilities (infrastructure, pipeline, etc.)	Defined	Defined
Block Flow Diagrams	Completed	Completed
Plot Plans	Preliminary	Preliminary
Process Flow Diagrams (PFDs)	Completed	Completed
Utility Flow Diagrams (UFDs)	Completed	Completed
Piping & Instrument Diagrams (P&IDs)	Completed	Completed
Heat & Material Balances	Completed	Completed
Process Equipment List	Completed	Completed
Utility Equipment List	Completed	Completed
Electrical Single-Line Drawings and Load List	Completed	Completed
Specifications & Datasheets	Preliminary / Completed	Completed (major)
General Equipment Arrangement Drawings	Completed	Completed
Spare Parts Listings	Preliminary	Started
Mechanical Discipline Drawings	Started/ Preliminary	Preliminary
Electrical Discipline Drawings	Started/ Preliminary	Preliminary
Instrumentation/Control Discipline Drawings	Started/ Preliminary	Started
Civil/Structural/Architectural Discipline Drawings	Started/ Preliminary	Started

21.1.3 Work Breakdown Structure

The Capex estimate and documentation has been structured on the Work Breakdown Structure (WBS) and the cost coding structure defined for the Project. Table 21.2 shows the Work Breakdown Structure used for the Project.

Table 21.2: Work Breakdown Structure – Level 1

Area	Description
1000	Administration and overhead
2000	Exploration and drilling
3000	Mining
4000	Power and electrical
5000	Infrastructure
6000	Process plant
7000	Studies and engineering
8000	TSF and water management
9000	PCM, contingency, other indirects and other costs

21.1.4 Infrastructure Supply Packages

A list of supply packages was determined for the infrastructure. A client-approved list of bidders was developed for each building package. As a goal, the minimum number of suppliers for each supply package was three, unless there were insufficient suitable potential suppliers for a particular supply package.

The material and equipment supply package for infrastructure is presented in Table 21.3.

Table 21.3: Infrastructure Supply Package List

Package Number	Description
ROSE-B-001	Modular Building
ROSE-B-002	Conventional Building
ROSE-B-003	Fabric Building
ROSE-B-009	Truck Scale
ROSE-B-010	Electric Gate - Camera System
ROSE-B-011	Building Dismantling
ROSE-C-001	Concrete Plant
ROSE-C-002	Reinforcing Steel - Formwork - finishes
ROSE-C-003	Concrete Installation for Process Plant
ROSE-C-005	Retaining Wall
ROSE-E-001	Electrical Station
ROSE-E-002	Overhead Electrical Line
ROSE-E-003	Generator
ROSE-F-001	Fuel Tank and Distribution System
ROSE-F-002	LNG Tank and Distribution System
ROSE-F-003	Gasoline Tank and Distribution System
ROSE-G-002	Maintenance Shop Equipment
ROSE-G-003	Hydraulics Parts
ROSE-G-004	Lubrication System
ROSE-I-001	Effluent Monitoring Instrumentation
ROSE-L-002	Construction Manpower Rates
ROSE-M-001	Surface Water Submersible Pump
ROSE-M-002	Mine Dewatering Submersible Pump
ROSE-M-003	Reclaim Water Centrifugal Pump
ROSE-M-006	400 Ton Silo
ROSE-P-001	Piping
ROSE-S-001	Structure Supply and Installation for Process Plant
ROSE-T-001	Telecomm - Optic Fibre
ROSE-T-002	Telecomm - IT Material
ROSE-T-003	Telecomm - Towers
ROSE-W-002	Final Effluent Water Treatment

21.1.5 Budgetary Supply Quotations

Each infrastructure package Request for Quotation (RFQ) was prepared with the following sections:

- Instructions to Bidders;
- Technical Specification Sheet, with a section to be completed by the vendor;
- Scope of Supply;
- Acknowledgment of Receipt Form;
- Bid Form;
- Reference Drawings and Documentation;
- Site Conditions;
- Package Dictionary.

The vendors supplied a detailed price including delivery lead times and packing and transportation costs. Where applicable, the vendors also provided an estimate of installation hours/duration for both the installation and commissioning. A bid analysis document was completed for each package, including the technical compliance, commercial analysis and recommendations. The pricing recommendation for the CAPEX estimate was identified and selected in collaboration with CELC.

21.1.6 Labour Hours

Labour hours were estimated for all construction tasks. If no hours were received with a quote, hours were estimated using experience from similar projects or handbooks. Direct field supervision hours are included in the labour hours of each item and trades (foremen).

A Productivity Factor adjustment of 1.21 was integrated to all disciplines labour hours to account for local site conditions such as Project location / size, labour availability, working schedule, workforce skills and availability, distance from camp to site, weather, working conditions, contract strategy, staff breaks, daily / weekly coordination and health and safety meetings.

21.1.7 Direct Labour Rates

WSP requested quotations for onsite installation work from local general contractors located in the James Bay area, or the adjoining area, to supply a weighted labour rate for each trade, considering 70 hours per week, 14 days in / 14 days out schedule, supervisor/foreman, overtime, benefits, tools, individual protective equipment, transportation to site premium, insurances, contractor's administrative fees and profit. A 20% indirect supervision factor was considered for the contractor's high-level project management team (construction supervisor, administrative clerk, procurement / logistics, HSSE agent, etc.) and also the required construction equipment supply / rental for each discipline (mobile and lifting equipment, expensive specialized tools). The weighted average labour rates per discipline are outlined in Table 21.4.

Room and board, mobilization/demobilization, field site temporary facilities, temporary construction infrastructures (scaffolding, platform, etc.), consumables (fuel, lubricant, etc.) and winter conditions are not included in these weighted complete hourly rates. These costs are all included in the construction indirect costs.

Table 21.4: Weighted Labour Rates Summary

Discipline Group	Weighted Complete Hourly Rates ($)
Earthworks	194.00
Concrete	169.00
Structure	204.00
Architecture	154.00
Mechanical - Light	174.00
Mechanical - Heavy	229.00
Piping	180.00
Electrical	194.00

21.1.8 Material Take-Offs and Unit Costs

Material take-offs (MTOs) are based on neat quantities, with applied factors for waste and details not shown in actual documentation. However, no design growth factor was applied on these quantities.

21.1.9 Earthworks

Earthwork quantities are generated from grading designs using Autodesk Civil 3D 2017 software. Excavation of topsoil and allowances for rock excavation/drill and blast are based on the preliminary geotechnical information from boreholes and test pits performed on site.

Unit costs were established based on past project productivity and references, such as the Caterpillar performance handbook. Cost of operated machinery was based on the applying escalation factors to the rates of the "Taux de location de machinerie lourde avec opérateur," published by the Centre de services partagés du Québec for the year 2017. This reference recommends using a 10% overhead on equipment rental cost for works north of the 49th parallel when compared to rates used in southern Québec. Those rates include the cost of rental, operation (oil and gas), and the operator man-hour. Aggregate prices are based on prices taken from Wemindji Paving, a local contractor specialized in paving and aggregate production.

Buried services (potable water, fire water, fresh water, natural gas, and sewage) piping length, and valve quantities were based on conceptual designs, which identify pipe sizes and routing. Piping characteristics were calculated from required flows for each building and material selected according to the fluid requirement.

It is assumed in the civil works estimations that the pad around the building area is brought to the subgrade line level. The additional excavation and backfill quantities required for the foundations and the installation of a building were calculated separately from the pad and were associated to this building.

The key assumptions are as follows.

- Overburden stockpile located in a mean radius of 1 km from the construction.
- A layer of organic matter of 250 mm (average) was considered.
- Cut and fill activities include excavation of second-class material, haulage within 500 m from its point of origin, and reuse in the backfill of roads or pads below the infrastructure line.
- Excavation activities include excavation of second-class material and haulage within 1,000 m from its point of origin.
- If muck is used for the backfill, no cost was considered, since doing a mass backfill with muck is comparable to the disposal in a waste dump by the mining contractor.
- Timber cut during deforestation will not be sold to the neighbouring forest companies.

- A return period of 1/10 years was used for rainfall and drainage design.
- No pavement is required on site.

21.1.10 Concrete

Concrete material take-offs were done using two methods: detailed design for each building for the majority of concrete items, and ratio-comparison estimation from previous projects for certain smaller concrete items.

The first method, detailed design, follows the normal procedure used for detailed engineering. The first step is to obtain the load at the support from the steel structure modelling software (Graitec's Advance Design America) used to design the structural steel for all the surface buildings. The support is a node that is generally located at the base of a column and supports the loads that are transmitted by the columns to the foundation. These loads (compression, traction, and lateral loads) are used for the design of the pier and footing. The pier dimensions are adjusted according to the steel column above. The footing dimensions are determined according to the bearing capacity of the soil and CSA standard requirements.

Once the dimensions and internal reinforcements have been calculated, the quantities are extracted for cost estimation purposes. A waste factor of 5% was added to the neat, calculated, quantities. The concrete strength used in the estimate is 30 MPa, while 25 MPa was used for slabs-on-grade.

Unit costs associated with concrete construction were established according to quotations obtained from a specialized contractor and validated based upon previous similar projects. Man-hours dedicated to each task for concrete preparation (formwork, foundation wall, slab, etc.) were also validated from specialized contractors' data. Suggested man-hours include reinforcing bars cutting and folding and staff breaks on site during construction.

Concrete will be supplied by a contractor with a mixing plant based on a cost of 276 $/m^3$, including crushed stone and sand provided nearby.

21.1.11 Structure and Architecture

Structural steel material take-offs were done using two methods: mostly through detailed design of each building and through the comparison to historical projects for smaller structures (staircases, handrails, etc.). Graitec's Advance Design America was used to model the structure for this Project. Once the structural framing was established, the equipment loads and floor loading specified in the design criteria were added to the model.

Several analyses were conducted in order to select the shape of steel that is the most adequate to the application. The load limit for beams and columns is 80 to 90%. Whenever possible, material optimization was conducted for static loads, but no dynamic analysis was performed.

Architecture unit costs were prepared by an architect from Architecture49 based on building's design criteria, budget cost quotations to vendors and the database of similar projects. The architect also conducted a Building Code analysis on the general arrangement to validate safety issues and fireproofing requirements.

21.1.12 HVAC

The methodology for estimating the building mechanics (ventilation, heating, air conditioning and plumbing) was based on a conceptual design. Major equipment costs were obtained from quotations from suppliers. Smaller equipment cost information was based on previous similar projects.

21.1.13 Electrical and Instrumentation

Budget quotations were obtained for major electrical distribution and main electrical substation material. Cable sizing and lengths were estimated based on the Feasibility Study's General Arrangements. A waste of 10 m was considered for each power and control cable.

Man-hours for the installation of the equipment, services, grounding, cable trays, and cables were based on an estimation book edited by the *Corporation des maîtres électriciens du Québec* ["Guild of Master Electricians of Québec"] (Antoine Poggi, 2006).

21.1.14 Factors Applied to Direct Costs

The following direct cost factors were considered and applied as described below.

- Design growth – not factored on direct costs, design growth is considered a component of contingency in indirect costs.
- Construction waste – there was some allowance for waste added to industrial material direct cost estimated by WSP in the process plant – e.g. 5% for concrete, 10 m for each electrical cable and cable tray material, 5% for piping material.
- Productivity factor – as described in the hourly rates section above.
- Seasonal influence – there was no cost added in direct costs for seasonal influence.

21.1.15 Estimate Exclusions

The following costs are not included in the CAPEX estimate.

- Schedule delays and/or associated costs, such as those caused by:
  - unexpected site conditions;
  - unidentified ground conditions;
  - labour disputes;
  - force majeure;
  - permit applications;
- Foreign currency changes from Project exchange rates.
- Economy factors/pressure on labour productivity (less skilled workforce).

21.2 Infrastructure Direct Cost Estimates

CAPEX summaries and details for infrastructures are presented Table 21.5 to Table 21.15. The overall infrastructure costs shown in the Table 21.5 are additional to the capital costs provided for mining and milling by InnovExplo as Item 21.4 and Bumigeme as Item 21.5.

Table 21.5: Summary of Infrastructures Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Earthwork - Access Road	22,121,388	1,400,908	23,522,296
Surface Infrastructure	45,078,015	556,984	45,634,999
Process Plant Building and Services	65,481,667	0	65,481,667
Electrical Power Capital Costs	37,904,174	769,180	38,673,354
Communication system Capital Costs	1,755,126	129,694	1,884,820
Open Pit Mine - Dewatering Wells	1,071,699	4,211,656	5,283,355
Waste and Dry Tailing Stockpile	1,215,056	14,027,470	15,242,526
Effluent Water Treatment	7,754,805	556,984	8,311,789
Earthwork - Industrial Pad	10,362,001	0	10,362,001
Restoration Plan (Direct costs only)	0	14,510,316	14,510,316
TOTAL	**192,753,911**	**36,163,192**	**228,907,103**

Table 21.6: Infrastructures - Earthwork - Access Road Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Site Access Road	1,058,410	0	1,058,410
Access Road - Explosive Plant	135,502	0	135,502
Access Road - Main Electric Station	127,587	0	127,587
Access Road - Water Treatment Plant	212,278	0	212,278
Aggregate Production - By a Contractor	10,647,759	0	10,647,759
Main Haulage and Access Road	4,234,227	0	4,234,227
Haulage and Access Road - Pit Peripheral Road	3,188,663	0	3,188,663
Ramp to Primary Crusher	1,762,155	0	1,762,155
Road Lighting	227,917	0	227,917
Waste stockpile peripheral road - Phase 2	0	1,359,412	1,359,412
Deforestation of the overburden pile footprint	197,652	0	197,652
Deforestation of the waste pile footprint	329,238	41,496	370,734
TOTAL	**22,121,388**	**1,400,908**	**23,522,296**

Table 21.7 : Infrastructures - Surface Infrastructure Capital Costs

Items	Pre-production ($)	Ongoing ($)	Total ($)
Administration Building	6,133,631	0	6,133,631
Garage (shop) & Warehouse	15,298,688	0	15,298,688
Gate and Truck Scale	1,265,128	0	1,265,128
Fuel Distribution and Storage	455,766	0	455,766
LNG Distribution and Storage	4,273,190	0	4,273,190
Site Facilities - Permanent Camp Rooms	2,615,755	0	2,615,755
Warehouse - Cold Storage	482,368	0	482,368
Final Tailings Dewatering and Storage	7,483,902	0	7,483,902
Explosive Storage	457,174	0	457,174
Blasting Cap Storage	54,403	0	54,403
TSF and Water Management	6,558,010	556,984	7,114,993
TOTAL	**45,078,015**	**556,984**	**45,634,999**

Table 21.8: Infrastructures Process Plant Building and Services Capital Costs

Items	Pre-production ($)	Ongoing ($)	Total ($)
Earthworks	7,700,086	0	7,700,086
Concrete	17,147,265	0	17,147,265
Structure	28,714,447	0	28,714,447
Architecture	5,697,885	0	5,697,885
HVAC and Plumbing	3,776,075	0	3,776,075
Electrical Service	2,006,092	0	2,006,092
Fire Protection	439,817	0	439,817
TOTAL	**65,481,667**	**0**	**65,481,667**

Table 21.9: Infrastructures - Electrical Power Capital Costs

Items	Pre-production ($)	Ongoing ($)	Total ($)
Main Substation	37,310,656	0	37,310,656
Secondary Substation	555,624	769,180	1,324,804
Other Distribution	75,690	0	75,690
TOTAL	**37,904,174**	**769,180**	**38,673,354**

Table 21.10: Infrastructures - Communication System Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Video System	223,426	0	223,426
Network Cabinet	258,432	76,612	335,044
Fibre Optic	381,450	53,082	434,531
Ethernet System	17,616	0	17,616
IP Phone and Two-way Radio	174,202	0	174,202
Communications	700,000	0	700,000
TOTAL	**1,755,126**	**129,694**	**1,884,820**

Table 21.11: Infrastructures - Open Pit Mine - Dewatering Wells Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Electrical Distribution	310,668	474,404	785,072
Dewatering Pump and Piping	664,806	3,241,452	3,906,258
Borehole Drilling	96,225	495,800	592,025
Total	**1,071,699**	**4,211,656**	**5,283,355**

Table 21.12: Infrastructures - Waste and Dry Tailing Stockpile Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Foundation (Toe Berm)	0	4,996,391	4,996,391
Backfill and Compaction	14,930	245,416	260,345
Cut and Fill	306,878	1,764,495	2,071,373
Deforestation	346,503	1,028,465	1,374,968
Drilling and Blasting (ditch / pond)	99,293	1,505,546	1,604,839
Stripping, Grubbing and Disposal	180,556	845,303	1,025,859
Electrical Distribution	14,048	397,659	411,707
Piping and Pump	0	492,829	492,829
Rip-rap Protection	252,849	2,751,366	3,004,215
TOTAL	**1,215,056**	**14,027,470**	**15,242,526**

Table 21.13: Infrastructures - Effluent Water Treatment Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Water Treatment Plant - Pad	680,637	0	680,637
Water Treatment Plant Building	516,158	0	516,158
WTP Complete System	6,046,346	556,984	6,603,330
Piping and Pumps	511,664	0	511,664
TOTAL	**7,754,805**	**556,984**	**8,311,789**

Table 21.14: Infrastructures - Earthwork - Industrial Pad Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Electrical Distribution	1,076,374	0	1,076,374
Site Preparation	6,835,046	0	6,835,046
Foundation Muck	217,254	0	217,254
Piping	2,233,327	0	2,233,327
TOTAL	10,362,001	0	10,362,001

Table 21.15: Infrastructures - Restoration Plan Capital Costs

Items	Pre-Production ($)	Ongoing ($)	Total ($)
Dismantling and disposal of site buildings	0	5,923,204	5,923,204
Restoration of dismantled infrastructure footprint	0	576,726	576,726
Rehabilitation of contaminated soils	0	117,258	117,258
Restoration of road infrastructures	0	458,673	458,673
Restoration of water management infrastructure	0	1,668,989	1,668,989
Restoration of ore and ROM pads	0	226,209	226,209
Restoration of overburden stockpile	0	474,825	474,825
Restoration of waste stockpile	0	4,806,097	4,806,097
5-year environmental follow-up	0	258,335	258,335
Indirect costs and contingency	0	7,182,607	7,182,607
TOTAL (Direct and Indirect costs)	0	21,692,923	21,692,923

Table 21.16 provides a summary of the key quantities.

Table 21.16: Material Key Quantities

Construction Material	Unit of Measure	Qty
Concrete	m^3	11,049
Formwork	m^2	13,603
Rebar	kg	1,256,506
Concrete finishing	m^2	19,800
Structural steel	tonne	1,997
Steel floor decking (galvanized)	m^2	1,161

21.3 Indirect Capital Costs

21.3.1 Basis of Estimate for Indirect Capital Costs

SUMMARY OF INDIRECT CAPITAL COSTS

The indirect Capital cost covers for administration and overhead, project development, and EPCM and other indirects.

The provisions for indirect Capital costs were established by detailed cost estimation of the items based on requirements and budget proposals from qualified suppliers. Indirect Capital costs are summarized in Table 21.17.

Table 21.17: Summary of Indirect Capital Costs

Item	Initial Capital (M CAN$)
Indirect Capital Estimate	
Administration & Overhead	57.2
PCM, Other indirects & Other costs	50.9
Total Indirect Capital Estimate	108.1

SCOPE AND BASIS OF ESTIMATION OF INDIRECT COSTS

Administrative and overhead includes management, accounting, and health and safety labour necessary for the detailed engineering and construction period. It also includes such services as air and ground transportation, electricity, LNG, camp services, water management, site security, road maintenance, general liability and construction insurances, and purchase of service equipment. Equipment purchases include $13.7M for concentrate transportation containers. Cost estimation is based on requirements and proposed budget unit costs.

EPCM includes detailed engineering, procurement, construction management, commissioning, and CELC EPCM oversight team.

- EPCM cost is based on a factor of 12% on all construction estimates with the exception of pre-production excavations which will be managed by the pre-production mining team, and Hydro-Québec costs related to the displacement of the high-voltage power line and power supply preparations which they will manage.
- The Critical Element's EPCM oversight team costs are based on labour requirements and associated costs.
- Spare parts and freight are based on a factor on materials and equipment. Spare parts and freight for the mining equipment are included in the equipment purchase costs.

21.3.2 Contingency

A provision of $42.1M is included in the initial capital for contingency, based on the level of development stage of the Project.

In order to meet the budget established for the Project in this estimate, it is expected that sufficiently developed engineering, adequate project management, realistic construction schedule and appropriate controls will be implemented.

21.3.3 Mine Rehabilitation Bond

The total estimated mine rehabilitation cost for the life of mine is $21.7M. According to the environmental regulations of the Province of Québec, 50% of this amount is to be paid to a reserve fund as one of the conditions to obtain the mining lease. The remaining 50% is to be paid to the fund in two instalments of 25% each.

The rehabilitation fund may be replaced by a bond issued by a reputable insurance company. Critical Elements will obtain a bond to secure its rehabilitation obligations toward the Province of Québec. The cost of the bond during the pre-production period is estimated to be $244,045.

21.4 Mining Capital Costs

Capital costs directly related to the mining operation were estimated by InnovExplo. Capital cost estimates are based on budgetary quotes for major mining equipment. Mill start-up defines the beginning of the production period. The capital cost estimate for the pre-production period is $39.1M, and $90.5M for the production period, for a total of $129.5M over the mine life. Table 21.18 presents the mining capital costs.

Table 21.18: Mining Capital Costs

Mining Capital Cost Items ($M)	Pre-Production	Ongoing	Total
Pre-Production Work	$22.8	$0.0	$22.8
Equipment Purchases	$16.3	$90.5	$106.8
TOTAL	**$39.1**	**$90.5**	**$129.5**

The cost of pre-production work is $22.8M. This includes all mining operations during the 19 months of pre-production, such as overburden removal, drilling, blasting, loading and hauling of all rock material, and all other auxiliary work. This cost includes the mobilization of a mining contractor for the removal of overburden.

Equipment purchases total $106.8M of which $16.3M is incurred in the pre-production period. This cost includes all the main mining equipment (i.e. trucks, drills, excavators, etc.) and all the support equipment (i.e. pick-up trucks, pumps, cables and sub-station for the electric front shovel, tower lights, etc.).

Table 21.19 presents the purchasing and replacement schedule for all the main mining equipment. The equipment purchases are incurred in the year the equipment is needed. These costs are not depreciated over time and do not consider a salvage value at the end of equipment life. No contingencies were considered for the purchase prices. During the negotiation process for the purchase of the equipment, it could be advantageous to consider a financing plan to spread out these costs over time.

Table 21.19: Main Mining Equipment Purchasing and Replacement Schedule

Equipment	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	LOM
Backhoe Excavator	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	**2**
Electric Front Shovel	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Production Wheel Loader	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**1**
Haul Trucks ±65t	3	0	1	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	**7**
Haul Trucks ±135t	0	0	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**7**
Rotary Drills	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**
DTH Drills	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Bulldozer	1	0	1	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	**6**
Wheel dozer	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	**2**
Motor Grader	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	**4**
Auxiliary Excavator	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**2**
Auxiliary Wheel Loader	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	**2**
Water/Sand Trucks	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	**2**

New Purchase	Replacement	Used Purchase

Given that the production period is defined as the start-up of the mill, no capitalized revenue is generated during the pre-production period.

21.5 Spodumene Plant Project Capital

The capital and operating costs for the process plant were estimated by Bumigeme Inc. Capital cost estimate for the spodumene plant is based on the construction of milling facility at the Project site. The cost estimation is based on 1,610,000 tonnes of ore milled per year.

The process facilities include the primary and secondary crushing sections, crushed ore storage dome, the concentrator, and the storage silos for spodumene and tantalum concentrates. The office, laboratory including assay lab and bagging facility for tantalum concentrate are also included. Tailings will be sent out on a belt conveyor to the truck loading station. Trucks will dispatch the tailings to the waste rock stockpile.

21.5.1 Process Equipment

The costs for major process equipment were obtained from qualified suppliers and the remaining equipment costs were estimated from database or in-house estimation. Table 21.20 shows the capital cost estimate for the spodumene plant.

Table 21.20: Spodumene Plant Capital Cost Estimate

Area Code	Description	Capital Costs ($)
6100	Crushing area	8,446,792
6200	Crushed ore stockpile, grinding, and classification	9,294,383
6300	Tantalite recovery, dewatering, bagging, and storage	4,716,790
6400	Mica flotation	1,910,930
6500	Spodumene flotation	6,605,707
6600	Final tailings dewatering and storage	2,884,258
6610	Spodumene concentrate dewatering, drying, and storage	5,969,121
6700	Reagent storage, preparation, and distribution	1,393,767
6800	Air and water services	1,344,016
6900	Mineral processing and assaying laboratory	688,464
	Total Process Equipment Delivered Cost	**43,254,227**
4100	Electrical and communication	11,434,779
4130	Emergency gen set	303,917
	Instrumentation and control	1,551,680
	Piping and valves	2,581,906
	Total Equipment Delivered Cost	**59,126,508**
	Equipment Installation	28,680,786
	Total Direct Cost	**87,807,294**
	EPCM	10,536,875
	Contingency	8,780,729
9000	**Total Indirect Cost**	**19,317,605**
	Total Fixed Capital Cost	**107,124,899**
	Working Capital	8,231,606

21.5.2 Electrical and Communications

The electrical and communication costs were obtained from supplier quotes and in-house database.

21.5.3 Instrumentation and Control

Instrumentation costs were obtained from a qualified supplier, and control costs were estimated from database and in-house estimation.

21.5.4 Piping

For the spodumene plant, piping costs were estimated from database and in-house estimation.

21.5.5 Equipment Installation

Installation costs were estimated in-house, and quotes were obtained from qualified suppliers.

The working capital required for plant start-up (first three months of operation) is estimated at $8,231,606.

21.5.6 Process Buildings

The costs for the spodumene plant buildings and ancillary installations were estimated by WSP based on Bumigeme mechanical layouts.

21.6 Operating Costs

21.6.1 Mining Costs

The mining costs reflect the LOM plan prepared by InnovExplo and have been divided into the following categories:

- Loading
- Hauling
- Drilling
- Blasting
- Stockpile and road maintenance
- Mine services
- Engineering department
- Geology department
- Maintenance
- Overburden removal
- General and management

The total operating costs for the Project are $823.4M, or 3.81$/t mined. Table 21.21 presents the total and unit Operating costs for each category for the entire Project. Table 21.22 presents the total Operating and unit costs for each sub-category for the entire Project.

Table 21.21: Mine Operating Costs by Category

Mine Operating Cost Categories	Unit Cost ($/t mined)	Total Cost ($M)
Loading	$0.31	$66.0
Hauling	$1.10	$237.9
Drilling	$0.22	$47.8
Blasting	$0.69	$149.3
Stockpile & road maintenance	$0.29	$62.3
Mine services	$0.25	$54.5
Engineering department	$0.15	$31.5
Geology department	$0.15	$32.1
Maintenance	$1.01	$218.2
Overburden removal	$0.24	$52.4
General and management	$0.20	$44.0
TOTAL	**$4.63**	**$996.0**

Table 21.22: Mine Operating Costs by Sub-Category

Mine Operating Cost Sub-Categories	Unit Cost ($/t mined)	Total Cost ($M)
Salaries – hourly	$0.86	$185.8
Salaries - Staff	$0.31	$67.3
Benefits - hourly	$0.31	$66.9
Benefits - staff	$0.15	$31.8
Diesel	$1.15	$247.5
Electricity	$0.02	$5.0
Tires	$0.09	$19.3
Wear parts	$0.19	$39.9
Explosives	$0.36	$76.5
Explosive accessories	$0.09	$20.1
Crushed rock	$0.01	$1.4
Piping and accessories	$0.00	$0.9
Blast monitoring	$0.01	$2.2
Samples	$0.04	$8.1
Maintenance work	$0.54	$115.8
Personal protective equipment	$0.01	$2.7
Contractor fees	$0.45	$97.7
Other	$0.03	$7.1
TOTAL	$4.63	$996.0

- The Loading, Hauling, and Drilling categories are comprised mainly of the costs incurred for the operator's salaries and benefits, energy (fuel and electricity), and the main consumables (e.g. ground engaging tools, drill bits and rods, tires, etc.). An electricity cost of 0.065$/kWh and a diesel fuel cost of 1.70$/l were used and provided by Critical Elements.
- The Blasting costs are comprised mainly of the management fees incurred for the explosive's contractor (which include supervision, rental of the explosives site, explosive truck operators, and blasters), the explosives, and the accessories. It should be noted that it is possible to purchase the explosives site plant

from the supplier and reduce the operating costs over the mine life. However, this option requires an initial capital investment.

- The Stockpile and Road Maintenance category consists of the work related to the management of the waste and ore stockpiles, as well as the maintenance of the haul roads.
- The Mine Services category consists of all work related to clearing the area around the electric front shovel, pit dewatering, and other support work around the mine.
- The Engineering Department category consist mainly of the staff salaries and benefits.
- The Geology Department costs consist mainly of the staff salaries and benefits, the assays, and the blast movement technology related costs.
- The Maintenance category mainly includes the salaries and benefits for the maintenance staff (i.e. mechanics, helpers, welders and electricians), preventive maintenance costs and major components.
- The Overburden Removal category has been separated from the rest of the mining activities as it will be executed by a mining contractor with its own mining fleet and support staff.
- The General and Management category mainly include all supervision and management related salaries and benefits.

All categories also include other lesser costs, such as light vehicle repairs and registration, personal protective equipment, office supplies, etc.

A detailed list of the manpower requirements is presented in Table 21.23. This list does not include contractor personnel.

For the salaries and benefits, a northern allowance and a production bonus, each equivalent to 5% of the base salary, were considered as the Project is remote and employees will be lodged on site. The fringe benefits were estimated at 30% of the base salary to cover all health plans, while paid holidays were estimated at 6% of the base salary. Some overtime and yearly bonuses were also considered and vary based on the position. These salaries and benefits were compared to similar projects.

Table 21.23: Manpower Requirements by Department

Department	Type	-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Loading	Hourly	1	2	8	10	10	10	9	10	10	9	9	8	9	10	11	9	6	3	0
Hauling	Hourly	3	4	24	36	40	41	39	37	48	49	44	43	47	51	58	49	25	9	0
Drilling	Hourly	1	2	7	9	9	9	9	9	10	9	9	9	9	10	11	9	5	2	0
Blasting	Hourly	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0
Stockpile and Road Maintenance	Hourly	4	4	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	4
Mine Services	Hourly	2	2	11	16	15	16	16	16	17	16	16	16	16	16	16	16	10	10	8
Engineering Department	Salaried	5	5	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	11	3
Geology Department	Salaried	4	4	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	2
Maintenance	Hourly	3	4	21	52	52	58	52	52	58	58	58	58	58	64	70	58	40	22	4
	Salaried	0	0	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2	1
General and Management	Salaried	4	7	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	12	2
TOTAL	Hourly	**14**	**18**	**91**	**143**	**146**	**154**	**145**	**144**	**163**	**161**	**156**	**154**	**159**	**171**	**186**	**161**	**106**	**66**	**16**
	Salaried	**13**	**16**	**39**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**41**	**33**	**8**
	TOTAL	**27**	**34**	**130**	**184**	**187**	**195**	**186**	**185**	**204**	**202**	**197**	**195**	**200**	**212**	**227**	**202**	**147**	**99**	**24**

21.6.2 Spodumene Plant Operating Costs

Annual and unit process operating costs for the spodumene plant were determined for an annual ore milling of 1,610,000 tonnes that will produce 199,117 tonnes of spodumene concentrate and 6,423 tonnes of tantalum concentrate at 2% Ta_2O_5 as by-product per annum. The estimated operating costs for the spodumene plant are summarized in Table 21.24 and include manpower requirement for mill operation, electrical power cost, grinding media and reagents, dryer fuel consumption, consumables consumption, big bags for tantalum concentrate, spare parts, and miscellaneous. The total operating costs were estimated to be $32,010,607 per year or $19.88 per tonne of ore milled. The operating cost estimate of $160.77 per tonne includes both spodumene and tantalum concentrates production cost.

Table 21.24: Spodumene Plant Operating Costs

Description	Annual Costs ($)	Costs $/t milled	Costs $/t conc.	% of Total Costs
Manpower	7,721,728	4.80	38.78	24.0
Electrical power	3,429,961	2.13	17.23	11.0
Grinding media and reagents	14,097,265	8.76	70.80	44.0
Dryer fuel	2,983,502	1.85	14.98	9.0
Maintenance wear items	2,881,112	1.79	14.47	9.0
Big bags	310,046	0.19	1.56	1.0
Spare parts and miscellaneous	586,993	0.36	2.95	2.0
TOTAL OPERATING COST	**$32,010,607**	**$19.88**	**$160.79**	**100.0%**

MANPOWER COSTS

The manpower requirement for the spodumene plant will be 70 persons (see Table 21.25 for details). There will be 8 employees working in office and 62 employees will be working on shifts. These personnel will be required for proper operation of the spodumene plant. The manpower includes the area of mill operation including mill administration, maintenance, and metallurgy. Assay laboratory and environmental are included with the metallurgy area. The labour rates and benefits were based on the rates for similar job classifications in Canada. The total manpower estimate is $7,721,728 per year, or $4.80 per tonne of ore milled.

Table 21.25: Spodumene Plant Manpower Costs

Area	Number of Persons	Total Cost ($/y)	Unit Cost ($/t)
Mill Operations	33	3,616,076	2.25
Mill Maintenance	14	1,686,890	1.05
Mill Metallurgy	23	2,418,762	1.50
TOTAL MANPOWER	**70**	7,721,728	4.80

Note: Totals may not add up due to rounding.

ELECTRICAL POWER COSTS

The electrical power costs were calculated using the total load of the spodumene plant milling operation. The cost breakdown by areas is shown in Table 21.26. The total power demand of the plant was estimated at 8.55 MW, which is equal to 63.37 MWh per year. The electrical power was estimated from Hydro-Québec tariff L rates, $13.003 per kW for premium power, and energy price of $0.03306 per kWh for estimating the energy consumed. The total electrical power cost is $3,429,961 per year, or $2.13 per tonne of ore milled.

Table 21.26: Spodumene Plant Electrical Power Cost

Process Area	Power		Cost	
	Power Demand MW	Consumption kWh/y	Total Cost $/y	Unit Cost $/t
Crushing	1.16	5,093,792	349,865	0.22
Crushed ore stockpile and grinding	4.00	31,554,257	1,667,689	1.04
Tantalite recovery	0.30	2,388,441	126,233	0.08
Mica Flotation	0.38	3,024,221	159,835	0.10
Spodumene flotation	1.38	10,841,408	572,984	0.36
Tailings dewatering and dry stacking	0.41	3,249,888	171,761	0.11
Spodumene conc. dewatering and drying	0.24	1,891,980	99,994	0.06
Reagents preparation and distribution	0.05	322,541	17,047	0.01
Services	0.63	5,005,586	264,553	0.16
TOTAL ELECTRICAL POWER COST	**8.55**	**63,372,114**	**$3,429,961**	**$2.13**

GRINDING MEDIA AND REAGENTS COSTS

The total grinding media and spodumene reagents Operating costs presented in Table 21.27 were estimated at $14,097,265 per year, or $8.76 per tonne of ore milled. The grinding media cost was obtained from suppliers. Reagents quantities were estimated from SGS Lakefield spodumene concentrate production tests. The reagents costs were obtained from suppliers.

Table 21.27: Grinding Media and Reagents Costs

Description	Consumption kg/y	Price $/kg	Cost $/y	Cost $/t
Grinding Media				
Ball Mill Balls (75 mm)	609,616	2.55	1,554,520	0.97
Spodumene Plant Reagents				
Soda Ash	515,200	0.78	401,856	0.25
AERO 3030C	120,750	11.88	1,434,510	0.89
Pionera F220	1,046,500	3.90	4,081,350	2.54
Caustic Soda	483,000	0.98	473,340	0.29
Fatty Acid-2	1,147,930	5.15	5,911,840	3.67
Flocculant	43,451	5.52	239,850	0.15
Sub-total Reagents			12,542,745	7.79
TOTAL MEDIA AND REAGENTS COSTS			**$14,097,265**	**$8.76**

Note: Totals may not add up due to rounding.

DRYER FUEL COSTS

Natural gas will be used as fuel for the spodumene rotary dryer and tantalite rotary dryer. The fuel consumption cost will be $2,983,502 per year, or $14.98 per tonne of concentrate, or $1.85 per tonne of ore milled.

MAINTENANCE WEAR ITEMS COSTS

The maintenance wear items costs comprise of spodumene plant equipment wear parts. The maintenance wear items cost per equipment is shown in Table 21.28. The total cost was estimated at $2,884,712, or $1.79 per tonne of ore milled. The consumable costs were obtained from supplier wear parts list or estimated from equipment Capital cost. An allowance of $60,000 per year was made for assay laboratory supplies.

Table 21.28: Maintenance Wear Items Costs

Process Equipment Description	Cost	
	$/y	$/t
Vibrating grizzly feeder wear parts	152,424	0.09
Jaw crusher wear parts	148,304	0.09
Cone crusher wear parts	221,332	0.14
Vibrating screen wear parts	286,608	0.18
Conveyors wear parts	194,615	0.12
Ball mill lifters and liners	206,871	0.13
Attrition scrubber wear parts	229,675	0.14
Dewatering and desliming cyclones wear parts	84,063	0.05
Wet magnetic separator wear parts	93,341	0.06
Mica flotation wear parts	37,607	0.02
Spodumene flotation wear parts	81,491	0.05
Thickener wear parts	87,643	0.05
Tank agitator wear parts	18,581	0.01
Pump wear parts	801,550	0.50
Disc filters wear parts	129,193	0.08
Dryer wear parts	41,164	0.03
Bagging system wear parts	10,250	0.01
Assay laboratory supply	60,000	0.04
TOTAL CONSUMABLES COST	**$2,884,712**	**$1.79**

Note: Totals may not add up due to rounding.

BIG BAGS

Big bags, or super sacks, will be used for shipping tantalite concentrates. The cost for the big bags was estimated at $310,046 per year, or $0.19 per tonne of ore milled.

SPARE PARTS AND MISCELLANEOUS COSTS

Spare parts and miscellaneous costs have been estimated at 1.5% of the total equipment cost which is $586,993 per year, or $0.36 per tonne of ore milled.

21.6.3 General and Administrative Costs

General and administrative costs (Table 21.29) include management, accounting, and health and safety labour necessary for the detailed engineering and construction period. It also includes such services as air and ground transportation, electricity, LNG, camp services, water management, site security, road maintenance, general liability and construction insurances, and purchase of service equipment. Cost estimation is based on requirements and proposed budget unit costs.

Table 21.29: General and Administrative Costs

Item	Average Annual Total (M CAN$)
Administration Manpower	3.7
Air Transportation	5.1
Ground Transportation - Buses	0.2
Electricity and Communications- Infrastructure	4.6
LNG - Infrastructure	7.9
Camp operation	5.9
Surface Water Pumping	0.1
Water Treatment	0.9
Security	0.4
Road maintenance	1.5
Insurances	0.8
Val-d'Or office	0.2
TOTAL GENERAL & ADMINISTRATIVE	**31.4**

21.6.4 Concentrate Transportation Costs

Transportation costs (Table 21.30) include trucking of concentrate containers to a rail loading location, shipment by rail to a boat loading facility and loading of the containers onto the boat.

Table 21.30: Transportation Concentrate Costs

Stage	Cost per tonne - concentrate
Transport between the mine and the Matagami transhipment yard	$67.00
Matagami Transhipment Yard	$9.00
Rail transportation via CN network to a port in Quebec	$44.00
Transfer from train to boat ("off the hook")	$15.00
TOTAL	**$135.00**

Over the life of the project, it is projected that about 3.6M tonnes of concentrate will be shipped amounting to a total cost of $490.6M, which equates to $18.66/t ore milled.

The following logistical chain was assumed in order to develop costing:

1 The logistical chain starts at the mine where material loaded from the silo into a specially adapted container (e.g., a “rotainer” to be more specific). The material would stay within the same container until it is loaded unto a ship.

2 The containers would then be trucked from the mine to the rail yard via the road network.

3 Containers would then be unloaded from trucks, stored and then loaded onto rail cars. Empty containers would then be loaded unto trucks for the return trip to the mine.

4 Containers would then be transported by rail to a port facility.

5 Containers would be unloaded at the port facility and then stored until the next port call by the monthly ship.

6 Once the ship is at the port, containers would then be emptied into the ship's hatches using ship-mounted or shore-based cranes. Empty containers would then be stored at the Port and loaded unto rail cars for the return trip.

7 The ship would then sail to its end client (not included in the costing).

22 ECONOMIC ANALYSIS

22.1 Introduction

An engineering economic model was prepared for the Project to estimate annual cash flows and assess sensitivities to certain economic parameters. The economic results of this report are based upon the engineering performed by WSP, Bumigeme Inc., InnovExplo, and CELC.

The Project includes an open pit mine, a spodumene plant for the recovery of spodumene concentrate and tantalum concentrate, surface infrastructure to support the mine and mill operations (maintenance and office facilities), water management features, and a tailings storage facility.

The Project indicates an after-tax cash flow of $4,354 million, after-tax NPV (8%) of $2,487 million and after-tax IRR of 82.4%. The project is most sensitive to Lithium concentrate commodity prices and currency exchange rates.

Table 22.1 summarizes the Economic Analysis results.

Table 22.1: Summary of Economic Analysis Results, Base Case

Item	Units	Value
Production		
Project life (from start of construction to closure)	years	19
Mine life	years	17
Total mill feed tonnage	M t	26.3
Average mill feed grade		
Li_2O	% Li_2O	0.87
Ta_2O_5	ppm Ta_2O_5	138
Lithium Concentrate Production		
% of Production, Chemical Grade	%	75
% of Production, Technical Grade	%	25
Mill recoveries		
Li_2O, Chemical Grade	%	90
Li_2O, Technical Grade	%	87
Ta_2O_5	%	40
Payable		
5.5% Li_2O Concentrate, Chemical Grade	t	2,798,000
6% Li_2O Concentrate, Technical Grade	t	829,000
Ta_2O_5 contained in concentrate	kg	1,453,000
Commodity Prices		
5.5% Li_2O Concentrate, Chemical Grade – LoOP Average	US$/t conc.	1,852
6% Li_2O Concentrate, Technical Grade – **Lo**OP Average	US$/t conc.	4,039
Ta_2O_5 contained in concentrate	US$/kg contained	130
Exchange rate		1 US$: 1.30 CAN$
		0.77 US$: 1 CAN$
Project Costs		**CAN$**
Average Mining Cost	$/t milled	37.89
Average Milling Cost	$/t milled	19.88
Average General & Administrative Cost	$/t milled	20.30
Average Concentrate Transport Costs	$/t milled	18.66

Item	Units	Value
Project Economics		**CAN$**
Gross Revenue	$M	10,855
Total Selling Cost Estimate	$M	236
Total Operating Cost Estimate	$M	2,543
Total Sustaining Capital Cost Estimate	$M	160
Total Capital Cost Estimate	$M	464
Duties and Taxes	$M	3,098
Average Annual EBITDA	$M	493
Pre-Tax Cash Flow	$M	7,452
After-Tax Cash Flow	$M	4,354
Discount Rate		8%
Pre-Tax Net Present Value @ 8%	$M	4,368
Pre-Tax Internal Rate of Return		125.0%
Pre-Tax Payback Period	years	1.0
After-Tax Net Present Value @ 8%	$M	2,487
After-Tax Internal Rate of Return		82.4%
After-Tax payback period	years	1.4

Note:
* Average Annual EBITDA is defined as Average of (Revenue less Selling Cost, less Opex, less Mine Rehab Costs) for Years 2 through 16

22.2 Cautionary Statement

The results of the Economic Analysis are based on forward looking information that are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those presented here.

Forward-looking statements in this Item include, but are not limited to, statements with respect to:

- Future prices of spodumene and tantalum concentrates;
- Currency exchange rate fluctuations;
- Estimation of Mineral Reserves;
- Realization of Mineral Reserve estimates; and
- Estimated costs and timing of capital and operating expenditures.

22.3 Principal Assumptions

The cash flow estimate includes only revenue, costs, duties and taxes, and other factors applicable to the Project. Corporate obligations, financing costs, sunk costs, and taxes at the corporate level are excluded.

The model was prepared from mining schedules estimated on an annual basis. The cash flow model was based on the following:

- All costs are reported in Canadian dollars (CA$) and referenced as '$', unless otherwise stated.
- One hundred percent (100%) equity basis.
- No cost escalation beyond 2022.
- No provision for effects of inflation.

- Constant 2022 dollar analysis.
- The economic analysis consists of the technical assumptions outlined in the previous Items, together with the economic assumptions and estimated Capital and Operating costs described in Item 21.
- The economic analysis is based on CELC' preferred scenario of selling three products:
  - A chemical grade lithium concentrate:
    - 75% of lithium production;
    - 90% recovery;
    - 5.5% Li_2O concentrate grade;
    - 1,852 US$/t concentrate, average selling price over the Life of Operating Plan (LoOP).
  - A technical grade lithium concentrate:
    - 25% of lithium production;
    - 87.3% recovery;
    - 6.0% Li_2O concentrate grade;
    - 4,039 US$/t concentrate, average selling price over the Life of Operating Plan (LoOP).
  - A tantalum concentrate:
    - 40% recovery;
    - 20% Ta_2O_5 concentrate grade;
    - 130 US$/kg Ta_2O_5 contained, average selling price over the Life of Operating Plan (LoOP).
- A constant exchange rate assumption of 1 US$: 1.30 CAN$ (1 CAN$: 0.77 US$) was used in the economic analysis.
- Exploration costs are deemed outside of the project.
- Any additional project study costs have not been included in the analysis.
- Reclamation costs and requirements for a reclamation bond have been estimated and included in the economic analysis. The bond would likely be secured with insurance or similar financial instrument at some annual cost. Costs of financing the bond have been estimated at annual costs of 2.25% of the remaining balance.

22.4 Taxes and Royalties

22.4.1 Duties and Taxes

The Project has been evaluated on an after-tax basis. It must be noted that there are many potential complex factors that affect the taxation of a mining project. The taxes, depletion, and depreciation calculations in the FS economic analysis are simplified and only intended to give a general indication of the potential tax implications.

The Project will be subject to the following taxes as they relate to the Project:

- A federal income tax rate of 15%.
- A provincial corporate income tax rate ranging from 11.8% (in 2022) to 11.5% (in 2025 and thereafter).
- A provincial mining tax rate from 16% to 28% depending on the profit margin of the year.

Processing Allowance

A company is entitled to deduct a processing allowance in the calculation of its mining profit. Basically, this deduction corresponds to 10% of the original value of an asset used in the ore processing.

Depreciation Allowance

A company may claim a depreciation allowance on an asset used in the mining operations at the declining rate of 30%.

22.4.2 Royalties

The Project royalties are described in Item 4. One percent (1%) will be purchased before the start of production and will be paid for with shares, therefore no cash disbursement. A 1% NSR royalty is included in the cash flow model.

22.5 Economic Results, Base Case

The results are derived from the Life-of-Mine schedule presented in Item 16 the recovery method are discussed in Item 17, and Capital and Operating costs are presented in Item 21. Table 22.2 summarizes the cost inputs for the Economic Analysis.

Figure 22.1 shows the cash flow model results. The cash flow is presented in Table 22.3.

Table 22.2: Summary of Cost Inputs

Cost Item / Description	Pre-Production M $	Production / Sustaining M $	Total M $	$/t milled	$/t Li_2O conc.
Mining	0	996.0	996.0	37.89	274
Processing	0	522.6	522.6	19.88	144
General and Administration	0	533.5	533.5	20.30	147
Transportation Concentrate	0	490.6	490.6	18.66	136
1 - Total Operating Costs (Mining + Processing + GA + Transport)	**0**	**2,542.7**	**2,542.7**	**96.73**	**701**
SG&A	0	127.8	127.8	4.9	35
Royalties	0	108.5	108.5	4.1	30
2 - Subtotal Costs (Operating Costs + Selling Costs + Royalties)	**0**	**2,779.0**	**2,779.0**	**105.72**	**766**
Capital Cost Estimate					
Administration & Overhead	57.2		57.2		
Mine Rehabilitation	0.0	21.7	21.7		
Mine Rehabilitation Bond & Costs	0.2	8.0	8.3		
Mining	62.8	110.3	173.1		
Power & Electrical	39.3	0.8	40.1		
Infrastructure	40.2		40.2		
Process plant	153.3		153.3		
Studies & Engineering	0.4		0.4		
TSF and Water management	17.2	6.9	24.1		
PCM, Other indirects & Other costs	50.9	0.5	51.4		
Contingency	42.1	11.8	54.0		
Total Capital Costs with Contingency	**463.7**	**160.0**	**623.7**	**23.37**	**172**

Cost Item / Description	Pre-Production M $	Production / Sustaining M $	Total M $	$/t milled	$/t Li_2O conc.
Working Capital	34.4	-34.4	0.0		
3 - All-in Costs, Pre-Tax* (Operating Costs + Selling Costs + Royalties + Total Capital + Working Capital; excl. Tax)	**498.1**	**2,904.6**	**3,402.7**	**129.45**	**938**
Duties and Taxes	0	3098.4	3098.4	117.87	854
4 - All-in Costs* (All estimated costs, incl. Tax)	**498.1**	**6,002.9**	**6,501.1**	**247.32**	**1792**

Note:
*Non-GAAP financial performance measures with no standardized definition

Figure 22.1: Cash Flow Model Results, Base Case

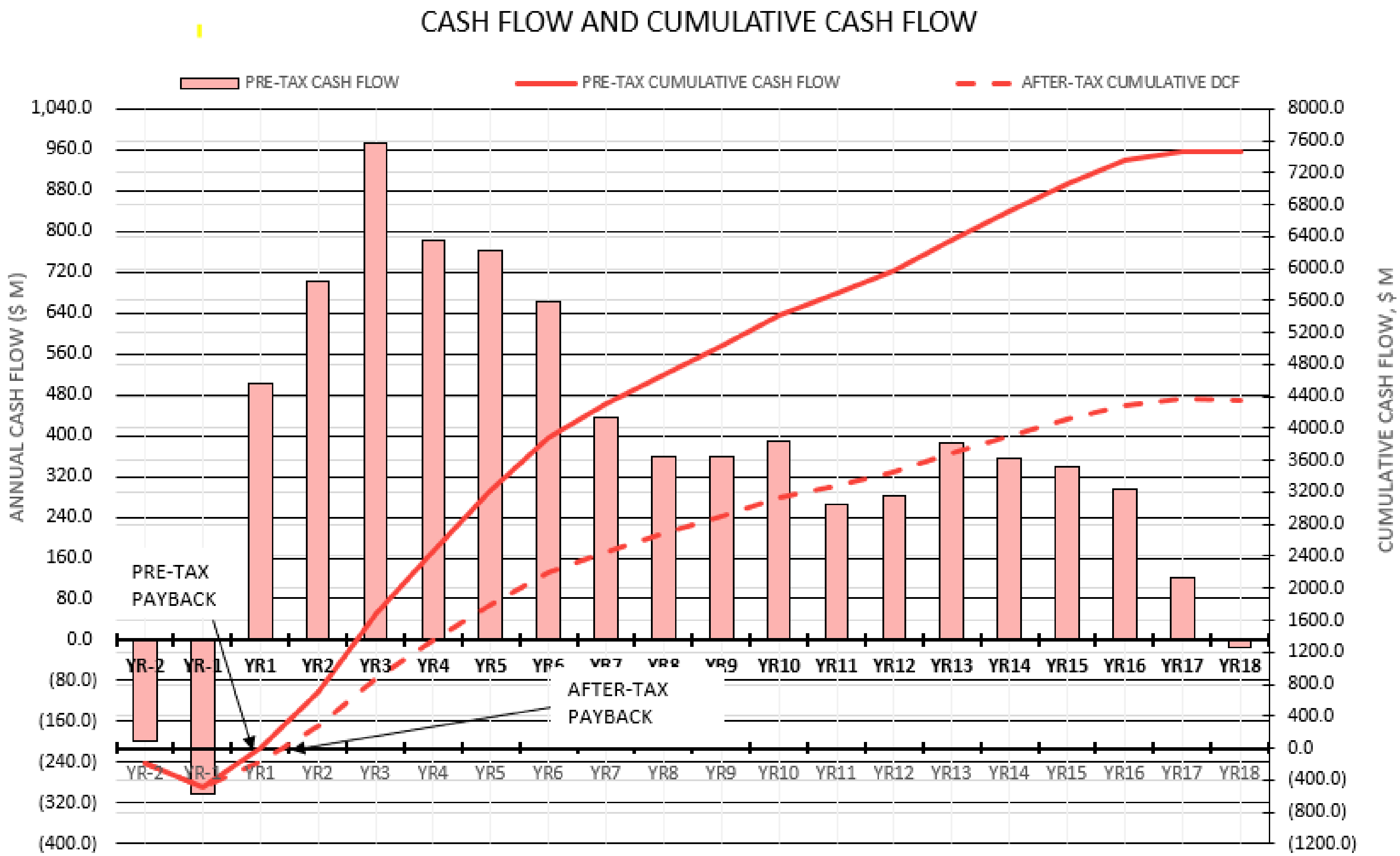


Table 22.3: Cash Flow Model, Base Case

			PRE-PRODUCTION		PRODUCTION																	CLOSURE
	Total	Units	YR-2	YR-1	YR1	YR2	YR3	YR4	YR5	YR6	YR7	YR8	YR9	YR10	YR11	YR12	YR13	YR14	YR15	YR16	YR17	YR18
Mill feed production tonnage	26.3	Mt	0.0	0.0	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	0.7	0.0
Mill feed head grades																						
Li_2O	0.87%	%	0.00%	0.00%	0.84%	0.93%	1.21%	1.03%	0.98%	1.06%	0.97%	0.85%	0.85%	0.87%	0.67%	0.72%	0.89%	0.81%	0.72%	0.61%	0.60%	0.00%
Ta_2O_5	138	ppm	0	0	167	175	162	149	153	143	163	104	113	145	161	163	106	100	107	111	121	0
Concentrate production																						
Li_2O Concentrate, Chemical Grade, 5.5%	2,798	kt	0	0	144	184	238	203	194	210	191	168	167	173	132	141	176	159	142	120	54	0
Li_2O Concentrate, Technical Grade, 6%	829	kt	0	0	43	55	71	60	57	62	57	50	50	51	39	42	52	47	42	35	16	0
Ta_2O_5 Contained in Concentrate	1,453	t	0	0	94	113	104	96	98	92	105	67	73	93	104	105	68	64	69	71	35	0
Assumptions																						
Commodity price																						
Li_2O Concentrate, Chemical Grade, 5.5%		US$/t conc.	2,292	2,292	2,292	2,292	2,292	2,292	2,292	1,862	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432	1,432
Li_2O Concentrate, Technical Grade, 6%		US$/t conc.	4,848	4,848	4,848	4,848	4,848	4,848	4,848	4,091	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333	3,333
Ta_2O_5 Contained in Concentrate		US$/kg contained	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130	130
Exchange rate, 1 US$: CAN$			1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30	1.30
Gross Revenue	8,358.1	MUS$	0.0	0.0	330.9	421.9	546.5	464.6	444.5	391.6	273.8	240.9	239.6	247.5	189.0	202.5	252.6	227.9	203.9	171.2	76.6	0.0
	10,854.7	M$	0.0	0.0	715.2	910.6	1172.4	997.9	955.7	855.2	618.5	540.1	538.2	559.0	432.3	462.1	565.8	511.1	459.0	387.8	174.1	0.0
Selling Costs	236.4	M$	0.0	0.0	14.7	16.6	19.2	17.5	17.1	16.1	13.7	12.9	12.9	13.1	11.8	12.1	13.2	12.6	12.1	11.4	9.3	0.0
Operating Costs	2,542.7	M$	0.0	0.0	137.8	171.8	176.9	172.0	174.7	174.0	167.8	166.0	163.8	153.8	152.8	155.3	170.3	151.9	112.6	88.2	53.1	0.0
Capital Costs (incl. Contingency)	463.7	M$	197.0	266.6																		
Sustaining Capital Costs (incl. Contingency)	160.0	M$			53.0	18.0	5.6	24.4	3.2	5.6	3.0	2.9	5.1	4.0	0.6	9.8	0.6	0.7	0.9	3.0	2.9	16.7
Working Capital	0.0	M$	0.0	34.4	8.5	1.3	-1.2	0.7	-0.2	-1.6	-0.5	-0.5	-2.5	-0.2	0.6	3.8	-4.6	-9.8	-6.1	-8.8	-13.3	0.0
Duties & Taxes	3,098.4	M$	0.0	0.0	168.0	257.2	379.8	314.4	301.8	264.2	169.3	139.4	141.6	156.8	104.2	116.2	154.6	140.6	137.2	117.4	42.3	-6.6
Cash flow results																						
EBITDA		M$	0.0	-0.2	562.3	721.7	975.7	807.9	763.5	664.6	436.5	360.7	361.0	391.6	267.2	294.1	381.8	346.1	333.8	285.3	108.9	-16.7
Pre-tax cash flow	7,452.0	M$	-197.0	-301.1	501.2	702.9	971.9	783.3	760.9	661.1	434.5	358.8	358.9	388.3	266.4	281.0	386.3	355.7	339.5	294.0	122.1	-16.7
Cumulative Pre-Tax Cash Flow		M$	-197.0	-498.1	3.1	706.0	1,677.8	2,461.1	3,222.0	3,883.1	4,317.6	4,676.4	5,035.3	5,423.6	5,690.1	5,971.1	6,357.4	6,713.1	7,052.5	7,346.6	7,468.7	7,452.0
After-tax cash flow	4,353.7	M$	-197.0	-301.1	333.2	445.7	592.1	468.9	459.2	396.9	265.2	219.4	217.2	231.5	162.2	164.9	231.7	215.1	202.2	176.6	79.9	-10.1
Cumulative After-Tax Cash Flow		M$	-197.0	-498.1	-165.0	280.7	872.8	1,341.7	1,800.9	2,197.8	2,463.0	2,682.3	2,899.6	3,131.1	3,293.3	3,458.2	3,689.9	3,905.0	4,107.2	4,283.9	4,363.7	4,353.7

Table 22.4 summarizes the economic indicators, both pre-tax and after-tax, for the estimated cash flow model in Table 22.3.

Table 22.4: Economic Indicators, Base Case

Economic Indicators	Units	Pre-Tax	After-Tax
Payback Period *(from start of production)*	years	1.0	1.4
Internal Rate of Return, IRR	%	125.0%	82.4%
Net Present Value @ 5%	M$	$5,253	$3,023
Net Present Value @ 8%	M$	$4,368	$2,487
Net Present Value @ 10%	M$	$3,896	$2,201

22.6 Sensitivity Analysis, Pre-Tax Basis

The pre-tax cash flow was evaluated for sensitivity to commodity prices, currency exchange rates, Capital expenditures, and Operating costs. All sensitivities were analyzed as mutually exclusive variations.

The project's pre-tax NPV was most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. Figure 22.2 and Figure 22.3 and Table 22.5 to Table 22.10 summarize the pre-tax sensitivity results.

Figure 22.2: Pre-Tax Sensitivity Analysis on NPV 8%

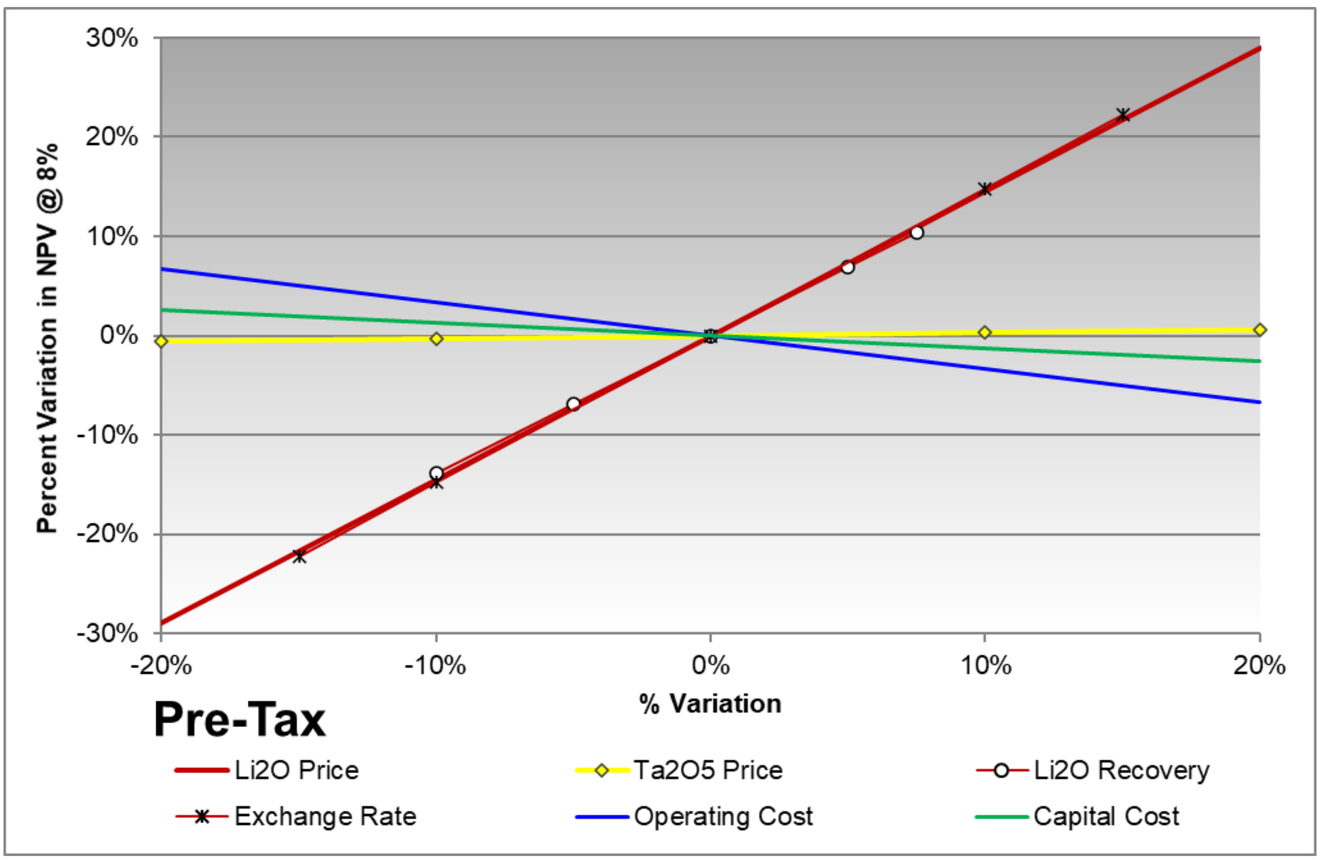


Figure 22.3: Pre-Tax Sensitivity Analysis on IRR

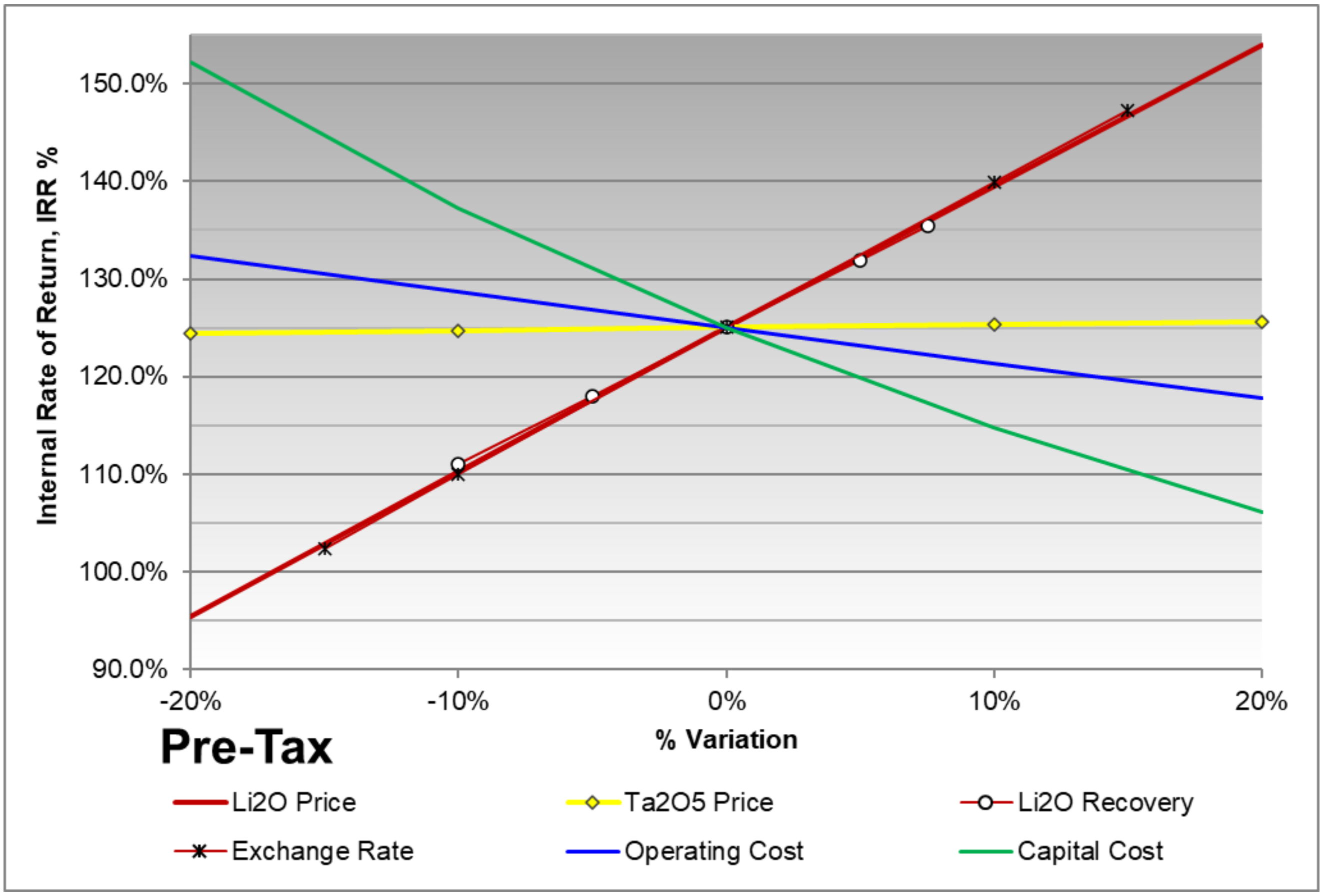


Table 22.5: Pre-Tax Sensitivity on Li_2O Metal Recovery

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-10%	-5%	**0%**	5%	7.5%
	Value – Chemical Grade	%	81.0%	85.5%	**90.0%**	94.5%	96.8%
	Value – Technical Grade	%	78.6%	82.9%	**87.3%**	91.7%	93.8%
Pre-tax							
Discount rate	0%	$M	6,450.7	6,951.3	**7,452.0**	7,952.7	8,203.1
	5%	$M	4,534.8	4,893.7	**5,252.7**	5,611.7	5,791.2
	8%	**$M**	**3,763.1**	**4,065.4**	**4,367.7**	**4,670.1**	**4,821.2**
	10%	$M	3,351.8	3,624.1	**3,896.4**	4,168.7	4,304.9
	12%	$M	3,003.5	3,250.5	**3,497.5**	3,744.5	3,868.0
Internal Rate of Return (IRR)		%	111.0%	118.0%	**125.0%**	132.0%	135.4%
Payback period		years	1.1	1.0	**1.0**	0.9	0.9

Table 22.6: Pre-Tax Sensitivity on Li_2O Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-20%	-10%	**0%**	10%	20%
	Value – Chemical Grade	US$/$t_{conc}$	1,481	1,667	**1,852**	2,037	2,222
	Value – Technical Grade	US$/$t_{conc}$	3,231	3,635	**4,039**	4,443	4,847
Pre-tax							
Discount rate	0%	$M	5.351.4	6.401.7	**7,452.0**	8,502.4	9,552.7
	5%	$M	3.748.6	4.500.6	**5,252.7**	6,004.8	6,756.8
	8%	**$M**	**3.101.7**	**3.734.7**	**4,367.7**	**5,000.7**	**5,633.7**
	10%	$M	2.756.6	3.326.5	**3,896.4**	4,466.3	5.036.2
	12%	$M	2.464.1	2.980.8	**3,497.5**	4,014.2	4.530.9
Internal Rate of Return (IRR)		%	95.4%	110.3%	**125.0%**	139.6%	154.0%
Payback period		years	1.3	1.1	**1.0**	0.9	0.8

Table 22.7: Pre-Tax Sensitivity on Exchange Rate

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-15%	-10%	**0%**	10%	15%
	Value	1 US$: $	1.10	1.17	**1.30**	1.43	1.49
Pre-tax							
Discount rate	0%	$M	5,840.1	6,377.4	**7,452.0**	8,526.6	9,064.0
	5%	$M	4,099.5	4,483.9	**5,252.7**	6,021.5	6,405.9
	8%	**$M**	**3,397.6**	**3,720.9**	**4,367.7**	**5,014.5**	**5,337.9**
	10%	$M	3,023.2	3,314.2	**3,896.4**	4,478.5	4,769.6
	12%	$M	2,706.0	2,969.8	**3,497.5**	4,025.2	4,289.0
Internal Rate of Return (IRR)		%	102.4%	110.0%	**125.0%**	139.9%	147.3%
Payback period		years	1.2	1.1	**1.0**	0.9	0.8

Table 22.8: Pre-Tax Sensitivity on Total Operating Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	$M	3,051	2,797	**2,543**	2,288	2,034
Pre-tax							
Discount rate	0%	$M	6,943.5	7,197.8	**7,452.0**	7,706.3	7,960.6
	5%	$M	4,900.3	5,076.5	**5,252.7**	5,428.9	5,605.1
	8%	**$M**	**4,076.4**	**4,222.1**	**4,367.7**	**4,513.4**	**4,659.1**
	10%	$M	3,636.9	3,766.7	**3,896.4**	4,026.1	4,155.8
	12%	$M	3,264.6	3,381.0	**3,497.5**	3,613.9	3,730.4
Internal Rate of Return (IRR)		%	117.8%	121.4%	**125.0%**	128.7%	132.4%
Payback period		years	1.0	1.0	**1.0**	1.0	0.9

Table 22.9: Pre-Tax Sensitivity on Total Capital Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value (including reclamation, sustaining capital, contingency)	$M	748	686	**624**	561	499
Pre-tax							
Discount rate	0%	$M	7,327.3	7,389.7	**7,452.0**	7,514.4	7,576.8
	5%	$M	5,135.0	5,193.9	**5,252.7**	5,311.5	5,370.4
	8%	**$M**	**4,252.8**	**4,310.2**	**4,367.7**	**4,425.2**	**4,482.7**
	10%	$M	3,782.9	3,839.6	**3,896.4**	3,953.1	4,009.9
	12%	$M	3,385.2	3,441.4	**3,497.5**	3,553.6	3,609.8
Internal Rate of Return (IRR)		%	106.1%	114.8%	**125.0%**	137.3%	152.1%
Payback period		years	1.1	1.1	**1.0**	0.9	0.8

Table 22.10: Pre-Tax Sensitivity on Ta_2O_5 Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	US$/kg contained	156	143	**130**	117	104
Pre-tax							
Discount rate	0%	$M	7,500.6	7,476.3	**7,452.0**	7,427.7	7,403.5
	5%	$M	5,286.1	5,269.4	**5,252.7**	5,236.0	5,219.3
	8%	**$M**	**4,395.3**	**4,381.5**	**4,367.7**	**4,353.9**	**4,340.2**
	10%	$M	3,920.9	3,908.7	**3,896.4**	3,884.1	3,871.9
	12%	$M	3,519.5	3,508.5	**3,497.5**	3,486.5	3,475.5
Internal Rate of Return (IRR)		%	125.6%	125.3%	**125.0%**	124.7%	124.4%
Payback period		years	1.0	1.0	**1.0**	1.0	1.0

22.7 Sensitivity Analysis, After-Tax Basis

The after-tax cash flow was evaluated for sensitivity to commodity prices, currency exchange rates, capital expenditures, and operating costs. All sensitivities were analyzed as mutually exclusive variations.

The project's after-tax NPV was also most sensitive to the factors impacting revenue, that is, Li_2O commodity pricing, Li_2O metal recovery, and currency exchange rate. Figure 22.4 and Figure 22.5 and Table 22.11 to Table 22.16 summarize the after-tax sensitivity results.

Figure 22.4: After-Tax Sensitivity Analysis on NPV 8%

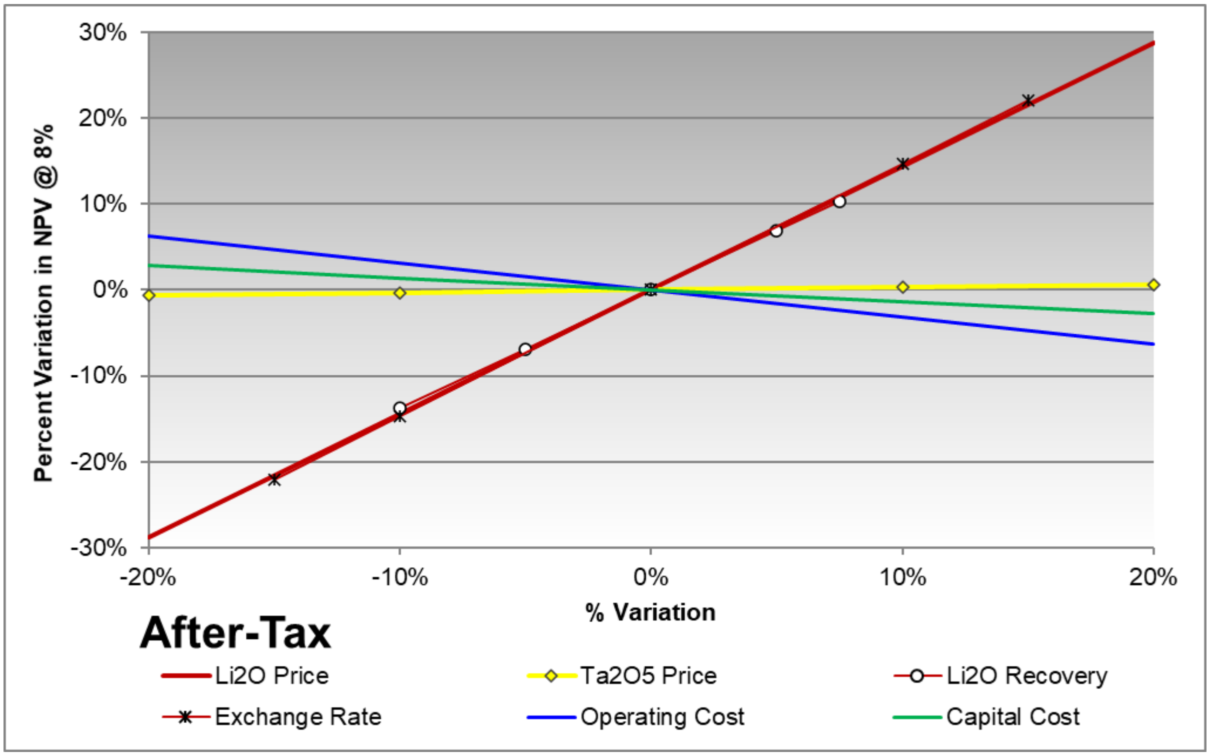


Figure 22.5: After-Tax Sensitivity Analysis on IRR

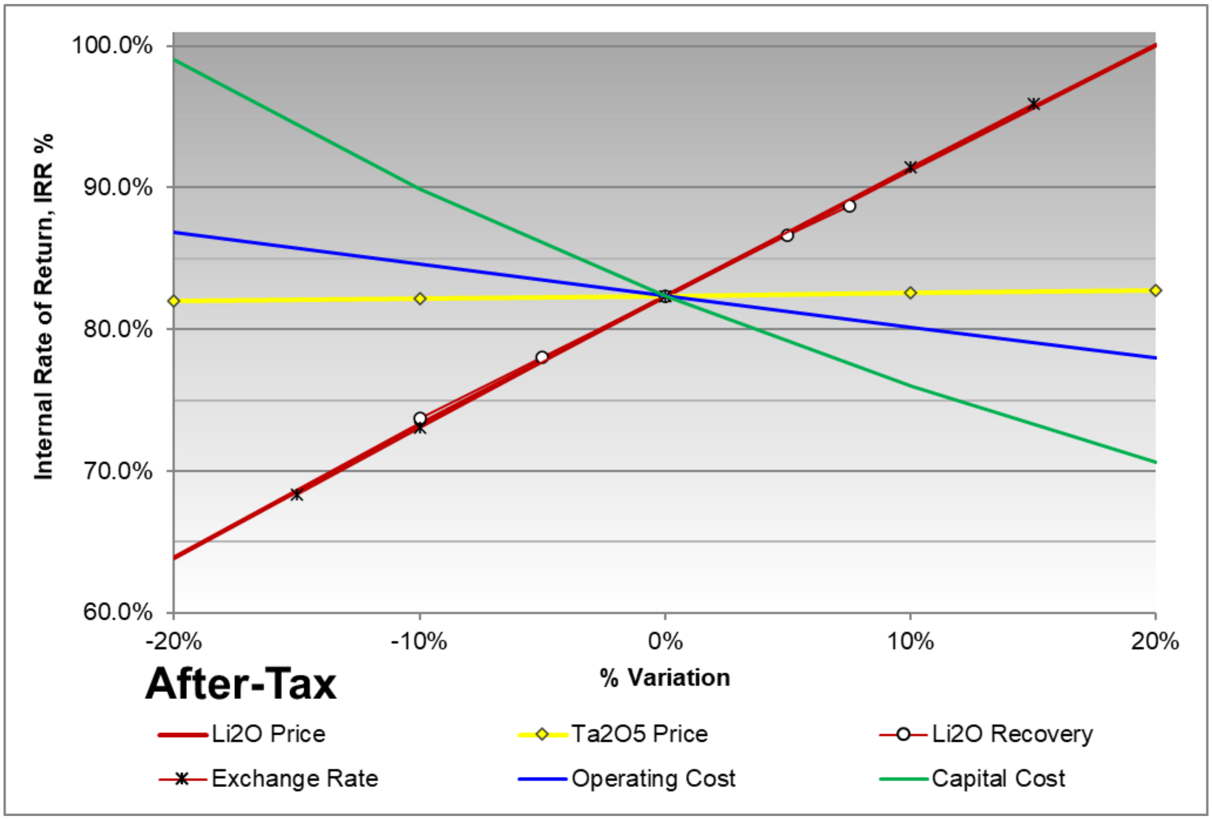


Table 22.11: After-Tax Sensitivity on Li_2O Metal Recovery

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-10%	-5%	**0%**	5%	7.5%
	Value – Chemical Grade	%	81.0%	85.5%	**90.0%**	94.5%	96.8%
	Value – Technical Grade	%	78.6%	82.9%	**87.3%**	91.7%	93.8%
After-tax							
Discount rate	0%	$M	3,786.1	4,069.9	**4,353.7**	4,637.4	4,779.3
	5%	$M	2,616.1	2,819.4	**3,022.7**	3,226.1	3,327.7
	8%	**$M**	**2,144.4**	**2,315.6**	**2,486.8**	**2,658.0**	**2,743.6**
	10%	$M	1,892.8	2,047.0	**2,201.1**	2,355.3	2,432.4
	12%	$M	1,679.7	1,819.5	**1,959.3**	2,099.1	2,169.0
Internal Rate of Return (IRR)		%	73.7%	78.1%	**82.4%**	86.6%	88.7%
Payback period		years	1.5	1.4	**1.4**	1.3	1.3

Table 22.12: After-Tax Sensitivity on Li_2O Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-20%	-10%	**0%**	10%	20%
	Value – Chemical Grade	US$/$t_{conc}$	1,481	1,667	**1,852**	2,037	2,222
	Value – Technical Grade	US$/$t_{conc}$	3,231	3,635	**4,039**	4,443	4,847
After-tax							
Discount rate	0%	$M	3,165.9	3,760.2	**4,353.7**	4,947.1	5,540.5

Description		Unit	Net Present Value (M $)				
	5%	$M	2,172.1	2,597.8	**3,022.7**	3,447.6	3,872.6
	8%	**$M**	**1,770.8**	**2,129.1**	**2,486.8**	**2,844.4**	**3,202.0**
	10%	$M	1,556.5	1,879.2	**2,201.1**	2,523.1	2,845.1
	12%	$M	1,374.7	1,667.4	**1,959.3**	2,251.2	2,543.1
Internal Rate of Return (IRR)		%	63.9%	73.3%	**82.4%**	91.3%	100.1%
Payback period		years	1.7	1.5	**1.4**	1.3	1.2

Table 22.13: After-Tax Sensitivity on Exchange Rate

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	-15%	-0.1	**0**	0.1	0.15
	Value	1 US$: $	1.10	1.17	**1.30**	1.43	1.49
After-tax							
Discount rate	0%	$M	3,442.9	3,746.5	**4,353.7**	4,960.8	5,264.4
	5%	$M	2,371.2	2,588.4	**3,022.7**	3,457.1	3,674.3
	8%	**$M**	**1,938.6**	**2,121.4**	**2,486.8**	**2,852.2**	**3,034.9**
	10%	$M	1,707.8	1,872.2	**2,201.1**	2,530.1	2,694.5
	12%	$M	1,512.1	1,661.1	**1,959.3**	2,257.4	2,406.5
Internal Rate of Return (IRR)		%	68.4%	73.1%	**82.4%**	91.5%	95.9%
Payback period		years	1.6	1.5	**1.4**	1.3	1.2

Table 22.14: After-Tax Sensitivity on Total Operating Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	$M	3,051	2,797	**2,543**	2,288	2,034
After-tax							
Discount rate	0%	$M	4,084.5	4,219.1	**4,353.7**	4,488.2	4,622.8
	5%	$M	2,834.2	2,928.5	**3,022.7**	3,117.0	3,211.3
	8%	**$M**	**2,329.9**	**2,408.3**	**2,486.8**	**2,565.2**	**2,643.6**
	10%	$M	2,060.9	2,131.0	**2,201.1**	2,271.3	2,341.4
	12%	$M	1,832.8	1,896.1	**1,959.3**	2,022.5	2,085.7
Internal Rate of Return (IRR)		%	78.0%	80.2%	**82.4%**	84.6%	86.8%
Payback period		years	1.4	1.4	**1.4**	1.3	1.3

Table 22.15: After-Tax Sensitivity on Total Capital Cost

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value (including reclamation, sustaining capital, contingency)	$M	748	686	**624**	561	499
After-tax							
Discount rate	0%	$M	4,292..7	4,323.2	**4,353.7**	4,384.2	4,414.7
	5%	$M	2,956.0	2,989.4	**3,022.7**	3,056.1	3,089.5
	8%	**$M**	**2,417.3**	**2,452.1**	**2,486.8**	**2,521.5**	**2,556.2**
	10%	$M	2,130.2	2,165.7	**2,201.1**	2,236.6	2,272.1
	12%	$M	1,886.9	1,923.1	**1,959.3**	1,995.5	2,031.7

Description		Unit	Net Present Value (M $)				
Internal Rate of Return (IRR)		%	70.6%	76.0%	**82.4%**	89.9%	99.0%
Payback period		years	1.6	1.5	**1.4**	1.3	1.2

Table 22.16: After-Tax Sensitivity on Ta_2O_5 Metal Price

Description		Unit	Net Present Value (M $)				
Variation	Percentage	%	20%	10%	**0%**	-10%	-20%
	Value	US$/kg contained	156	143	**130**	117	104
After-tax							
Discount rate	0%	M	4,381.1	4,367.4	**4,353.7**	4,339.9	4,326.2
	5%	$M	3,041.6	3,032.2	**3,022.7**	3,013.3	3,003.9
	8%	**$M**	**2,502.3**	**2,494.6**	**2,486.8**	**2,479.0**	**2,471.2**
	10%	$M	2,215.0	2,208.1	**2,201.1**	2,194.2	2,187.3
	12%	$M	1,971.7	1,965.5	**1,959.3**	1,953.1	1,946.9
Internal Rate of Return (IRR)		%	82.7%	82.5%	**82.4%**	82.2%	82.0%
Payback period		years	1.4	1.4	**1.4**	1.4	1.4

Table 22.17 tabulates the after-tax sensitivity on the NPV(8%) with respect to the Chemical Grade Li_2O price and exchange rate (Technical Grade price remained at base case assumption).

Table 22.17: After-Tax Sensitivity on Chemical Grade Li_2O Price

Exchange Rate USD/CAD	After-Tax NPV 8% Discount Rate - M CA$ Li_2O Price - Chemical Grade US$/tonne				
	-20%	-10%	Base Case	10%	20%
-10%	1,475	1,799	2,121	2,443	2,765
Base Case	1,771	2,129	2,487	2,844	3,202
10%	2,065	2,459	2,852	3,246	3,639

23 ADJACENT PROPERTIES

Figure 23.1 presents the current owners of adjacent properties. There are no adjacent properties that are relevant to the technical report or to the progress of the issuer's Property.

The Property is almost completely surrounded by land held by companies or prospectors. The only contiguous areas available for staking are to the south of the Property.

Figure 23.1: Current Owners of Adjacent Properties

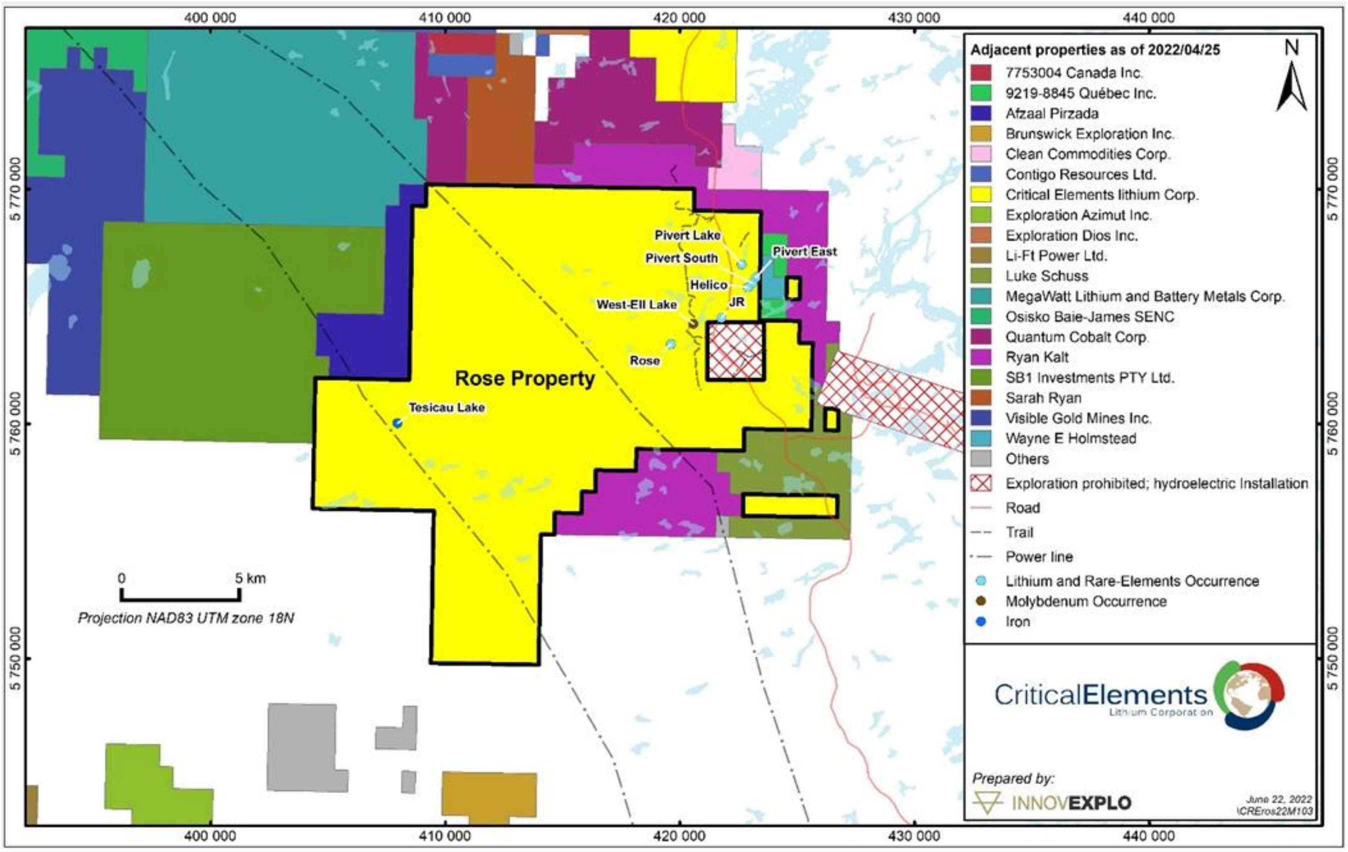
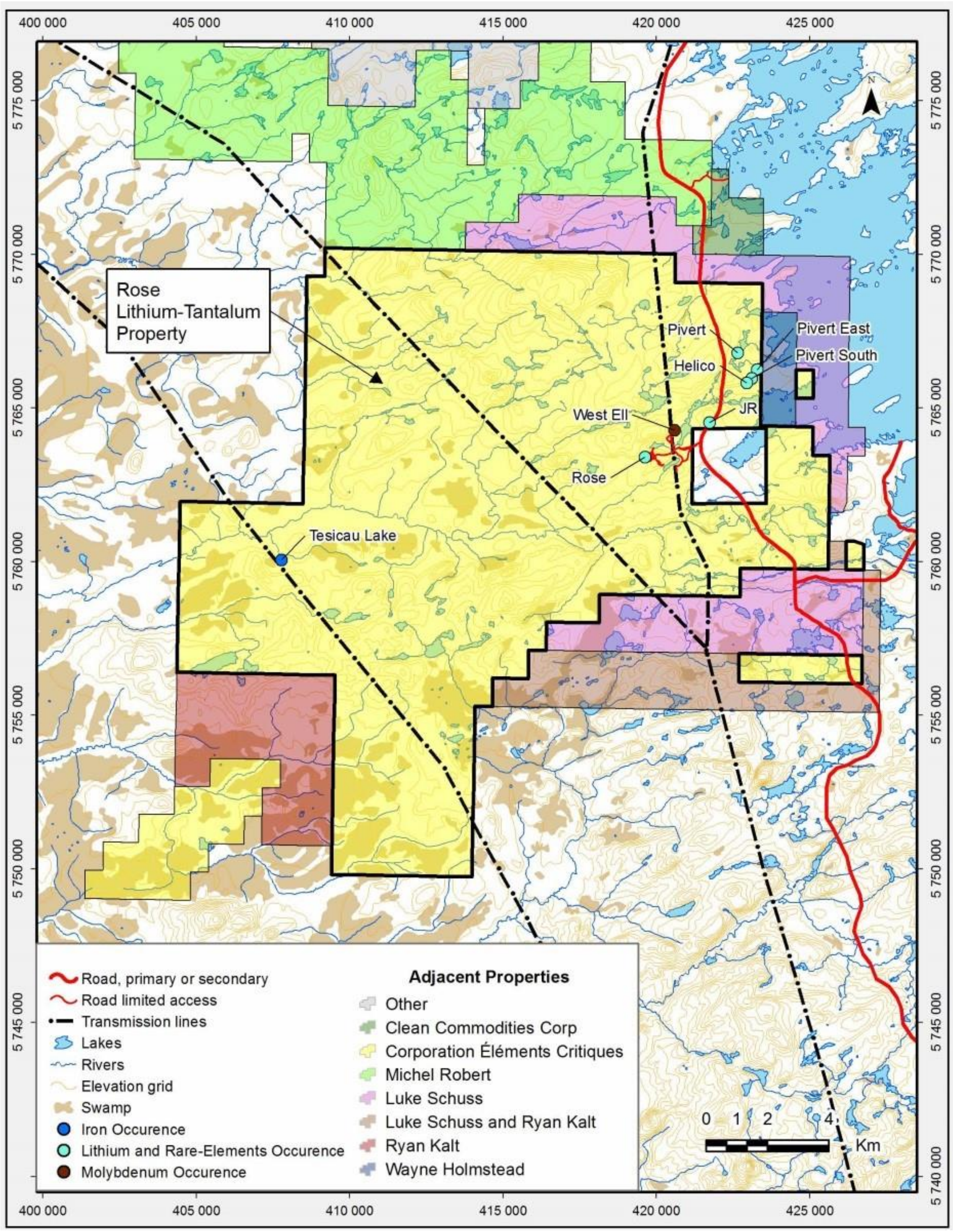


Figure 23.2 shows the Rose Lithium-Tantalum project mining claims.

Figure 23.2: Rose Lithium-Tantalum Project Mining Claims



24 OTHER RELEVANT DATA AND INFORMATION

24.1 Implementation

The Project implementation schedule covers all the areas of the Project and includes the engineering, procurement, permitting, construction, and commissioning of the facilities, and pre-production excavations. The facilities include the main electrical station, 315 kV power line displacement, the process plant, and site infrastructure.

The Project schedule assumes environmental certificates of authorization and the mining lease will be obtained in due time. The planned mill start-up is planned for Q2 2025. Figure 24.1 presents a summary of the Project Schedule.

The final environmental impact assessment (EIA) was submitted to the governments of Canada and Quebec in February 2019. CELC has answered a series of questions from both government bodies (COMEX and CEAA). In August 2021, CELC announced that the Federal Minister of Environment and Climate Change had rendered a favorable decision in respect of the proposed Rose Project. CELC has received no further questions from the Environmental and Social Impact Review Committee ("COMEX") and remains confident in a positive outcome given the stated support for lithium project development After receiving all governmental authorizations, the project will proceed to detailed engineering, to be ready when the environmental certificates of authorization will be required and in parallel CELC will work on the development of construction mandates and the purchase of equipment required for the project. Detailed engineering will begin soon after the completion of the FS. Mine site construction work is scheduled to begin in Q3 2023. The mill start-up is scheduled for Q2 2025 and will ramp up over 6 months.

CELC will have an Owner's team to manage the detailed engineering, procurement, and construction. It will contract consultants to conduct the detailed engineering for each discipline, as required.

The Project will require a camp of 575 rooms during the construction period and 300 rooms during production. Camp and associated services will be provided locally and negotiations are under way with local vendors. It is assumed that camp will be in place for the start of mine site construction. The camp complex will include dormitories, a kitchen and recreational area to accommodate the Project construction phase.

Hydro-Québec completed in 2018 its technical study for the relocation of the 315 kV power line section passing over the mine site and the supply of electrical power. CELC will coordinate activities with Hydro-Quebec to provide power in time for mill commissioning or earlier. The construction work will be powered by diesel generators until electricity is available from the Hydro Québec power grid.

Delivery periods were requested from suppliers for major equipment. The delivery periods for such items as the crushers, the ball mill, conveyors, etc. ranged between 26 and 60 weeks. These deliveries were taken in consideration for the implementation schedule. Long lead items will be procured early to ensure delivery corresponds with the implementation schedule.

Mine construction priority will be given to site preparation and installation of temporary infrastructure to initiate the mill construction as early as possible. Temporary roads will be established using exploration roads, the industrial pad will be cleared and leveled, and excavation of waste material from the starter pit will be initiated early to provide aggregates for the infrastructure. When mill construction has begun, permanent roads and other items may be initiated.

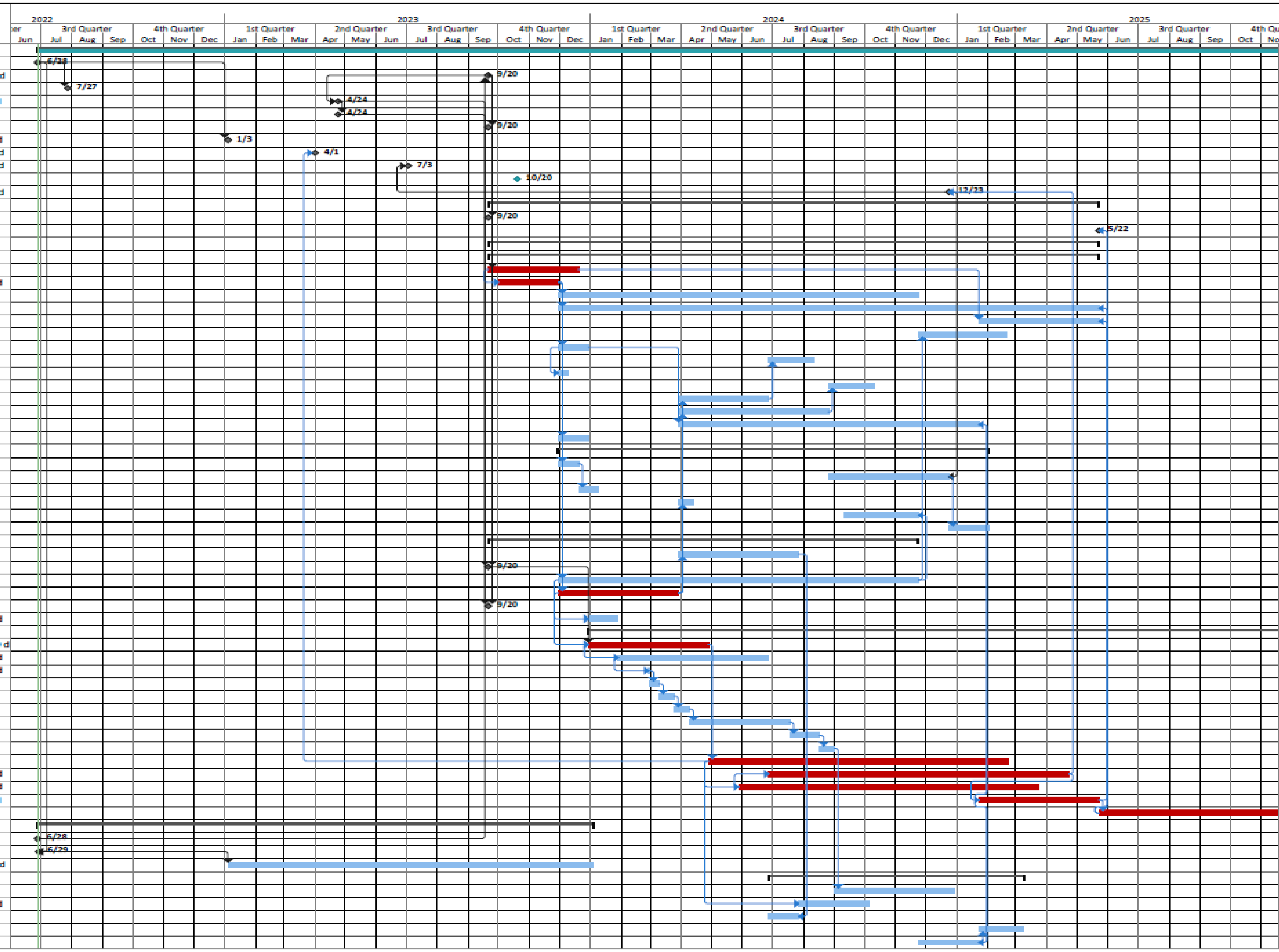
The starter pit pre-production excavation will total 4.3M tonnes. While the overburden will be excavated by a contractor, the rock will be excavated by a small mining crew and minimal mining equipment. This will permit establishing a competent mining team prior to start of production. As detailed in Item 18.5, the overburden will be stored in an overburden stockpile for later use for the restoration of the co-disposal stockpile area and the mine site.

Figure 24.1: Project Implementation Schedule

Rose Lithium-Tantalum Project
Implementation Schedule

r20170830

ID	WBS	Activity	Work Days	Start	Finish	Predecessor
1	**1**	**CECORP ROSE PROJECT MASTER SCHEDULE**	**1240 d**	**Tue 6/28/22**	**Tue 11/18/25**	
2	1.1	Feasibility Study Report	0 d	Tue 6/28/22	Tue 6/28/22	
3	1.2	Permits Delivery Date	0 d	Wed 9/20/23	Wed 9/20/23	62FS+450 d
4	1.3	IBA	0 d	Wed 7/27/22	Wed 7/27/22	2FS+30 d
5	1.4	Permanent Camp Contract	0 d	Mon 4/24/23	Mon 4/24/23	3SS-150 d
6	1.5	Construction Camp Contract	0 d	Mon 4/24/23	Mon 4/24/23	5
7	1.6	Civil Work Start	0 d	Wed 9/20/23	Wed 9/20/23	3
8	1.7	Detailed Engineering Start	0 d	Tue 1/3/23	Tue 1/3/23	2FS+190 d
9	1.8	Long Lead Item Order	0 d	Sat 4/1/23	Sat 4/1/23	56SS-393 d
10	1.9	Hydro Québec (HQ) Contract	0 d	Mon 7/3/23	Mon 7/3/23	12SS-540 d
11	1.10	HQ Power Line Relocated	0 d	Fri 10/20/23	Fri 10/20/23	
12	1.11	HQ Power Up	0 d	Mon 12/23/24	Mon 12/23/24	57FF-120 d
13	**1.12**	**Site Construction**	**610 d**	**Wed 9/20/23**	**Thu 5/22/25**	
14	1.12.1	Construction Start	0 d	Wed 9/20/23	Wed 9/20/23	3
15	1.12.2	Construction End	0 d	Thu 5/22/25	Thu 5/22/25	59FF
16	**3000**	**Mining**	**610 d**	**Thu 9/21/23**	**Fri 5/23/25**	
17	**3100**	**Mining**	**610 d**	**Thu 9/21/23**	**Fri 5/23/25**	
18	1.13.1.	Pre-Work - Quarry	90 d	Thu 9/21/23	Tue 12/19/23	3
19	1.13.1.	Temporary Roads	60 d	Sun 10/1/23	Wed 11/29/23	18SS+10 d
20	1.13.1.	Overburden Excavation (1.1M tonnes)	360 d	Thu 11/30/23	Sat 11/23/24	19
21	1.13.1.	Waste Excavation (2.7M tonnes)	540 d	Thu 11/30/23	Fri 5/23/25	19,60SF
22	1.13.1.	Ore Excavation (167,000 tonnes)	120 d	Thu 1/23/25	Fri 5/23/25	18,60SF
23	3110	Open Pit Mine Dewatering Wells	88 d	Sun 11/24/24	Wed 2/19/25	42
24	3230	Explosive storage	30 d	Thu 11/30/23	Fri 12/29/23	19
25	3240	Fuel Distribution and Storage	45 d	Thu 6/27/24	Sat 8/10/24	28
26	3250	Blasting cap storage	10 d	Thu 11/30/23	Sat 12/9/23	24SS
27	3260	Warehouse - Cold Storage	45 d	Mon 8/26/24	Wed 10/9/24	29
28	3270	LNG Distribution and Storage	90 d	Fri 3/29/24	Wed 6/26/24	43
29	3280	Maintenance Shop & Warehouse	150 d	Fri 3/29/24	Sun 8/25/24	43
30	3320	Waste & Dry Tailings Storage Pad	300 d	Fri 3/29/24	Thu 1/23/25	24,59SF
31	3330	Overburden Pad	30 d	Thu 11/30/23	Fri 12/29/23	19
32	**4000**	**Power_and_Electrical**	**430 d**	**Thu 11/30/23**	**Sat 2/1/25**	
33	4100	Electrical & Communications	20 d	Thu 11/30/23	Tue 12/19/23	19
34	4110	Main Sub-Station	120 d	Mon 8/26/24	Mon 12/23/24	12FF
35	4120	Communications/IT	20 d	Wed 12/20/23	Mon 1/8/24	33
36	4130	Emergency gensets	15 d	Fri 3/29/24	Fri 4/12/24	43
37	4140	Site distribution lines	75 d	Tue 9/10/24	Sat 11/23/24	42FF
38	4150	Secondary Sub-Station	40 d	Tue 12/24/24	Sat 2/1/25	34
39	**5000**	**Infrastructure**	**430 d**	**Wed 9/20/23**	**Sat 11/23/24**	
40	5050	administration building	120 d	Fri 3/29/24	Fri 7/26/24	43
41	5100	Permanent Camp Ready	0 d	Wed 9/20/23	Wed 9/20/23	3,5
42	5110	Earthwork - Roads	360 d	Thu 11/30/23	Sat 11/23/24	19
43	5120	Infrastructures - Industrial Pad	120 d	Thu 11/30/23	Thu 3/28/24	19
44	5190	Construction Camp Ready	0 d	Wed 9/20/23	Wed 9/20/23	3,6
45	5360	Gate	30 d	Sat 12/30/23	Sun 1/28/24	42SS+30 d
46	**6000**	**Process_plant**	**690 d**	**Sat 12/30/23**	**Tue 11/18/25**	
47	6100	Crushing Area	120 d	Sat 12/30/23	Sat 4/27/24	41,43SS+30 d
48	6200	Crushed ore stockpile, grinding and classification	150 d	Mon 1/29/24	Wed 6/26/24	47SS+30 d
49	6300	Tantalite recovery, dewatering, tantalite bagging and stora	1 d	Wed 2/28/24	Wed 2/28/24	48SS+30 d
50	6400	Mica Flotation	10 d	Thu 2/29/24	Sat 3/9/24	49
51	6500	Spodumene Flotation	15 d	Sun 3/10/24	Sun 3/24/24	50
52	6600	Final tailings dewatering and storage	15 d	Mon 3/25/24	Mon 4/8/24	51
53	6610	Spodumene concentrate dewatering, drying and storage	100 d	Tue 4/9/24	Wed 7/17/24	52
54	6700	Reagents storage, preparation and distribution	30 d	Thu 7/18/24	Fri 8/16/24	53
55	6800	Air and water Services	15 d	Sat 8/17/24	Sat 8/31/24	54
56	1.16.1(	Plant Mechanical	300 d	Sun 4/28/24	Fri 2/21/25	47
57	1.16.1:	Plant Electrical	300 d	Thu 6/27/24	Tue 4/22/25	58SS+30 d
58	1.16.1:	Plant Piping	300 d	Tue 5/28/24	Sun 3/23/25	56SS+30 d
59	1.16.1:	Commissionning	120 d	Thu 1/23/25	Thu 5/22/25	57FS-90 d
60	1.16.1	Plant ramp-up	180 d	Fri 5/23/25	Tue 11/18/25	59
61	**7000**	**Studies_and_Engineering**	**555 d**	**Tue 6/28/22**	**Wed 1/3/24**	
62	7100	ESIA Submital	0 d	Tue 6/28/22	Tue 6/28/22	
63	7200	Feasibility Completion	0 d	Wed 6/29/22	Wed 6/29/22	2FF
64	7300	Detailed Engineering	365 d	Wed 1/4/23	Wed 1/3/24	63FS+189 d
65	**8000**	**TSF_and_Water_management**	**255 d**	**Thu 6/27/24**	**Sat 3/8/25**	
66	8140	Dry Tailings Load Out Facility	120 d	Sun 9/1/24	Sun 12/29/24	55
67	8200	Fresh Water Treatment Plant	70 d	Sat 7/27/24	Fri 10/4/24	56SS+90 d
68	8210	Wastewater / Sewage Facilities	30 d	Thu 6/27/24	Fri 7/26/24	40FF
69	8260	Fire protection Water Station	45 d	Thu 1/23/25	Sat 3/8/25	70
70	8300	Final Effluent Water Treatment Plant	60 d	Sun 11/24/24	Thu 1/23/25	59SF



24.2 Project Risks

As with all mining projects, there are technical risks that could affect the technical feasibility and economic outcome of the Project. At the feasibility stage, this Project has reasonably reduced the uncertainties and validated baseline assumptions. The remaining risks are considered to be manageable during the next phases of the Project. These risks are common to most mining projects, many of which can be mitigated with adequate engineering, planning, and pro-active management.

External risks are, to a certain extent, beyond the control of the Project proponents and are much more difficult to anticipate and mitigate, although, in many instances, some risk reduction can be achieved. External risks are things such as the political situation in the Project region, mineral price, exchange rate, and government legislation. These external risks are generally applicable to all mining projects. Negative variance to these items from the assumptions made in the economic model would reduce the profitability of the mine and the mineral resource estimates.

During the Feasibility Study, a risk identification template was submitted to all QPs to be filled in with three of their respective high-level critical risks. At that time, Table 24.1 was compiled by the Project Integrator and remains as what is currently deemed to be the most significant technical project risks, the potential effects, the proposed mitigation approach, and the action to be taken in order to address the risk at the correct time.

This initial project risk register should be revisited, reviewed and updated at each stage gate of the Project (i.e., detailed engineering, procurement, construction, commissioning, etc.). Further, it is recommended that as the Project develops, additional risk workshops be held to access different levels of risk such as HAZOP and field risks.

24.3 Project Opportunities

Although only open pit mining has been evaluated in this study, underground mining could be an option to mine deeper portions of the mineralized zones. Many zones, especially Zone 115 from which most of the ore in the pit comes from, are known to continue outside the pit boundaries.

Table 24.1: Project Risk Register

Area	Item #	Risk Title	Risk Description	Cause	Effect	Mitigation
Mining	1	Underground water infiltration	High levels of water infiltrating into the pit.	The presence of large quantities of water near the pit and several fractured zones in the pit could allow great quantities of water to inflow.	Flooding of pit, pit wall instability, loss of production, potential health and safety hazard.	Hydrogeological study is necessary to better understand the flow of all sources of water on and around the site.
	2	Dilution and mining recovery	Excess dilution or poor ore mining recovery due to improper mining methods.	Poor drilling and blasting practices, poor follow-up from the geology department, and inefficient shovel operators can lead to both excess waste material being sent to the mill and ore being sent to the waste stockpile.	Higher costs, lost revenue.	- Testing in-pit to improve drill and blast parameters (blast patterns, timing, etc.). - Use of blast monitoring technology to follow the heave of the blast. - Training geology technicians to properly guide the operations for the ore calls. - Train the shovel operators to be as efficient and precise as possible.
	3	Faults and other destabilizing geological structures	Pit walls becoming unstable due to faults and other geological structures.	Insufficient knowledge of all geotechnical parameters, lack of follow-up by the engineering team with regards to geomechanics during excavation.	Potential health and safety risk for workers in the pit, loss of equipment, excessive rehabilitation generating delays and costs, loss of production.	- Gather more geotechnical information. - Create a policy for declaring all potential geotechnical hazards. - Ensure the engineering team has the right training and tools to follow the evolution of the pit with regards to geotechnical stability.
Surface infrastructure	4	Liquid Natural Gas (LNG) fire / explosion	Leakage causing fire or explosion.	Incorrect design/construction, external contact, earthquake, adjacent fire, incorrect filling procedure, poor piping installation.	Danger of fatality and severe equipment damage, production stop.	Retention pit with open ditch, design as per CSA Z276-F15, including required distances, construction supervision and approval.
	5	Electricity supply failure	No electricity available on site.	315kV line or 25kV line damaged, main	No electricity on site, dangerous on a	Gensets for camps, pumps and other essential services, spare

Area	Item #	Risk Title	Risk Description	Cause	Effect	Mitigation
				transformer or substation equipment failure caused by external contact, lightning, earthquake, ice, etc.	remote site, production stop.	electrical material available on site, evacuation procedure planned.
	6	Diesel / Oil / Lubricant spill	Environmental spill of a diesel / oil / lubricant tank or truck.	Spill during filling of tank, tank failure caused by external contact, incorrect specifications, lightning, earthquake, ice, etc.	Permit violation, fines, social acceptance decreased, harm to personnel in contact.	Retention basins, double-wall tanks and oil/water separators wherever needed. Material inspection and filling procedures application. Construction supervision and approval.
Environmental & Permitting	7	Delays	Authorizations from both level of government could take longer than expected.	Changes in the regulations, elections.	Project delayed.	Having a realistic schedule, keeping close contact with the authorities throughout the process.
	8	Project not accepted as presented	Major modifications requested from one or both government levels.	Inadequate designs.	Project delayed, more costs incurred.	Include technologies and practices well accepted in the mining/industrial industry.
	9	No social acceptability	Project is not accepted by the local communities.	Lack of communication with the local authorities.	The project cannot go forward.	Keeping regular communication with stakeholders.
Processing	10	Metallurgical recoveries	The metallurgical recoveries in this study are based on numerous tests including pilot tests but results may vary when actual orebody is mined.	Fluctuating ore grades.	A drop in recoveries would have a direct impact on project economics.	Plant optimization and continued test work during the plant operation would help improve recoveries.
	11	Loss of lithium in slimes	Loss of lithium through slimes	Slimes generation during handling, attrition scrubbing stage, and various dewatering stages	Lithium losses as slimes in the process can impact metallurgical recovery.	A second stage desliming step will help minimize lithium losses.
	12	Deleterious elements	The concentration of deleterious elements (Fe_20_3) in the concentrate could	Presence of deleterious elements in the ROM.	The concentration of deleterious elements such as Fe_20_3, Na_2O, K_2O, CaO, MgO in the	ROM sent to the plant needs to be closely monitored for these elements. Close monitoring of the

Area	Item #	Risk Title	Risk Description	Cause	Effect	Mitigation
			present problems with concentrate marketing.		spodumene concentrate could present problems with concentrate marketing and could reduce the value of the concentrate.	process will ensure maintain expected concentrations.
Owner	13	Fly-In Fly-Out operation	Flight delays.	Bad weather can cause flights to be delayed by one day.	Lower production.	Keep employees at work an extra day.
	14	Employee camp	No camp agreement with local vendor.	An agreement with local vendor not reached.	Need to construct own camp, higher Capex, longer construction schedule.	Prepare own camp option at mine site for readiness to reduce effects.

25 INTERPRETATIONS AND CONCLUSIONS

25.1 Mineral Processing and Metallurgical Testing

The objective of achieving a spodumene concentrate with a minimum grade of 6.0% Li_2O was achieved during a series of metallurgical testing program at SGS Canada in Lakefield.

The spodumene plant is designed to process 1 610 000 tonnes of ore per year to produce 199,117 tonnes of spodumene concentrate with a chemical grade lithium concentrate of 5.5% Li_2O with a recovery over 90% or a technical grade lithium concentrate of 6.0% with a recovery over 87%.

Tantalum will be recovered as a by-product.

The flowsheet selected includes three-stage conventional crushing, grinding, magnetic separation, mica flotation, spodumene flotation, spodumene concentrate and tantalum concentrate thickening, filtering, drying and spodumene and tantalum concentrates storage and shipping.

Bumigeme concludes that the Project is technically feasible as well as economically viable for moving it to the detailed engineering followed by construction.

25.2 Mineral Resource Estimate

The QP validated drilling procedures and sample preparation, including a QA/QC protocol, for 255 holes drilled by CELC since 2009 at the Project as well as the assay results obtained by ALS Laboratory and found CELC's database for the Project to be valid and reliable. A subset of 202 holes cut across the mineralized zones of the Rose deposit.

Given the density of the processed data, the search ellipse criteria, the drillhole density and the specific interpolation parameters, the QP is of the opinion that the current mineral resource estimate can be classified as Indicated and Inferred resources. The estimate was prepared in accordance with CIM's standards and guidelines for reporting mineral resources and reserves. This is the most recent Mineral Resources estimate for the Project and it comprises Indicated Mineral Resources of 31.5 Mt grading 0.91% Li_2O and 148 ppm Ta_2O_5 and Inferred Mineral Resources of 2.7 Mt grading 0.77% Li_2O and 141 ppm Ta_2O_5 using $31.4 NSR per tonne cut-off for the potential open-pit extraction scenario and $121.12 NSR cut-off for the potential underground extraction scenario.

The effective date of the estimate is May 27, 2022, based on compilation status, metal price parameters, and metallurgical recovery inputs.

25.3 Mineral Reserve Statement

The Mineral Reserves estimate (Table 25.1) for the Project was prepared by Mr. Simon Boudreau, P.Eng, an employee of InnovExplo Inc. and is effective as of May 27, 2022. The Mineral Reserves estimate stated herein is consistent with the CIM Standards on Mineral Resources and Mineral Reserves and is suitable for public reporting. As such, the Mineral Reserves are based on Measured and Indicated Resources, and do not include any Inferred Resources. Measured and Indicated Resources are inclusive of Proven and Probable Reserves.

The FS Life-of-Mine plans and Mineral Reserves estimate were developed from the geological block model prepared by InnovExplo, with the exception that a constant mill recovery is used. The effects of using a constant recovery were found to not materially affect the results of the FS. As of the date of this report, the QP has not identified any risks, legal, political, or environmental, that would materially affect potential development of the Mineral Reserves.

Table 25.1: Mineral Reserve Estimate

Category	Tonnage (Mt)	NSR ($)	Li_2O_eq (%)	Li_2O (%)	Ta_2O_5 (ppm)
Probable	26.3	204	0.92	0.87	138
Total	26.3	204	0.92	0.87	138

Notes:

- The Independent and Qualified Person for the Mineral Reserve Estimate, as defined by NI 43 101, is Simon Boudreau, P.Eng, of InnovExplo Inc.
- The effective date of the Mineral Reserves estimate is May 27, 2022.
- The reserve estimate is based on the current resource estimate with the exception of a constant recovery of 85% Li2O. Metal prices are set at US$20,000/t Li2O and US$130$/kg Ta2O5 using an exchange rate of 1.3 CAN$:US$. Metallurgical recoveries set constant at 85% for Li2O and 64% for Ta2O5. The cut-off NSR value of CAN$36.92/t.
- The model includes 17 mineralized zones.
- Calculations used metric units (metres, tonnes and ppm).
- The number of metric tons was rounded to the nearest thousand. Any discrepancies in the totals are due to rounding effects. Rounding followed the recommendations in NI 43-101.
- InnovExplo is not aware of any known environmental, permitting, legal, title-related, taxation, socio-political, marketing or other relevant issue that could materially affect the Mineral Reserve Estimate.

25.4 Mining Methods

The Rose deposit is made of stacked mineralized lenses oriented N296° with an average dip of 15° to the northeast (varying locally between 5° and 25°). The orebody is relatively flat and close to the surface, so the FS is based entirely on an open pit operation.

A conventional truck and shovel mining method is proposed to mine 219.6 Mt of material over the mine life, comprising 26.3 Mt of ore, 182.4 Mt of waste and 10.9 Mt of overburden, for an average stripping ratio of 7.35:1. This FS is based on a milling capacity of 4,600 tonnes of ore per day (tpd) and 350 operating days. To achieve these milling production targets, the yearly mining production rate will vary accordingly between 12 and 16 Mt of rock material. All overburden material will be mined by a contractor. The open pit mining schedule resulted in a LOM of approximately 19 years, starting with 19 months of pre-production, just over 16 years of production, and ending with 5 months of stockpile processing. The mine plan includes four different phases to delay overburden removal, to keep the ore extraction rate relatively constant, and to improve mill feed grade in the first years of the Project.

25.4.1 Geotechnical Considerations

The pit design for the Project is based on single benching with 10-m bench heights. This bench height was selected based on the loading and hauling equipment that would best suit the mining operation. The geotechnical report recommends an inter-ramp angle of 57° and an overall pit slope angle of 55°.

25.4.2 Final Pit Design

The final pit design is based on the selected optimized pit shell and geotechnical parameters. The pit design includes haulage ramp access to all benches, except for the final bench which will be excavated via a temporary ramp.

25.4.3 Mining Phase Design

Based on the Whittle pit shell optimizations, three nesting intermediate pit shells were used as guidelines to design the mining phases. By subdividing the ultimate pit into these four separate phases, the ore mining rate is kept relatively constant. The selection of these mining phases results in a low production rate for the pre-production period and improves the mill feed grade in the first years of the Project.

25.4.4 Mine Production Schedule

The life-of-mine plan (LOM) for the Project is based on an ore processing rate of 1,610,000 t per calendar year. The LOM plan was prepared to supply the required ore quantities to the mill while reducing the overall quantities of material to be mined, and to send higher grade ore to the mill in the first years of operation.

25.4.5 Waste Rock, Overburden, and Tailings Management

Two stockpiles have been designed to store mining waste. One large waste rock stockpile is located directly to the west of the pit and near the main ramp exit, and one overburden stockpile is located south of the pit.

The waste rock pile will be constructed in two phases. A co-deposition strategy will be used to store dry tailings from the mill and mined waste rock on the same pile.

25.4.6 Mining Equipment

Based on the production targets and operational constraints, the loading fleet comprise a 7.4 m^3 backhoe excavator for ore handling, a 15 m^3 electric hydraulic front shovel for waste rock handling, and a 13.8 m^3 production wheel loader for operational flexibility.

The ore mined from the pit will be hauled by a maximum of seven ±65t payload trucks while, while waste mining, dry tailings transport and reclaimed ore will be hauled by a maximum of seven ±135 t payload trucks.

Most production drilling will occur in waste as the strip ratio for the project is high. Two high-capacity rotary diesel blasthole drills are dedicated to drilling waste panels, whereas drilling in ore panels will be performed by a down-the-hole drill rig. The down-the-hole drill is also suited to perform pre-splitting of the final walls.

During the pre-production period, this drill will also perform all drilling in waste panels.

25.4.7 Manpower

A total of 220 employees will be needed at the peak of mining operations, not including contractors. This manpower requirement is based on an operation that runs 24 hours per day, 7 days per week, and 350 days per year.

As the site is remotely located, the working schedule for all employees will be a fly-in/fly-out rotation of 2 working weeks and 2 rest weeks, for 12 hours each day.

25.5 Environment

The Environmental Impact Study has taken into account Environmental and Social Baseline and the Project Description to evaluate the impacts. Consultations were held with the First Nations, and CELC enjoys ongoing good relationships with its stakeholders. CELC has submitted its Impact Study to both provincial and federal authorities, and received questions and comments as part of the Environmental Evaluation Processes. The Federal Minister of Environment and Climate Change had rendered a favorable decision in respect of the proposed Rose Project. The Environmental and Social Impact Review Committee (“COMEX”) will soon render its decision and CELC remains confident in a positive outcome. Once the provincial and federal administrators have issued Authorizations for Project Development, final permits will be sought from the MDDELCC, DFO, MERN, and all relevant other authorities.

25.6 Economics

Based on the study results, the conclusions are as follows:

- The overall economic results indicate that the Project will have positive economic returns and generate approximately $4,354 million net after-tax cash flow ($7,452 million pre-tax) over the Project's 17-year mine life.
- Total capital requirements for the Project have been estimated at approximately $464 million prior to the commencement of concentrate production. With approximately $160 million required as sustaining capital over the remaining life of the Project. These are inclusive of contingency.
- Total Operating expenses over the life of the mine are estimated to be approximately $2,543 million or $96.73 per tonne milled or $701 per tonne of Li_2O and Ta_2O_5 concentrates.
- At the base case metal prices, the Project's post-tax net present value is estimated at approximately $2,487 million at a discount rate of 8%. The post-tax IRR is estimated at 82.4% and payback has been calculated at 1.4 years.

26 RECOMMENDATIONS

26.1 Geological Setting and Mineralization

The QP recommends that Critical Element considers additional drilling on the JR, Pivert, Pivert-East, Pivert South and Helico showings, and perhaps West-Ell, to determine their potential. Drilling a stratigraphic fence NE and SW of the Rose deposit should also be considered in order to potentially identify other mineralized structures associated with Rose. The portion between the Rose area and the JR area should be prioritized as the QP believes the potential to fill this area with new zones is high. Apart from immediately drilling the known mineralized pegmatites, a creek-sediment geochemical survey and a visual satellite photo reconnaissance program covering the entire property could be the first step in determining which portions of the property should be investigated more closely. Based on the results, systematic geological survey grids should be established and geochemistry rock samples collected.

- **Regional survey ($650,000):** Systematic grids should be ground prospected on the large and relatively unexplored Property. Using a 100-m grid, samples of every outcropping intrusion should be assayed in order to identify their fertility. Every pegmatite should be sampled regardless of any pre-defined grid. Creek sediments could also be collected and assayed. It is estimated that a total of 35 days with four prospectors would be needed.
- **Drilling on showings other than Rose ($750,000)**: The objective of drilling on showings other than Rose is to continue to investigate their potential extensions laterally and at depth. Positive results from drilling will potentially lead to a resource estimate on these showings. A total of 5,000 m in approximately 50 holes is recommended at this stage for the best targets.
- **Drilling new regional exploration targets on the Property ($360,000):** Drilling should be considered for any new mineralization recognized during the regional survey presented above. The number of metres will be determined by the number of targets, but the QP estimates approximately 1,500 m in ±15 holes for drilling the best targets in a first Phase.

26.2 Mineral Processing and Metallurgical Testing

The process flowsheet selected for spodumene recovery is robust based on the results of bench scale metallurgical tests and proven technology. Lithium recovery over 90% at a chemical grade of 5.5% Li_2O or a technical grade lithium concentrate of 6.0% Li_2O with a recovery over 87% could be produced at a head grade of 0.85% Li_2O.

Bumigeme Inc. considers that the Project is technically and economically feasible and recommends that the Project move forward to the next engineering phase.

To improve tantalite grade up to 20% Ta with decent Ta recovery, more bench scale test work is necessary in this direction.

Further, the Project could become more viable economically by producing mica, feldspar, and silica as by-products.

26.3 Mining Operations

Although InnovExplo considers this FS complete and based on sufficient information, some aspects require further studies. While such information is not expected to have a significant impact on the Project, it will be needed for the detailed engineering phase. The main issues that need further investigation are the following.

- Several risks identified in the geotechnical study, including the fact that analyses conducted by Mine Design Engineering Inc. consider only dry pit slope conditions. Once a hydrogeological model for the site is completed, the results should be sent to the firm for re-assessment. Moreover, joint persistence should be investigated more thoroughly when excavating the mine.
- The 30-metre perimeter used as an exclusion zone around Lake #3 and whether it is sufficient to avoid water infiltrating the pit. Hydrogeological and geotechnical studies will be required.
- The operational efficiency and geotechnical stability of the co-deposition strategy to store both dry tailings and mine waste rock.
- The mine dewatering needs once the hydrogeological model of the site is completed.
- The thickness of the overburden over the entire pit area and any adjustments to the mine design that would arise from such findings.

26.4 Project Infrastructure

- The following actions and studies are recommended prior to or during the surface infrastructure detailed engineering mandate.
  - Reconfirm electricity supply contract and 315 kV line relocation contract with Hydro-Québec.
  - Confirm LNG supply contract and reserve expected volumes with Energir.
  - Establish detailed waste and dry tailings co-deposition plan with mining plan and process plant production schedule.
  - Revise conceptual design with available geotechnical investigation campaign held recently to optimize major infrastructure locations with confirmed bedrock depth and bearing capacity.
  - Establish characterization of the tailings and waste rock, including proctor tests to document the unsaturated moisture-density relationship in the tailings, evaluation of the tailings shear strength by means of direct shear box and the saturated and unsaturated hydraulic conductivity and the water retention curve of the tailings.
  - Conduct a specific investigation program to determine the nature, the properties and to assess the volume of lakes 1 and 2 sediments.

26.5 Environment

- Continue the various steps involved in obtaining the CA and other permits.
- Continue discussions throughout the Project and aligning the different phases of the Project with the Aboriginal communities to understand their concerns and consider their comments in the Project.

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28 CERTIFICATES OF QUALIFIED PERSONS

I, Carl Pelletier, state that:

- I am a co-president founder at:

  InnovExplo Inc
  560 3rd Avenue
  Val-d'Or, Québec J9P 1S4

- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28, 2022 (the "Technical Report").
- I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Université du Québec à Montréal with a bachelor's degree in geology in 1992. I am a member of the Ordre des Géologues du Quebec (OGQ, No. 384), the Association of Professional Geoscientists of Ontario (PGO, No. 1713), the Association of Professional Engineers and Geoscientists of British Columbia (EGBC, No. 43167) and the Northwest Territories Association of Professional Engineers and Geoscientists (NAPEG, No. L4160). My relevant experience after graduation and over 30 years for the purpose of the Technical Report includes my mining expertise which has been acquired at the Silidor, Sleeping Giant, Bousquet II, Sigma-Lamaque and Beaufor mines. My exploration experience has been acquired with Cambior Inc. and McWatters Mining Inc. I have been a consulting geologist for InnovExplo Inc. since February 2004.
- The requirement for a site visit is not applicable to me.
- I am responsible for Item(s) 6 to 12, 14 and 23 and co-responsible of items 1 to 3 and 24 to 27 of the Technical Report.
- I am independent of the issuer as described in Section 1.5 of NI 43-101.
- My prior involvement with the property that is the subject of the Technical Report is as follows: January 24, 2011: Technical Report on the Pivert-Rose Property and September 7, 2011: 43-101 Technical Report and Resource Estimate on the Pivert-Rose Property.
- I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Val-d'Or, Québec this 26 of July 2022.

(*Original document signed and stamped*)

Carl Pelletier, P.Geo. (OGQ, No. 384)
InnovExplo Inc.

I, Simon Boudreau, P.Eng, state that:

- I am a Consulting Mining Engineer at:
  InnovExplo Inc. 560, 3e Avenue
  Val d'Or, Quebec, J9P 1S4
- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28, 2022 (the "Technical Report").
- I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Laval University with Mining Engineering degree, in 2003, and I'm a member of Ordre des ingénieurs du Québec (No: 132 338). My relevant experience after graduation and over 19 years for the purpose of the Technical Report includes mine engineering and production at Troilus mine for four (4) years, HRG Taparko mine for four (4) years, Dumas Contracting for three (3) years. I have also worked as independent consultant for the mining industry for five (5) years and with InnovExplo for three (3) year. As consultant I have been involved in many base metals projects.
- My most recent personal inspection of each property described in the Technical Report occurred on May 31st, 2022 and was for a duration of 1 day.
- I am responsible for Items 15, 16, 21.4. 21.6.1 and responsible for contribution to Items 1, 25, 26, 27 of the Technical Report.
- I am independent of the issuer as described in Section 1.5 of NI 43-101.
- I have not had prior involvement with the property that is the subject of the Technical Report.
- I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Trois-Rivieres, Québec this 22 of July 2022.

(*Original document signed and stamped*)

Simon Boudreau, P.Eng (OIQ: 132 338)
InnovExplo Inc.

I, Florent Baril, state that:

- I am a professional engineer and president of:
  Bumigeme Inc.
  750-615 Blvd René-Lévesque West
  Montreal, Quebec, H3B 1P5
- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28. 2022 (the "Technical Report").
- I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I graduated from Laval university in Metallurgical Engineering in 1954. I'm a member of the Ordre des Ingenieurs du Quebec and the Canadian Institute of Mining (Life Member). My relevant experience after graduation in 1954 for the purpose of the Technical Report includes responsibility of several NI 43-101 Feasibility Study on similar projects.
- The requirement for a site visit is not applicable to me.
- I am responsible for Items 13, 17, 18.14, 21.5, 21.6.2 and have collaborated to Items 1, 3, 24, 25, 26 and 27 of the Technical Report.
- I am independent of the issuer as described in Section 1.5 of NI 43-101.
- My prior involvement with the property that is the subject of the Technical Report is as follows:
  December 10, 2011: Preliminary Economic Assessment Technical Report;
  November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report.
- I have read NI 43-101 and the part of the Technical Report for which I'm responsible has been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief of the parts of the Technical Report for which I'm responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Montréal, Québec this 26 of July 2022.

(*Original document signed and stamped*)

Florent Baril, P. Eng. (OIQ, No. 6972)
Bumigeme Inc.

I, William Richard McBride, P.Eng. state that:

- I am a Senior Mining Engineer at:

  WSP Canada Inc.
  33 Mackenzie Street, Suite 100
  Sudbury, Ontario, P3C 4Y1

- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28, 2022 (the "Technical Report").
- I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of Queen's University with a Bachelor of Science in Mining Engineering (B.Sc. 1973). I am a member in good standing of the Association of Professional Engineers of Ontario (PEO), License Number 29888013. My relevant experience includes 49 years of experience in mine engineering and operations, including long-range and short-range mine planning and the managing of projects from concept through to start-up. From 1970 to 2008, I worked at Canadian and Central American mines holding positions as a Miner, Certified Open Pit Blaster, Planning Engineer (open pit and underground), Certified Underground Hard Rock Supervisor, Engineering Supervisor, Chief Mine Engineer, Superintendent Technical Services and Senior Projects Manager. From 2009 to 2021, I worked as a consultant Project Manager, a Senior Mining Engineer and a consultant Mining Engineer. Since 2021, I have worked as a Senior Mining Engineer. I have completed scoping studies, prefeasibility studies, feasibility studies, project evaluations, due diligences, technical reviews and economic analyses for nickel sulphide PGE-type deposits, palladium deposits, narrow vein gold deposits, chromite deposits, and scandium deposits. I am a "Qualified Person" for the purposes of National Instrument 43-101 (the "Instrument").
- The requirement for a site visit is not applicable to me.
- I am responsible for Item(s) Items 2, 19, 22 and portions of Items 1, 3, 24, 25, 26 and 27 that are based on those Items for the Technical Report.
- I am independent of Imperial Mining Group, the issuer of the report, as described in Section 1.5 of NI 43-101.
- I have no prior involvement with the Property that is the subject of the Technical Report.
- I have read NI 43-101 and the sections of The Technical Report for which I am responsible have been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the sections of The Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Sudbury, Ontario this 26 of July 2022.

(*Original document signed and stamped*)

William Richard McBride, P. Eng. 29888013
WSP Canada Inc.

I, Eric Poirier, state that:

- I am a Project Manager and Electrical Engineer at:
  WSP Canada Inc
  1075, 3rd Avenue East
  Val-d’Or, Québec, Canada J9P 0J7

- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28, 2022 (the “Technical Report”).
- I am a “qualified person” for the purposes of National Instrument 43-101 (“NI 43-101”). My qualifications as a qualified person are as follows. I am a graduate of Université du Québec à Chicoutimi with Electrical Engineering degree (B.Sc., 1996). I am a member in good standing of the Ordre des ingénieurs du Québec (OIQ No. 120063), Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG No. L2229), and Professional Engineers Ontario (PEO No. 100112909). I hold the credential of Project Management Professional (PMP) from the Project Management Institute (PMI No. 6115196). My relevant experience after graduation and over 24 years for the purpose of the Technical Report includes working as multi-disciplinary project manager and discipline lead for surface infrastructure, buildings, water management, electrical distribution, automation, and communications projects.
- My most recent personal inspection of the property described in the Technical Report occurred on November 16, 2016 for a duration of two days.
- I am responsible for Items 5 (excluding 5.2 to 5.4), 18 (excluding 18.14), 20.3.1, 21.1, 21.2, 21.3, 21.6.3, 21.6.4 and portions of Items 1, 3, 24, 25, 26 and 27 of the Technical Report.
- I am independent of the issuer as described in Section 1.5 of NI 43-101.
- My prior involvement with the property that is the subject of the Technical Report is as follows: November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report.
- I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Val-d’Or, Québec this 26 of July 2022.

(*Original document signed and stamped*)

Éric Poirier, P.Eng., PMP (OIQ, No. 120063)
WSP Canada Inc.

I, Olivier Joyal, P.Geo., state that:

- I am an Executive Vice President, Environment, at:

  WSP Canada inc.
  1600, René-Lévesque Blvd W
  Montréal, Québec, H3H 1P9

- This certificate applies to the technical report titled Rose Lithium-Tantalum Project Feasibility Study with an effective date of: June 28, 2022 (the "Technical Report").
- I am a "qualified person" for the purposes of National Instrument 43-101 ("NI 43-101"). My qualifications as a qualified person are as follows. I am a graduate of graduate of the Université du Québec à Montréal (UQÀM). I am a member in good standing of Ordre des Géologues du Québec (OGQ No. 825). My relevant experience after graduation for the purpose of the Technical Report includes 15 years of experience in exploration and operations, including all Environmental aspects.
- The requirement for a site visit is not applicable to me.
- I am responsible for Items 4, 5.2 to 5.4, 20 (excluding 20.3.1) and portions of Items 1, 3, 24, 25, 26 and 27 of the Technical Report.
- I am independent of the issuer as described in Section 1.5 of NI 43-101.
- My prior involvement with the property that is the subject of the Technical Report is as follows: November 29, 2017: Rose Lithium-Tantalum Project Feasibility Study NI 43-101 Technical report.
- I have read NI 43-101 and the part of the Technical Report for which I am responsible has been prepared in compliance with NI 43-101.
- At the effective date of the Technical Report, to the best of my knowledge, information, and belief, the parts of the Technical Report for which I am responsible, contain(s) all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Dated at Montréal, Québec this 26 of July 2022

(*Original document signed and stamped*)

Olivier Joyal, P.Geo. (OGQ, No. 825)
WSP Canada Inc.

APPENDIX

4 A

ROSE LITHIUM-TANTALUM PROJECT MINING TITLES

ROSE LITHIUM-TANTALUM PROJECT MINING TITLES

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2188276	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188277	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188278	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188279	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188280	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188281	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188282	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188283	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188284	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188285	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188286	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188287	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2188288	Active	2009-09-14	2022-09-13	Corporation Lithium Éléments Critiques
2193368	Active	2009-11-04	2022-11-03	Corporation Lithium Éléments Critiques
2193369	Active	2009-11-04	2022-11-03	Corporation Lithium Éléments Critiques
2193370	Active	2009-11-04	2022-11-03	Corporation Lithium Éléments Critiques
2193605	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193606	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193607	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193608	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193609	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193610	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193611	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193618	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193619	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193627	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193629	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193630	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193632	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193633	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2193634	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193635	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193636	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193640	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193641	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193642	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193643	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193644	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
2193645	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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2193647	Active	2009-11-05	2022-11-04	Corporation Lithium Éléments Critiques
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Title Number	Status	Registration Date	Expiration Date	Registered Owner
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Title Number	Status	Registration Date	Expiration Date	Registered Owner
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2219171	Active	2010-04-22	2023-04-21	Corporation Lithium Éléments Critiques
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2219855	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219856	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219857	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219858	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219859	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219860	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219861	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219862	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
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2219864	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219865	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219866	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219867	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219868	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219869	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219870	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
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2219872	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
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2219874	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
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2219877	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219878	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219879	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219880	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219881	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2219882	Active	2010-04-23	2023-04-22	Corporation Lithium Éléments Critiques
2221268	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221269	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221270	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221271	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221272	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221273	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221274	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221275	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221276	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221277	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221278	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221279	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221280	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221281	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221282	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221283	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221284	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221285	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221286	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221287	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221288	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221289	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221290	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221291	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221292	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221293	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221294	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2221295	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2221296	Active	2010-04-26	2023-04-25	Corporation Lithium Éléments Critiques
2234761	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234762	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234763	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234764	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234765	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234766	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234767	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234768	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234769	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2234770	Active	2010-05-20	2023-05-19	Corporation Lithium Éléments Critiques
2235670	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235671	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235672	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235673	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235674	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235675	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235676	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235677	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235678	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235679	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235680	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235681	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235682	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2235683	Active	2010-05-31	2023-05-30	Corporation Lithium Éléments Critiques
2236704	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236705	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236706	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236707	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236708	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236709	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236710	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236711	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236712	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236713	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2236714	Active	2010-06-04	2023-06-03	Corporation Lithium Éléments Critiques
2242441	Active	2010-07-27	2023-07-26	Corporation Lithium Éléments Critiques
2242442	Active	2010-07-27	2023-07-26	Corporation Lithium Éléments Critiques
2242443	Active	2010-07-27	2023-07-26	Corporation Lithium Éléments Critiques
2244690	Active	2010-08-05	2023-08-04	Corporation Lithium Éléments Critiques
2244691	Active	2010-08-05	2023-08-04	Corporation Lithium Éléments Critiques
2244692	Active	2010-08-05	2023-08-04	Corporation Lithium Éléments Critiques
2248769	Active	2010-09-03	2023-09-02	Corporation Lithium Éléments Critiques
2251858	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251859	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251860	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2251861	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251862	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251863	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251864	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251865	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251866	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251867	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251868	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251869	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2251870	Active	2010-09-29	2023-09-28	Corporation Lithium Éléments Critiques
2327176	Active	2011-12-06	2022-12-05	Corporation Lithium Éléments Critiques
2327177	Active	2011-12-06	2022-12-05	Corporation Lithium Éléments Critiques
2328997	Active	2011-12-19	2022-12-18	Corporation Lithium Éléments Critiques
2360910	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360911	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360912	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360913	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360914	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360915	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360916	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360917	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360918	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360919	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360920	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360921	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360922	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360923	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360924	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360925	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360926	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360927	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360928	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360929	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360930	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360931	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360932	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360933	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360934	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360935	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360936	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360937	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360938	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360939	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360940	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360941	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360942	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360943	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2360944	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360945	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360946	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360947	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360948	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360949	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360950	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360951	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2360952	Active	2012-08-17	2023-08-16	Corporation Lithium Éléments Critiques
2446457	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446458	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446459	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446460	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446462	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446463	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446464	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446470	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446471	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446472	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446474	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446476	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446477	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446478	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446479	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446480	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446524	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446527	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446528	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446529	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446531	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446532	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446533	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446534	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2446535	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446536	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446537	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446538	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446603	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446604	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446605	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446606	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446607	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446608	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446609	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446612	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446613	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446614	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446616	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446623	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446633	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446634	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446638	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446639	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446640	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446641	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446642	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446643	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2446644	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446645	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446646	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446647	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446648	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446649	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446650	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446651	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446652	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446653	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446654	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446655	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446899	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446900	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446901	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446903	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446905	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446906	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446907	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446908	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446909	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446910	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446911	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446912	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446913	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446919	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
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2446924	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446925	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446926	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446927	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446928	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446929	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446930	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446931	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446932	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446933	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques

Title Number	Status	Registration Date	Expiration Date	Registered Owner
2446934	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446935	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446936	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446937	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques
2446938	Active	2016-06-02	2023-06-01	Corporation Lithium Éléments Critiques

END OF APPENDIX 4-A

APPENDIX

17 A

DESIGN CRITERIA, DETAILED MASS BALANCE, AND WATER BALANCE

CriticalElements Corporation	PROCESS DESIGN CRITERIA C20203 Bankable Feasibility Study Rose Lithium Tantalum Project - Quebec Spodumene Plant	BUMIGEME Bureau mines, geologie et metallurgie **Revision:** E **Date:** 08 August 2017
Prepared by: S. Koppalkar	**Approved by:** F. Baril	**Doc No:** C20203-00-SPC-100

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.0	**GENERAL PROCESSING DESIGN CRITERIA**			
2.0.1	**General Design Base**			
	Design production rate (dry)	t/y	1 610 000	from Paul - milling schedule 26, July, 2017
	Operating days per year	d/y	365	
	Operating days per week	d/w	7	
	Operating hours per day	h/d	24	
2.1	**Project Geography and Weather**			
2.1.1	**Property Location**			
	Plant location	Pivert-Rose Property, James Bay Area		InnovExplo report
	Site Elevation	m AMSL	275	WSP email from Eric Poirier 20-12-2016
	Average latitude (UTM)	m E	409 700	InnovExplo Tech Report, Jan 2011
	Average longitude (UTM)	m N	5 761 000	InnovExplo Tech Report, Jan 2011
2.1.2	**Climate at**	Pivert-Rose Property		
	Minimum design temperature	°C	-21	InnovExplo Tech Report, Jan 2011
	Maximum design temperature	°C	15	InnovExplo Tech Report, Jan 2011
	Average relative humidity	%	60.0%	Assumed
2.2	**Ore Characteristics**			
2.2.1	**Design Ore Grade**			
	Lithium content	% Li_2O	0.85	from Paul - milling schedule 26, July, 2017
	Tantalum content	Ta g/t	109	from Paul - milling schedule 26, July, 2017
2.2.2	**Ore Specifications**			
	Design ore dry specific gravity		2.71	InnovExplo (Meeting at WSP, 26-10-2016)
	ROM porosity factor	%	12%	Estimated
	Apparent density	t/m^3	2.42	Calculation
	ROM swell factor	%	56%	Estimated
	Dry bulk density	t/m^3	1.55	
	Moisture in ore (assumed)	% w/w	5.0%	PEA Report, confirmed by Dave Buckley
	Wet bulk density	t/m^3	1.63	Estimated -need confirmation
	Angle of repose	deg	37.0	Estimated
2.2.4	**Ore Physical competency specifications and indices**			
	Abrasion index (Ai)	g	0.429	Hazen Research Comminution test results
	Abrasion index (Ai)	g	0.301	SGS Report 14120-005, Jan 2017
	Crusher work index (CWi)	kWh/t	8.19	SGS Report 14120-005, Jan 2017
	Bond rod mill work index (RWi)	kWh/t	9.82	Hazen Research Comminution test results
	Bond rod mill work index (RWi)	kWh/t	8.00	SGS Report 14120-001, April 2015
	Bond ball mill work index (BWi)	kWh/t	12.90	SGS Report 14120-001, April 2015
	Bond ball mill work index (BWi)	kWh/t	14.63	Hazen Research Comminution test results
	Bond ball mill work index (BWi)	kWh/t	13.33	ACMEMET Comminution test results
	Bond ball mill work index (BWi)	kWh/t	14.60	SGS Report 14120-005, Jan 2017
2.3	**Processing Criteria**			
2.3.1	**General Processing Facility Design Criteria**			
	Daily processing facility rate (dry nominal)	t/d	4 900	Calculated based on new milling schedule
	Crusher circuit operating percentage	%	50.0%	Email: Dave Buckley, 12-12-2016
	Concentrator operating percentage	%	90.0%	Bumigeme recommendation

CriticalElements Corporation	**PROCESS DESIGN CRITERIA** **C20203** **Bankable Feasibility Study** **Rose Lithium Tantalum Project - Quebec** **Spodumene Plant**	BUMIGEME Bureau mines, geologie et metallurgie **Revision:** E **Date:** 08 August 2017
Prepared by: S. Koppalkar	**Approved by:** F. Baril	**Doc No:** C20203-00-SPC-100

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.2	**Equipment Sizing Criteria**			
	Crushing plant equipment design factor	%	22%	Bumigeme recommendation
	Concentrator plant equipment design factor	%	11%	Bumigeme recommendation
	Concentrator plant slurry pump design factor	%	10%	Bumigeme recommendation
2.3.3	**Crushers Area Criteria (Area 6100)**			
	Crusher circuit average hrs operating per day	h/d	12.0	Email: Dave Buckley, 12-12-2016
	Nominal crushing circuit rate (dry)	t/h	408	
	Design circuit feed throughput (dry)	t/h	498	
	ROM top size	mm	1 000	To be confirmed
	ROM truck capacity	tonnes	68	75 st.ton trucks for ore (InnovExplo, 08/02/2017 WSP meeti
	ROM truck capacity	tonnes	120	Email: Paul Bonneville, 09-09-2016
	Grizzly opening (900 x 900)	mm	900	
	Crusher feed hopper capacity	tonnes	240	Two trucks load
	Crusher feed hopper capacity	tonnes	168	Calculation
	Crusher feed hopper volume	m^3	103	Calculation
	Jaw crusher - Feed F_{100}	mm	836	Crushing simulation
	Jaw crusher - Feed Bypass	%	44%	Crushing simulation
	Jaw crusher - Bypass size	mm	150	Crushing simulation
	Jaw crusher - Feed F_{80}	mm	670	Crushing simulation
	Jaw crusher discharge P_{80}	mm	150	Crushing simulation
	Secondary screen - oversize	%	81%	Crushing simulation
	Secondary cone crusher - Feed F_{100}	mm	237	Crushing simulation
	Secondary cone crusher - Feed F_{80}	mm	186	Crushing simulation
	Secondary cone crusher Product P_{80}	mm	39	Crushing simulation
	Tertiary screen - circulating load	%	78%	Crushing simulation
	Tertiary cone crusher - Feed F_{100}	mm	60	Crushing simulation
	Tertiary cone crusher - Feed F_{80}	mm	46	Crushing simulation
	Crushing circuit- Product P_{80}	mm	12.5	Crushing simulation
2.3.4	**Crushed ore stockpile (Area 6100)**			
	Number of stockpile		1	
	Design live capacity	days	2	Bumigeme recommendation
	Stockpile capacity (design)	tonnes	9 200	
	Stockpile volume	m^3	5 649	
	Stockpile diameter	m	40	
	Covered or open		Covered	
	Heated or not heated		Heated	
	Storage dome diameter	m	40	From supplier
	Storage dome height	m	20	From supplier
2.3.5	**Concentrator Area Criteria**			
	Concentrator average hrs operating per day	h/d	24.0	
	Nominal processing circuit rate (dry)	t/h	204	
	Design circuit feed throughput (dry)	t/h	227	
2.3.6	**Grinding Circuit Criteria (Area 6200)**			
	Grinding - Ball Mill Feed F_{80}	mm	12.5	From simulation
	Circulating load percent (based on fresh feed)	%	250%	Bumigeme recommendation
	Circulating load percent (based on fresh feed)	%	150%	Bumigeme recommendation
	Grinding circuit - Product P_{80}	mm	203	SGS Report 14120-003, November 2016

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.7	**Tantalum Recovery Circuit Criteria (Area 6300)**			
	Magnetic separation feed F_{100}	mm	0.300	SGS Report 14120-003, November 2016
	Rougher magnetic separation mass pull	%	0.5%	assumption
	Scavenger magnetic separation mass pull	%	0.4%	assumption
	Total magnetic rejects weight recovery (based on fresh f	%	0.9%	Test result F3-F4, SGS 14120-003, Nov 2016
	Tantalite concentrate specific gravity		3.72	SGS Report 14120-003, November 2016
	Tantalite concentrate bulk density	t/m^3	1.35	Estimated (to be confirmed by testwork)
	Desliming1 stage			
	Desliming 1 cyclone overflow (based on fresh feed)	%	2.3%	Test result F3-F4, SGS 14120-003, Nov 2016
2.3.8	**Mica Flotation Circuit Criteria (Area 6400)**			
	Desliming 2 cyclone overflow (based on fresh feed)	%	2.9%	Test result F3-F4, SGS 14120-003, Nov 2016
	Mica concentrate weight recovery (based on fresh feed)	%	5.0%	Test result F3-F4, SGS 14120-003, Nov 2016
	Mica cleaner concentrate weight recovery (based on fre	%	2.7%	LCT2, SGS Report 14120-001, April 2015
	Mica rougher concentrate specific gravity		2.770	Estimated
	Mica cleaner concentrate specific gravity		2.760	SGS Report 14120-003, November 2016
	Dewatering 1 stage			
	Mica tailings dewatering cyclone overflow	%	2.0%	Estimated
2.3.9	**Spodumene Flotation Circuit Criteria (Area 6500)**			
	Attrition scrubbing percent solids	%	63%	
	Flotation - Feed F_{80}	mm	203	SGS Report 14120-003, November 2016
	Rougher concentrate weight recovery (based on fresh fe	%	15.5%	Test result F3-F4, SGS 14120-003, Nov 2016
	Rougher concentrate specific gravity		3.00	Estimated; to be confirmed by SGS testwork
	Scavenger concentrate weight recovery (based on fresh	%	0.4	Test result F1-F2, SGS 14120-003, Nov 2016
	Scavenger concentrate specific gravity		2.956	Estimated; to be confirmed by SGS testwork
	Scavenger tailings specific gravity		2.634	Estimated; to be confirmed by SGS testwork
	Dewatering 2 stage			
	Rougher tailings dewatering cyclone overflow	%	0.1%	Estimated
	First cleaner weight recovery (based on fresh feed)	%	12.3%	Assumed for design purpose
	First cleaner concentrate specific gravity		3.030	Estimated; to be confirmed by SGS testwork
	First cleaner tailings specific gravity		2.984	Estimated
	Second cleaner weight recovery (based on fresh feed)	%	12.2%	Outotec simulation, 28/07/2017
	Second cleaner concentrate specific gravity		3.13	SGS Report 14120-003, November 2016
	Second cleaner tailings specific gravity		2.992	Estimated
2.3.10	**Final Tailings Dewatering Circuit Criteria (Area 6600)**			
	Tailings - P_{80}	mm	0.218	SGS Report 14120-003, November 2016
	Tailings specific gravity		2.65	SGS Report 14120-003, November 2016
	Tailings thickener underflow solids	%	60%	SGS Project No. CALR-14120-003, March 2017
	Tailings pressure filter cake moisture	%	17%	SGS Project No. CALR-14120-003, March 2017
	Pressure filter filtrate	%	0.01%	Estimated
	Tailings storage (Area 6600)			
	Number of hopper		1	
	Storage hopper capacity	tonnes	400	WSP Design
	Storage hopper volume	m^3	300	
	Covered or open		Covered	
	Heated or not heated		Heated	

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.3.11	**Spodumene Concentrate Dewatering Circuit Criteria (Area 6610)**			
	Spodumene concentrate - P_{80}	mm	0.209	SGS Report 14120-003, November 2016
	Spodumene concentrate specific gravity		3.130	SGS Report 14120-003, November 2016
	Spodumene concentrate thickener underflow solids	%w/w	65%	SGS Project No. CALR-14120-003, March 2017
	Spodumene concentrate vacuum filter cake moisture	%w/w	14%	SGS Project No. CALR-14120-003, March 2017
	Pressure filter filtrate	%	0.01%	Estimated
2.3.12	**Tantalum Concentrate Dewatering Circuit Criteria (Area 6300)**			
	Tantalum concentrate thickener underflow solids	%w/w	65%	Estimated
	Tantalum concentrate filter cake moisture	%w/w	15%	Estimated
	Disc filter filtrate	%	0.01%	Estimated
2.3.13	**Tantalite Concentrate Dryer (Area 6300)**			
	Dryer feed percent solids	%w/w	85%	
	Dried concentrate percent solids	%w/w	99.0%	
2.3.14	**Tantalite Product Silo (Area 6300)**			
	Tantalite Product Silo storage capacity	tonnes	100	Confirmed by CE
	Tantalite Product Silo storage capacity	days	2	Bumigeme recommendation
	Tantalite Product Silo storage volume	m^3	74	
	Tantalite concentrate bulk density	t/m^3	1.35	Estimated (to be confirmed by testwork)
	Tantalite Product Silo storage type	closed	One discharge outlet for product extraction	
2.3.15	**Spodumene Concentrate Dryer (Drying Criteria) (Area 6610)**			
	Dryer feed percent solids	%w/w	85%	
	Dried concentrate percent solids	%w/w	99.0%	
2.3.16	**Spodumene Product Silo (Outside plant)**			
	Spodumene Product Silo storage capacity	tonnes	1 200	
	Spodumene Product Silo storage capacity	days	2	Confirmed by Dave Buckley
	Spodumene Product Silo storage volume	m^3	839	
	Spodumene concentrate bulk density	t/m^3	1.43	Product specs. information
	Spodumene Product Silo storage type	closed	Two discharge outlets for product extraction	
2.4	**Utility Specifications (Area 6800)**			
2.4.1	**Water Requirements**			
	Raw (fresh) water source		Wells	Confirmed by CE (14th March meeting at WSP)
	Average daily fresh water required	m^3/d	703	
	Fresh water specific gravity		1.00	
	Fresh water solids density	% w/w	0%	
	Process water specific gravity		1.00	
	Process water solids density	% w/w	0%	
	Process water recycling rate	%	0%	Tailings dry stacking

REF.	ITEM	UNITS	CRITERIA	COMMENTS / REFERENCE
2.4.2	**Air Requirements**			
	High pressure air pressure	Bar	6.9	Process Plant air
	High pressure air volume	Nm^3/h	1 436	Process plant air
	Low pressure air pressure	Bar	0.3	Supplier quote
	Low pressure air volume	Nm^3/h	10 199	Supplier quote
2.4.3	**Electrical Requirements**			
	Power source		Hydro Quebec	
	Medium voltage	V	4 160	
	Low voltage	V	600	
	Phase	ph	3	
	Frequency	Hz	60	

BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

Revision: C

PREPARED BY	APPROVED BY	Date: 08-08-2017
S. KOPPALKAR	F. BARIL	DOC No.: C20203-00-SPC-101

Name	h/d	Solids t/d	Solids t/h	Solids m^3/h	Solids SG	Water m^3/d	Water t/h	Water m^3/h	Water SG	Slurry Total t/h	Slurry Total m^3/h	Slurry Total % w/w	Slurry Total SG
CRUSHING													
Vibrating Grizzly Feeder													
Vibrating feeder feed	12.0	4 900.0	408.3	150.7	2.710	257.9	21.5	21.5	1.000	429.8	172.2	95.0%	2.497
Jaw crusher feed	12.0	2 764.4	230.4	85.0	2.710	145.5	12.1	12.1	1.000	242.5	97.1	95.0%	2.497
Jaw crusher by-pass	12.0	2 135.6	178.0	65.7	2.710	112.4	9.4	9.4	1.000	187.3	75.0	95.0%	2.497
Jaw Crusher													
Jaw crusher feed	12.0	2 764.4	230.4	85.0	2.710	145.5	12.1	12.1	1.000	242.5	97.1	95.0%	2.497
Jaw crusher product	12.0	2 764.4	230.4	85.0	2.710	145.5	12.1	12.1	1.000	242.5	97.1	95.0%	2.497
Vibrating Screen 1													
Screen feed	12.0	4 900.0	408.3	150.7	2.710	257.9	21.5	21.5	1.000	429.8	172.2	95.0%	2.497
Screen 1 oversize	12.0	3 956.7	329.7	121.7	2.710	208.2	17.4	17.4	1.000	347.1	139.0	95.0%	2.497
Screen 1 undersize	12.0	943.3	78.6	29.0	2.710	49.6	4.1	4.1	1.000	82.7	33.1	95.0%	2.497
Secondary Crusher													
Secondary crusher feed	12.0	3 956.7	329.7	121.7	2.710	208.2	17.4	17.4	1.000	347.1	139.0	95.0%	2.497
Secondary crusher product	12.0	3 956.7	329.7	121.7	2.710	208.2	17.4	17.4	1.000	347.1	139.0	95.0%	2.497
Vibrating Screen 2													
Screen 2 feed	12.0	8 738.8	728.2	268.7	2.710	459.9	38.3	38.3	1.000	766.6	307.0	95.0%	2.497
Screen 2 oversize	12.0	3 838.8	319.9	118.0	2.710	202.0	16.8	16.8	1.000	336.7	134.9	95.0%	2.497
Screen 2 undersize	12.0	4 900.0	408.3	150.7	2.710	257.9	21.5	21.5	1.000	429.8	172.2	95.0%	2.497
Tertiary Crusher													
Tertiary crusher feed	12.0	3 838.8	319.9	118.0	2.710	202.0	16.8	16.8	1.000	336.7	134.9	95.0%	2.497
Tertiary crusher product	12.0	3 838.8	319.9	118.0	2.710	202.0	16.8	16.8	1.000	336.7	134.9	95.0%	2.497
Crushed Ore Stockpile													
Vibrating Screen 2 undersize	12.0	4 900.0	408.3	150.7	2.710	257.9	21.5	21.5	1.000	429.8	172.2	95.0%	2.497
Crushed ore Stockpile	12.0	4 900.0	408.3	150.7	2.710	257.9	21.5	21.5	1.000	429.8	172.2	95.0%	2.497
GRINDING													
Ball Mill													
Fresh feed from stockpile	21.6	4 900.0	226.9	83.7	2.710	257.9	11.9	11.9	1.000	238.8	95.6	95.0%	2.497
Cyclone 2 underflow	21.6	7 350.0	340.3	124.3	2.737	2 450.0	113.4	113.4	1.000	453.7	237.7	75.0%	1.908
Ball mill feed water	21.6	-	-	-	-	2 056.0	95.2	95.2	1.000	95.2	95.2	0.0%	1.000
Total Ball mill feed	21.6	12 250.0	567.1	208.0	2.726	4 763.9	220.6	220.6	1.000	787.7	428.6	72.0%	1.838
Ball mill trommel water	21.6	-	-	-	-	1 620.0	75.0	75.0	1.000	75.0	75.0	0.0%	1.000
Ball mill discharge	21.6	12 250.0	567.1	208.0	2.726	6 383.9	295.6	295.6	1.000	862.7	503.6	65.7%	1.713
Ball Mill Cyclone													
Ball mill cyclone pump discharge	21.6	12 250.0	567.1	208.0	2.726	6 383.9	295.6	295.6	1.000	862.7	503.6	65.7%	1.713
Stage 1 cyclone feed dilution water	21.6	-	-	-	-	3 240.0	150.0	150.0	1.000	150.0	150.0	0.0%	1.000
Stage 1 Cyclone feed	21.6	12 250.0	567.1	208.0	2.726	9 623.9	445.6	445.6	1.000	1 012.7	653.6	56.0%	1.549
Cyclone 1 underflow	21.6	7 962.5	368.6	135.2	2.726	2 654.2	122.9	122.9	1.000	491.5	258.1	75.0%	1.904
Cyclone 1 overflow	21.6	4 287.5	198.5	72.8	2.726	6 969.7	322.7	322.7	1.000	521.2	395.5	38.1%	1.318
Stage 2 cyclone feed pump box dilution water	21.6	-	-	-	-	216.0	10.0	10.0	1.000	10.0	10.0	0.0%	1.000
Stage 2 cyclone feed	21.6	7 962.5	368.6	135.2	2.726	2 870.2	132.9	132.9	1.000	501.5	268.1	73.5%	1.871
Cyclone 2 underflow to mill	21.6	7 350.0	340.3	124.3	2.737	2 450.0	113.4	113.4	1.000	453.7	237.7	75.0%	1.908
Cyclone 2 overflow	21.6	612.5	28.4	10.4	2.726	420.2	19.5	19.5	1.000	47.8	29.9	59.3%	1.601
Combined cyclone overflow	21.6	4 900.0	226.9	83.7	2.710	7 389.9	342.1	342.1	1.000	569.0	425.8	39.9%	1.336
MAGENTIC SEPARATION													
Pump Box	21.6	4 900.0	226.9	83.7	2.710	7 389.9	342.1	342.1	1.000	569.0	425.8	39.9%	1.336
Pump Box dilution water	21.6	-	-	-	-	1 080.0	50.0	50.0	1.000	50.0	50.0	0.0%	1.000
Feed to rougher magnetic separation	21.6	4 900.0	226.9	83.7	2.710	8 469.9	392.1	392.1	1.000	619.0	475.8	36.6%	1.301
Rougher magnetic concentrate	21.6	25.8	1.2	0.3	3.720	17.2	0.8	0.8	1.000	2.0	1.1	60.0%	1.782
Rougher non-magnetics	21.6	4 874.2	225.7	83.5	2.701	8 452.7	391.3	391.3	1.000	617.0	474.9	36.6%	1.299
Scavenger magnetic concentrate	21.6	17.2	0.8	0.2	3.720	17.2	0.8	0.8	1.000	1.6	1.0	50.0%	1.576
Combined magnetic Tantalum concentrate	21.6	42.9	2.0	0.5	3.720	34.3	1.6	1.6	1.000	3.6	2.1	55.6%	1.684
Non-magnetics to desliming cyclone pump box	21.6	4 857.1	224.9	83.2	2.701	8 435.5	390.5	390.5	1.000	615.4	473.8	36.5%	1.299
Desliming I Cyclones													
Non-magnetics to desliming cyclone feed pump	21.6	4 857.1	224.9	83.2	2.701	8 435.5	390.5	390.5	1.000	615.4	473.8	36.5%	1.299
Desliming cyclone feed	21.6	4 857.1	224.9	83.2	2.701	8 435.5	390.5	390.5	1.000	615.4	473.8	36.5%	1.299
Desliming I cyclone overflow	21.6	112.6	5.2	1.9	2.689	2 701.3	125.1	125.1	1.000	130.3	127.0	4.0%	1.026
Desliming I cyclone underflow to Mica flotation	21.6	4 744.5	219.7	81.3	2.701	5 734.3	265.5	265.5	1.000	485.1	346.8	45.3%	1.399

CriticalElements Corporation

BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT - QUEBEC

BUMIGEME — Bureau mines, géologie et métallurgie

PREPARED BY	APPROVED BY	Revision: C
		Date: 08-08-2017
S. KOPPALKAR	F. BARIL	DOC No.: C20203-00-SPC-101

Name		Solids				Water				Slurry Total			
	h/d	t/d	t/h	m^3/h	SG	m^3/d	t/h	m^3/h	SG	t/h	m^3/h	% w/w	SG
MICA FLOTATION													
Feed to conditioning tank	21.6	4 744.5	219.7	81.3	2.701	5 734.3	265.5	265.5	1.000	485.1	346.8	45.3%	1.399
Conditioning tank dilution water	21.6	-	-	-	-	324.0	15.0	15.0	1.000	15.0	15.0	0.0%	1.000
Conditionning tank feed	21.6	4 744.5	219.7	81.3	2.701	6 058.3	280.5	280.5	1.000	500.1	361.8	43.9%	1.382
Rougher Flotation													
Rougher feed dilution tank water	21.6	-	-	-	-	2 700.0	125.0	125.0	1.000	125.0	125.0	0.0%	1.000
Rougher feed	21.6	4 744.5	219.7	81.3	2.701	8 758.3	405.5	405.5	1.000	625.1	486.8	35.1%	1.284
Rougher tails	21.6	4 500.6	208.4	77.2	2.698	8 627.0	399.4	399.4	1.000	607.8	476.6	34.3%	1.275
Rougher concentrate	21.6	243.9	11.3	4.1	2.770	131.3	6.1	6.1	1.000	17.4	10.2	65.0%	1.710
Mica concentrate launder water	21.6	-	-	-	-	259.2	12.0	12.0	1.000	12.0	12.0	0.0%	1.000
Mica rougher concentrate	21.6	243.9	11.3	4.1	2.770	390.5	18.1	18.1	1.000	29.4	22.2	38.4%	1.326
Cleaner Flotation	21.6												
Cleaner feed	21.6	243.9	11.3	4.1	2.770	390.5	18.1	18.1	1.000	29.4	22.2	38.4%	1.326
Cleaner tails	21.6	111.6	5.2	1.9	2.782	302.3	14.0	14.0	1.000	19.2	15.9	27.0%	1.209
Cleaner concentrate	21.6	132.3	6.1	2.2	2.760	88.2	4.1	4.1	1.000	10.2	6.3	60.0%	1.275
Cleaner concentrate launder water	21.6	-	-	-	-	43.2	2.0	2.0	1.000	2.0	2.0	0.0%	1.000
Cleaner concentrate	21.6	132.3	6.1	2.2	2.760	131.4	6.1	6.1	1.000	12.2	8.3	50.2%	1.470
SPODUMENE FLOTATION													
Dewatering -1 Cyclones													
Cyclone feed	21.6	4 612.2	213.5	79.1	2.565	8 929.3	413.4	413.4	1.000	626.9	492.5	34.1%	1.273
Cyclone overflow	21.6	92.2	4.3	1.7	2.524	7 422.6	343.6	343.6	1.000	347.9	345.3	1.2%	1.007
Cyclone underflow	21.6	4 520.0	209.3	77.4	2.566	1 506.7	69.8	69.8	1.000	279.0	147.2	75.0%	1.896
Spodumene first cleaner tails	21.6	156.0	7.2	2.4	2.984	550.6	25.5	25.5	1.000	32.7	27.9	22.1%	1.172
Spodumene second cleaner tails	21.6	6.2	0.3	0.4	2.992	438.2	20.3	20.3	1.000	20.6	20.7	1.4%	0.995
Spodumene scavenger concentrate	21.6	1 905.8	88.2	29.8	2.956	1 335.4	61.8	61.8	1.000	150.1	91.7	58.8%	1.637
Attrition scrubber feed	21.6	6 588.0	305.0	110.1	2.689	3 830.8	177.4	177.4	1.000	482.4	287.4	63.2%	1.678
Desliming II cyclones													
Cyclone feed pump box water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000
Cyclone feed pump box	21.6	6 588.0	305.0	110.1	2.689	4 262.8	197.4	197.4	1.000	502.4	307.4	60.7%	1.634
Cyclones feed	21.6	6 588.0	305.0	110.1	2.689	4 262.8	197.4	197.4	1.000	502.4	307.4	60.7%	1.634
Cyclone overflow	21.6	142.0	6.6	2.5	2.650	2 697.7	124.9	124.9	1.000	131.5	127.4	5.0%	1.032
Cyclone underflow	21.6	6 446.0	298.4	107.6	2.690	1 565.1	72.5	72.5	1.000	370.9	180.0	80.5%	2.060
Conditioning tank dilution water	21.6	-	-	-	-	2 160.0	100.0	100.0	1.000	100.0	100.0	0.0%	1.000
High density conditioning tank	21.6	6 446.0	298.4	107.6	2.690	3 725.1	172.5	172.5	1.000	470.9	280.0	63.4%	1.682
Spodumene Rougher Flotation													
Rougher feed pump box water	21.6	-	-	-	-	3 564.0	165.0	165.0	1.000	165.0	165.0	0.0%	1.000
Rougher feed	21.6	6 446.0	298.4	107.6	2.690	7 289.1	337.5	337.5	1.000	635.9	445.0	46.9%	1.429
Rougher tails	21.6	5 685.8	263.2	99.9	2.635	6 782.3	314.0	314.0	1.000	577.2	410.2	45.6%	1.407
Rougher concentrate	21.6	760.2	35.2	11.4	3.100	506.8	23.5	23.5	1.000	58.7	34.8	60.0%	1.685
Rougher concentrate launder water	21.6	-	-	-	-	216.0	10.0	10.0	1.000	10.0	10.0	0.0%	1.000
Rougher concentrate	21.6	760.2	35.2	11.4	3.100	722.8	33.5	33.5	1.000	68.7	44.8	51.3%	1.532
Dewatering-2 Cyclones													
Cyclone feed	21.6	5 685.8	263.2	99.9	2.635	6 782.3	314.0	314.0	1.000	577.2	410.2	45.6%	1.407
Cyclone overflow	21.6	2.5	0.1	0.0	2.601	2 993.4	138.6	138.6	1.000	138.7	135.0	0.1%	1.028
Cyclone underflow	21.6	5 683.4	263.1	99.9	2.635	3 788.9	175.4	175.4	1.000	438.5	275.3	60.0%	1.593
Conditioning tank dilution water	21.6	-	-	-	-	-	-	-	1.000	-	-	0.0%	0.000
High density conditioning tank	21.6	5 683.4	263.1	99.9	2.635	3 788.9	175.4	175.4	1.000	438.5	275.3	60.0%	1.593
Spodumene Scavenger Flotation													
Scavenger feed pump box water	21.6	-	-	-	-	2 808.0	130.0	130.0	1.000	130.0	130.0	0.0%	1.000
Scavenger feed	21.6	5 683.4	263.1	99.9	2.635	6 596.9	305.4	305.4	1.000	568.5	405.3	46.3%	1.403
Scavenger tails	21.6	3 777.5	174.9	70.0	2.634	5 326.3	246.6	246.6	1.000	421.5	316.6	41.5%	1.331
Scavenger Concentrate	21.6	1 905.8	88.2	29.8	2.956	1 270.6	58.8	58.8	1.000	147.1	88.7	60.0%	1.658
Scavenger concentrate launder water	21.6	-	-	-	-	64.8	3.0	3.0	1.000	3.0	3.0	0.0%	1.000
Scavenger Concentrate	21.6	1 905.8	88.2	29.8	2.956	1 335.4	61.8	61.8	1.000	150.1	91.7	58.8%	1.637
Spodumene first cleaner flotation													
Spodumene rougher concentrate to pump box	21.6	760.2	35.2	11.4	3.100	722.8	33.5	33.5	1.000	68.7	44.8	51.3%	1.532
First cleaner feed pump box water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000
First cleaner feed	21.6	760.2	35.2	11.4	3.100	1 154.8	53.5	53.5	1.000	88.7	64.8	39.7%	1.368
First cleaner tails	21.6	156.0	7.2	2.4	2.984	550.6	25.5	25.5	1.000	32.7	27.9	22.1%	1.172
First cleaner concentrate	21.6	604.2	28.0	9.2	3.030	604.2	28.0	28.0	1.000	55.9	37.2	50.0%	1.504
First cleaner concentrate launder water	21.6	-	-	-	-	108.0	5.0	5.0	1.000	5.0	5.0	0.0%	1.000
First cleaner concentrate	21.6	604.2	28.0	9.2	3.030	712.2	33.0	33.0	1.000	60.9	42.2	45.9%	1.444

CriticalElements Corporation	BANKABLE FEASIBILITY STUDY ROSE LITHIUM TANTALUM PROJECT - QUEBEC	BUMIGEME Bureau mines, geologie et metallurgie Revision: C
PREPARED BY	APPROVED BY	Date: 08-08-2017
S. KOPPALKAR	F. BARIL	DOC No.: C20203-00-SPC-101

Name	h/d	Solids				Water				Slurry Total			
		t/d	t/h	m^3/h	SG	m^3/d	t/h	m^3/h	SG	t/h	m^3/h	% w/w	SG
Spodumene second cleaner flotation													
First cleaner concentrate	21.6	604.2	28.0	9.2	3.030	712.2	33.0	33.0	1.000	60.9	42.2	45.9%	1.444
Second cleaner feed pump box water	21.6	-	-	-	-	324.0	15.0	15.0	1.000	15.0	15.0	0.0%	1.000
Second cleaner feed	21.6	604.2	28.0	9.2	3.030	1 036.2	48.0	48.0	1.000	75.9	57.2	36.8%	1.328
Second cleaner tails	21.6	6.2	0.3	0.4	2.992	438.2	20.3	20.3	1.000	20.6	20.7	1.4%	0.995
Second cleaner concentrate	21.6	598.0	27.7	8.8	3.130	598.0	27.7	27.7	1.000	55.4	36.5	50.0%	1.516
Second cleaner concentrate launder water	21.6	-	-	-	-	108.0	5.0	5.0	1.000	5.0	5.0	0.0%	1.000
Second cleaner concentrate	21.6	598.0	27.7	8.8	3.130	706.0	32.7	32.7	1.000	60.4	41.5	45.9%	1.454
DEWATERING - TANTALITE CONCENTRATE													
Tantalite concentrate thickener													
Tantalite concentrate from magnetic separation	21.6	42.9	2.0	0.5	3.720	34.3	1.6	1.6	1.000	3.6	2.1	55.6%	1.684
Filtrate from disc filter	21.6	0.0	0.0	0.0	3.720	19.9	0.9	0.9	1.000	0.9	0.9	0.0%	1.000
Tantalite thickener dilution water	21.6	-	-	-	-	189.1	8.8	8.8	1.000	8.8	8.8	0.0%	1.000
Tantalite concentrate thickener feed	21.6	42.9	2.0	0.5	3.720	243.3	11.3	11.3	1.000	13.3	11.8	15.0%	1.123
Tantalite concentrate thickener underflow	21.6	42.9	2.0	0.5	3.720	23.1	1.1	1.1	1.000	3.1	1.6	65.0%	1.906
Tantalite thickener overflow to process water tank	21.6	-	-	-	-	220.2	10.2	10.2	1.000	10.2	10.2	0.0%	1.000
Filter feed holding tank dilution water	21.6	-	-	-	-	4.3	0.2	0.2	1.000	0.2	0.2	0.0%	1.000
Filter feed holding tank	21.6	42.9	2.0	0.5	3.720	27.4	1.3	1.3	1.000	3.3	1.8	61.0%	1.805
Tantalite concentrate filter													
Disc filter feed	21.6	42.9	2.0	0.5	3.720	27.4	1.3	1.3	1.000	3.3	1.8	61.0%	1.805
Disc filter filtrate	21.6	0.0	0.0	0.0	3.720	19.9	0.9	0.9	1.000	0.9	0.9	0.0%	1.000
Tantalite concentrate to dryer	21.6	42.9	2.0	0.5	3.720	7.6	0.4	0.4	1.000	2.3	0.9	85.0%	2.642
Tantalite concentrate dryer													
Dryer feed	21.6	42.9	2.0	0.5	3.720	7.6	0.4	0.4	1.000	2.3	0.9	85.0%	2.642
Evaporation	21.6	-	-	-	-	7.1	0.3	0.3	1.000	0.3	0.3	0.0%	1.000
Tantalite concentrate to storage	21.6	42.9	2.0	0.5	3.720	0.4	0.0	0.0	1.000	2.0	0.6	99.0%	3.621
DEWATERING - SPODUMENE CONCENTRATE													
Spodumene conc. from second cleaner	21.6	598.0	27.7	8.8	3.130	706.0	32.7	32.7	1.000	60.4	41.5	45.9%	1.454
Spodumene concentrate thickener													
Spodumene conc. from second cleaner	21.6	598.0	27.7	8.8	3.130	706.0	32.7	32.7	1.000	60.4	41.5	45.9%	1.454
Spodumene conc. filtrate	21.6	0.0	0.0	0.0	3.132	6.8	0.3	0.3	1.000	0.3	0.3	0.5%	1.003
Spod. conc. Thickener feed dilution water	21.6	-	-	-	-	3 240.0	150.0	150.0	1.000	150.0	150.0	0.0%	1.000
Spodumene conc. thickener feed	21.6	598.1	27.7	8.8	3.130	3 952.8	183.0	183.0	1.000	210.7	191.8	13.1%	1.098
Spod.conc. thickener overflow to process water tank	21.6	-	-	-	-	3 630.8	168.1	168.1	1.000	168.1	168.1	0.0%	1.000
Spodumene conc. thickener underflow	21.6	598.0	27.7	8.8	3.130	322.0	14.9	14.9	1.000	42.6	23.8	65.0%	1.793
Spodumene Thickener underflow to holding tank	21.6	598.1	27.7	8.8	3.130	322.0	14.9	14.9	1.000	42.6	23.8	65.0%	1.793
Spod concentrate holding tank	21.6	598.0	27.7	8.8	3.130	322.0	14.9	14.9	1.000	42.6	23.8	65.0%	1.793
Spodumene Concentrate filter													
spodumene conc. Filter feed	21.6	598.0	27.7	8.8	3.130	322.0	14.9	14.9	1.000	42.6	23.8	65.0%	1.793
Spodumene conc. filtrate	21.6	0.0	0.0	0.0	3.132	6.8	0.3	0.3	1.000	0.3	0.3	0.5%	1.003
Spodumene conc. to dryer	21.6	598.0	27.7	8.8	3.130	315.3	4.5	4.5	1.000	32.2	13.4	86.0%	2.409
Spodumene Concentrate Dryer													
Dryer feed	21.6	598.0	27.7	8.8	3.130	315.3	4.5	4.5	1.000	32.2	13.4	86.0%	2.409
Evaporation	21.6	-	-	-	-	309.2	14.3	14.3	1.000	4.2	4.2	0.0%	1.000
Spodumene concentrate (α-spodumene)	21.6	598.0	27.7	8.8	3.130	6.0	0.3	0.3	1.000	28.0	9.1	99.0%	3.065
Spodumene storage silo	21.6	598.0	27.7	8.8	3.130	6.0	0.3	0.3	1.000	28.0	9.1	99.0%	3.065
DEWATERING - TAILINGS													
Scavenger tailings	21.6	3 777.5	174.9	70.0	2.634	5 326.3	246.6	246.6	1.000	421.5	316.6	41.5%	1.331
Tailings thickener													
Desliming I cyclone overflow	21.6	112.6	5.2	1.9	2.689	2 701.3	125.1	125.1	1.000	130.3	127.0	4.0%	1.026
Cyclone overflow	21.6	142.0	6.6	2.5	2.650	2 697.7	124.9	124.9	1.000	131.5	127.4	5.0%	1.032
Cyclone overflow	21.6	92.2	4.3	1.7	2.524	7 422.6	343.6	343.6	1.000	347.9	345.3	1.2%	1.007
Cyclone overflow	21.6	2.5	0.1	0.0	2.601	2 993.4	138.6	138.6	1.000	138.7	135.0	0.1%	1.028
Mica concentrate	21.6	132.3	6.1	2.2	2.760	131.4	6.1	6.1	1.000	12.2	8.3	50.2%	1.470
Scavenger tailings	21.6	3 777.5	174.9	66.4	2.634	5 326.3	246.6	246.6	1.000	421.5	313.0	41.5%	1.347
Tailings filtrate to tailings thickener	21.6	0.4	0.0	0.0	2.665	2 798.4	129.6	129.6	1.000	129.6	129.6	0.0%	1.000
Tailings thickener feed	21.6	4 259.5	197.2	74.4	2.650	24 071.1	1 114.4	1 114.4	1.000	1 311.6	1 188.8	15.0%	1.103
Tailings thickener overflow to process water tank	21.6	-	-	-	-	21 231.5	982.9	982.9	1.000	982.9	982.9	0.0%	1.000
Tailings thickener underflow	21.6	4 259.5	197.2	74.4	2.650	2 839.6	131.5	131.5	1.000	328.7	205.9	60.0%	1.596
Tailings holding tank dilution water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000

CriticalElements Corporation	BANKABLE FEASIBILITY STUDY ROSE LITHIUM TANTALUM PROJECT - QUEBEC	BUMIGEME Revision: C
PREPARED BY	APPROVED BY	Date: 08-08-2017
S. KOPPALKAR	F. BARIL	DOC No.: C20203-00-SPC-101

		Solids				Water				Slurry Total			
Name	**h/d**	**t/d**	**t/h**	**m³/h**	**SG**	**m³/d**	**t/h**	**m³/h**	**SG**	**t/h**	**m³/h**	**% w/w**	**SG**
Tailings filter holding tank	21.6	4 259.5	197.2	106.9	2.650	3 271.6	151.5	151.5	1.000	348.7	225.9	56.6%	1.544
Tailings filter													
Tailings filter feed	21.6	4 259.5	197.2	106.9	2.650	3 271.6	151.5	151.5	1.000	348.7	225.9	56.6%	1.544
Tailings filtrate to tailings thickener	21.6	0.4	0.0	0.0	2.665	2 798.4	129.6	129.6	1.000	129.6	129.6	0.0%	1.000
Tailings for dry stacking	21.6	4 259.0	197.2	74.4	2.650	473.2	21.9	21.9	1.000	219.1	96.3	90.0%	2.275
WATER SERVICES													
Fresh (Raw) Water Tank													
IN													
Raw water from Wells	21.6					703.2	32.6	32.6	1.000	32.6	32.6	0.0%	1.000
OUT													
To Gland seal water tank	21.6					65.0	3.0	2.7	1.000	3.0	2.7	0.0%	1.000
To Reagent preparation	21.6					100.0	4.6	4.6	1.000	4.6	4.6	0.0%	1.000
To Process water tank	21.6					538.2	24.9	24.9	1.000	24.9	24.9	0.0%	1.000
Total out fresh water tank						703.2	32.6	32.3	1.009	27.9	27.6	0.0%	1.011
Process Water tank in the Spodumene plant													
IN													
Tantalite thickener overflow to process water tank	21.6					220.2	10.2	10.2	1.000	10.2	10.2	0.0%	1.000
Spod.conc. thickener overflow to process water tank	21.6					3 630.8	168.1	168.1	1.000	168.1	168.1	0.0%	1.000
Tailings thickener overflow to process water tank	21.6					21 231.5	982.9	982.9	1.000	982.9	982.9	0.0%	1.000
Reclaim water pump	21.6					-	-	-	1.000	-	-	0.0%	1.000
Raw water from Wells	21.6					538.2	24.9	24.9	1.000	24.9	24.9	0.0%	1.000
Total IN process water from process						25 620.6	1 186.1	1 186.1	1.000	1 186.1	1 186.1	0.0%	1.000
OUT													
Ball mill feed water	21.6	-	-	-	-	2 056.0	95.2	95.2	1.000	95.2	95.2	0.0%	1.000
Ball mill trommel water	21.6	-	-	-	-	1 620.0	75.0	75.0	1.000	75.0	75.0	0.0%	1.000
Stage 1 cyclone feed dilution water	21.6	-	-	-	-	3 240.0	150.0	150.0	1.000	150.0	150.0	0.0%	1.000
Stage 2 cyclone feed pump box dilution water	21.6	-	-	-	-	216.0	10.0	10.0	1.000	10.0	10.0	0.0%	1.000
Pump Box dilution water	21.6	-	-	-	-	1 080.0	50.0	50.0	1.000	50.0	50.0	0.0%	1.000
Conditioning tank dilution water	21.6	-	-	-	-	324.0	15.0	15.0	1.000	15.0	15.0	0.0%	1.000
Rougher feed dilution tank water	21.6	-	-	-	-	2 700.0	125.0	125.0	1.000	125.0	125.0	0.0%	1.000
Mica concentrate launder water	21.6	-	-	-	-	259.2	12.0	12.0	1.000	12.0	12.0	0.0%	1.000
Cleaner concentrate launder water	21.6	-	-	-	-	43.2	2.0	2.0	1.000	2.0	2.0	0.0%	1.000
Cyclone feed pump box water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000
Conditioning tank dilution water	21.6	-	-	-	-	2 160.0	100.0	100.0	1.000	100.0	100.0	0.0%	1.000
Rougher feed pump box water	21.6	-	-	-	-	3 564.0	165.0	165.0	1.000	165.0	165.0	0.0%	1.000
Rougher concentrate launder water	21.6	-	-	-	-	216.0	10.0	10.0	1.000	10.0	10.0	0.0%	1.000
Conditioning tank dilution water	21.6	-	-	-	-	-	-	-	1.000	-	-	0.0%	0.000
Scavenger feed pump box water	21.6	-	-	-	-	2 808.0	130.0	130.0	1.000	130.0	130.0	0.0%	1.000
Scavenger concentrate launder water	21.6	-	-	-	-	64.8	3.0	3.0	1.000	3.0	3.0	0.0%	1.000
First cleaner feed pump box water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000
First cleaner concentrate launder water	21.6	-	-	-	-	108.0	5.0	5.0	1.000	5.0	5.0	0.0%	1.000
Second cleaner feed pump box water	21.6	-	-	-	-	324.0	15.0	15.0	1.000	15.0	15.0	0.0%	1.000
Second cleaner concentrate launder water	21.6	-	-	-	-	108.0	5.0	5.0	1.000	5.0	5.0	0.0%	1.000
Tantalite thickener dilution water	21.6	-	-	-	-	189.1	8.8	8.8	1.000	8.8	8.8	0.0%	1.000
Filter feed holding tank dilution water	21.6	-	-	-	-	4.3	0.2	0.2	1.000	0.2	0.2	0.0%	1.000
Tailings holding tank dilution water	21.6	-	-	-	-	432.0	20.0	20.0	1.000	20.0	20.0	0.0%	1.000
Spod. conc. Thickener feed dilution water	21.6	-	-	-	-	3 240.0	150.0	150.0	1.000	150.0	150.0	0.0%	1.000
Total OUT process water from process						25 620.6	1 186.1	1 186.1	1.000	1 186.1	1 186.1	0.0%	1.000
MASS BALANCE SUMMARY													
STREAMS - IN													
Fresh (Raw) water source		-	-	-	-	538.2	24.9	24.9	1.000	24.9	24.9	0.0%	1.000
Ball mill feed from stockpile		4 900.0	226.9	83.7	2.710	257.9	11.9	11.9	1.000	238.8	95.6	95.0%	2.497
TOTAL IN		4 900.0	226.9	83.7	2.710	796.1	36.9	36.9	1.000	263.7	120.6	86.0%	2.187
STREAMS - OUT													
Evaporation - Tantalite dryer		-	-	-	-	7.1	0.3	0.3	1.000	0.3	0.3	0.0%	1.000
Evaporation - Spodumene dryer		-	-	-	-	309.2	14.3	14.3	1.000	4.2	4.2	0.0%	1.000
Tantalite concentrate for bagging		42.9	2.0	0.5	3.720	0.4	0.0	0.0	1.000	2.0	0.6	99.0%	3.621
Spodumene concentrate for shipping		598.0	27.7	8.8	3.130	6.0	0.3	0.3	1.000	28.0	9.1	99.0%	3.065
Tailings for dry stacking		4 259.0	197.2	74.4	2.650	473.2	21.9	21.9	1.000	219.1	96.3	90.0%	2.275
TOTAL OUT		4 900.0	226.9	83.8	2.707	796.1	36.9	36.9	1.000	263.7	120.6	86.0%	2.186

CriticalElements Corporation

WATER BALANCE

C20203

Banakable Feasibility Study Rose Lithium Tantalum Project

Critical Elemets Corp.

BUMIGEME
Bureau mines, geologie et metallurgie

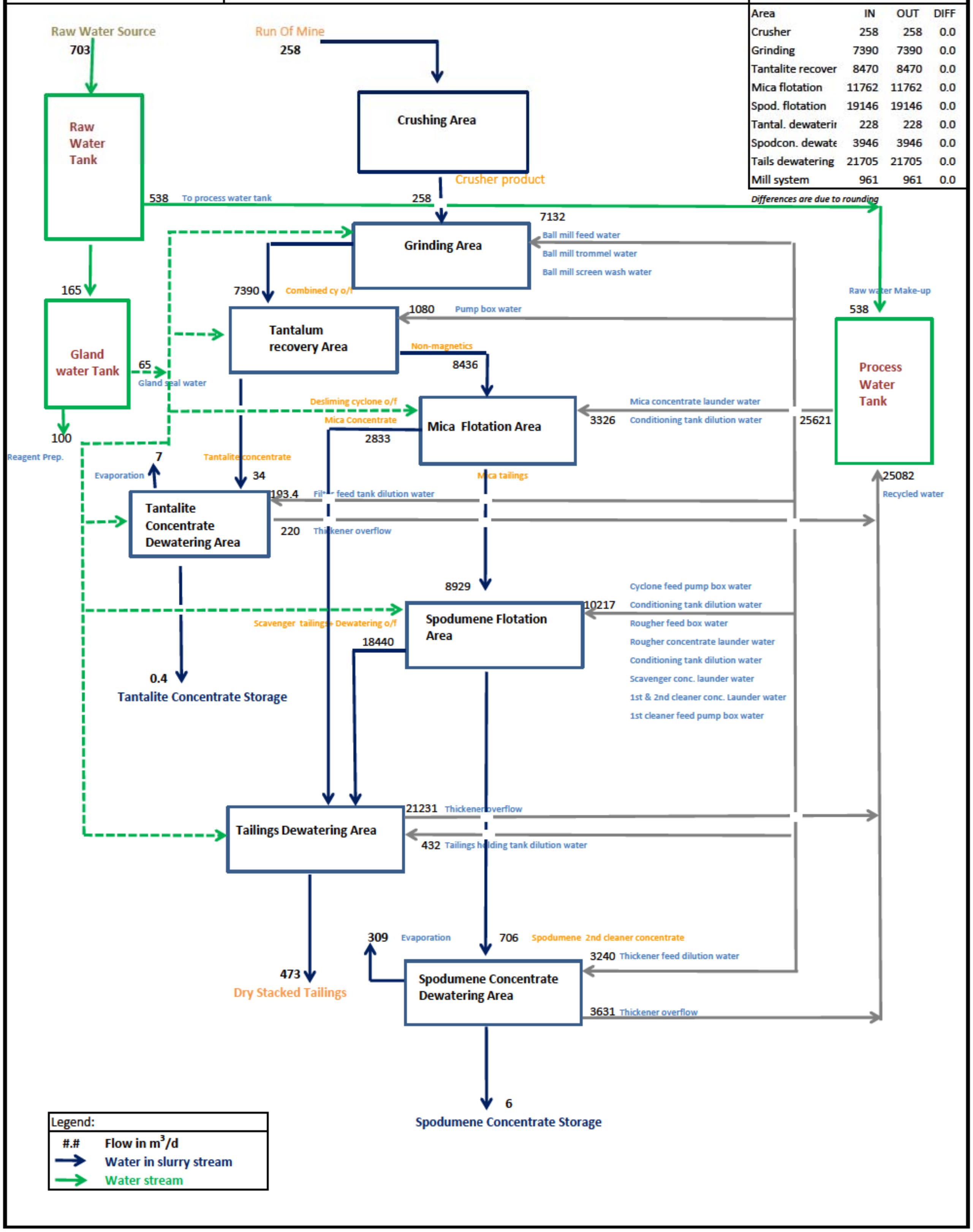
Revision: D

Date: 08-08-2017

DOC No.: C20203-00-SPC-102

Area	IN	OUT	DIFF
Crusher	258	258	0.0
Grinding	7390	7390	0.0
Tantalite recover	8470	8470	0.0
Mica flotation	11762	11762	0.0
Spod. flotation	19146	19146	0.0
Tantal. dewaterir	228	228	0.0
Spodcon. dewate	3946	3946	0.0
Tails dewatering	21705	21705	0.0
Mill system	961	961	0.0

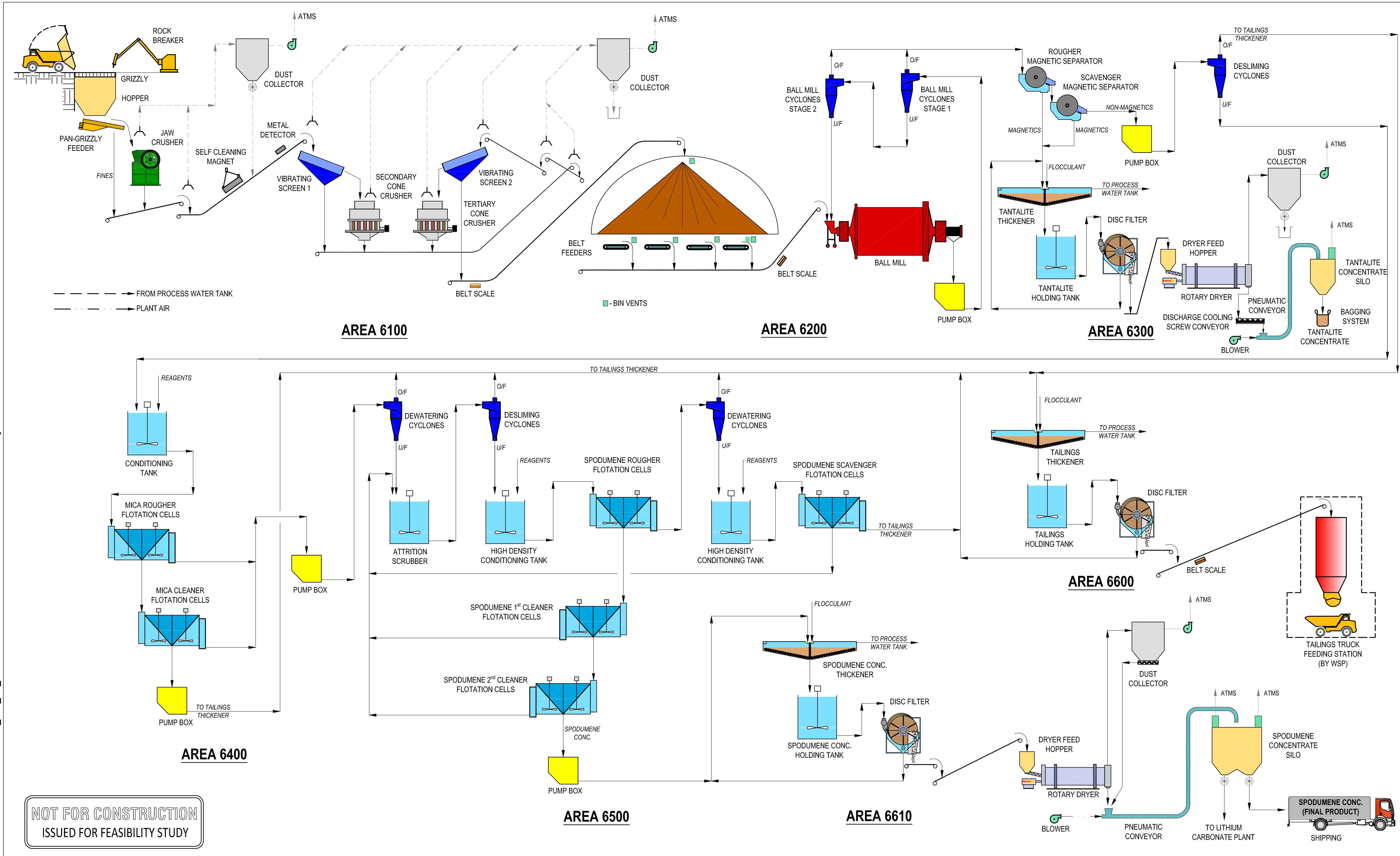
Differences are due to rounding



APPENDIX

17 B

PROCESS FLOWSHEETS



REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				E	31-03-2017	AREA CODE CHANGED	S.K.
				D	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				C	02-02-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				B	26-01-2017	ISSUED FOR COMMENTS	S.K.
F	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.	A	12-12-2016	ISSUED FOR COMMENTS	S.K.
		AREA 6100 / 6300 / 6600 / 6610 WAS REVISED		P03	01-11-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S. Koppalkar	15-09-2016
DRAWN:	A. Cristea	15-09-2016
VERIFY:	S. Koppalkar	16-09-2016
APPROVED:	F. Baril, ing.	16-09-2016

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CLIENT: Critical Elements Corporation

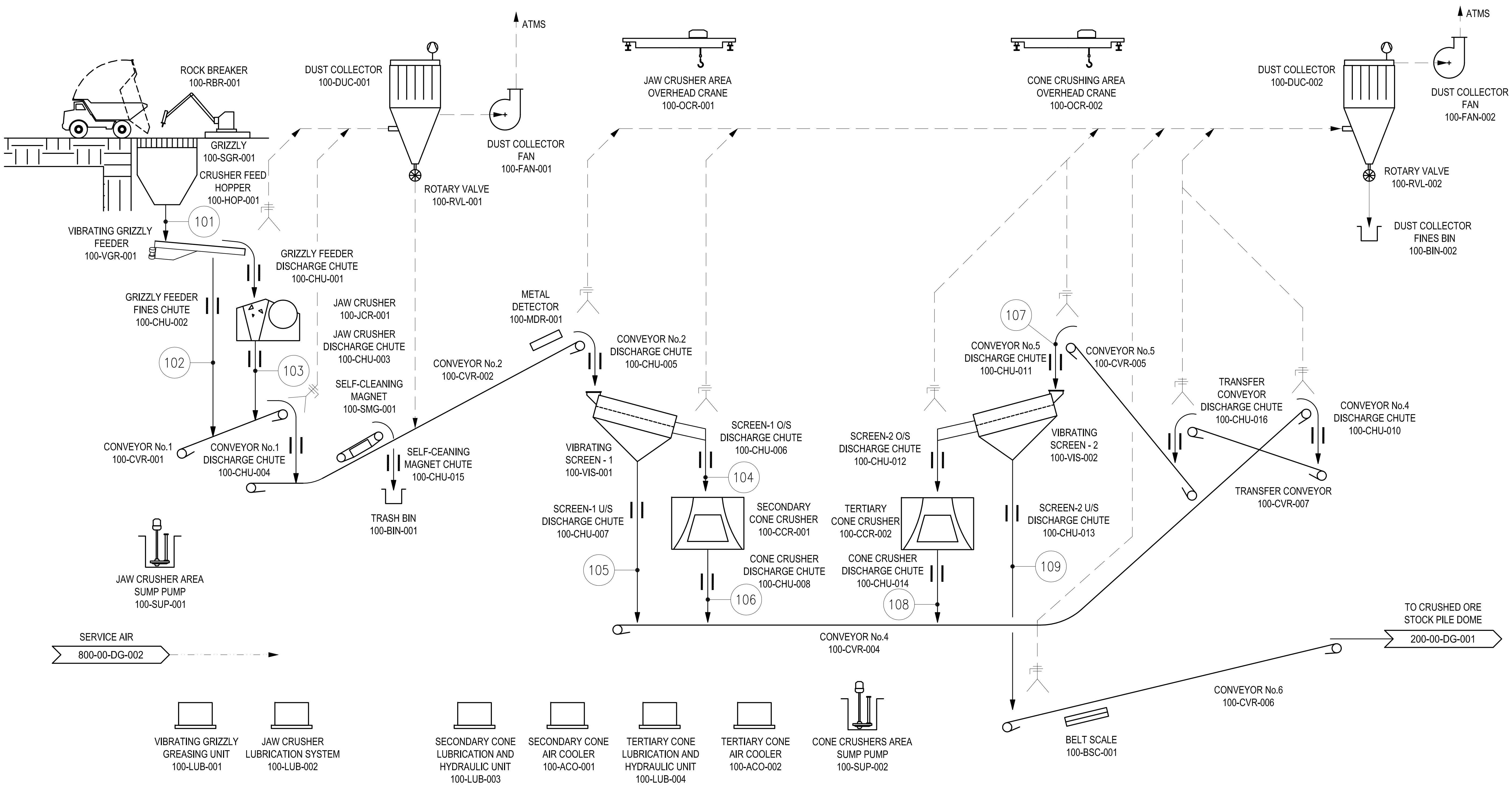
PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: SIMPLIFIED PROCESS FLOWSHEET

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 - 00 - DG - 001 (PROJECT - DISC. - TYPE - SEQ.) | REV. F

SAVED ON: 17-07-31 9:34 BY Jbradette
PATH: Z:\INGENERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20203-ÉtudeFaisabilité_43-101_Rose_Juillet 2016\DESS\00-PROCE\CAD detailed PFD - final\C20203-00-DG-001-F (PFD SIMPLIFIED).dwg



Crushing Area		Vibrating feeder feed	Jaw crusher by-pass	Jaw crusher product	Screen 1 oversize	Screen 1 undersize	Secondary crusher product	Screen 2 feed	Tertiary crusher product	Screen 2 undersize
Stream No.		101	102	103	104	105	106	107	108	109
Solids	t/h	408,3	178,0	230,4	329,7	78,6	329,7	728,2	319,9	408,3
Solution	t/h	21,5	9,4	12,1	17,4	4,1	17,4	38,3	16,8	21,5
Slurry	t/h	429,8	187,3	242,5	347,1	82,7	347,1	766,6	336,7	429,8
Slurry	m^3/h	172,2	75,0	97,1	139,0	33,1	139,0	307,0	134,9	172,2
Solids	Sp. Gr.	2,71	2,71	2,71	2,71	2,71	2,71	2,71	2,71	2,71
Slurry	Sp. Gr.	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,50
Solids	wt. %	95%	95%	95%	95%	95%	95%	95%	95%	95%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6100

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
						AREA 6100 CONVEYORS REVISED	
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A.CRISTEA	18-11-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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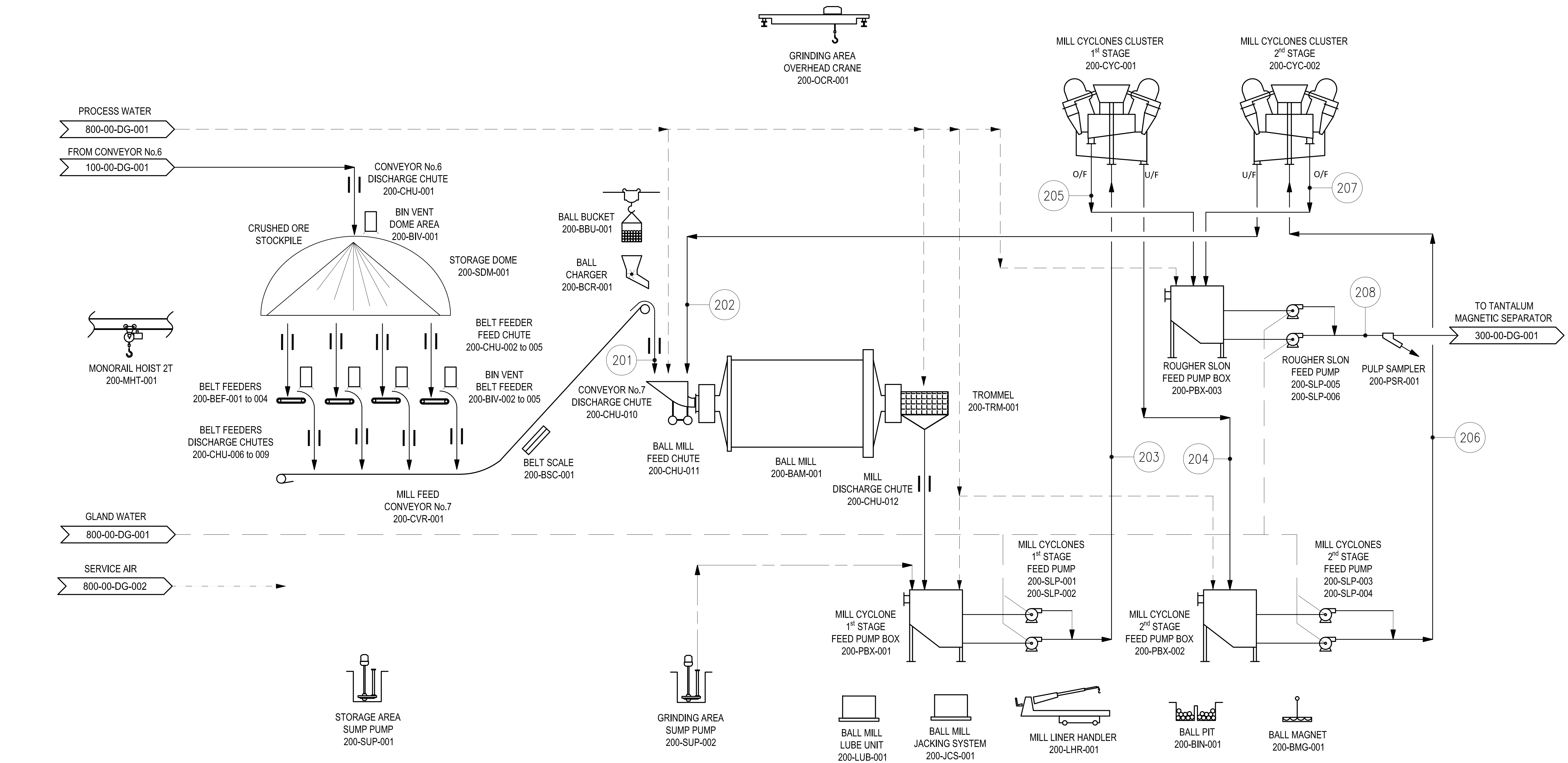
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
CRUSHING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 100 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)



Grinding Area		Fresh feed from stockpile	Cyclone 2 underflow	Stage 1 Cyclone feed	Cyclone 1 underflow	Cyclone 1 overflow	Stage 2 cyclone feed	Cyclone 2 overflow	Combined cyclone overflow
Stream No.		201	202	203	204	205	206	207	208
Solids	t/h	226,9	340,3	567,1	368,6	198,5	368,6	28,4	226,9
Solution	t/h	11,9	113,4	445,6	122,9	322,7	132,9	19,5	342,1
Slurry	t/h	238,8	453,7	1012,7	491,5	521,2	501,5	47,8	569,0
Slurry	m^3/h	95,6	237,7	653,6	258,1	395,5	268,1	29,9	425,8
Solids	Sp. Gr.	2,71	2,74	2,73	2,73	2,73	2,73	2,73	2,71
Slurry	Sp. Gr.	2,50	1,91	1,55	1,90	1,32	1,87	1,60	1,34
Solids	wt. %	95%	75%	56%	75%	38%	74%	59%	40%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6200

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A.CRISTEA	18-11-2016
VERIFY:	S.KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
STORAGE AND GRINDING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 200 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)

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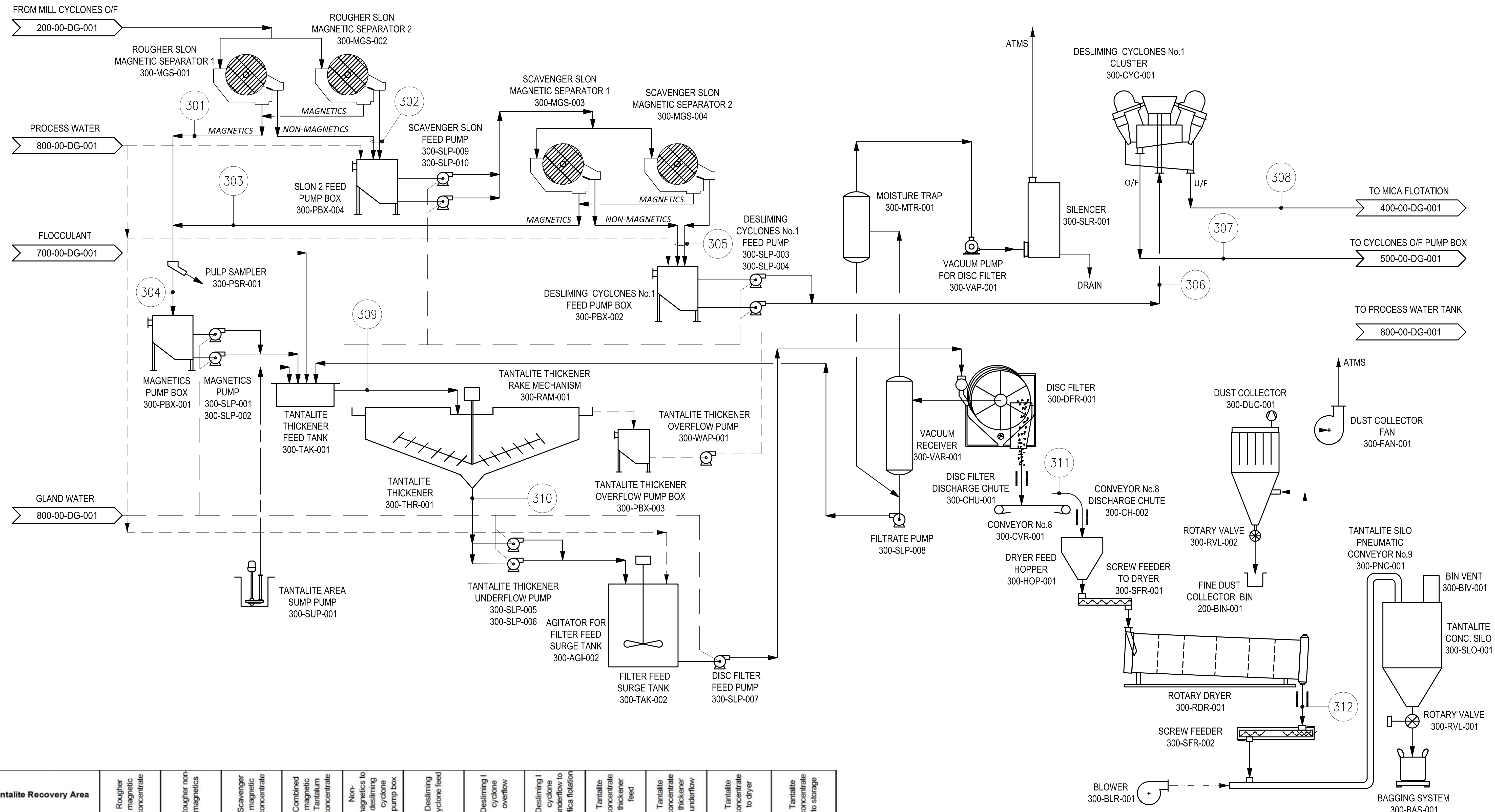

Tantalite Recovery Area		Rougher magnetic concentrate	Rougher non-magnetics	Scavenger magnetic concentrate	Combined magnetic Tantalum concentrate	Non-magnetics to desliming cyclone pump box	Desliming cyclone feed	Desliming I cyclone overflow	Desliming I cyclone underflow to Mica flotation	Tantalite concentrate thickener feed	Tantalite concentrate thickener underflow	Tantalite concentrate to dryer	Tantalite concentrate to storage
Stream No.		301	302	303	304	305	306	307	308	309	310	311	312
Solids	t/h	1,2	225,7	0,8	2,0	224,9	224,9	5,2	219,7	2,0	2,0	2,0	2,0
Solution	t/h	0,8	391,3	0,8	1,6	390,5	390,5	125,1	265,5	11,3	1,1	0,4	0,0
Slurry	t/h	2,0	617,0	1,6	3,6	615,4	615,4	130,3	485,1	13,3	3,1	2,3	2,0
Slurry	m^3/h	1,1	474,9	1,0	2,1	473,8	473,8	127,0	346,8	11,8	1,6	0,9	0,6
Solids	Sp. Gr.	3,72	2,70	3,72	3,72	2,70	2,70	2,69	2,70	3,72	3,72	3,72	3,72
Slurry	Sp. Gr.	1,78	1,30	1,58	1,68	1,30	1,30	1,03	1,40	1,12	1,91	2,64	3,62
Solids	wt. %	60%	37%	50%	56%	37%	37%	4%	45%	15%	65%	85%	99%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6300

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.) AREA 6300 PADDLE DRYER REPLACED BY A ROTARY DRYER	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A.CRISTEA	12-12-2016
VERIFY:	S.KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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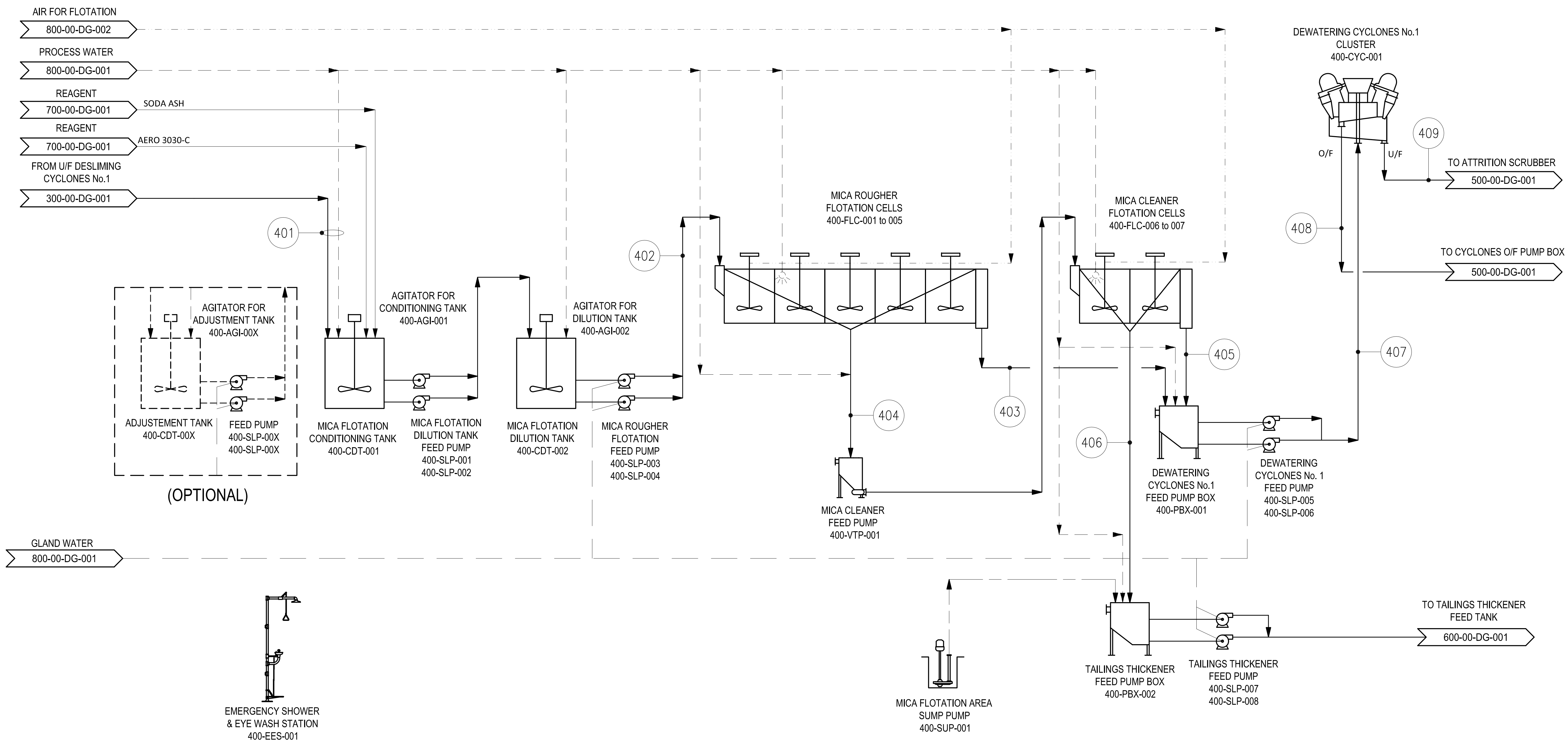
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 300 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) C (REV.)



Mica Flotation Area		Conditionning tank feed	Rougher feed	Rougher tails	Mica rougher concentrate	Cleaner tails	Cleaner concentrate	Cyclone feed	Cyclone overflow	Cyclone underflow
Stream No.		401	402	403	404	405	406	407	408	409
Solids	t/h	219,7	219,7	208,4	11,3	5,2	6,1	213,5	4,3	209,3
Solution	t/h	280,5	405,5	399,4	18,1	14,0	6,1	413,4	343,6	69,8
Slurry	t/h	500,1	625,1	607,8	29,4	19,2	12,2	626,9	347,9	279,0
Slurry	m^3/h	361,8	486,8	476,6	22,2	15,9	8,3	492,5	345,3	147,2
Solids	Sp. Gr.	2,70	2,70	2,70	2,77	2,78	2,76	2,57	2,52	2,57
Slurry	Sp. Gr.	1,38	1,28	1,28	1,33	1,21	1,47	1,27	1,01	1,90
Solids	wt. %	44%	35%	34%	38%	27%	50%	34%	1%	75%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6400

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A. CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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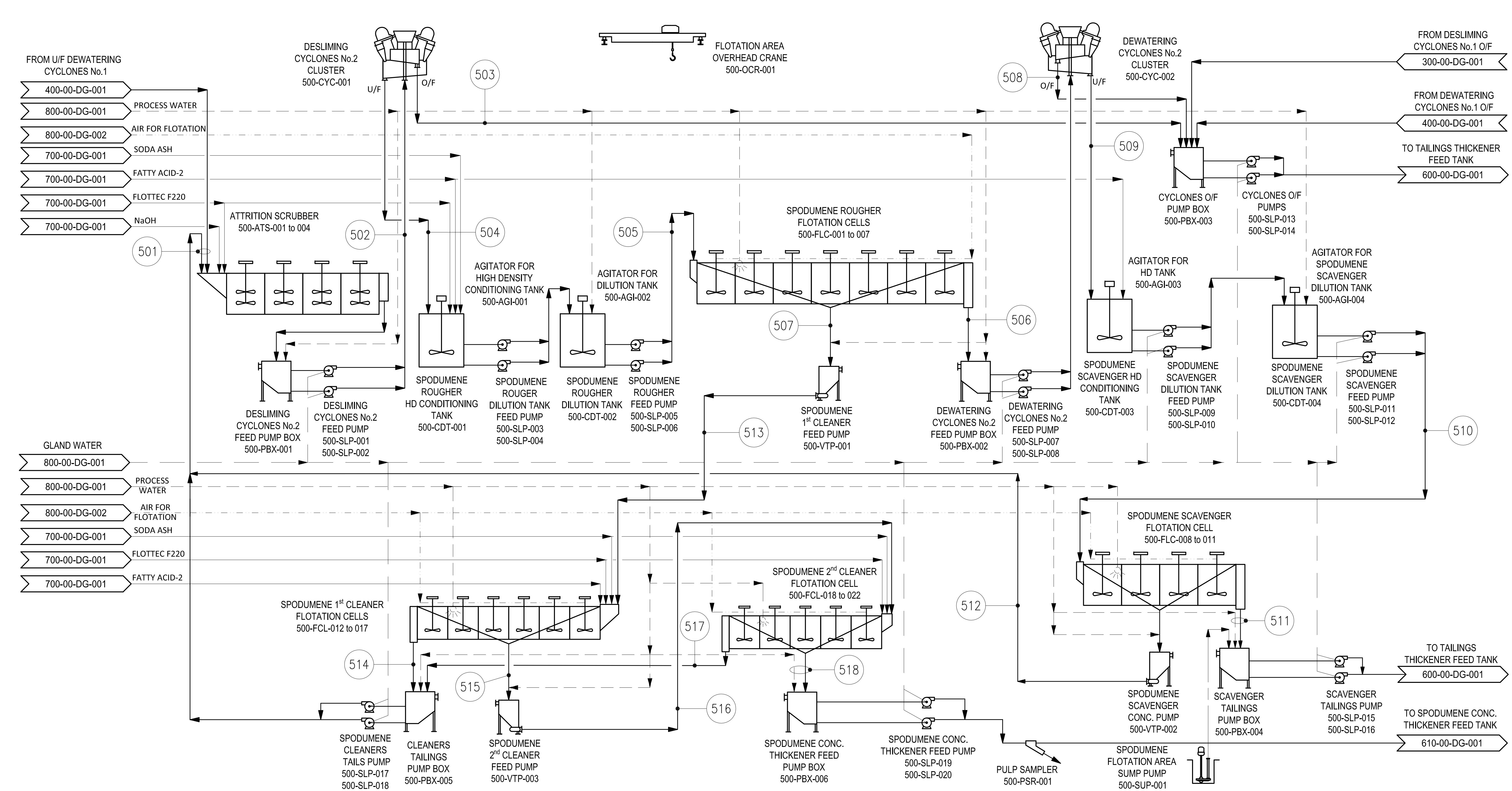
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
MICA FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 400 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)



Spodumene Flotation Area		Attrition scrubber feed	Cyclones feed	Cylone overflow	Cyclone underflow	Rougher feed	Rougher tails	Rougher concentrate	Cyclone overflow	Cyclone underflow	Scavenger feed	Scavenger tails	Scavenger Concentrate	First cleaner feed	First cleaner tails	First cleaner concentrate	Second cleaner feed	Second cleaner tails	Second cleaner concentrate
Stream No.		501	502	503	504	505	506	507	508	509	510	511	512	513	514	515	516	517	518
Solids	t/h	305,0	305,0	6,6	298,4	298,4	263,2	35,2	0,1	263,1	263,1	174,9	88,2	35,2	7,2	28,0	28,0	0,3	27,7
Solution	t/h	177,4	197,4	124,9	72,5	337,5	314,0	33,5	138,6	175,4	305,4	246,6	61,8	53,5	25,5	33,0	48,0	20,3	32,7
Slurry	t/h	482,4	502,4	131,5	370,9	635,9	577,2	68,7	138,7	438,5	568,5	421,5	150,1	88,7	32,7	60,9	75,9	20,6	60,4
Slurry	m^3/h	287,4	307,4	127,4	180,0	445,0	410,2	44,8	135,0	275,3	405,3	316,6	91,7	64,8	27,9	42,2	57,2	20,7	41,5
Solids	Sp. Gr.	2,69	2,69	2,65	2,69	2,69	2,64	3,10	2,60	2,64	2,64	2,63	2,96	3,10	2,98	3,03	3,03	2,99	3,13
Slurry	Sp. Gr.	1,68	1,63	1,03	2,06	1,43	1,41	1,53	1,03	1,59	1,40	1,33	1,64	1,37	1,17	1,44	1,33	1,00	1,45
Solids	wt. %	63%	61%	5%	80%	47%	46%	51%	0%	60%	46%	41%	59%	40%	22%	46%	37%	1%	46%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6500

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A. CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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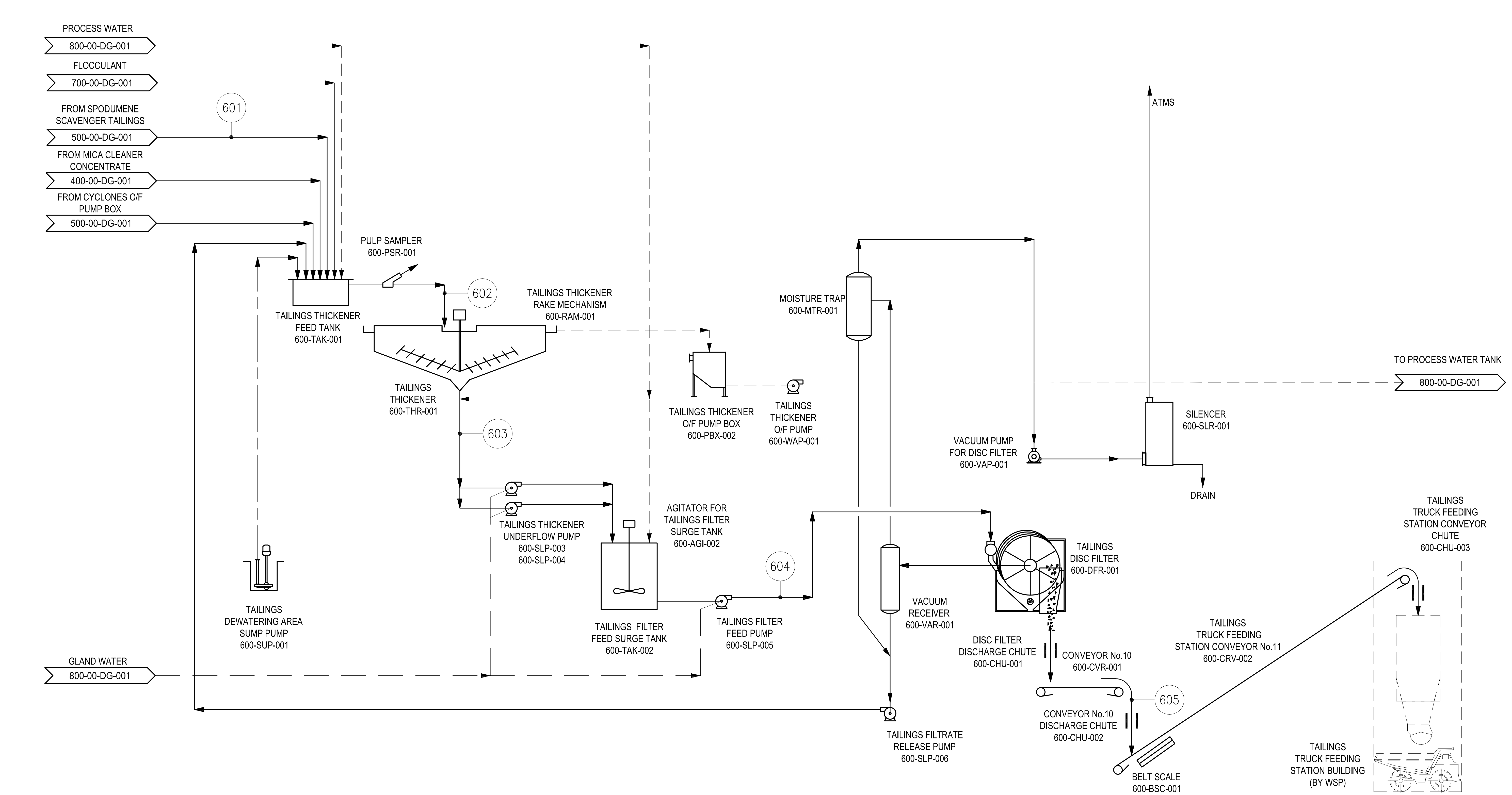
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 500 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)



Tailings Dewatering Area		Scavenger tailings	Tailings thickener feed	Tailings thickener underflow	Tailings filter feed	Tailings for dry stacking
Stream No.		601	602	603	604	605
Solids	t/h	174,9	197,2	197,2	197,2	197,2
Solution	t/h	246,6	1114,4	131,5	151,5	21,9
Slurry	t/h	421,5	1311,6	328,7	348,7	219,1
Slurry	m^3/h	313,0	1188,8	205,9	225,9	96,3
Solids	Sp. Gr.	2,63	2,65	2,65	2,65	2,65
Slurry	Sp. Gr.	1,35	1,10	1,60	1,54	2,27
Solids	wt. %	41%	15%	60%	57%	90%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6600

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.) AREA 6600 TRANSFER CONV. & STOCKPILE DOME REMOVED & TAILINGS TRUCK FEEDING STATION ADDED (BY WSP)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A. CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
TAILINGS DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) | 600 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)

SAVED ON: 17-08-09 9:24 BY Jbradette
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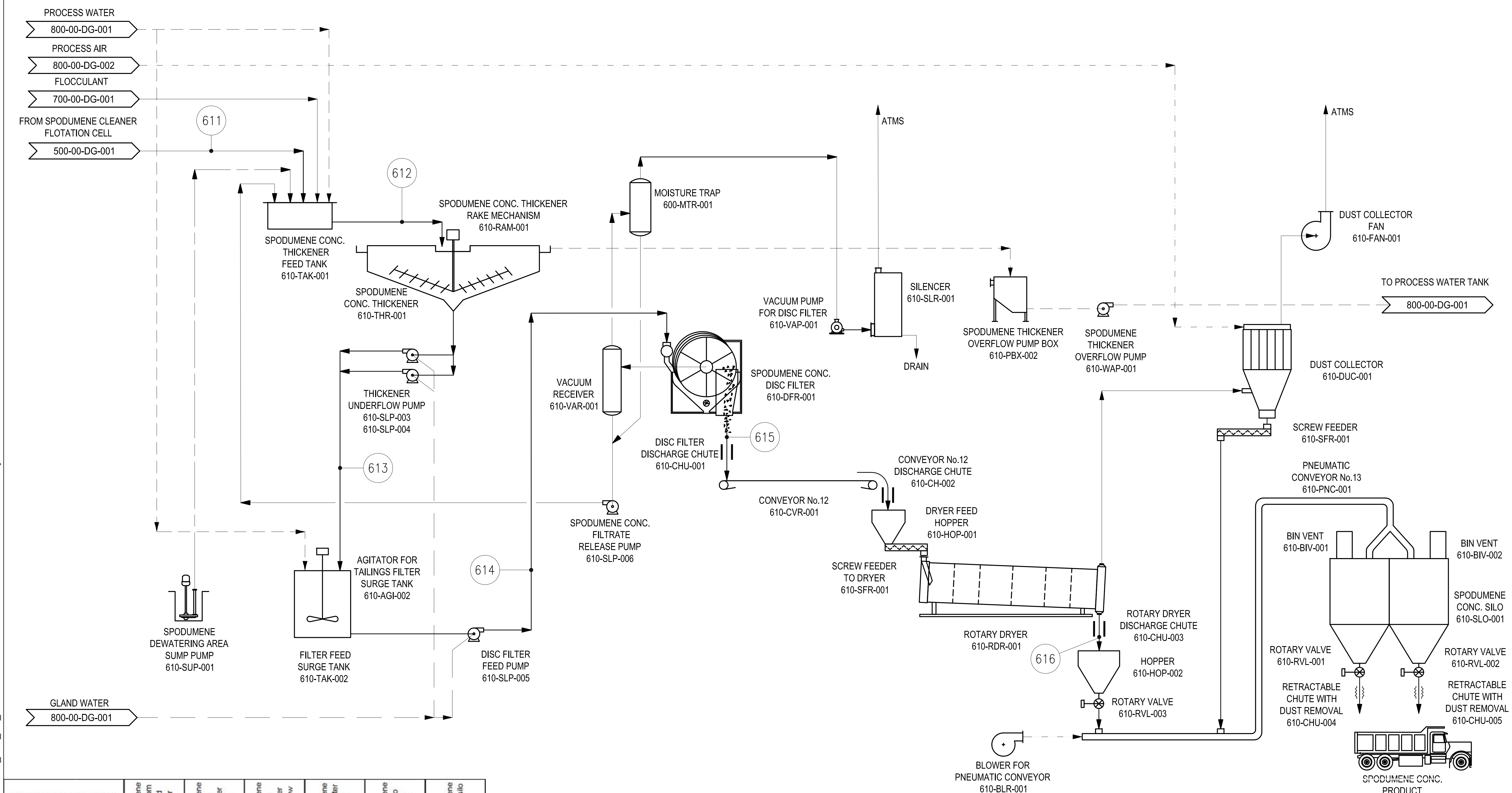

Spodumene Concentrate Dewatering Area		Spodumene conc. from second cleaner	Spodumene conc. thickener feed	Spodumene conc. thickener underflow	spodumene conc. Filter feed	Spodumene conc. to dryer	Spodumene storage silo
Stream No.		611	612	613	614	615	616
Solids	t/h	27,7	27,7	27,7	27,7	27,7	27,7
Solution	t/h	32,7	183,0	14,9	14,9	4,5	0,3
Slurry	t/h	60,4	210,7	42,6	42,6	32,2	28,0
Slurry	m^3/h	41,5	191,8	23,8	23,8	13,4	9,1
Solids	Sp. Gr.	3,13	3,13	3,13	3,13	3,13	3,13
Slurry	Sp. Gr.	1,45	1,10	1,79	1,79	2,41	3,06
Solids	wt. %	46%	13%	65%	65%	86%	99%

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6610

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A. CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

BUMIGEME
Mining, Geology and Metallurgy
615, René-Levesque O. Room 750
Montréal, Québec, H3B 1P5, Canada
Tél. 514-843-6565, Fax. 514-843-6508, www.bumigeme.com

CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PROCESS FLOW DIAGRAM
SPODUMENE DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 610 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) C (REV.)

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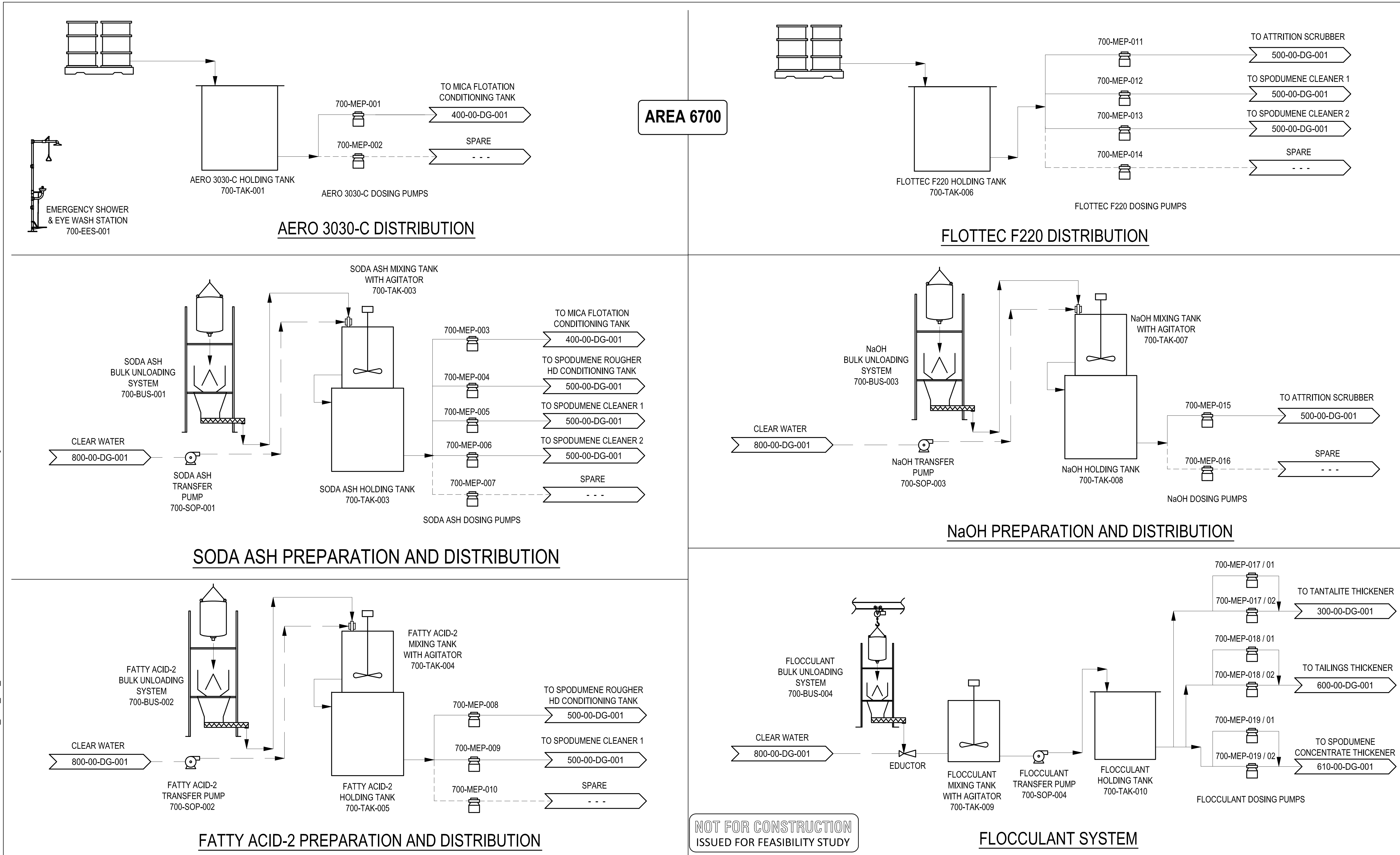

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
REAGENTS PREPARATION

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 700 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)

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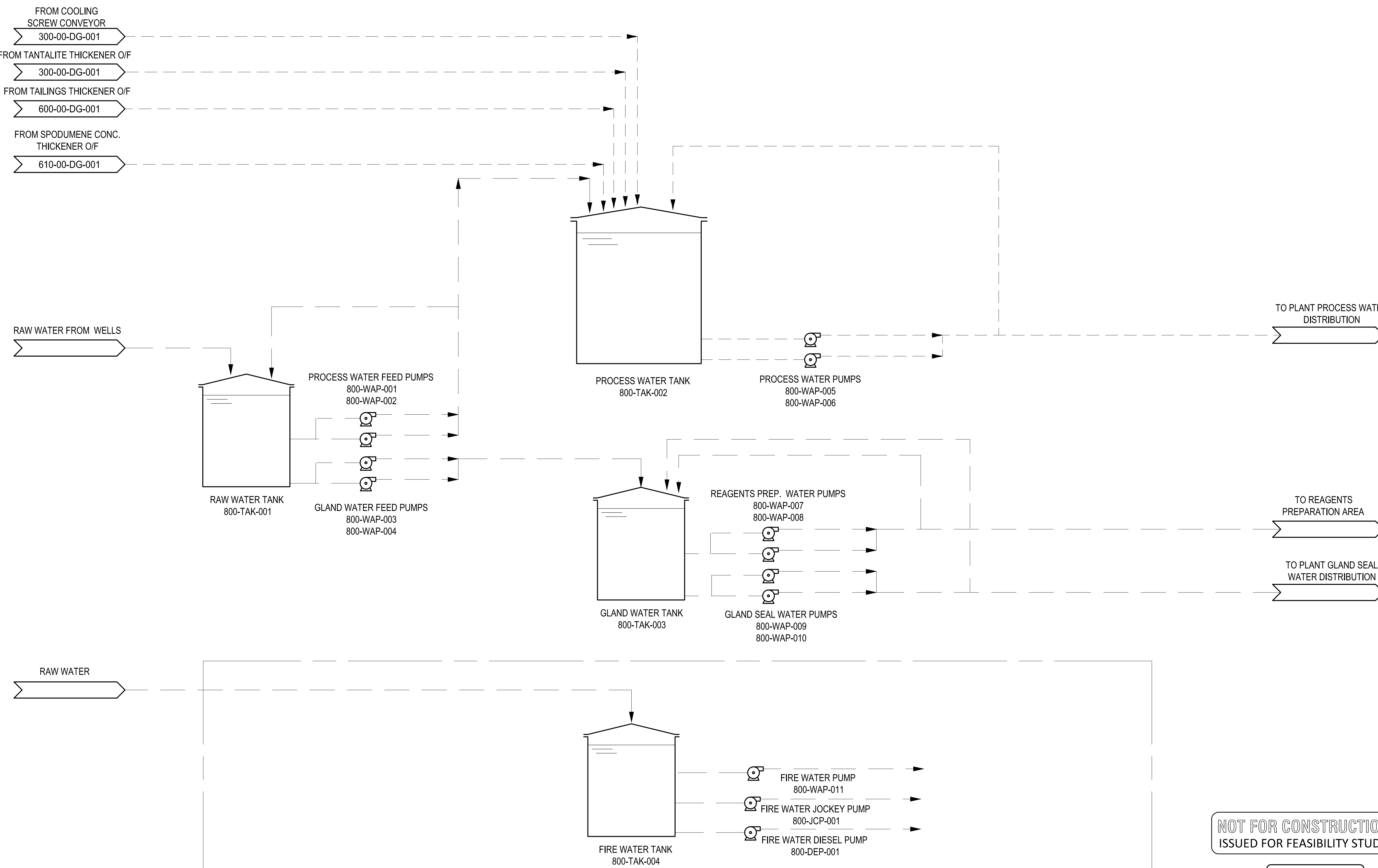

(FIRE PROTECTION BY WSP)

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6800

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A.CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
WATER SERVICES

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/2

DRAWING NO.: C20203 (PROJECT) 800 (AREA) - 00 (DISC.) - DG (TYPE) - 001 (SEQ.) | C (REV.)

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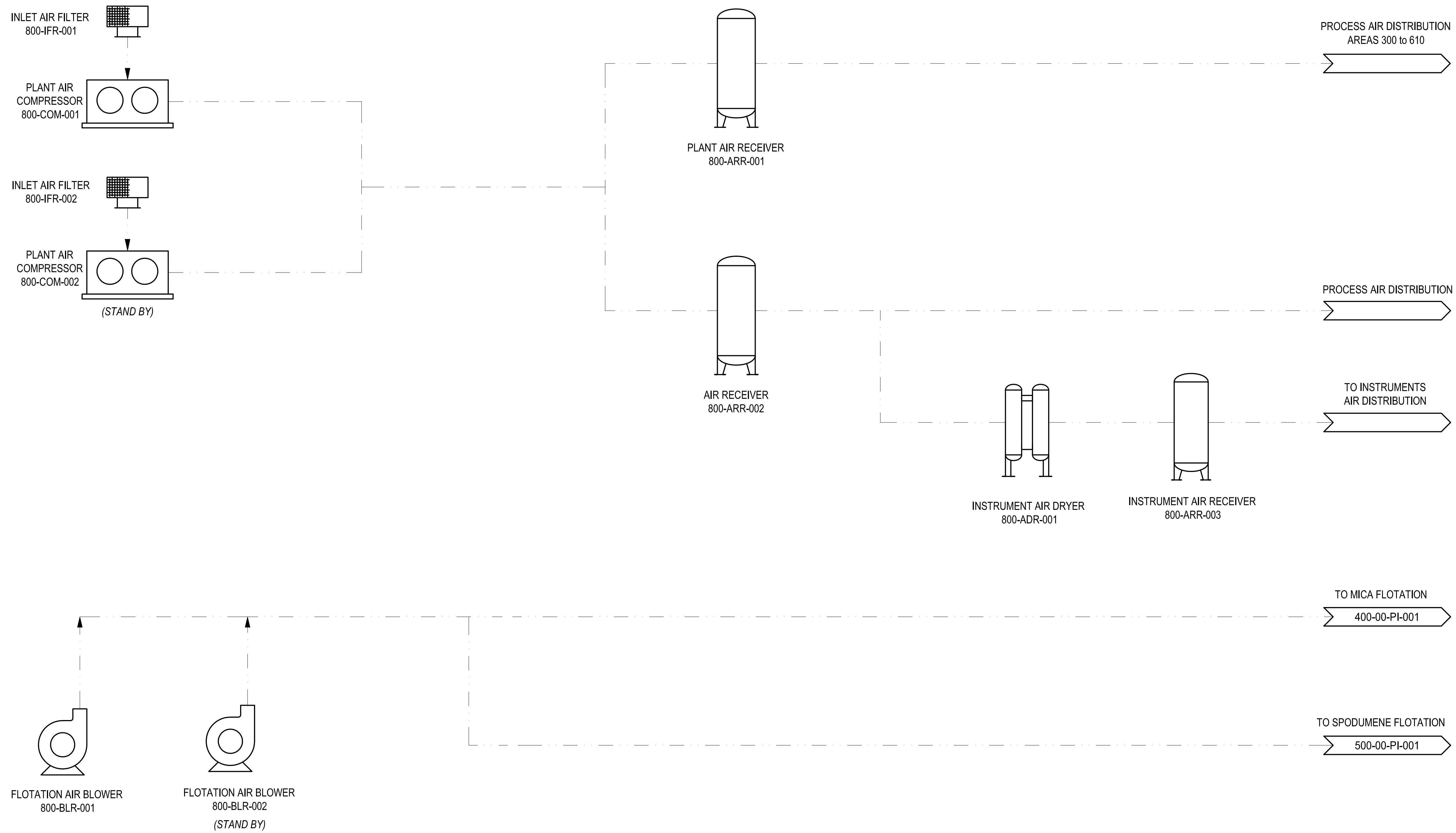

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6800

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
				A	19-12-2016	ISSUED FOR COMMENTS	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	A.CRISTEA	12-12-2016
VERIFY:	S. KOPPALKAR	15-12-2016
APPROVED:	F. BARIL ing.	15-12-2016

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PROCESS FLOW DIAGRAM
AIR SERVICES

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 800 (AREA) - 00 (DISC.) - DG (TYPE) - 002 (SEQ.) | C (REV.)

SAVED ON: 17-08-09 9:24 BY Jbradette
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APPENDIX

17C

EQUIPMENT LIST

EQUIPMENT LIST

CriticalElements Corporation

BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT

PROJECT NUMBER: C20203

BUMIGEME
Bureau mines, geologie et metallurgie

Doc No.: C20203-00-RE-001 Detailed

PREPARED BY: Sunil Koppalkar	VERIFIED BY: Lies Amkhoukh	APPROVED BY: F. Baril	REV. D	DATE: 03-05-2022

Area	AREA CODE	EQUIP CODE	#ITEM	EQUIPMENT TAG	DESCRIPTION	CAPACITY / DIMS.	POWER, kW Operating	POWER, kW Standby	MODEL	POSSIBLE SUPPLIER
100 - CRUSHING	100	RBR	001	100-RBR-001	Hydraulic Rock Breaker	SA440/HA30/M15	39	0	M440	Sandvik
	100	SGR	001	100-SGR-001	Stationary Grizzly	900mm x 900mm	0			Database
	100	HOP	001	100-HOP-001	Crusher feed Hopper	140 t capacity	0			Database
	100	VGR	001	100-VGR-001	Vibrating Grizzly Feeder	1600 mm wide x 6100 m long	30	0	VF661	Metso
	100	LUB	001	100-LUB-001	Vibrating Grizzly Greasing Unit		8			
	100	CHU	001	100-CHU-001	Grizzly Feeder Discharge Chute		0			Database
	100	CHU	002	100-CHU-002	Grizzly Feeder Fines Chute		0			Database
	100	JCR	001	100-JCR-001	Jaw Crusher	1100 x 1400 mm	224	0	C150	Metso
	100	LUB	002	100-LUB-002	Jaw Crusher Lubrication System		8			
	100	CHU	003	100-CHU-003	Jaw Crusher Discharge Chute		0			LMManutentions
	100	CVR	001	100-CVR-001	Belt Conveyor No.1	1050 mm wide x 16.5 m long, horizontal	11			LMManutentions
	100	CHU	004	100-CHU-004	Belt Conveyor No.1 Discharge Chute		0			LMManutentions
	100	CVR	002	100-CVR-002	Belt Conveyor No.2	1050 mm wide x 70 m long, 15 degrees	56			LMManutentions
	100	SMG	001	100-SMG-001	Self cleaning magnet		10			Database
	100	CHU	015	100-CHU-015	Self cleaning magnet chute		0			Database
	100	BIN	001	100-BIN-001	Trash Bin (6000 lbs. Capacity)	Heavy duty steel dumping hopper (1 cu.yard)	0			Uline.Ca
	100	MDR	001	100-MDR-001	Metal detector		0			Database
	100	CHU	005	100-CHU-005	Belt Conveyor No.2 Discharge Chute		0			Database
	100	VIS	001	100-VIS-001	Vibrating Screen -1	1800 x 4800 mm	30	0	RF 1848-2	Metso
	100	CHU	006	100-CHU-006	Screen 1 O/S Discharge Chute		0			Database
	100	CHU	007	100-CHU-007	Screen 1 U/S Discharge Chute		0			Database
	100	CCR	001	100-CCR-001	Secondary Cone Crusher	HP400	300	0	HP400	Metso
	100	LUB	003	100-LUB-003	Secondary Cone Lubrication and Hydraulic Unit		8			
	100	ACO	001	100-ACO-001	Secondary Cone Air Cooler		6			
	100	CHU	008	100-CHU-008	Cone Crusher Discharge Chute		0			Database
	100	CVR	004	100-CVR-004	Belt Conveyor No.4	1050 mm wide x 65 m long, 15 degrees	75			LMManutentions
	100	CHU	010	100-CHU-010	Belt Conveyor No.4 Discharge Chute		0			LMManutentions
	100	CVR	007	100-CVR-007	Transfer conveyor	1050 mm wide x 8 m long, horizontal	15			Database
	100	CHU	016	100-CHU-016	Transfer conveyor Chute					Database
	100	CVR	005	100-CVR-005	Belt Conveyor No.5	1050 mm wide x 69 m long, 15 degrees	75			LMManutentions
	100	CHU	011	100-CHU-011	Belt Conveyor No.5 Discharge Chute		0			Database
	100	VIS	002	100-VIS-002	Vibrating Screen-2	2400 x 8500 mm	40,0	0	MF 1861-2	Metso
	100	CHU	012	100-CHU-012	Screen 2 O/S Discharge Chute		0,0			Database
	100	CHU	013	100-CHU-013	Screen 2 U/S Discharge Chute		0,0			Database
	100	CCR	002	100-CCR-002	Tertiary Cone Crusher	HP5	375	0	HP5	Metso
	100	LUB	004	100-LUB-004	Tertiary Cone Lubrication and hydraulic unit		8			
	100	ACO	002	100-ACO-002	Tertiary Cone Air Cooler		6			
	100	CHU	014	100-CHU-014	Cone Crusher Discharge Chute		0			Database
	100	CVR	006	100-CVR-006	Crushed ore Storage Dome Feed Conveyor No.6	1050 mm wide x 105 m long	45			LMManutentions
	100	BSC	001	100-BSC-001	Belt Scale		0			Database
	100	DUC	001	100-DUC-001	Jaw crusher area Dust Collector	15389 CFM Baghouse type	0			Envisecure Inc
	100	FAN	001	100-FAN-001	Dust Collector Fan	15400 acfm fan	37			
	100	DUC	002	100-DUC-002	Cone crusher area Dust Collector	33471 CFM Baghouse type	0			Envisecure Inc
	100	FAN	002	100-FAN-002	Dust Collector Fan	33500 acfm fan	93			
	100	BIN	002	100-BIN-002	Dust Collector Fines Bin	Heavy duty steel dumping hopper (1 cu.yard)	0			Uline.Ca
	100	SUP	001	100-SUP-001	Jaw Crusher area sump pump		11	0	VS50 L150	Metso
	100	SUP	002	100-SUP-002	Cone Crusher area sump pump		11	0	VS50 L150	Metso
	100	OCR	001	100-OCR-001	Jaw Crusher Area Overhead Crane	16 t crane	22	0	tahl Double girde	Premium
	100	OCR	002	100-OCR-002	Cone Crusher Area Overhead Crane	5 t crane	13	0		Premium
200 - CRUSHED ORE STORAGE AND GRINDING	200	CHU	001	200-CHU-001	Belt Conveyor No.6 Discharge Chute		0			Database
	200	SDM	001	200-SDM-001	Crushed ore Storage Dome	9200 mt capacity, 40 m dia. X 20 m high	0	0		Triodetec
	200	CHU	002	200-CHU-002	Belt Feeder Feed Chute	Neddle gate manually operated single neddle ro	0	0	included	Sandvik
	200	CHU	003	200-CHU-003	Belt Feeder Feed Chute	Neddle gate manually operated single neddle ro	0	0	included	Sandvik
	200	CHU	004	200-CHU-004	Belt Feeder Feed Chute	Neddle gate manually operated single neddle ro	0	0	included	Sandvik
	200	CHU	005	200-CHU-005	Belt Feeder Feed Chute	Neddle gate manually operated single neddle ro	0	0	included	Sandvik
	200	BEF	001	200-BEF-001	Belt feeder	50-150 t/h, 650 mm wide x 2m long	4	0	HF 100 -650/2	Sandvik
	200	BEF	002	200-BEF-002	Belt feeder	50-150 t/h, 650 mm wide x 2m long	4	0	HF 100 -650/2	Sandvik
	200	BEF	003	200-BEF-003	Belt feeder	50-150 t/h, 650 mm wide x 2m long	0	4	HF 100 -650/2	Sandvik
	200	BEF	004	200-BEF-004	Belt feeder	50-150 t/h, 650 mm wide x 2m long	0	4	HF 100 -650/2	Sandvik
	200	CHU	006	200-CHU-006	Belt feeder discharge chute	Wear liners AR400 PL12, Hmax = 1000 mm	0	0	included	Sandvik
	200	CHU	007	200-CHU-007	Belt feeder discharge chute	Wear liners AR400 PL12, Hmax = 1000 mm	0	0	included	Sandvik
	200	CHU	008	200-CHU-008	Belt feeder discharge chute	Wear liners AR400 PL12, Hmax = 1000 mm	0	0	included	Sandvik
	200	CHU	009	200-CHU-009	Belt feeder discharge chute	Wear liners AR400 PL12, Hmax = 1000 mm	0	0	included	Sandvik
	200	MHT	001	200-MHT-001	Monorail Hoist	2t capacity	5	0	CXTM	KoneCrane
	200	BIV	001	200-BIV-001	Bin Vent Dome area	Cartridge Bin vent dust collector	6	0		Envisecure Inc
	200	BIV	002	200-BIV-002	Bin Vent belt feeder	Cartridge Bin vent dust collector	6	0		Envisecure Inc
	200	BIV	003	200-BIV-003	Bin Vent belt feeder	Cartridge Bin vent dust collector	6	0		Envisecure Inc
	200	BIV	004	200-BIV-004	Bin Vent belt feeder	Cartridge Bin vent dust collector	6	0		Envisecure Inc
	200	BIV	005	200-BIV-005	Bin Vent belt feeder	Cartridge Bin vent dust collector	6	0		Envisecure Inc
	200	SUP	001	200-SUP-001	Storage area Sump Pump		11	0	VS50 L150	Metso
	200	CVR	001	200-CVR-001	Ball Mill Feed Conveyor No.7	900 mm wide x 115 m long, 12 degrees	45			LMManutentions
	200	BSC	001	200-BSC-001	Belt Scale		0			Database
	200	CHU	010	200-CHU-010	Belt Conveyor No.7 Discharge Chute		0			Database
	200	BBU	001	200-BBU-001	Ball Bucket		0			Database
	200	BCR	001	200-BCR-001	Ball Charger		10			Database
	200	CHU	011	200-CHU-011	Ball Mill Feed Chute		0			Outotec
	200	BAM	001	200-BAM-001	Ball Mill	5.00 m dia. x 8.2 m	3550	0	Overflow	Outotec
	200	TRM	001	200-TRM-001	Trommel		0			
	200	JCS	001	200-JCS-001	Ball Mill Jacking System		10			
	200	LUB	001	200-LUB-001	Ball Mill Lube Unit		10			
	200	CHU	012	200-CHU-012	Mill Discharge Chute		0			Database
	200	PBX	001	200-PBX-001	Mill cyclones 1st Stage Feed Pump Box		0			LMManutentions
	200	SLP	001	200-SLP-001	Mill cyclone 1st Stage Feed Pump	10" x 8" AH	224	0	10/8 AH	Weir
	200	SLP	002	200-SLP-002	Mill cyclone 1st Stage Feed Pump	10" x 8" AH	0	224	10/8 AH	Weir
	200	CYC	001	200-CYC-001	Mill Cyclone Cluster -1st Stage	6 x gMax15	0		gMax	FLSmidth
	200	PBX	002	200-PBX-002	Mill cyclones 2nd Stage Feed Pump Box		0			LMManutentions
	200	SLP	003	200-SLP-003	Mill cyclone 2nd Stage Feed Pump	8" x 6" AH	149	0	8/6 AH	Weir
	200	SLP	004	200-SLP-004	Mill cyclone 2nd Stage Feed Pump	8" x 6" AH	0	149	8/6 AH	Weir
	200	CYC	002	200-CYC-002	Mill Cyclone Cluster -2nd stage	4 x gMax15	0		gMax	FLSmidth
	200	PBX	003	200-PBX-003	Rougher SLon Feed Pump Box		0			LMManutentions
	200	SLP	005	200-SLP-005	Rougher SLon Feed Pump	10" x 8" AH	75	0	10/8 AH	Weir
	200	SLP	006	200-SLP-006	Rougher SLon Feed Pump	10" x 8" AH	0	75	10/8 AH	Weir
	200	LHR	001	200-LHR-001	Mill Liner Handler	400 kg capacity -Liner handler	20	0	Millmast	RME
	200	BIN	001	200-BIN-001	Ball Pit	4 m x 6 m x 4 m	0			Database
	200	BMG	001	200-BMG-001	Ball Magnet		15			Database
	200	OCR	001	200-OCR-001	Grinding Area Overhead Crane	30 t capacity	37	0		KoneCrane
	200	SUP	002	200-SUP-002	Grinding Area Sump Pump		11	0	VS50 L150	Metso
	200	PSR	001	200-PSR-001	Pulp sampler		4	0		Database
	300	MGS	001	300-MGS-001	Rougher SLon Magnetic Separator 1	5.8 m L x 5.0 m W x 5.4 m H	22	0	SLon 2500	Outotec
	300	MGS	002	300-MGS-002	Rougher SLon Magnetic Separator 2	5.8 m L x 5.0 m W x 5.4 m H	22	0	SLon 2500	Outotec
	300	MGS	001	300-MGS-001	Scavenger SLon Magnetic Separator 1	5.8 m L x 5.0 m W x 5.4 m H	22	0	SLon 2500	Outotec
	300	MGS	002	300-MGS-002	Scavenger SLon Magnetic Separator 2	5.8 m L x 5.0 m W x 5.4 m H	22	0	SLon 2500	Outotec
	300	PBX	001	300-PBX-001	Magnetics Pump Box		0			LMManutentions
	300	SLP	001	300-SLP-001	Magnetics Pump	1.5" x 1" AH	4	0	1.5/1 AH	Weir
	300	SLP	002	300-SLP-002	Magnetics Pump	1.5" x 1" AH	0	4	1.5/1 AH	Weir
	300	PBX	004	300-PBX-004	Scavenger SLon Feed Pump Box		0			LMManutentions
	300	SLP	009	300-SLP-009	Scavenger SLon Feed Pump	8" x 6" AH	75	0	8/6 AH	Weir
	300	SLP	010	300-SLP-010	Scavenger SLon Feed Pump	8" x 6" AH	0	75	8/6 AH	Weir

EQUIPMENT LIST

Critical Elements Corporation	BANKABLE FEASIBILITY STUDY ROSE LITHIUM TANTALUM PROJECT	BUMIGEME Bureau mines, geologie et metallurgie
	PROJECT NUMBER: C20203	
	Doc No.: C20203-00-RE-001 Detailed	

PREPARED BY: Sunil Koppalkar	VERIFIED BY: Lies Amkhoukh	APPROVED BY: F. Baril	REV. D	DATE: 03-05-2022

Area	AREA CODE	EQUIP CODE	#ITEM	EQUIPMENT TAG	DESCRIPTION	CAPACITY / DIMS.	POWER, kW Operating	POWER, kW Standby	MODEL	POSSIBLE SUPPLIER
300 - TANTALITE RECOVERY	300	PBX	002	300-PBX-002	Desliming Cyclones 1 Feed Pump Box		0			LMManutentions
	300	SLP	003	300-SLP-003	Desliming Cyclones 1 Feed Pump	8" x 6" AH	93	0	8/6 AH	Weir
	300	SLP	004	300-SLP-004	Desliming Cyclones 1 Feed Pump	8" x 6" AH	0	93	8/6 AH	Weir
	300	CYC	001	300-CYC-001	Desliming Cyclones No.1 Cluster	4-place gMax15	0,0		Krebs gMax	FLSmidth
	300	TAK	001	300-TAK-001	Tantalite Thickener Feed Tank		0	0		LMManutentions
	300	THR	001	300-THR-001	Tantalite Thickener	2.1 m dia. high rate thickener	0	0		Westpro
	300	RAM	001	300-RAM-001	Tantalite Thickener Rake mechanism		4			Westrro
	300	PBX	003	300-PBX-003	Tantalite Thickener O/F Pump Box		0			LMManutentions
	300	WAP	001	300-WAP-001	Tantalite Thickener O/F Pump	1.5" x 1"	4	0	LF3196	ITT Goulds
	300	SLP	005	300-SLP-005	Tantalite Thickener U/F Pump	1.5" x 1" AH	4	0	1.5/1 AH	Weir
	300	SLP	006	300-SLP-006	Tantalite Thickener U/F Pump	1.5" x 1" AH	0	4	1.5/1 AH	Weir
	300	TAK	002	300-TAK-002	Filter Feed Surge Tank	3.0 m dia. x 4 m	0			Westpro
	300	AGI	002	300-AGI-002	Agitator for Filter Feed Surge Tank	Agitator for 3m dia. x 4 m tank	11		AGT1013	Westpro
	300	SLP	007	300-SLP-007	Disk Filter Feed Pump	1.5" x 1" AH	4	0	1.5/1 AH	Weir
	300	DFR	001	300-DFR-001	Disc Filter with agitator	4' 0" dia. x 3 discs	2			IEMCO-KCP
	300	CHU	001	300-CHU-001	Disk Filter Discharge Chute		0			Database
	300	VAR	001	300-VAR-001	Vacuum Receiver	24" dia. x 60" long	0			
	300	SLP	008	300-SLP-008	Filtrate pump	1.5" x 1" AH	4	0	1.5/1 AH	IEMCO-KCP
	300	VAP	001	300-VAP-001	Vacuum Pump for Disc Filter	900 m3/h@ 500 mm HG	34			
	300	SLR	001	300-SLR-001	Silencer		0			
	300	MTR	001	300-MTR-001	Moisture Trap	24" dia. x 72" long	0			
	300	CVR	001	300-CVR-001	Disc Filter Discharge Conveyor No.8	900 mm wide x 16.5 m long, horizontal	7			LMManutentions
	300	CHU	002	300-CHU-002	Conveyor No.8 Discharge Chute		0			Database
	300	HOP	001	300-HOP-001	Dryer Feed Hopper	5 t capacity	0			Database
	300	SFR	001	300-SFR-001	Screw Feeder to Dryer		5			Database
	300	RDR	001	300-RDR-001	Rotary Dryer		30	0		Database
	300	SFR	002	300-SFR-002	Screw Feeder for Dryer Discharge					Database
	300	DUC	001	300-DUC-001	Dust Collector		0			Database
	300	FAN	001	300-FAN-001	Dust collector fan		4			Database
	300	RVL	002	300-RVL-002	Rotary Valve		1			Database
	300	BIN	001	300-BIN-001	Fine dust collection bin	Heavy duty steel dumping hopper (1 cu.yard)	0			Uline.Ca
	300	PNC	001	300-PNC-001	Tantalite Silo Pneumatic Conveyor No.9		0			Pneuveyor
	300	BLR	001	300-BLR-001	Blower for pneumatic conveyor		19			Pneuveyor
	300	SLO	001	300-SLO-001	Tantalum (Ta_2O_5) Concentrate Silo	100 tonnes silo	0			Pneuveyor
	300	BIV	001	300-BIV-001	Bin vent	6 CFM bin vent	5			Pneuveyor
	300	RVL	001	300-RVL-001	Rotary Valve		1			Pneuveyor
	300	BAS	001	300-BAS-001	Swing-down Bulk Bagging System	66" x 14' 5.5" 10 Bags/hour	5	0	AL	Flexicon
	300	SUP	001	300-SUP-001	Tantalite Area Sump Pump		15	0	VS80 L150	Metso
	300	PSR	001	300-PSR-001	Pulp sampler		4	0		Database
400 - MICA FLOTATION	400	CDT	00X	400-CDT-00X	Mica Flotation Adjustement Tank	OPTIONAL				
	400	AGI	00X	400-AGI-00X	Agitator for Mica Flotation Adjustement Tank	OPTIONAL				
	400	SLP	00X	400-SLP-00X	Conditioning Tank Feed Pump	OPTIONAL				
	400	SLP	00X	400-SLP-00X	Conditioning Tank Feed Pump	OPTIONAL				
	400	CDT	001	400-CDT-001	Mica Flotation Conditioning Tank	3.0 m dia. x 3.2 m	0			Westpro
	400	AGI	001	400-AGI-001	Agitator for Mica Flotation Conditioning Tank	Agitator for 3 x 3.2 m tank	11		AGT1010.5	Westpro
	400	SLP	001	400-SLP-001	Mica Flotation Dilution Tank Feed Pump	8" x 6" AH	56	0	8/6 AH	Weir
	400	SLP	002	400-SLP-002	Mica Flotation Dilution Tank Feed Pump	8" x 6" AH	0	56	8/6 AH	Weir
	400	CDT	002	400-CDT-002	Mica Flotation Dilution Tank	3.0 m dia. x 3.2 m	0			Westpro
	400	AGI	002	400-AGI-002	Agitator for Mica Flotation Dilution Tank	Agitator for 3 x 3.2 m tank	11		AGT1010.5	Westpro
	400	SLP	003	400-SLP-003	Mica Rougher Flotation Feed Pump	8" x 6" AH	112	0	8/6 AH	Weir
	400	SLP	004	400-SLP-004	Mica Rougher Flotation Feed Pump	8" x 6" AH	0	112	8/6 AH	Weir
	400	FLC	001	400-FLC-001	Mica Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	400	FLC	002	400-FLC-002	Mica Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	400	FLC	003	400-FLC-003	Mica Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	400	FLC	004	400-FLC-004	Mica Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	400	FLC	005	400-FLC-005	Mica Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	400	VTP	001	400-VTP-001	Mica Cleaner Feed Pump (Sala Vertical)	2.0" x 2.5 "	19	0	VT80 04	Metso
	400	FLC	006	400-FLC-006	Mica Cleaner Flotation Cell	2.8 m^3 cell	11	0	FL100	Westpro
	400	FLC	007	400-FLC-007	Mica Cleaner Flotation Cell	2.8 m^3 cell	11	0	FL100	Westpro
	400	PBX	001	400-PBX-001	Dewatering Cyclones No.1 Feed Pump Box		0			LMManutentions
	400	SLP	005	400-SLP-005	Dewatering Cyclones No.1 Feed Pump	8" x 6" AH	93	0	8/6 AH	Weir
	400	SLP	006	400-SLP-006	Dewatering Cyclones No.1 Feed Pump	8" x 6" AH	0	93	8/6 AH	Weir
	400	CYC	001	400-CYC-001	Dewatering Cyclones No.1 Cluster	14-place gMax6	0		Krebs gMax	FLSmidth
	400	PBX	002	400-PBX-002	Tailings Thickener Feed pump Box		0			LMManutentions
	400	SLP	007	400-SLP-007	Tailings Thickener Feed Pump	1.5" x 1" AH	7	0	1.5/1 AH	Weir
	400	SLP	008	400-SLP-008	Tailings Thickener Feed Pump	1.5" x 1" AH	0	7	1.5/1 AH	Weir
	400	SUP	001	400-SUP-001	Mica Flotation Area Sump Pump		15	0	VS80 L150	Metso
	400	EES	001	400-EES-001	Emergency shower & Eye Wash station	Guardian GFR3100 heated wash station	0		GFR3100	EyewashDirect
500 - SPODUMENE FLOTATION	500	ATS	001	500-ATS-001	Attrition Scrubber	19.3 m^3	110	0	AS96VBH	Westpro
	500	ATS	002	500-ATS-002	Attrition Scrubber	19.3 m^3	110	0	AS96VBH	Westpro
	500	ATS	003	500-ATS-003	Attrition Scrubber	19.3 m^3	110	0	AS96VBH	Westpro
	500	ATS	004	500-ATS-004	Attrition Scrubber	19.3 m^3	110	0	AS96VBH	Westpro
	500	PBX	001	500-PBX-001	Desliming Cyclones No.2 Feed Pump Box		0			LMManutentions
	500	SLP	001	500-SLP-001	Desliming Cyclones No.2 Feed Pump	8" x 6" AH	112	0	8/6 AH	Weir
	500	SLP	002	500-SLP-002	Desliming Cyclones No.2 Feed Pump	8" x 6" AH	0	112	8/6 AH	Weir
	500	CYC	001	500-CYC-001	Desliming Cyclone No.2 Cluster	12-place gMax6	0		Krebs gMax	FLSmidth
	500	CDT	001	500-CDT-001	Spodumene Rougher HD Conditioning Tank	4.1 m dia. x 4.3 m	0			Westpro
	500	AGI	001	500-AGI-001	Agitator for High Density Conditioning Tank	Agitator for 4.1 x 4.3 m tank	22,4		AGT13.514	Westpro
	500	SLP	003	500-SLP-003	Spodumene Rougher Dilution Tank Feed Pump	6" x 4" AH	56	0	6/4 AH	Weir
	500	SLP	004	500-SLP-004	Spodumene Rougher Dilution Tank Feed Pump	6" x 4" AH	0	56	6/4 AH	Weir
	500	CDT	002	500-CDT-002	Spodumene Rougher Dilution Tank	4.1 m dia. x 4.3 m	0			Westpro
	500	AGI	002	500-AGI-002	Agitator for Dilution Tank	Agitator for 4.1 x 4.3 m tank	22,4		AGT13.514	Westpro
	500	SLP	005	500-SLP-005	Spodumene Rougher Feed Pump	8" x 6" AH	112	0	8/6 AH	Weir
	500	SLP	006	500-SLP-006	Spodumene Rougher Feed Pump	8" x 6" AH	0	112	8/6 AH	Weir
	500	FLC	001	500-FLC-001	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	002	500-FLC-002	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	003	500-FLC-003	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	004	500-FLC-004	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	005	500-FLC-005	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	006	500-FLC-006	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	007	500-FLC-007	Spodumene Rougher Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	VTP	001	500-VTP-001	Spodumene 1st Cleaner Feed Pump (Sala Vertical)	3" x 4"	37	0	VT100 04	Metso
	500	PBX	002	500-PBX-002	Dewatering Cyclones No.2 Feed Pump Box		0			LMManutentions
	500	SLP	007	500-SLP-007	Dewatering Cyclones No.2 Feed Pump	8" x 6" AH	112	0	8/6 AH	Weir
	500	SLP	008	500-SLP-008	Dewatering Cyclones No.2 Feed Pump	8" x 6" AH	0	112	8/6 AH	Weir
	500	CYC	002	500-CYC-002	Dewatering Cyclones No.2 Cluster	18-place gMax6	0		Krebs gMax	FLSmidth
	500	CDT	003	500-CDT-003	Spodumene Scavenger HD Conditioning Tank	4.1 m dia. x 4.3 m	0			Westpro
	500	AGI	003	500-AGI-003	Agitator for High Density Conditioning Tank	Agitator for 4.1 x 4.3 m tank	22,4		AGT13.514	Westpro
	500	SLP	009	500-SLP-009	Spodumene Scavenger Dilution Tank Feed Pump	8" x 6" AH	37	0	8/6 AH	Weir
	500	SLP	010	500-SLP-010	Spodumene Scavenger Dilution Tank Feed Pump	8" x 6" AH	0	37	8/6 AH	Weir
	500	CDT	004	500-CDT-004	Spodumene Scavenger Dilution Tank	4.1 m dia. x 4.3 m	0			Westpro
	500	AGI	004	500-AGI-004	Agitator for Spodumene Scavenger Dilution Tank	Agitator for 4.1 x 4.3 m tank	22,4		AGT13.514	Westpro
	500	SLP	011	500-SLP-011	Spodumene Scavenger Feed Pump	8" x 6" AH	75	0	8/6 AH	Weir
	500	SLP	012	500-SLP-012	Spodumene Scavenger Feed Pump	8" x 6" AH	0	75	8/6 AH	Weir
	500	PBX	003	500-PBX-003	Cyclones O/F Discharge Pump Box		0			LMManutentions
	500	SLP	013	500-SLP-013	Cyclones O/F Discharge Pump	10" x 8" AH	75	0	10/8 AH	Weir
	500	SLP	014	500-SLP-014	Cyclones O/F Discharge Pump	10" x 8" AH	0	75	10/8 AH	Weir
	500	FLC	008	500-FLC-008	Spodumene Scavenger Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	009	500-FLC-009	Spodumene Scavenger Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro

EQUIPMENT LIST

CriticalElements Corporation	**BANKABLE FEASIBILITY STUDY** **ROSE LITHIUM TANTALUM PROJECT**	BUMIGEME Bureau mines, geologie et metallurgie
	PROJECT NUMBER: C20203	
	Doc No.: C20203-00-RE-001 Detailed	

PREPARED BY: Sunil Koppalkar	VERIFIED BY: Lies Amkhoukh	APPROVED BY: F. Baril	REV. D	DATE: 03-05-2022

Area	AREA CODE	EQUIP CODE	#ITEM	EQUIPMENT TAG	DESCRIPTION	CAPACITY / DIMS.	POWER, kW Operating	POWER, kW Standby	MODEL	POSSIBLE SUPPLIER
	500	FLC	010	500-FLC-010	Spodumene Scavenger Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	FLC	011	500-FLC-011	Spodumene Scavenger Flotation Cell	14.2 m^3 cell	37	0	FL500	Westpro
	500	VTP	002	500-VTP-002	Scavenger Conc. Pump (Sala Vertical)	3" x 4"	37	0	VT100 04	Metso
	500	PBX	004	500-PBX-004	Scavenger Tailings Pump Box		0			LMManutentions
	500	SLP	015	500-SLP-015	Scavenger Tailings Pump	8" x 6" AH	75	0	8/6 AH	Weir
	500	SLP	016	500-SLP-016	Scavenger Tailings Pump	8" x 6" AH	0	75	8/6 AH	Weir
	500	FLC	012	500-FLC-012	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	013	500-FLC-013	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	014	500-FLC-014	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	015	500-FLC-015	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	016	500-FLC-016	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	017	500-FLC-017	Spodumene 1st Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	VTP	003	500-VTP-003	Spodumene 2nd Cleaner Feed Pump (Sala Vertical)	3" x 4"	30	0	VT100 04	Metso
	500	FLC	018	500-FLC-018	Spodumene 2nd Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	019	500-FLC-019	Spodumene 2nd Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	020	500-FLC-020	Spodumene 2nd Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	021	500-FLC-021	Spodumene 2nd Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	FLC	022	500-FLC-022	Spodumene 2nd Cleaner Flotation Cell	2.8 m^3 cell	11,2	0	FL100	Westpro
	500	PBX	005	500-PBX-005	Cleaner Tailings Pump Box		0			LMManutentions
	500	SLP	017	500-SLP-017	Cleaner Tailings Pump	3" x 2" AH	11	0	3/2 AH	Weir
	500	SLP	018	500-SLP-018	Cleaner Tailings Pump	3" x 2" AH	0	11	3/2 AH	Weir
	500	PBX	006	500-PBX-006	Spodumene Conc. Thickener Feed Pump Box		0			LMManutentions
	500	SLP	019	500-SLP-019	Spodumene thickener Feed Pump	3" x 2" AH	15	0	3/2 AH	Weir
	500	SLP	020	500-SLP-020	Spodumene thickener Feed Pump	3" x 2" AH	0	15	3/2 AH	Weir
	500	SUP	001	500-SUP-001	Spodumene Flotation Area Sump Pump		15	0	VS80 L150	Metso
	500	OCR	001	500-OCR-001	Flotation Area Overhead Crane	16 t crane	22	0	tahl Double girde	Premium
	500	PSR	001	500-PSR-001	Pulp Sampler		4	0		Database
600 - TAILINGS DEWATERING	600	TAK	001	600-TAK-001	Tailings Thickener Feed Tank		0			LMManutentions
	600	THR	001	600-THR-001	Tailings Thickener	19.8 m dia. high rate thickener	0	0		Westpro
	600	RAM	001	600-RAM-001	Tailings Thickener Rake Mechanism		8			Westpro
	600	PBX	002	600-PBX-002	Tailings Thickener O/F Pump Box		0			LMManutentions
	600	WAP	001	600-WAP-001	Tailings Thickener O/F Pump	10" x 8"	149	0	LF3196	ITT Goulds
	600	SLP	003	600-SLP-003	Tailings Thickener U/F Pump	4" x 3" AH	56	0	4/3 AH	Weir
	600	SLP	004	600-SLP-004	Tailings Thickener U/F Pump	4" x 3" AH	0	56	4/3 AH	Weir
	600	TAK	002	600-TAK-002	Tailings Filter Feed Surge Tank	12.0 m dia. x 14 m	0			Westpro
	600	AGI	002	600-AGI-002	Agitator for Tailings Filter Feed Surge Tank	Agitator for 12 m dia. x 14 m tank	112		AGT3946	Westpro
	600	SLP	005	600-SLP-005	Tailings Filter Feed Pump	6" x 4" AH	56	0	6/4 AH	Weir
	600	DFR	001	600-DFR-001	Tailings Disc Filter	6' 0" dia. x 5 discs	5			IEMCO-KCP
	600	VAR	001	600-VAR-001	Vacuum receiver	36" dia. x 72" long	0			
	600	VAP	001	600-VAP-001	Vacuum Pump for Disc Filter	3400 m3/h@ 500 mm HG	112			
	600	SLR	001	600-SLR-001	Silencer		0			
	600	MTR	001	600-MTR-001	Moisture Trap	36" dia. x 72" long	0			
	600	CHU	001	600-CHU-001	Disc Filter Discharge Chute		0			Database
	600	CVR	001	600-CVR-001	Conveyor No.10	900 mm wide x 16.5 m long, horizontal	7			LMManutentions
	600	CHU	002	600-CHU-002	Conveyor No. 10 Discharge Chute		0			LMManutentions
	600	CVR	002	600-CVR-002	Tailings Storage Bin Conveyor No.11	900 mm wide x 120 m long	30			LMManutentions
	600	BSC	001	600-BSC-001	Tailings Belt Scale		0			Database
	600	CHU	003	600-CHU-003	Conveyor No. 11 Discharge Chute		0			Database
	600	SLP	006	600-SLP-006	Tailings Filtrate Release Pump	4" x 3" AH	11	0	4/3 AH	IEMCO-KCP
	600	SUP	001	600-SUP-001	Tailings Dewatering area Area Sump Pump		22	0	VS80 L150	Metso
	600	PSR	001	600-PSR-001	Pulp Sampler		4	0		Database
610 - SPODUMENE CONC. DEWATERING	610	TAK	001	610-TAK-001	Spodumene Thickener Feed Tank		0			LMManutentions
	610	THR	001	610-THR-001	Spodumene Conc. Thickener	6.1 m dia. high rate thickener	0	0		Westpro
	610	RAM	001	610-RAM-001	Spodumene Conc. Thickener Rake Mechanism		4			Westpro
	610	PBX	002	610-PBX-002	Thickener O/F Pump Box		0			LMManutentions
	610	WAP	001	610-WAP-001	Thickener O/F Pump	6" x 4"	19	0	LF3196	ITT Goulds
	610	SLP	003	610-SLP-003	Thickener U/F Pump	1.5" x 1" AH	7	0	1.5/1 AH	Weir
	610	SLP	004	610-SLP-004	Thickener U/F Pump	1.5" x 1" AH	0	7	1.5/1 AH	Weir
	610	TAK	002	610-TAK-002	Filter Feed SurgeTank	7.0 m dia. x 8 m	0			Westpro
	610	AGI	002	610-AGI-002	Agitator for Filter Feed SurgeTank	Agitator for 7 m dia. x 8 m tank	45		AGT2326	Westpro
	610	SLP	005	610-SLP-005	Disc Filter Feed Pump	3" x 2" AH	19	0	3/2 AH	Weir
	610	DFR	001	610-DFR-001	Spodumene Conc. Disc Filter	4' 0" dia. x 3 discs	5			IEMCO-KCP
	610	VAR	001	610-VAR-001	Vacuum receiver	24" dia. x 60" long	0			
	610	SLP	006	610-SLP-006	Spodumene Conc. Filtrate Release Pump	1.5" x 1" AH	7	0	1.5/1 AH	IEMCO-KCP
	610	VAP	001	610-VAP-001	Vacuum Pump for Disc Filter	900 m3/h@ 500 mm HG	34			
	610	SLR	001	610-SLR-001	Silencer		0			
	610	MTR	001	610-MTR-001	Moisture Trap	24" dia. x 72" long	0			
	610	CHU	001	610-CHU-001	Disc Filter Discharge Chute		0			LMManutentions
	610	CVR	001	610-CVR-001	Dryer Feed Conveyor No.12	900 mm wide x 40 m long, 25 degrees	15			LMManutentions
	610	CHU	002	610-CHU-002	Dryer Feed Conveyor No.12 Discharge Chute		0			Database
	610	HOP	001	610-HOP-001	Dryer Feed Hopper	50 t capacity	0			Database
	610	SFR	001	610-SFR-001	Screw Feeder to dryer		5			Database
	610	RDR	001	610-RDR-001	Rotary Dryer	1.8 m dia. X 10.7 m long	22	0	RD635	Westpro
	610	CHU	003	610-CHU-003	Rotary Dryer Discharge Chute		0			Database
	610	DUC	001	610-DUC-001	Pulse-jet Bag house Dust Collector	Cyclone, fan and rotary valve	0			Westpro
	610	FAN	001	610-FAN-001	Dust Collector Fan	26 000 acfm fan	56			Westpro
	610	SFR	002	610-SFR-002	Dust collector discharge screw feeder		2			Database
	610	HOP	002	610-HOP-002	Hopper	1m dia.x 1m h, 1 m^3 volume	0			Database
	610	RVL	003	610-RVL-003	Rotary Valve		2			
	610	PNC	001	610-PNC-001	Pneumatic Conveyor No.13		0			Pneuveyor
	610	BLR	001	610-BLR-001	Blower for pneumatic conveyor		56			Pneuveyor
	610	SLO	001	610-SLO-001	Spodumene Concentrate Silo	2 x 400 m^3, two silos	0			Pneuveyor
	610	BIV	001	610-BIV-001	Bin vent	6 CFM bin vent	5			Pneuveyor
	610	BIV	002	610-BIV-002	Bin vent	6 CFM bin vent	5			Pneuveyor
	610	RVL	001	610-RVL-001	Rotary Valve		2			Pneuveyor
	610	RVL	002	610-RVL-002	Rotary Valve		2			Pneuveyor
	610	CHU	004	610-CHU-004	Retractable chute		0			Pneuveyor
	610	CHU	005	610-CHU-005	Retractable chute		0			Pneuveyor
	610	SUP	001	610-SUP-001	Spodumene Dewatering Area Sump Pump		22	0	VS80 L150	Metso
RATION AND DISTRIBUTION	700	TAK	001	700-TAK-001	AERO 3030 Holding Tank	48" x 48" x 42", 1500 L tank	0			Westpro
	700	MEP	001	700-MEP-001	AERO 3030 Dosing Pump		2			Westpro
	700	MEP	002	700-MEP-002	AERO 3030 Dosing Pump (Standby)		0	2		Westpro
	700	TAK	002	700-TAK-002	Soda Ash Mixing Tank with Agitator	9 m^3 volume; Agitator:15GTC-1.5	5			Westpro
	700	SOP	001	700-SOP-001	Soda Ash Transfer Pump		2			Westpro
	700	TAK	003	700-TAK-003	Soda Ash Holding Tank	1.5 m dia. x 2.5 m high	0			Westpro
	700	MEP	003	700-MEP-003	Soda Ash Dosing Pump		1			Westpro
	700	MEP	004	700-MEP-004	Soda Ash Dosing Pump		1			Westpro
	700	MEP	005	700-MEP-005	Soda Ash Dosing Pump		1			Westpro
	700	MEP	006	700-MEP-006	Soda Ash Dosing Pump		1			Westpro
	700	MEP	007	700-MEP-007	Soda Ash Dosing Pump (Standby)		0	1		Westpro
	700	TAK	004	700-TAK-004	Fatty Acid-2 Mixing Tank with Agitator	1.5 m^3 volume; Agitator:8GTC-0.5	5			Westpro
	700	SOP	002	700-SOP-002	Fatty Acid-2 Transfer Pump		2			Westpro
	700	TAK	005	700-TAK-005	Fatty Acid-2 Holding Tank		0			Westpro
	700	MEP	008	700-MEP-008	Fatty Acid-2 Dosing Pump		1			Westpro
	700	MEP	009	700-MEP-009	Fatty Acid-2 Dosing Pump		1			Westpro
	700	MEP	010	700-MEP-010	Fatty Acid-2 Dosing Pump (Standby)		0	1		Westpro
	700	TAK	006	700-TAK-006	F220 Depressant Holding Tank	1.8 m dia. x 3.6 m high	0			Westpro
	700	MEP	011	700-MEP-011	F220 Depressant Dosing Pump		1			Westpro

EQUIPMENT LIST

CriticalElements Corporation

BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT

BUMIGEME Bureau mines, geologie et metallurgie

PROJECT NUMBER: C20203

Doc No.: C20203-00-RE-001 Detailed

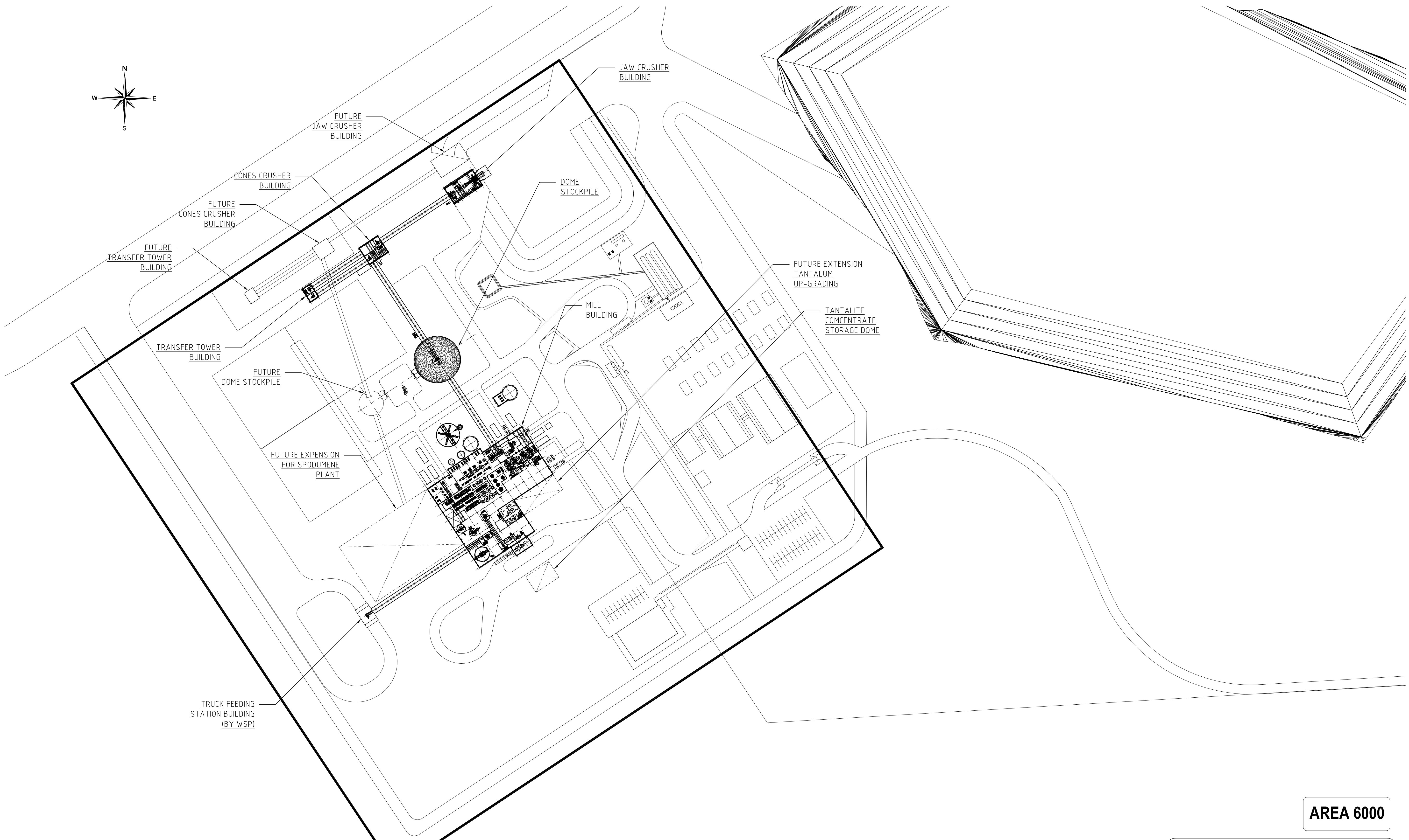
PREPARED BY: Sunil Koppalkar | VERIFIED BY: Lies Amkhoukh | APPROVED BY: F. Baril | REV. D | DATE: 03-05-2022

Area	AREA CODE	EQUIP CODE	#ITEM	EQUIPMENT TAG	DESCRIPTION	CAPACITY / DIMS.	POWER, kW Operating	POWER, kW Standby	MODEL	POSSIBLE SUPPLIER
700 - REAGENTS PREPA	700	MEP	012	700-MEP-012	F220 Depressant Dosing Pump		1			Westpro
	700	MEP	013	700-MEP-013	F220 Depressant Dosing Pump		1			Westpro
	700	MEP	014	700-MEP-014	F220 Depressant Dosing Pump (Standby)		0	1		Westpro
	700	TAK	007	700-TAK-007	NaOH Mixing Tank with Agitator	9 m^3 volume; Agitator:15GTC-1.5	5			Westpro
	700	SOP	003	700-SOP-003	NaOH Transfer Pump		2			Westpro
	700	TAK	008	700-TAK-008	NaOH Holding Tank	3.3 m dia. x 4 m high	0			Westpro
	700	MEP	015	700-MEP-015	NaOH Dosing Pump		1			Westpro
	700	MEP	016	700-MEP-016	NaOH Dosing Pump (Standby)		0	1		Westpro
	700	TAK	009	700-TAK-009	Flocculant Mixing Tank with Agitator	1830 mm dia. x 3000 mm high	5		DBF400	SNF Canada
	700	SOP	004	700-SOP-004	Flocculant Transfer Pump	400 LPM	2			SNF Canada
	700	TAK	010	700-TAK-010	Flocculant Holding Tank	2200 mm dia. x 3000 mm	0			SNF Canada
	700	MEP	017	700-MEP-017	Flocculant Dosing Pump		1			SNF Canada
	700	MEP	018	700-MEP-018	Flocculant Dosing Pump		1			SNF Canada
	700	MEP	019	700-MEP-019	Flocculant Dosing Pump		1			SNF Canada
	700	MEP	020	700-MEP-020	Flocculant Dosing Pump (Standby)		0	1		SNF Canada
	700	SUP	001	700-SUP-001	Reagent Prep. Area sump pump		11	0	VS50 L150	Metso
	700	EES	001	700-EES-001	Emergency shower & Eye Wash station	Guardian GFR3100 heated wash station	0		GFR3100	EyewashDirect
800 - AIR & WATER SERVICES	800	TAK	001	800-TAK-001	Raw Water Tank	6 m dia. x 7 m h	0			Database
	800	WAP	001	800-WAP-001	Process Water Feed Pump	6" x 4"	22	0	LF3196	ITT Goulds
	800	WAP	002	800-WAP-002	Process Water Feed Pump	6" x 4"	0	22	LF3196	ITT Goulds
	800	WAP	003	800-WAP-003	Gland Water Feed Pump	10" x 8"	19	0	LF3196	ITT Goulds
	800	WAP	004	800-WAP-004	Gland Water Feed Pump	10" x 8"	0	19	LF3196	ITT Goulds
	800	TAK	002	800-TAK-002	Process Water Tank	12 m dia. x 14 m h	0			Database
	800	WAP	005	800-WAP-005	Process Water Pump	12" x 12"	93	0	LF3180	ITT Goulds
	800	WAP	006	800-WAP-006	Process Water Pump	12" x 12"	0	93	LF3180	ITT Goulds
	800	TAK	003	800-TAK-003	Gland Water Tank	5 m dia. x 6 m h	0			Database
	800	WAP	007	800-WAP-007	Reagent Prep. Water Pump	1.5" x 1"	4	0	LF3196	ITT Goulds
	800	WAP	008	800-WAP-008	Reagent Prep. Water Pump	1.5" x 1"	0	4	LF3196	ITT Goulds
	800	WAP	009	800-WAP-009	Gland Seal Water Pump	3" x 2"	56	0	LF3196	ITT Goulds
	800	WAP	010	800-WAP-010	Gland Seal Water Pump	3" x 2"	0	56	LF3196	ITT Goulds
	800	TAK	004	800-TAK-004	Fire Water Tank	By others - WSP	0,0			
	800	WAP	011	800-WAP-011	Fire Water Pump	By others - WSP	56			
	800	JCP	001	800-JCP-001	Fire Water Jockey Pump	By others - WSP	5			
	800	DEP	001	800-DEP-001	Fire Water Diesel Pump	By others - WSP	0			
	800	IFR	001	800-IFR-001	Inlet Air Filter		0			Atlas Copco
	800	COM	001	800-COM-001	Plant Air Compressor	Rotary screw compressor GA75+175 APC	75	0	GA75	Atlas Copco
	800	IFR	002	800-IFR-002	Inlet Air Filter		0			Atlas Copco
	800	COM	002	800-COM-002	Plant Air Compressor	Rotary screw compressor GA75+175 APC	0	75	GA75	Atlas Copco
	800	ARR	001	800-ARR-001	Plant Air Receiver		0			Atlas Copco
	800	ARR	002	800-ARR-002	Air Receiver		0			Atlas Copco
	800	ARR	003	800-ARR-003	Instrument Air Receiver		0			Atlas Copco
	800	ADR	001	800-ADR-001	Instrument Air Dryer		0			Atlas Copco
	800	BLR	001	800-BLR-001	Flotation Air Blower	6000 acfm @4psig, multistage centrifugal	149	0		Westrpo/Atlas
	800	BLR	002	800-BLR-002	Flotation Air Blower	6000 acfm @4psig, multistage centrifugal	0	149		Westrpo/Atlas
	800				Heating and lighting		370			

APPENDIX

18 A

LAYOUT AND SECTIONAL DRAWINGS



SPODUMENE PLANT

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
000-01-AM-004	G.A. SPODUMENE PLANT	B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
000-01-AM-003	G.A. SPODUMENE PLANT			AREA 6100 / 6300 /6600 / 6610 WAS REVISED	
000-01-AM-002	G.A. SPODUMENE PLANT	A	31/03/2017	ISSUED FOR FEASIBILITY STUDY	J.B.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S.KOPPALKAR	27-03-2017
APPROVED:	F.BARIL ing.	27-03-2017

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Montréal, Québec, H3B 1P5, Canada
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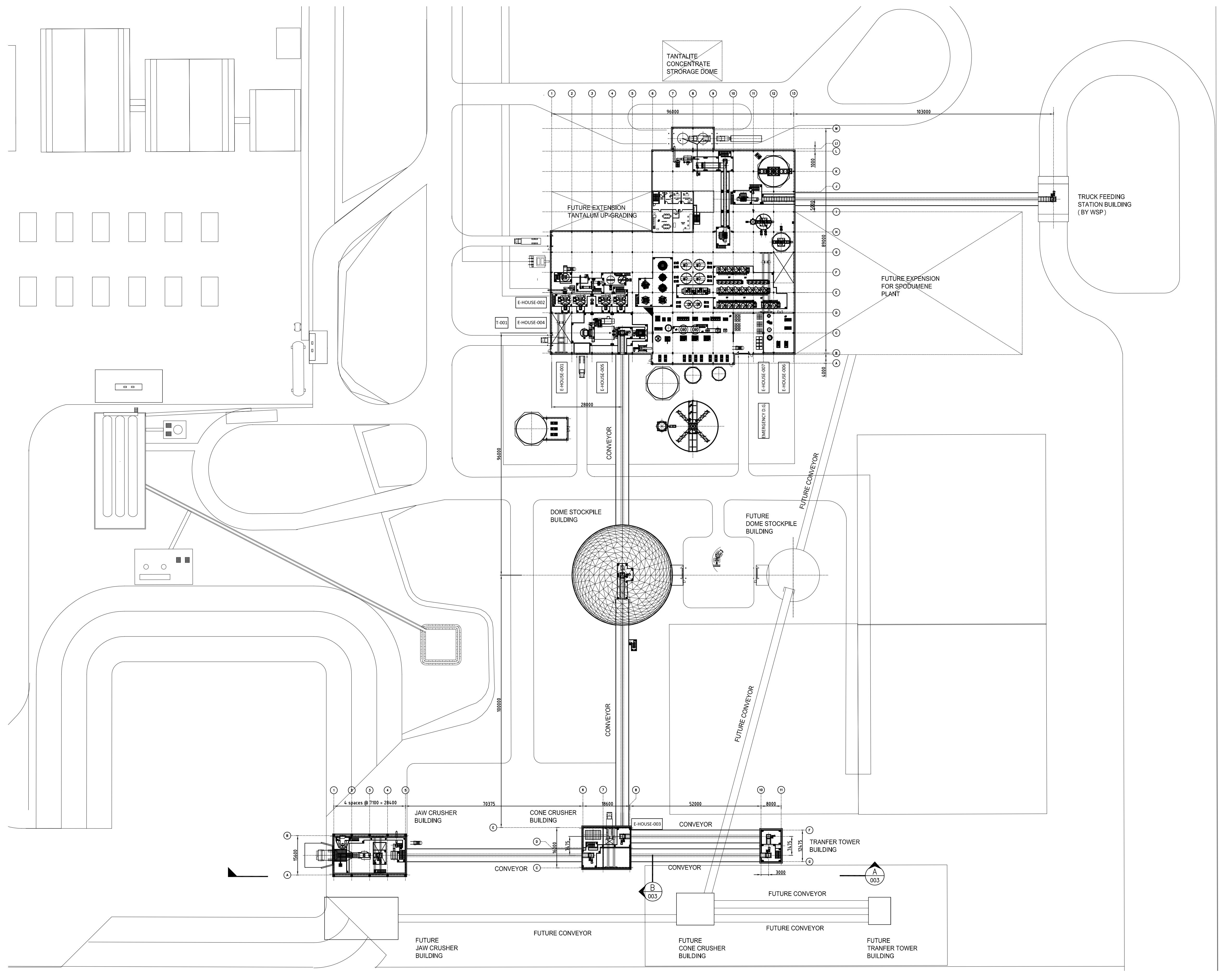
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: 1:1500 | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 001 (SEQ.) B (REV.)



AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED) AREA 6100 / 6300 / 6600 / 6610 WAS REVISED	J.B.
000-01-AM-003	G.A. SPODUMENE PLANT	A	31/03/2017	ISSUED FOR FEASIBILITY STUDY	J.B.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S.KOPPALKAR	27-03-2017
APPROVED:	F.BARIL ing.	27-03-2017

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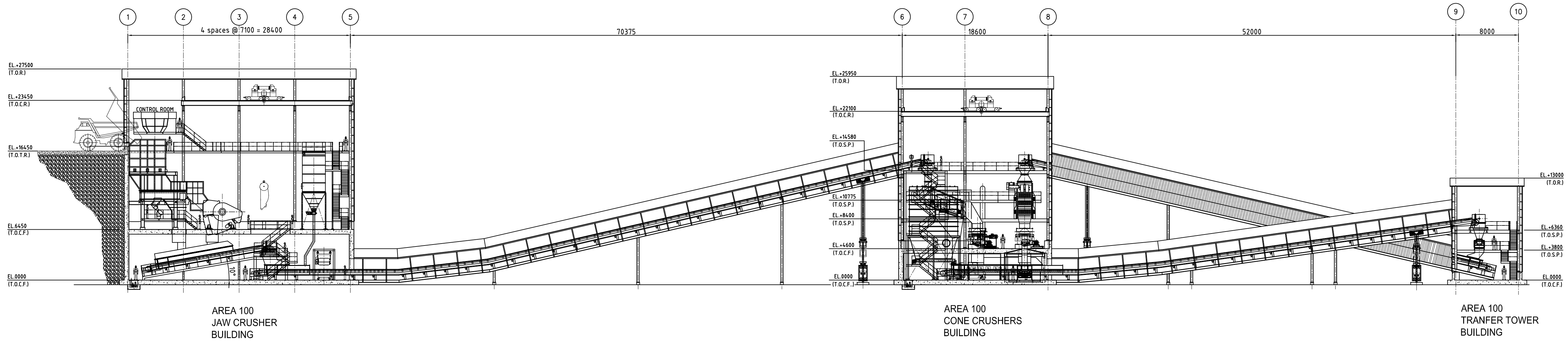
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

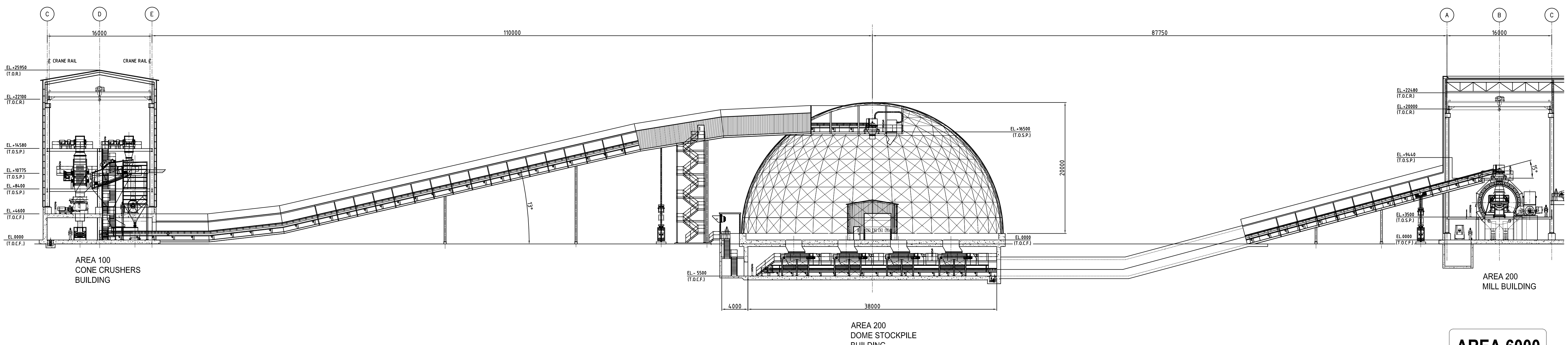
DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: 1:750 | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 002 (SEQ.) B (REV.)



SECTION A (1:300) 002



SECTION B (1:300) 002

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
				AREA 6100 / OPTIMIZATIONS CRUSHING AREA	
000-01-AM-002	G.A. SPODUMENE PLANT	A	31/03/2017	ISSUED FOR FEASIBILITY STUDY	J.B.
DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S.KOPPALKAR	27-03-2017
APPROVED:	F.BARIL ing.	27-03-2017

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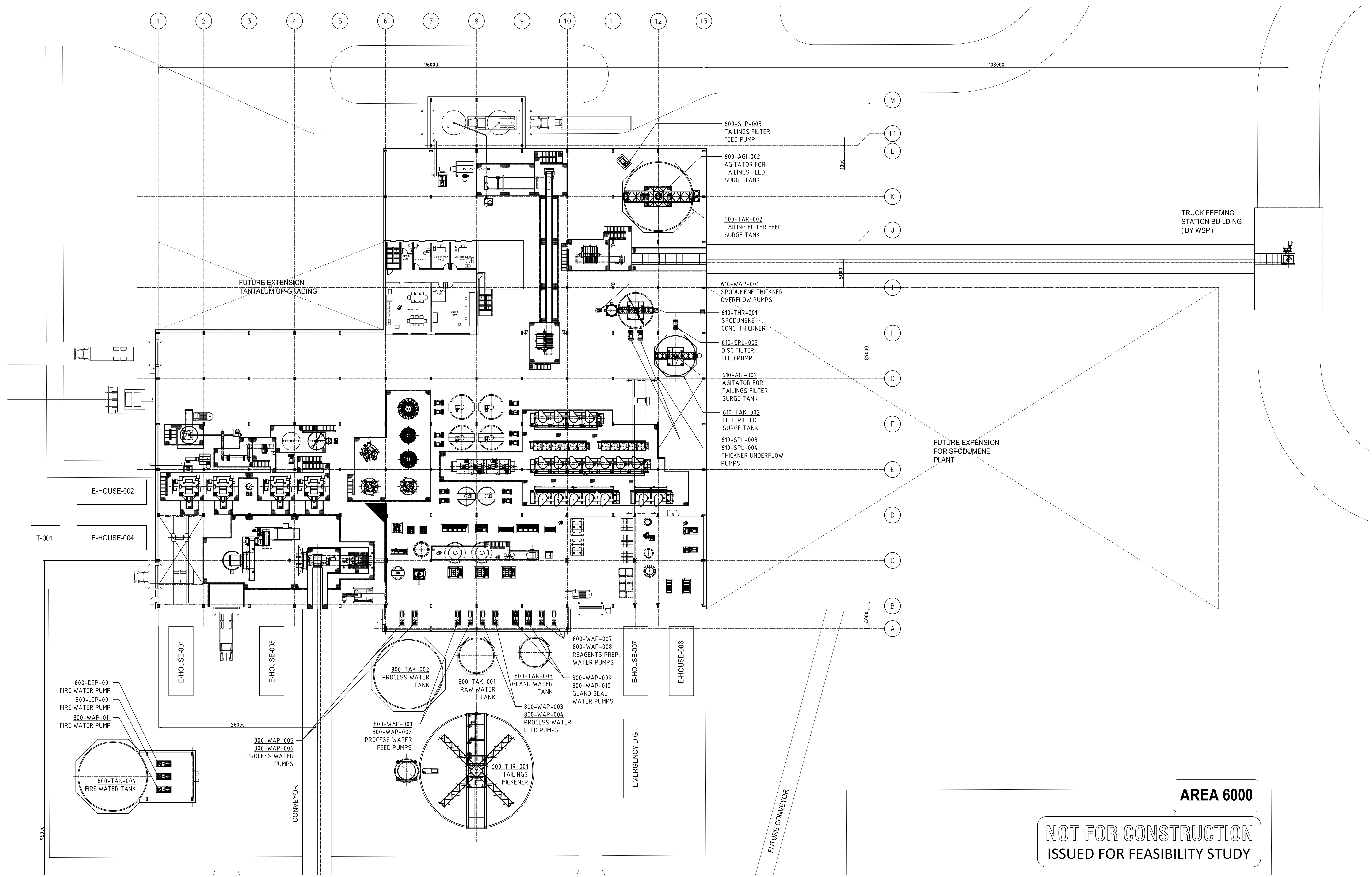
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N. | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 003 (SEQ.) B (REV.)



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000-01-AM-002	G.A. SPODUMENE PLANT			AREA 6300 / 6600/ 6610 WAS REVISED	
000-01-AM-001	G.A. SPODUMENE PLANT	A	31/03/2017	ISSUED FOR FEASIBILITY STUDY	J.B.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S.KOPPALKAR	27-03-2017
APPROVED:	F.BARIL ing.	27-03-2017

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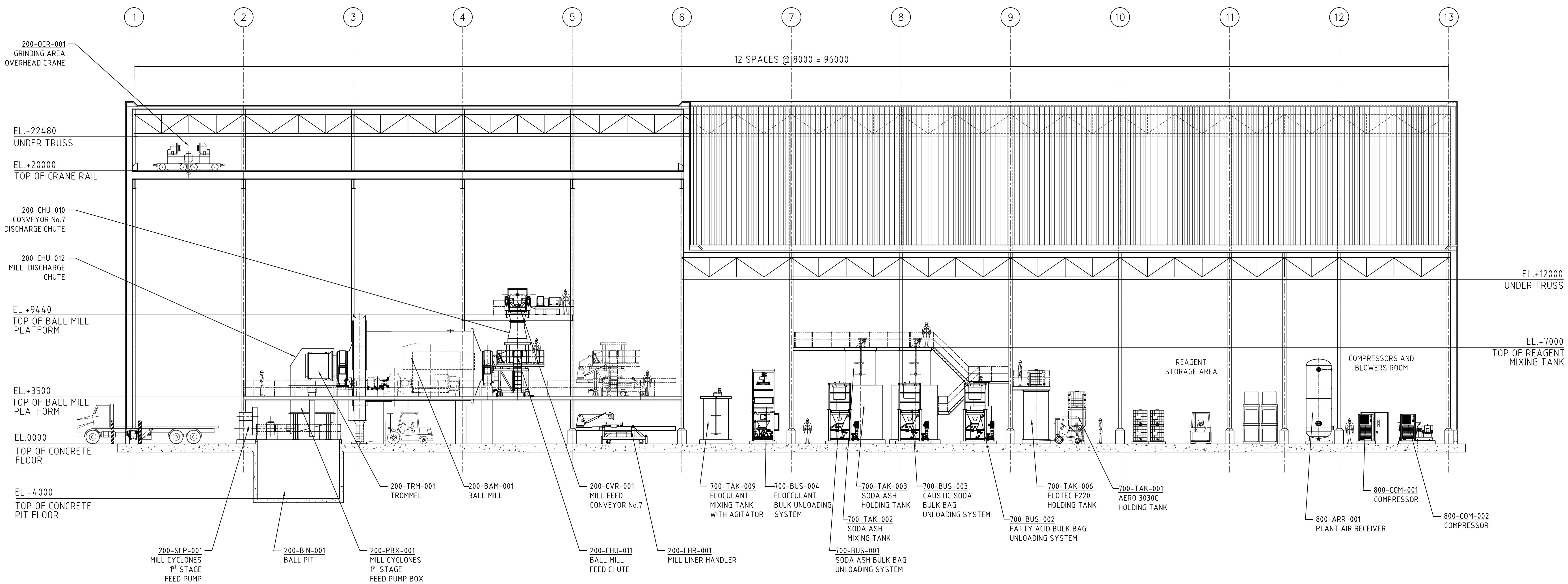
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT SPODUMENE PLANT

SCALE: 1:300 | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) - 000 (AREA) - 01 (DISC.) - AM (TYPE) - 004 (SEQ.) | B (REV.)



SECTION–LIGNE B / 004
1:150

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
000-01-AM-004	G.A. SPODUMENE PLANT	A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S. KOPPALKAR	27-03-2017
APPROVED:	F. BARIL ing.	27-03-2017

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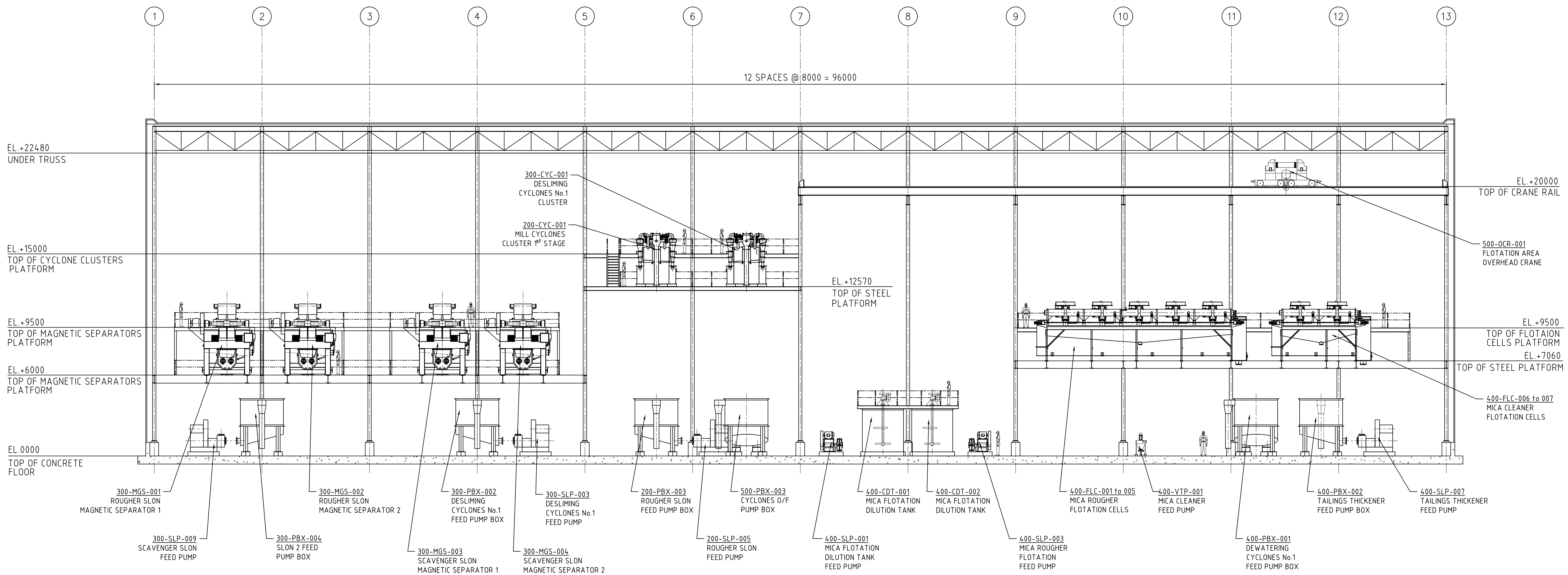
CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N.	UNITS: mm	FORMAT: A1	PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 005 (SEQ.) A (REV.)



SECTION–LIGNE D / 004
1:150

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

000-01-AM-004	G.A. SPODUMENE PLANT	A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.
DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S. KOPPALKAR	27-03-2017
APPROVED:	F. BARIL ing.	27-03-2017

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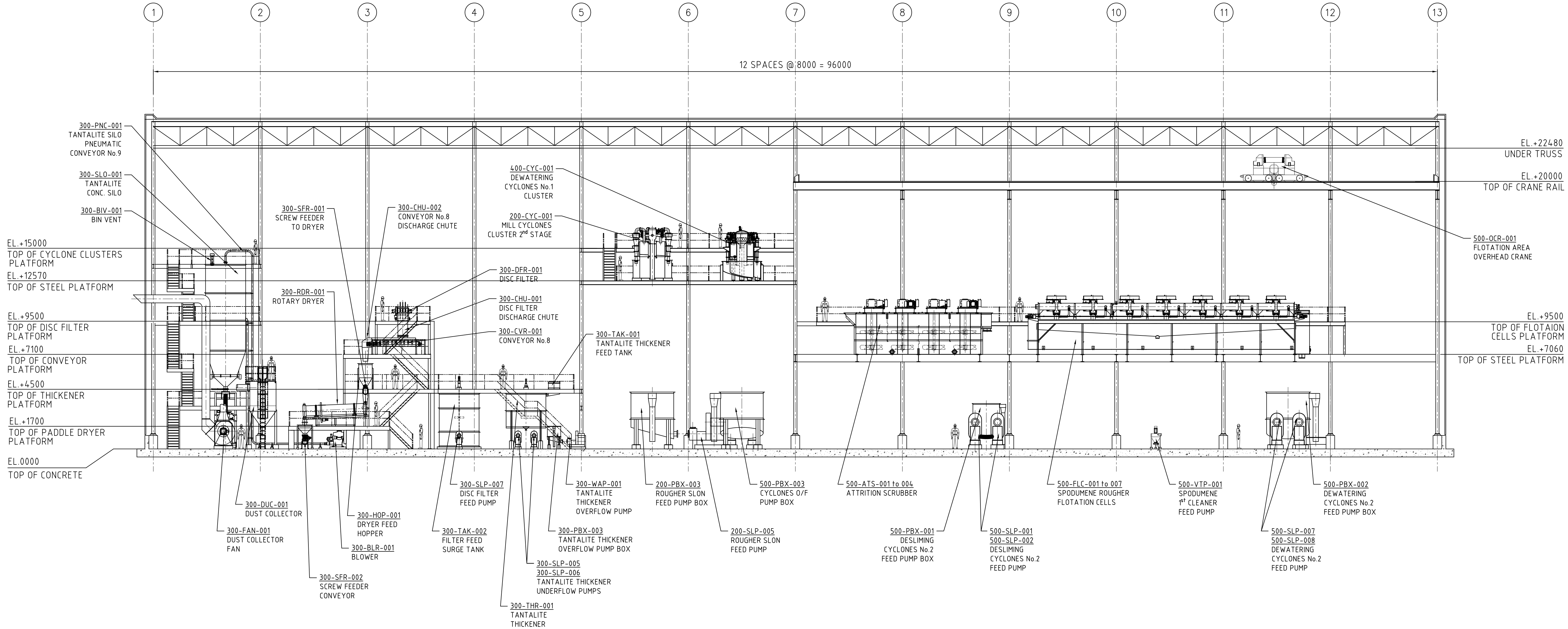
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N.	UNITS: mm	FORMAT: A1	PAGE: 1/1

DRAWING NO.:

PROJECT	AREA	DISC.	TYPE	SEQ.	REV.
C20203	000	01	AM	006	A



SECTION–LIGNE E 004
1:150

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
				AREA 6300 / PADDLE DRYER REPLACED	
				BY A ROTARY DRYER	
000-01-AM-004	G.A. SPODUMENE PLANT	A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S. KOPPALKAR	27-03-2017
APPROVED:	F. BARIL ing.	27-03-2017

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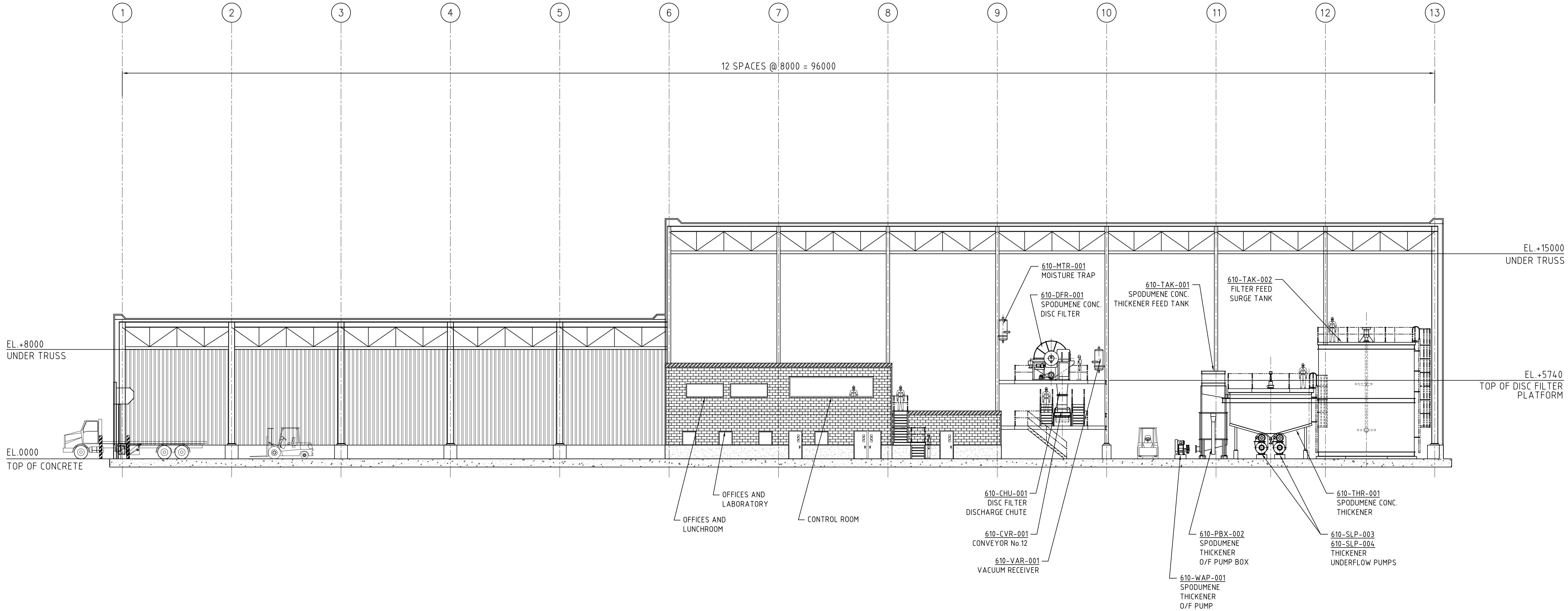
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N. | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 007 (SEQ.) B (REV.)



SECTION–LIGNE G / 004
1:150

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
				AREA 6300 TANTALITE STORAGE REMOVED	
				OFFICES & LAB REVISED/AREA 6600 TAILINGS DISC FILTER	
				& TAILINGS COVEYOR REVISED	
000-01-AM-004	G.A. SPODUMENE PLANT	A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S. KOPPALKAR	27-03-2017
APPROVED:	F. BARIL ing.	27-03-2017

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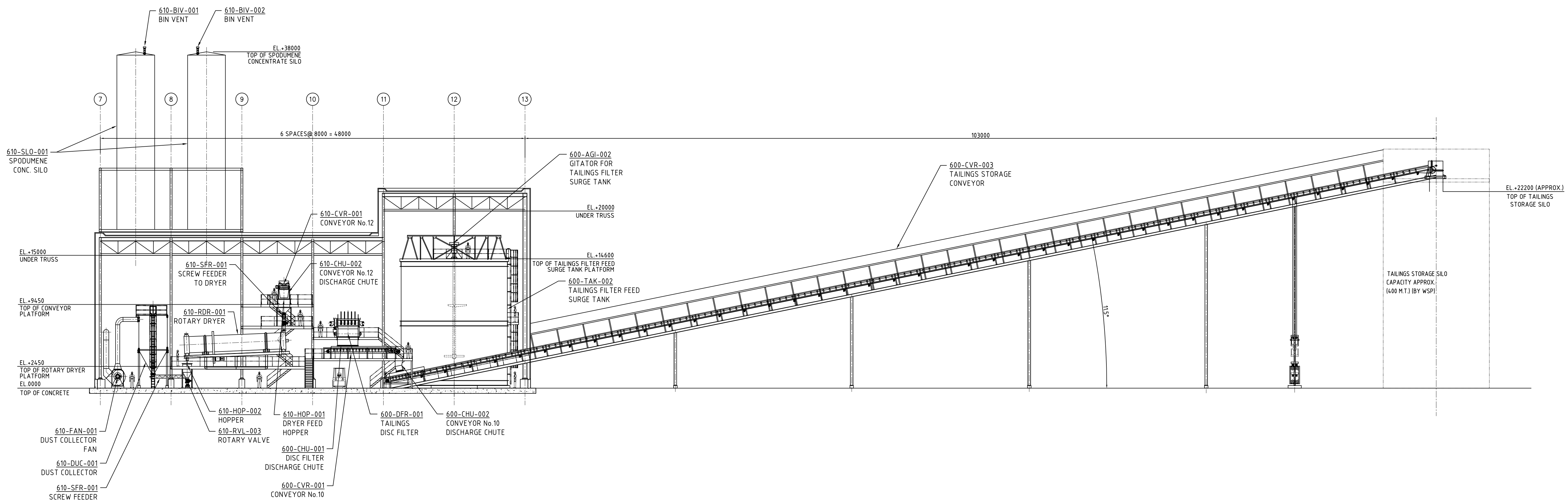
PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N.	UNITS: mm	FORMAT: A1	PAGE: 1/1

DRAWING NO.:

PROJECT	AREA	DISC.	TYPE	SEQ.	REV.
C20203	000	01	AM	008	B



SECTION–LIGNE 1/004
1:225

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
				AREA 6300 TANTALITE STORAGE REMOVED	
				AREA 6600 TAILINGS DISC FILTER	
				& TAILINGS CONV. REVISED	
000-01-AM-004	G.A. SPODUMENE PLANT	A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	S.K.

DESIGN:	S.KOPPALKAR	15-09-2016
DRAWN:	J.BRADETTE	02-12-2016
VERIFY:	S. KOPPALKAR	27-03-2017
APPROVED:	F. BARIL ing.	27-03-2017

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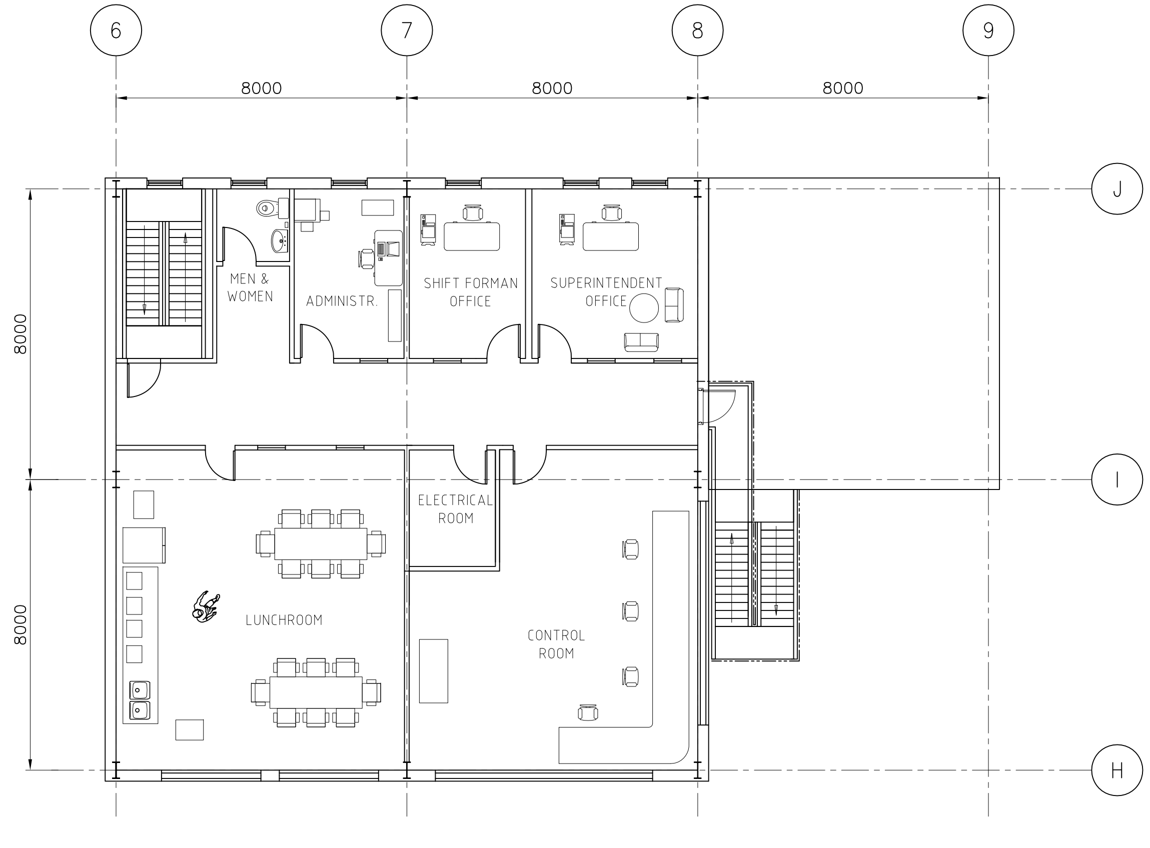
CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

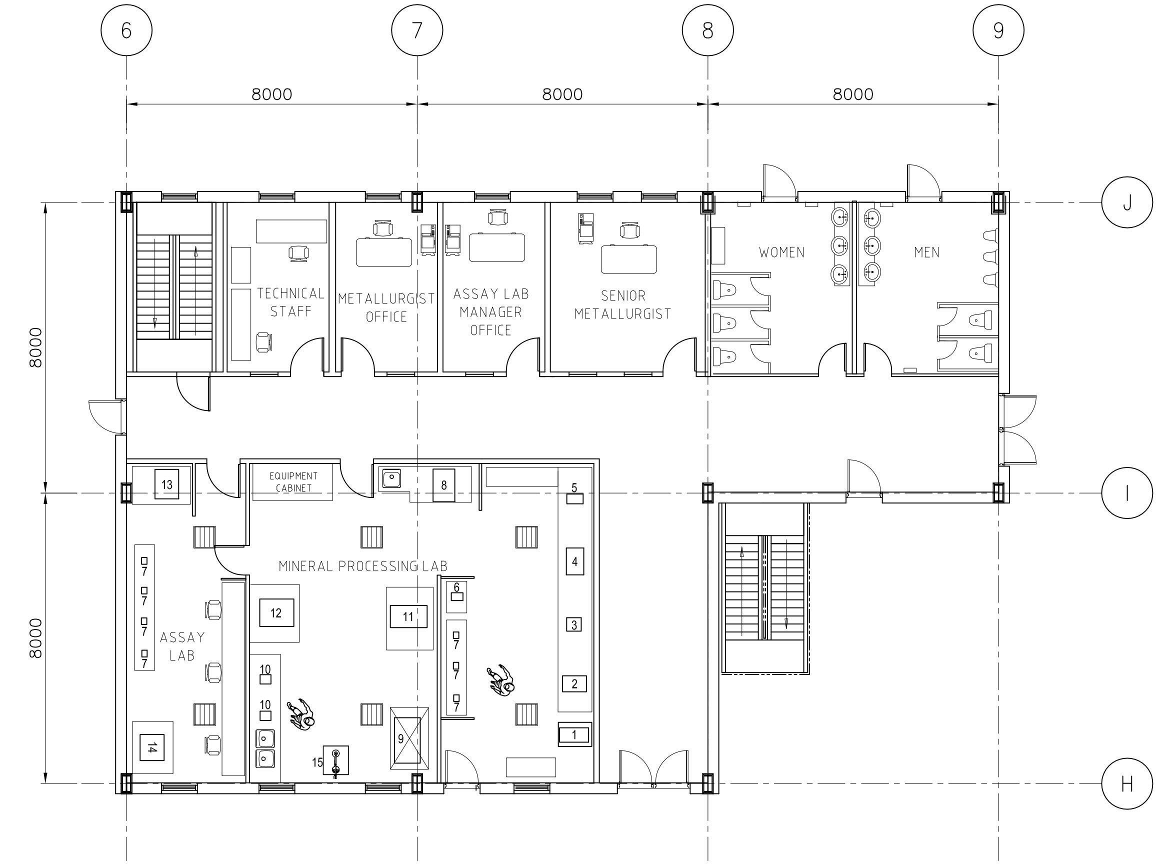
DESCRIPTION: GENERAL ARRANGEMENT
SPODUMENE PLANT

SCALE: A.N. | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 009 (SEQ.) B (REV.)

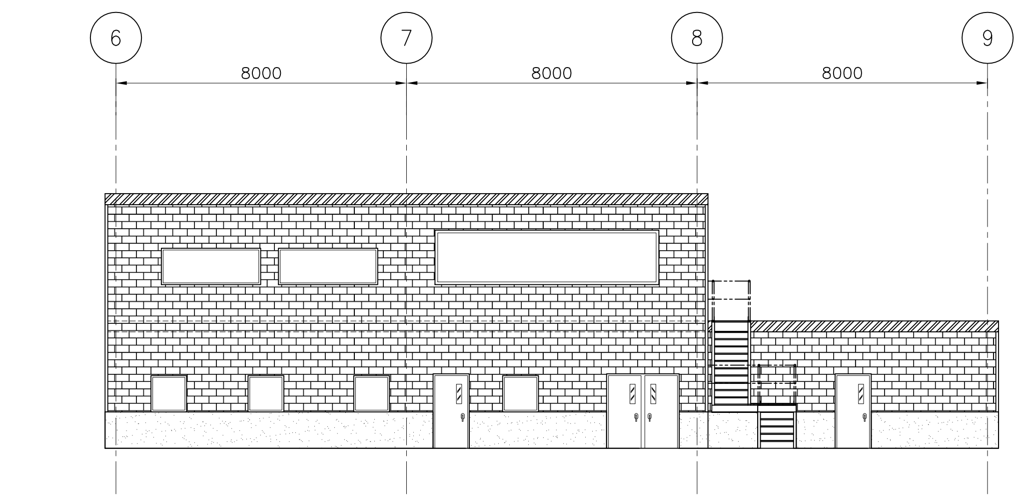


PLAN VIEW 1st FLOOR
(1:100)

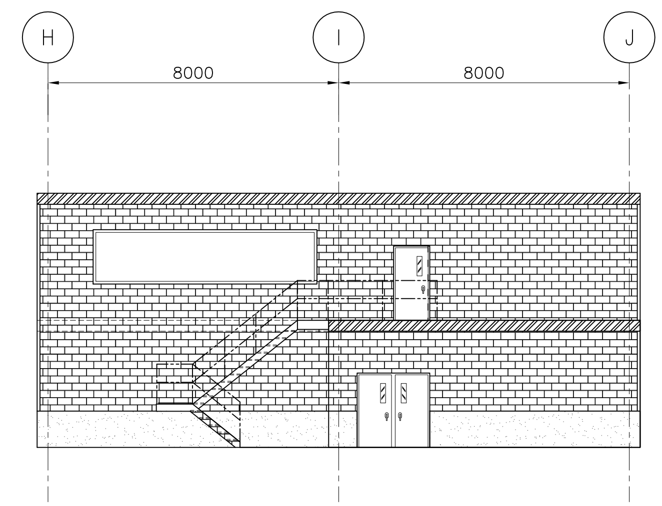


PLAN VIEW 2nd FLOOR
(1:100)

LAB EQUIPMENT IDENTIFICATION	
ID	EQUIPMENT
1	JAW CRUSHER
2	DISC MILL
3	SIEVE SHAKER
4	RIFFLE SAMPLER SPLITTERS
5	ROTARY CONE SAMPLER DIVIDER
6	MOISTURE BALANCE
7	ANALYTICAL SCALES
8	DENVER FLOTATION CELL
9	LARGE CAPACITY BENCH OVEN
10	PRESSURE FILTER
11	LARGE CAPACITY ROTARY SAMPLE DIVIDER
12	LARGE CAPACITY SIEVE MACHINE
13	AVIO 200 ICP
14	VIBRATING CUP MILL
15	EMERGENCY EYE WASH AND SHOWER



ELEVATION VIEW
(1:100)



PROFILE VIEW
(1:100)

AREA 6000

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY
		B	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV. AS NOTED)	J.B.
				OFFICES & LAB BUILDING REVISED	
				OFFICES & LAB BUILDING ELEVATIONS ADDED	
		A	31-03-2017	ISSUED FOR FEASIBILITY STUDY	J.B.

DESIGN:	A.CRISTEA	02-02-2017
DRAWN:	A.CRISTEA	02-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	07-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: GENERAL ARRANGEMENT
OFFICES AND LABORATORY

SCALE: 1:100 | UNITS: mm | FORMAT: A1 | PAGE: PAGE

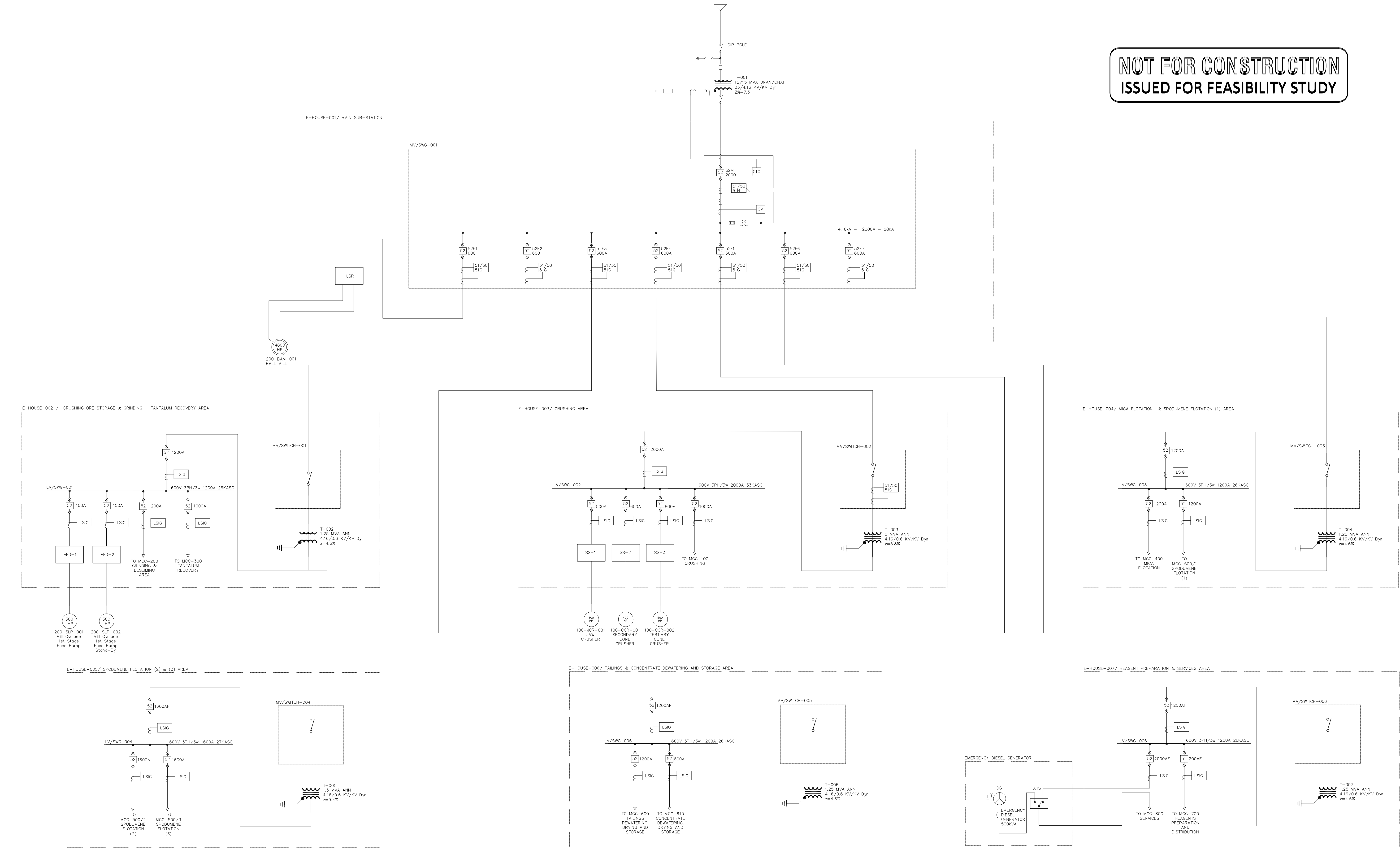
DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 01 (DISC.) - AM (TYPE) - 011 (SEQ.) B (REV.)

APPENDIX

18 B

SPODUMENE PLANT ELECTRICAL INSTALLATION SINGLE-LINE DIAGRAM

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY



REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY

DESIGN: L.AMKHOUKH — 2016/12/26
DRAWN: DRAWN — DATE 2
VERIFY: VERIFY — DATE3
APPROVED: APPROVED — DATE4

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CLIENT:

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
SPODUMENE PLANT
SINGLE LINE DIAGRAM

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 06 (DISC.) - DG (TYPE) - 001 (SEQ.) | D (REV.)

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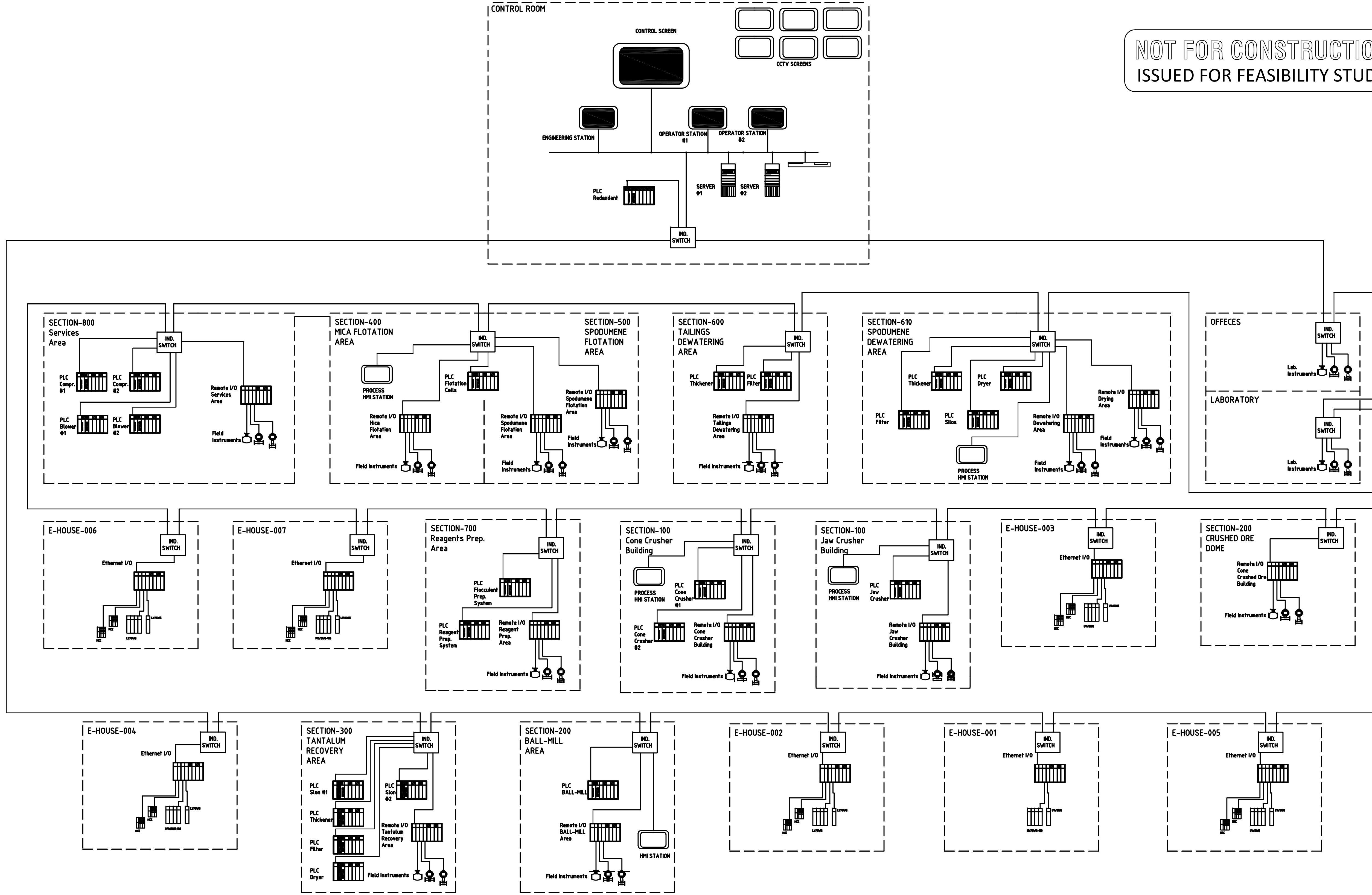
APPENDIX

18C

SPODUMENE PLANT CONTROL SYSTEM AND F.O. LOOP



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REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY

DESIGN: L.AMKHOUKH 2017/03/22
DRAWN: DRAWN DATE 2
VERIFY: VERIFY DATE3
APPROVED: APPROVED DATE4

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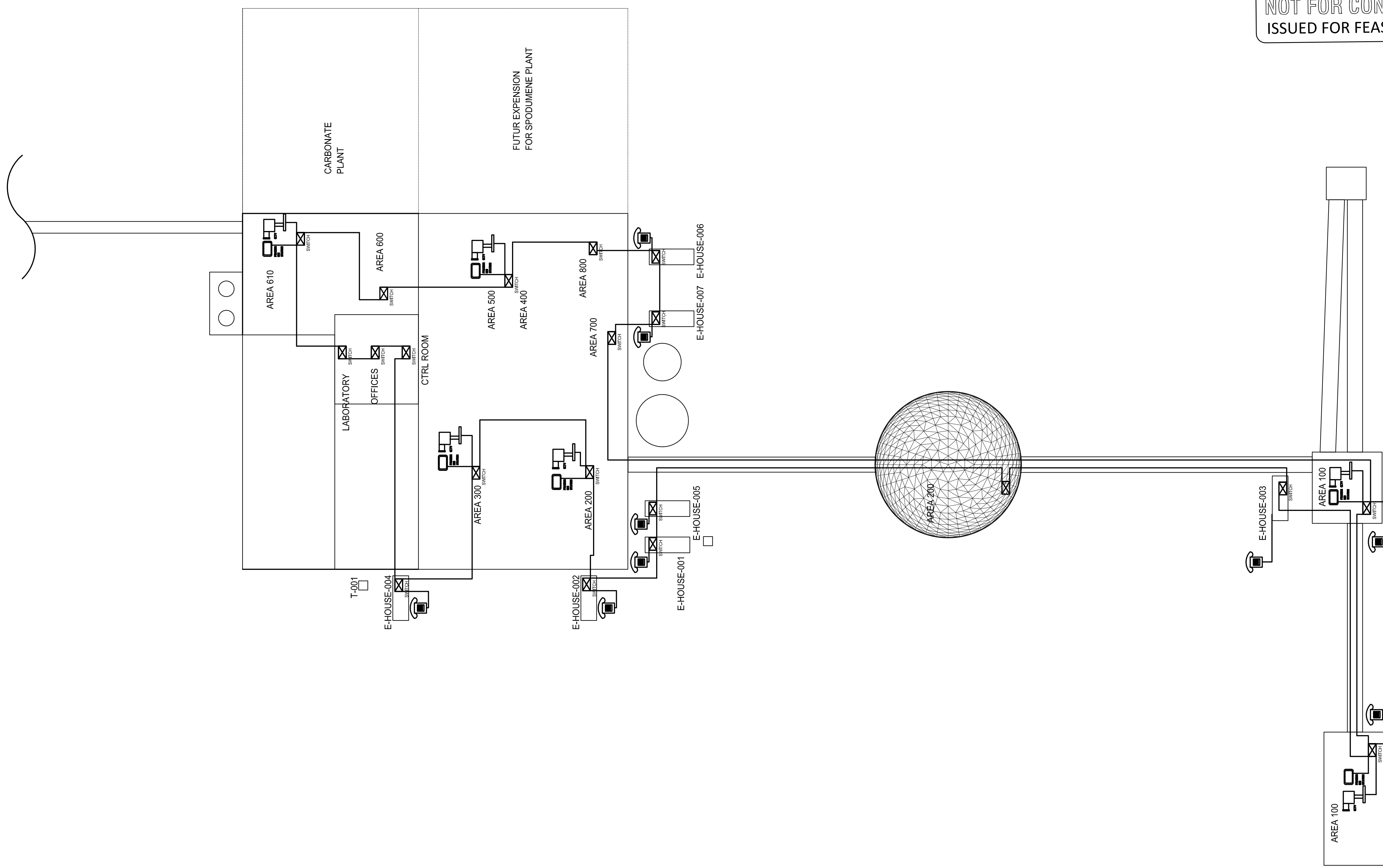
PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: SPODUMENE PLANT CONTROL SYSTEM

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 08 (DISC.) - DG (TYPE) - 001 (SEQ.) D (REV.)



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DWG. NO.	REFERENCE DRAWINGS	REV	DATE	DESCRIPTION	BY

DESIGN:	L.AMKHOUKH	2017-03-20
DRAWN:		
VERIFY:	VERIFY	DATE3
APPROVED:	APPROVED	DATE4

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CLIENT:

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: SPODUMENE PLANT
F.O LOOP

SCALE: A.N. | UNITS: mm | FORMAT: A1 | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 000 (AREA) - 08 (DISC.) - DG (TYPE) 002 (SEQ.) C (REV.)

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APPENDIX

18D

P&IDS

INSTRUMENTS SYMBOLS

- LE LEVEL PRIMARY ELEMENT
- LIT LEVEL INDICATING TRANSMITTER
- LIC LEVEL INDICATING CONTROLLER
- FE FLOW PRIMARY ELEMENT
- FIT FLOW INDICATING TRANSMITTER
- FIC FLOW INDICATING CONTROLLER
- TE TEMPERATURE PRIMARY ELEMENT
- TIT TEMPERATURE INDICATING TRANSMITTER
- TAH HIGH TEMPERATURE ALARM
- LSH HIGH LEVEL SWITCHE
- LSL LOW LEVEL SWITCHE
- DE DENSITY PRIMARY ELEMENT
- DIT DENSITY INDICATING TRANSMITTER
- DIC DENSITY INDICATING CONTROLLER
- PID ELECTROPNEUMATIC CONVERTER
- FV FLOW FINAL ELEMENT (VALVE)
- FY SOLENOID DEVICE
- ZSL LOW POSITION SWITCHE
- ZSH HIGH POSITION SWITCHE
- VLV VALVE LOCKED VARIABLE (OPEN OR CLOSE)

INSTRUMENTS CODES

1st LETTER	2nd LETTER	3rd LETTER
D: DENSITY	A: ALARM	H: HIGH
F: FLOW	C: CONTROL	L: LOW
H: HAND	E: MEASURING ELEMENT	V: VALVE
J: POWER	I: INDICATOR	C: CONTROL
L: LEVEL	S: SWITCH	
P: PRESSURE	T: TRANSMITER	
S: SPEED		
T: TEMPERATURE		
V: MECHANICAL ANALYSIS		
Y: NOT RATED		
Z: POSITION		
W: WEIGHT		

INSTRUMENTATION SIGNALS SYMBOLS

- ELECTRICAL SIGNALS
- LINK TO COMPUTER NETWORK
- INSTRUMENT AIR SIGNALS

EQUIPMENTS CODES

SYMBOL	EQUIPMENT	SYMBOL	EQUIPMENT
ACO	AIR COOLER	JCS	JACKING SYSTEM
ADR	AIR DRYER	LHR	LINER HANDLER
AGI	AGITATOR	LUB	LUBE UNIT
ARR	AIR RECEIVER	MDR	METAL DETECTOR
ATS	ATTRITION SCRUBBER	MEP	METERING PUMP
BAM	BALL MILL	MGS	MAGNETIC SEPARATOR
BAS	BAGGING SYSTEM	MHT	MONORAIL HOIST
BBU	BALL BUCKET	MTR	MOISTURE TRAP
BCR	BALL CHARGER	OCR	OVERHEAD CRANE
BEF	BELT FEEDER	PBX	PUMP BOX
BIN	BIN	PNC	PNEUMATIC CONVEYOR
BIV	BIN VENT	RAM	RAKE MECHANISM
BLR	BLOWER	RBR	ROCK BREAKER
BMG	BALL MAGNET	RDR	ROTARY DRYER
BUS	BULK UNLOADING SYSTEM	RVL	ROTARY VALVE
CCR	CONE CRUSHER	SDM	STORAGE DOME
CDT	CONDITIONING TANK	SFR	SCREW FEEDER
CHU	CHUTE	SGR	STATIONARY GRIZZLY
COM	COMPRESSOR	SLO	SILO
CVR	CONVEYOR	SLP	SLURRY PUMP
CYC	CYCLONE CLUSTER	SLR	SILENCER
DEP	DIESEL PUMP	SMG	STATIONARY MAGNET
DFR	DISC FILTER	SOP	SOLUTION PUMP
DRY	PADDLE DRYER	TAK	TANK
DUC	DUST COLLECTOR	TFP	TRANSFER FLUID PUMP
EES	EMERGENCY EYE SHOWER	THR	THICKENER
FAN	FAN	TRM	TROMMEL
FLC	FLOTATION CELL	VAP	VACUUM PUMP
HOP	HOPPER	VAR	VACUUM RECEIVER
HTR	HEATER	VGR	VIBRATING GRIZZLY FEEDER
IFR	INLET FILTER	VIS	VIBRATING SCREEN
JCP	JOCKEY PUMP	VTP	VERTICAL PUMP (SALA)
JCR	JAW CRUSHER	WAP	WATER PUMP

VALVES SYMBOLS

- BUTTERFLY VALVE
- PINCH VALVE
- GATE VALVE
- BALL VALVE
- CHECK VALVE
- SELF CONTROL PRESSURE VALVE
- PNEUMATIC KNIFE GATE VALVE
- SOLENOID CONTROL VALVE
- PNEUMATIC VALVE
- MOTOR CONTROL VALVE
- RELIEF VALVE
- 3-WAY SOLENOID VALVE
- GLOBE VALVE

OPERATORS SYMBOLS

- HAND OPERATOR
- SOLENOID OPERATOR
- CYLINDER OPERATOR
- DIAPHRAGM OPERATOR
- ELECTRIC ACTUATOR

PIPING LINES SYMBOLS

- PRIMARY FLOW
- PROCESS WATER
- GLAND WATER
- AIR
- REAGENTS AND FLOCULANT
- INTERMITENT FLOW

OTHER SYMBOLS

- STRAINER
- DUPLEX BASKET STRAINER
- MOTOR
- FAN
- CENTRIFUGAL PUMP
- SUMP PUMP
- DOSING PUMP
- MAGNETIC FLOWMETER
- DE DX NUCLEAR DENSITY MONITOR
- LINE SPECIFICATION CHANGE
- PROGRESSIVE CAVITY METERING PUMP
- MOTOR REDUCER

TYPE OF PRODUCT

SYMBOL	PRODUCT	LINE CLASS
PRW	PROCESS WATER	CS
RAW	RAW WATER	CS
GLW	GLAND (SEALING) WATER	CS
CLW	CLEAR WATER	CS
WSW	WASTE WATER	CS
INA	INSTRUMENT AIR	CS
PRA	PROCESS AIR	CS
FLA	FLOTATION AIR	CS
WSA	WASTE AIR	CS
PRS	PROCESS SLURRY	CSRL/HDPE
SPS	SUMP SLURRY	HDPE
RGS	REAGENT SOLUTIONS	SS/PE
FLT	FILTRATE	HDPE

PIPING CODIFICATION

300 - 150 - PRS - CSRL - 001

- 300: AREA CODE
- 150: NOMINAL PIPE DIAMETER [mm]
- PRS: FLUID
- CSRL: MATERIAL
- 001: SEQUENTIAL NUMBER

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM LEGEND

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

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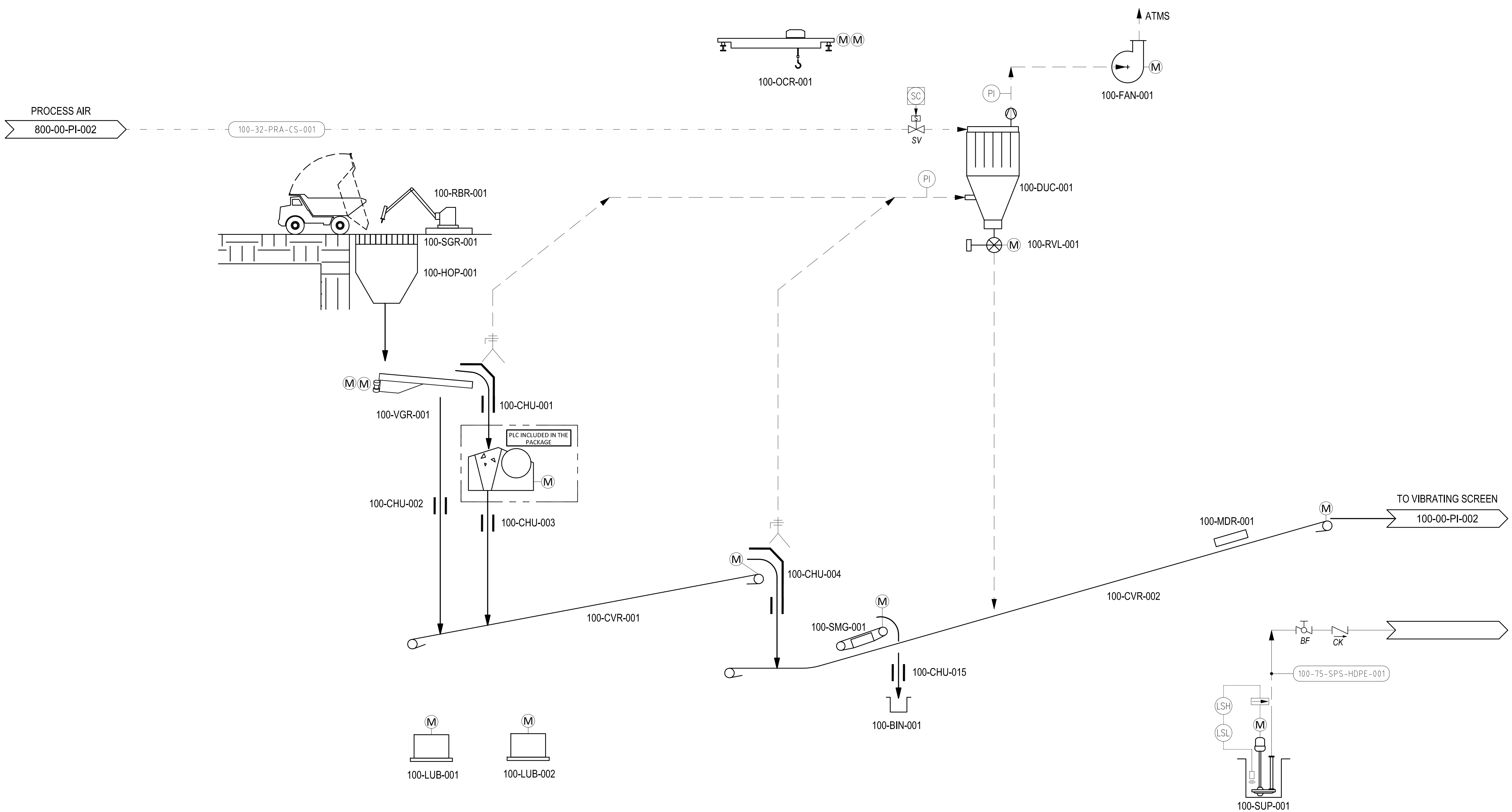
100-RBR-001 ROCK BREAKER | 100-SGR-001 GRIZZLY | 100-HOP-001 CRUSHER FEED HOPPER | 100-JCR-001 JAW CRUSHER | 100-OCR-001 CRUSHING AREA OVERHEAD CRANE | 100-DUC-001 DUST COLLECTOR | 100-RVL-001 ROTARY VALVE | 100-FAN-001 DUST COLLECTOR FAN



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VIBRATING GRIZZLY FEEDER	GRIZZLY FEEDER DISCHARGE CHUTE	GRIZZLY FEEDER FINES CHUTE	JAW CRUSHER DISCHARGE CHUTE	VIBRATING GRIZZLY GREASING UNIT	JAW CRUSHER LUBRICATION SYSTEM	CONVEYOR No.1	CONVEYOR No.1 DISCHARGE CHUTE	CONVEYOR No.2	SELF-CLEANING MAGNET	METAL DETECTOR	JAW CRUSHER AREA SUMP PUMP	TRASH BIN	SELF-CLEANING MAGNET

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AREA 6100

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.) AREA 6100 CONVEYORS REVISED	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A

DESIGN:	M.L AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
JAW CRUSHER AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 100 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) | C (REV.)

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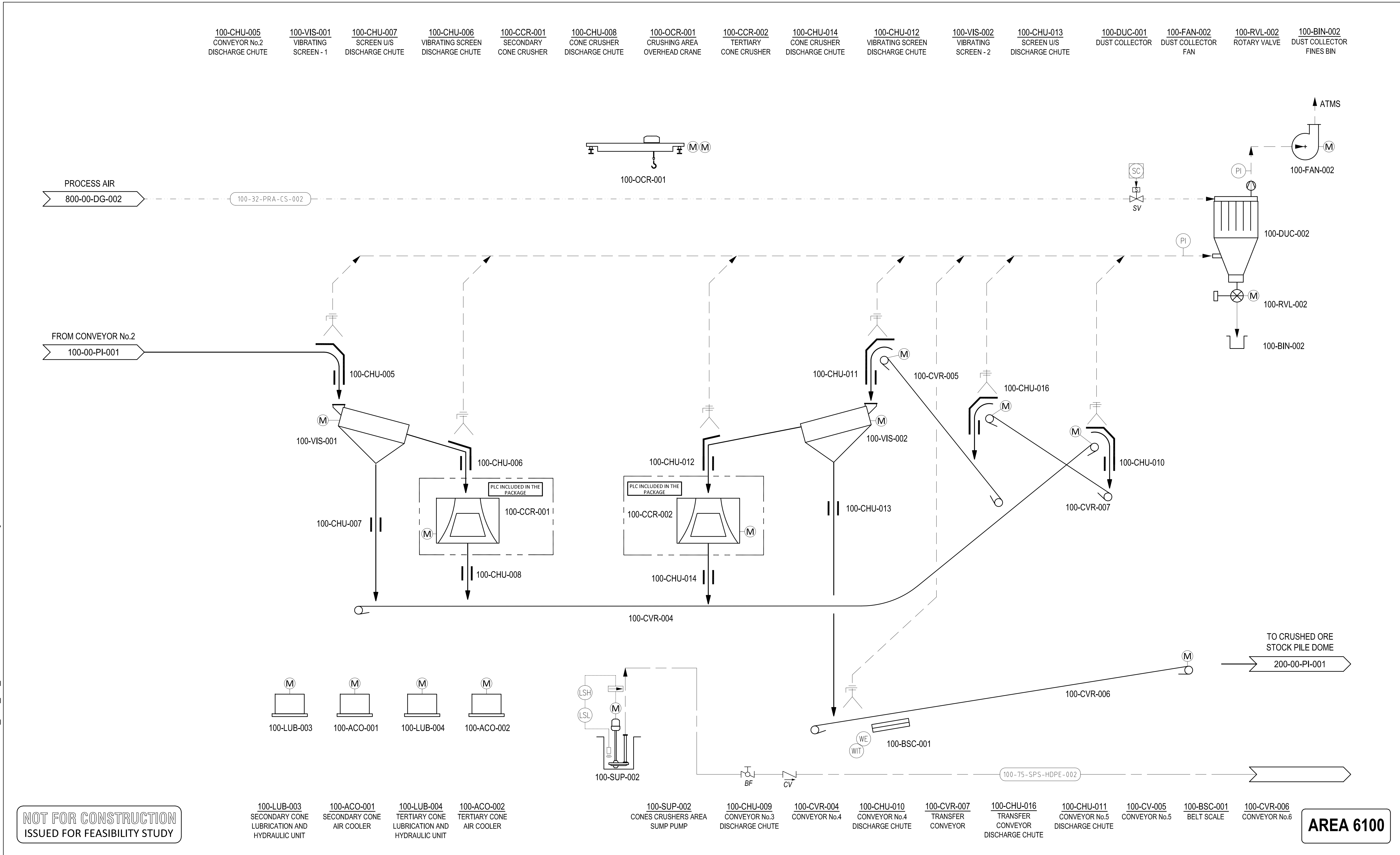

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				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
CONE CRUSHERS AREA

SCALE: NTS	UNITS: -	FORMAT: ANSI B	PAGE: 1/1

DRAWING NO.:

PROJECT	AREA	DISC.	TYPE	SEQ.	REV.
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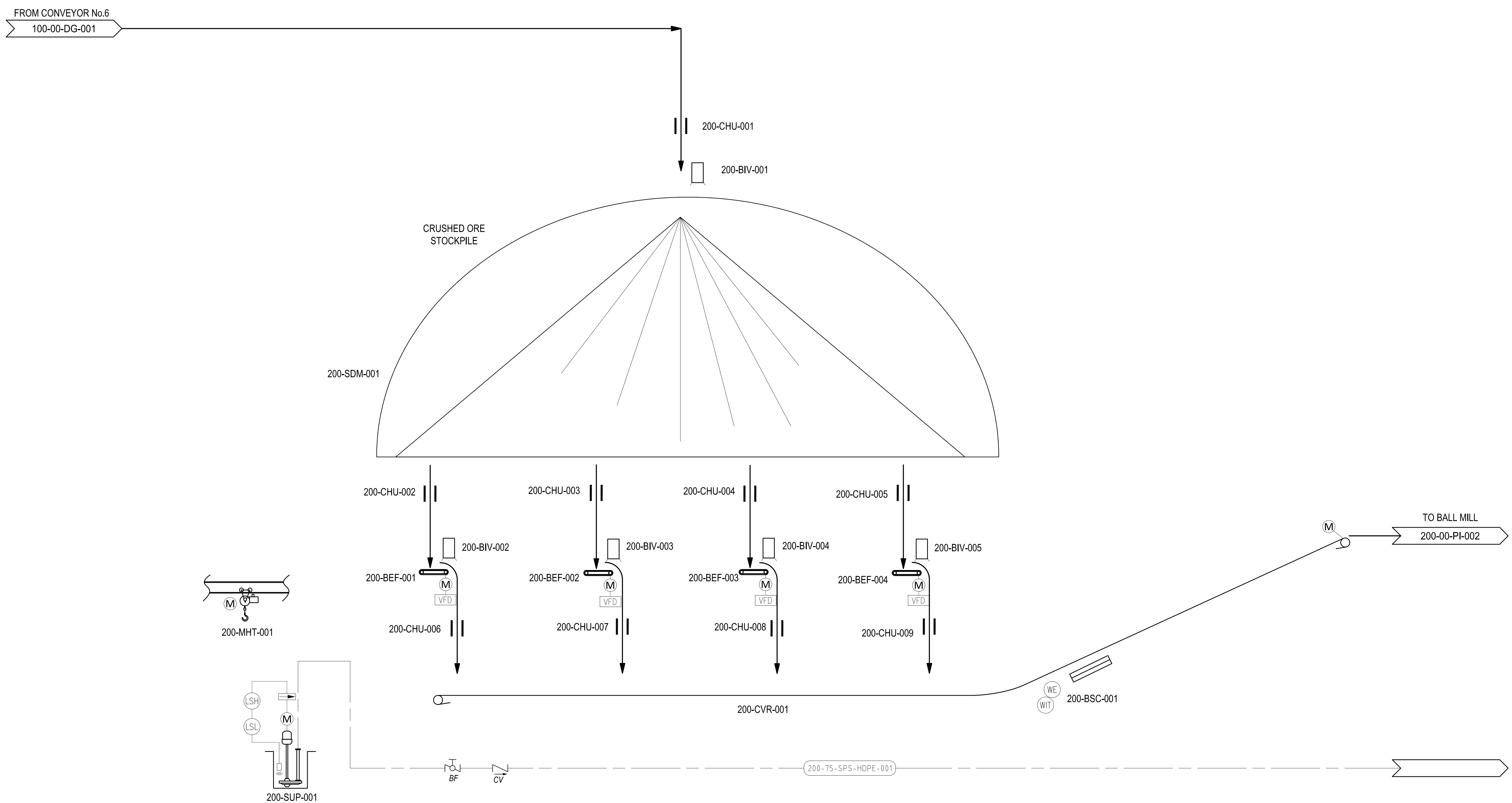
CONVEYOR No.6 DISCHARGE CHUTE	MONORAIL HOIST	STORAGE DOME	BELT FEEDER	BELT FEEDER	BELT FEEDER	BELT FEEDER	BIN VENT DOME AREA	BIN VENT BELT FEEDER



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STORAGE AREA SUMP PUMP	BELT FEEDER FEED CHUTE	BELT FEEDER DISCHARGE CHUTE	BELT FEEDER FEED CHUTE	BELT FEEDER DISCHARGE CHUTE	BELT FEEDER FEED CHUTE	BELT FEEDER DISCHARGE CHUTE	BELT FEEDER FEED CHUTE	BELT FEEDER DISCHARGE CHUTE	BELT SCALE	MILL FEED CONVEYOR No.7

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AREA 6200

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPNG & INSTRUMENTATION DIAGRAM
STORAGE AND RECLAIM AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

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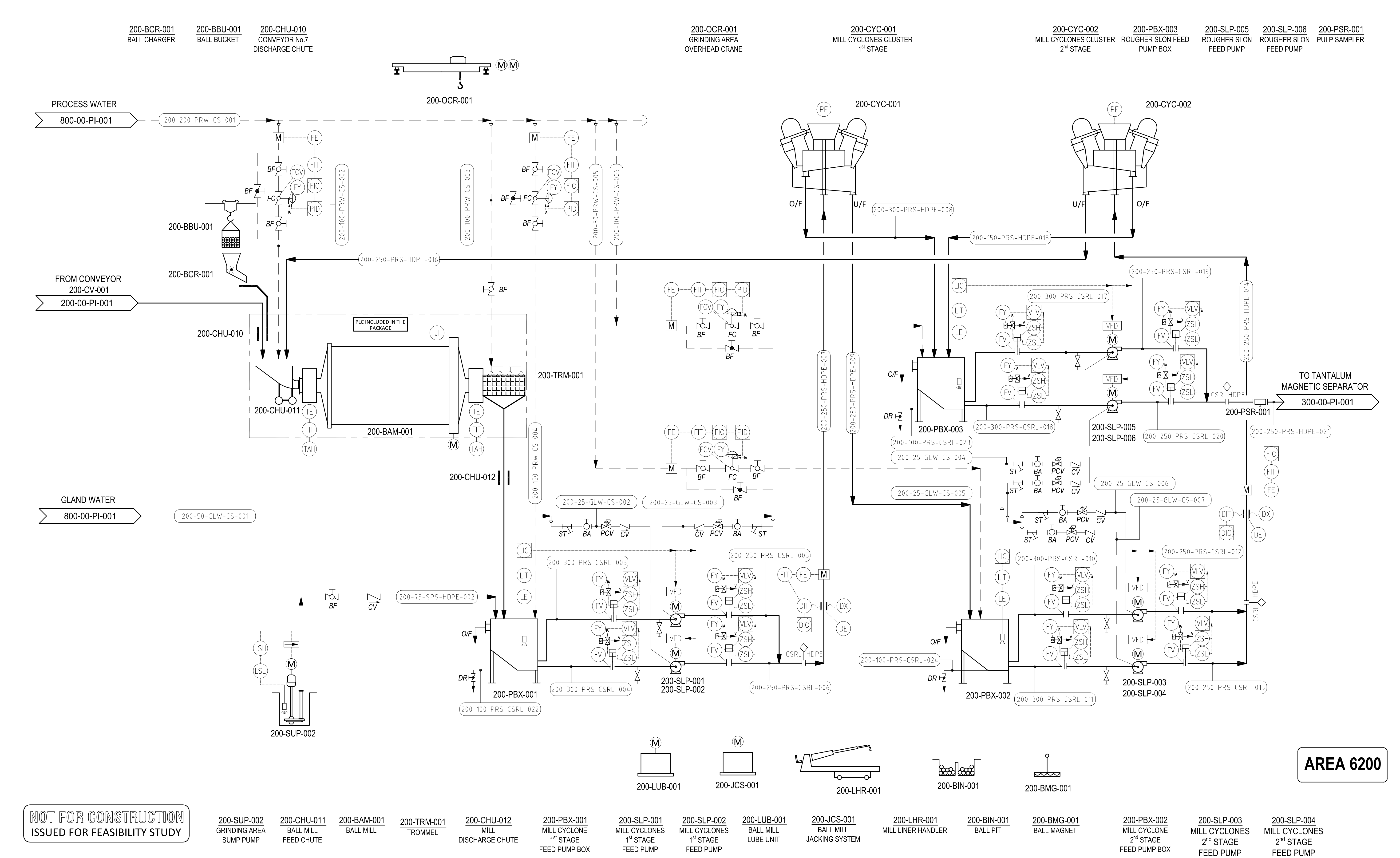

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B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L.AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
GRINDING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 200 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) C (REV.)

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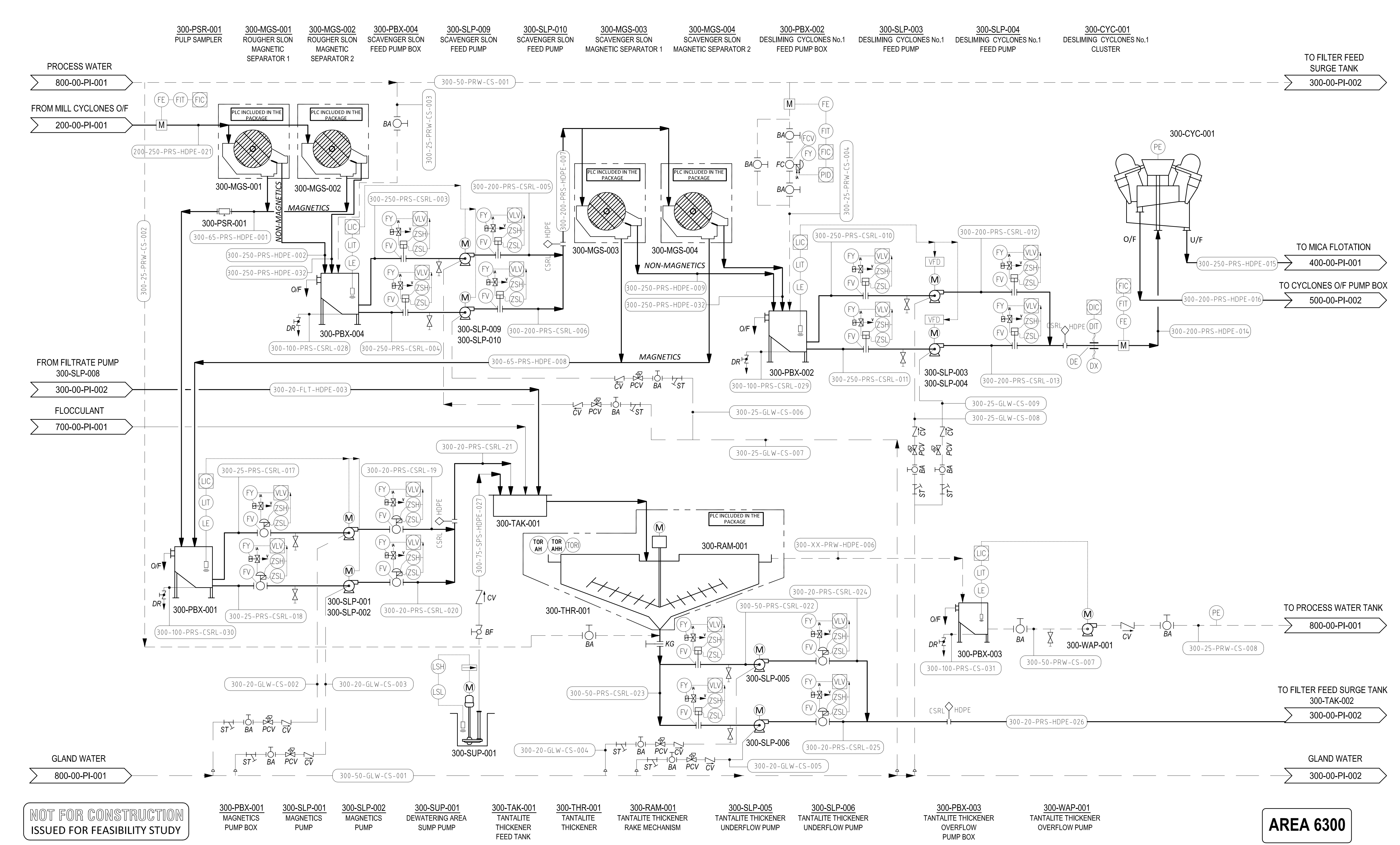

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REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L.AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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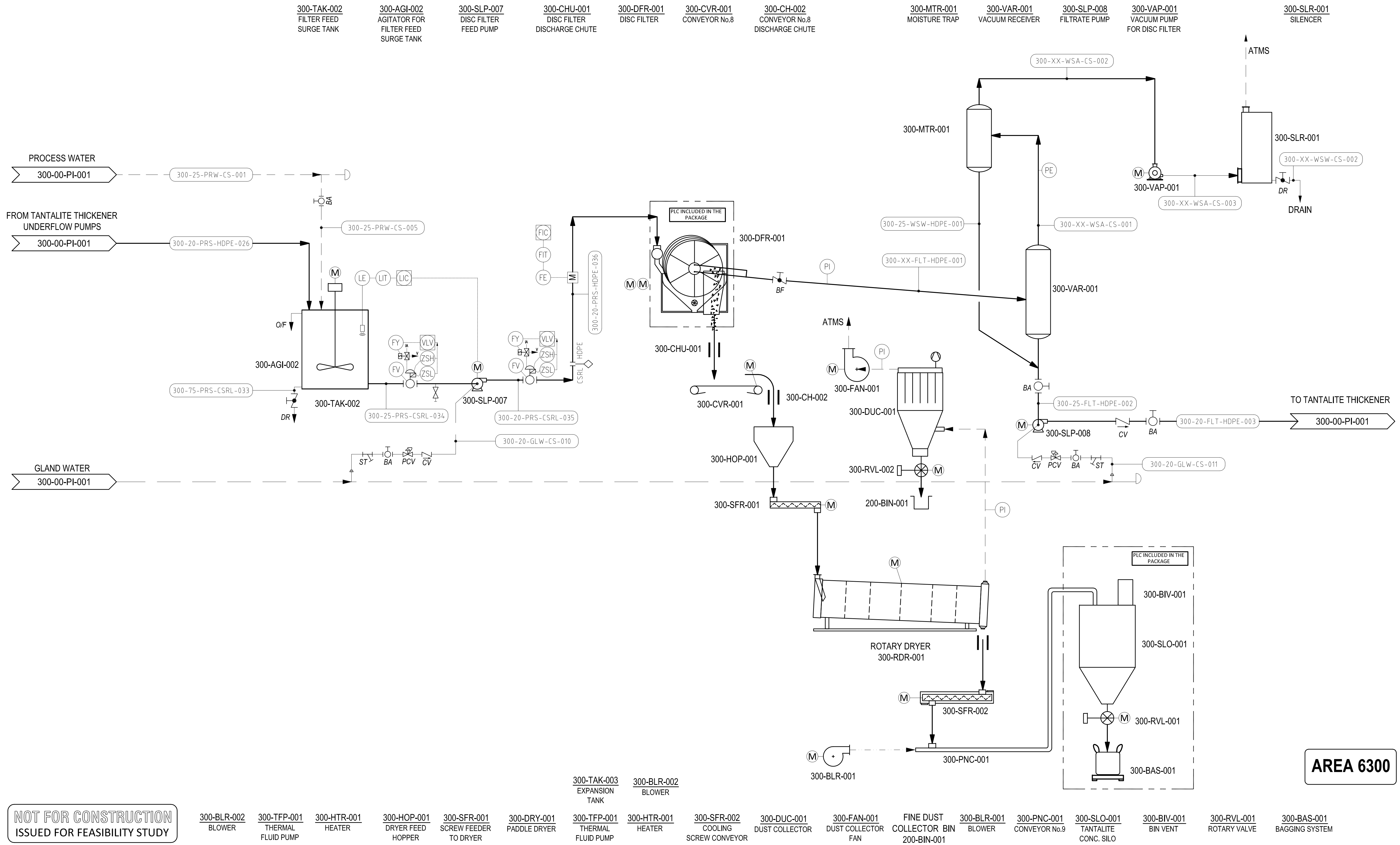
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 300 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) | REV. C



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B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L.AMIR, ing.	29-12-2016
DRAWN:	A. CRISTEA	29-12-2016
VERIFY:	S. KOPPALKAR	06-01-2017
APPROVED:	F. BARIL ing.	06-01-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTAION DIAGRAM
TANTALITE AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 300 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) C (REV.)

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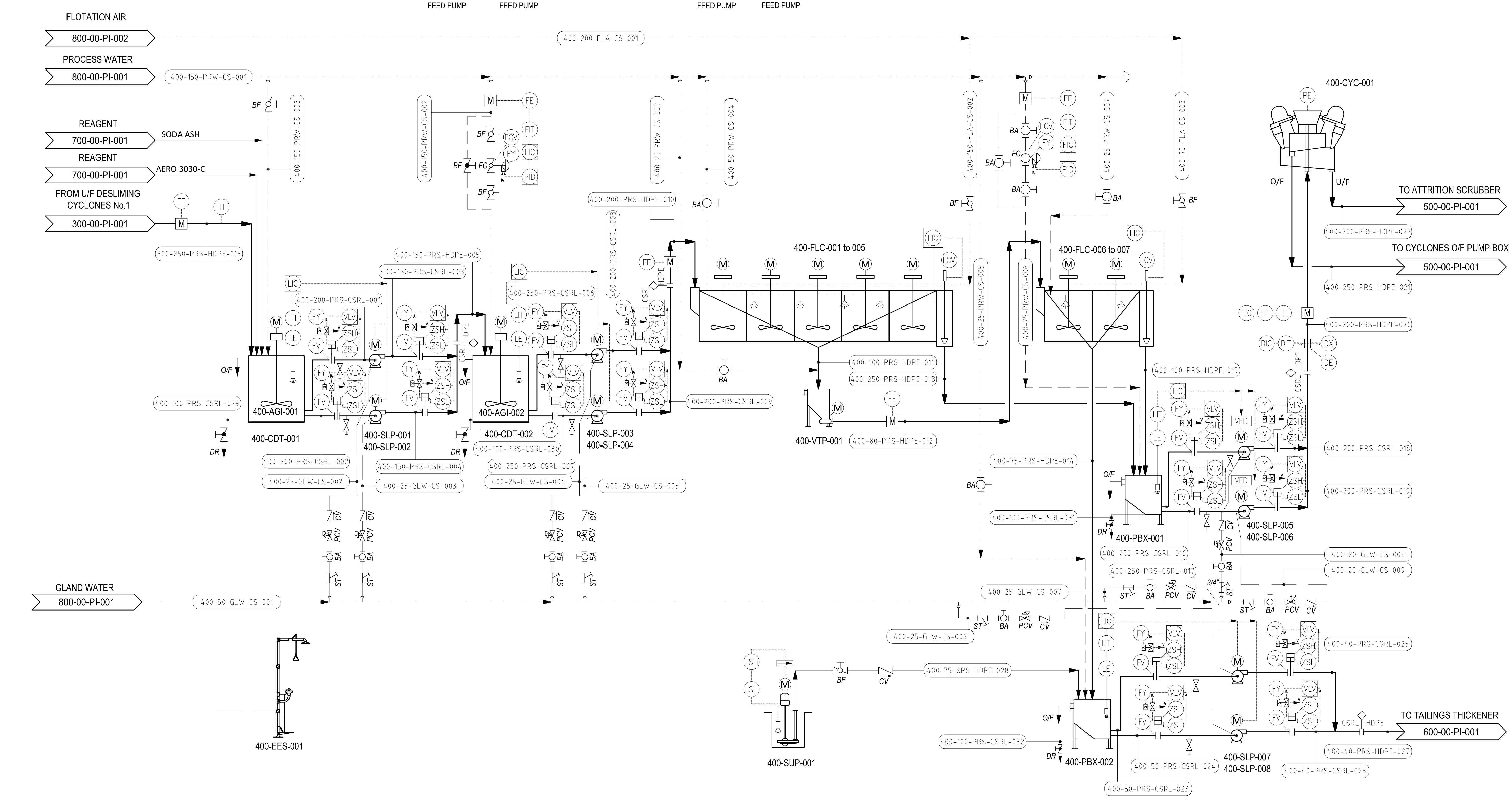
400-CDT-001	400-AGI-001	400-SLP-001	400-SLP-002	400-CDT-002	400-AGI-002	400-SLP-003	400-SLP-004	400-FLC-001 to 005	400-FLC-006 to 007	400-CYC-001
MICA FLOTATION CONDITIONING TANK	AGITATOR FOR CONDITIONING TANK	MICA FLOTATION DILUTION TANK FEED PUMP	MICA FLOTATION DILUTION TANK FEED PUMP	MICA FLOTATION DILUTION TANK	AGITATOR FOR DILUTION TANK	MICA ROUGHER FLOTATION FEED PUMP	MICA ROUGHER FLOTATION FEED PUMP	MICA ROUGHER FLOTATION CELLS	MICA CLEANER FLOTATION CELLS	DEWATERING CYCLONES No.1 CLUSTER



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ISSUED FOR FEASIBILITY STUDY

400-EES-001	400-VTP-001	400-SUP-001	400-PBX-002	400-SLP-007	400-SLP-008	400-PBX-001	400-SLP-005	400-SLP-006
EMERGENCY SHOWER AND EYE WASH STATION	MICA CLEANER FEED PUMP	MICA FLOTATION AREA SUMP PUMP	TAILINGS THICKENER FEED PUMP BOX	TAILINGS THICKENER FEED PUMP	TAILINGS THICKENER FEED PUMP	DEWATERING CYCLONES No.1 FEED PUMP BOX	DEWATERING CYCLONES No. 1 FEED PUMP	DEWATERING CYCLONES No. 1 FEED PUMP

AREA 6400

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L.AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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Montréal, Québec, H3B 1P5, Canada
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CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
MICA FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 400 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) | C (REV.)

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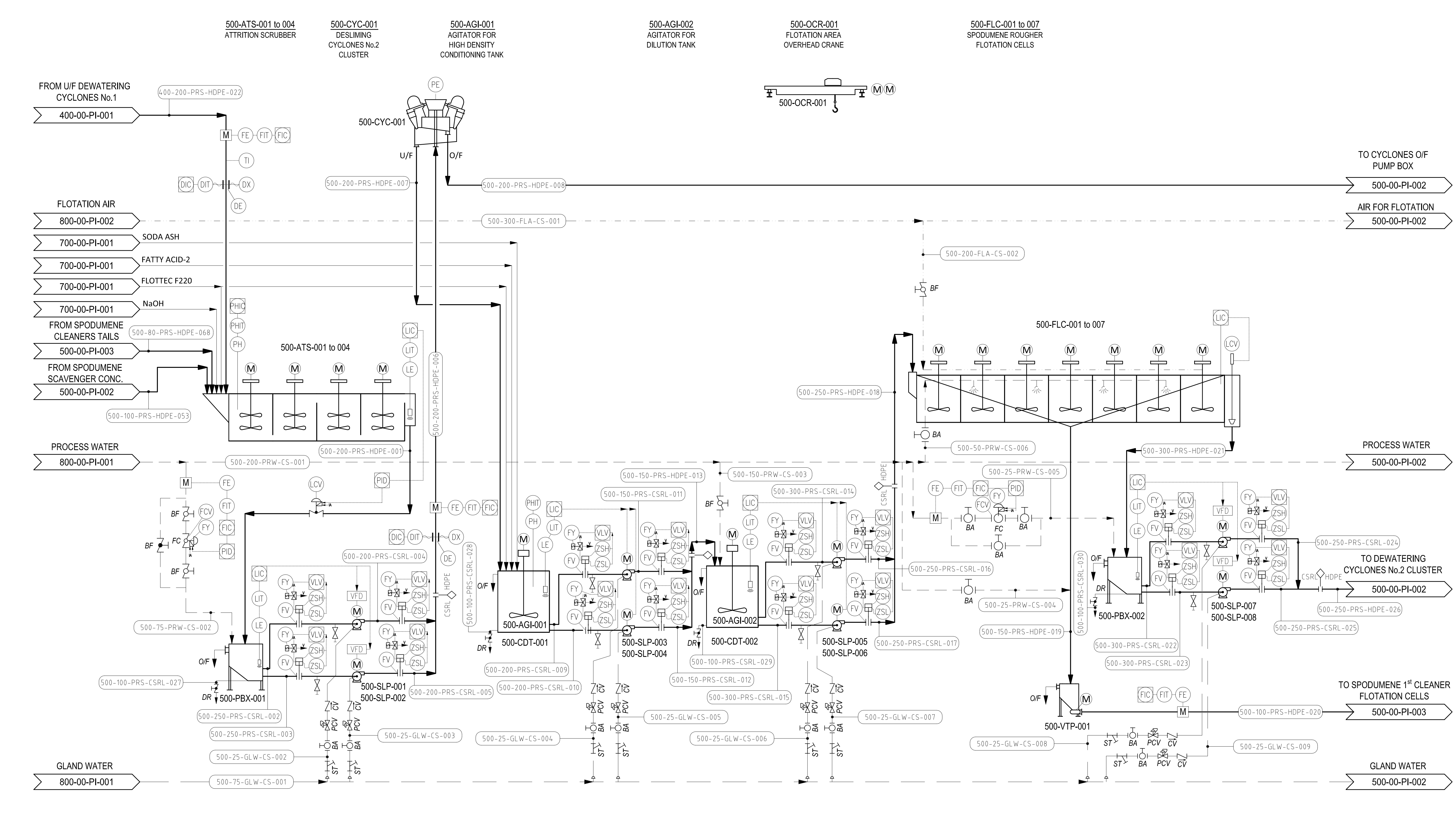

NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

500-PBX-001 DESLIMING CYCLONES No.2 FEED PUMP BOX	500-SLP-001 DESLIMING CYCLONES No.2 FEED PUMP	500-SLP-002 DESLIMING CYCLONES No.2 FEED PUMP	500-CDT-001 SPODUMENE ROUGHER HD CONDITIONING TANK	500-SLP-003 SPODUMENE ROUGER DILUTION TANK FEED PUMP	500-SLP-004 SPODUMENE ROUGHER DILUTION TANK FEED PUMP	500-CDT-002 SPODUMENE ROUGHER DILUTION TANK	500-SLP-005 SPODUMENE ROUGHER FEED PUMP	500-SLP-006 SPODUMENE ROUGHER FEED PUMP	500-VTP-001 SPODUMENE 1st CLEANER FEED PUMP	500-PBX-002 DEWATERING CYCLONES No.2 FEED PUMP BOX	500-SLP-007 DEWATERING CYCLONES No.2 FEED PUMP	500-SLP-008 DEWATERING CYCLONES No.2 FEED PUMP	AREA 6500

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
				B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L.AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 500 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) C (REV.)

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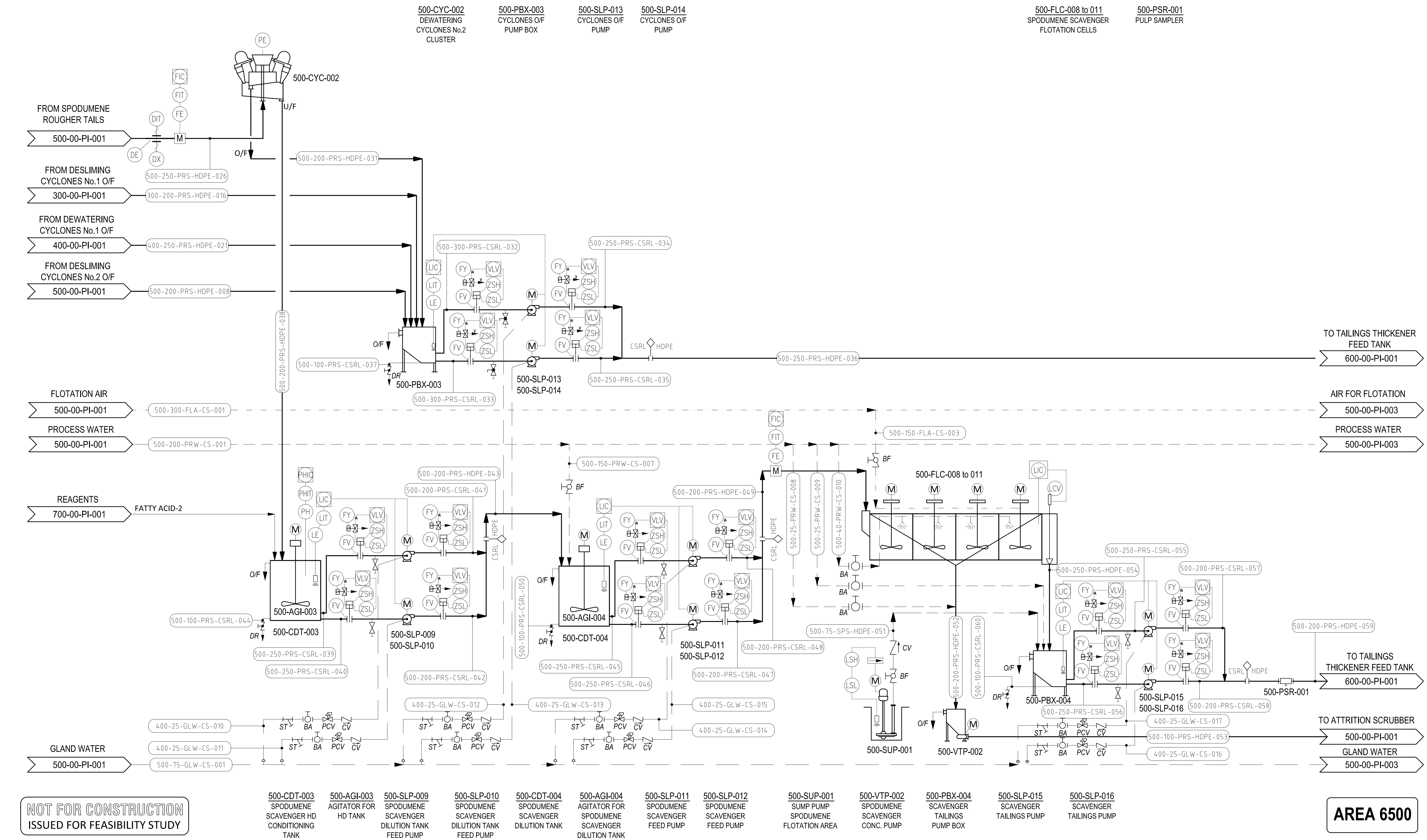

SAVED ON: 17-08-09 10:41 BY: Jbradette
PATH: Z:\INGENERIE\PROJETS EN COURS\CRITICAL ELEMENT - Rose\C20203-ÉtudeFaisabilité_43-101_Rose_Juillet 2016\DESS\07-INSTR\CAD - PID (final)\PID-Rev.C.dwg

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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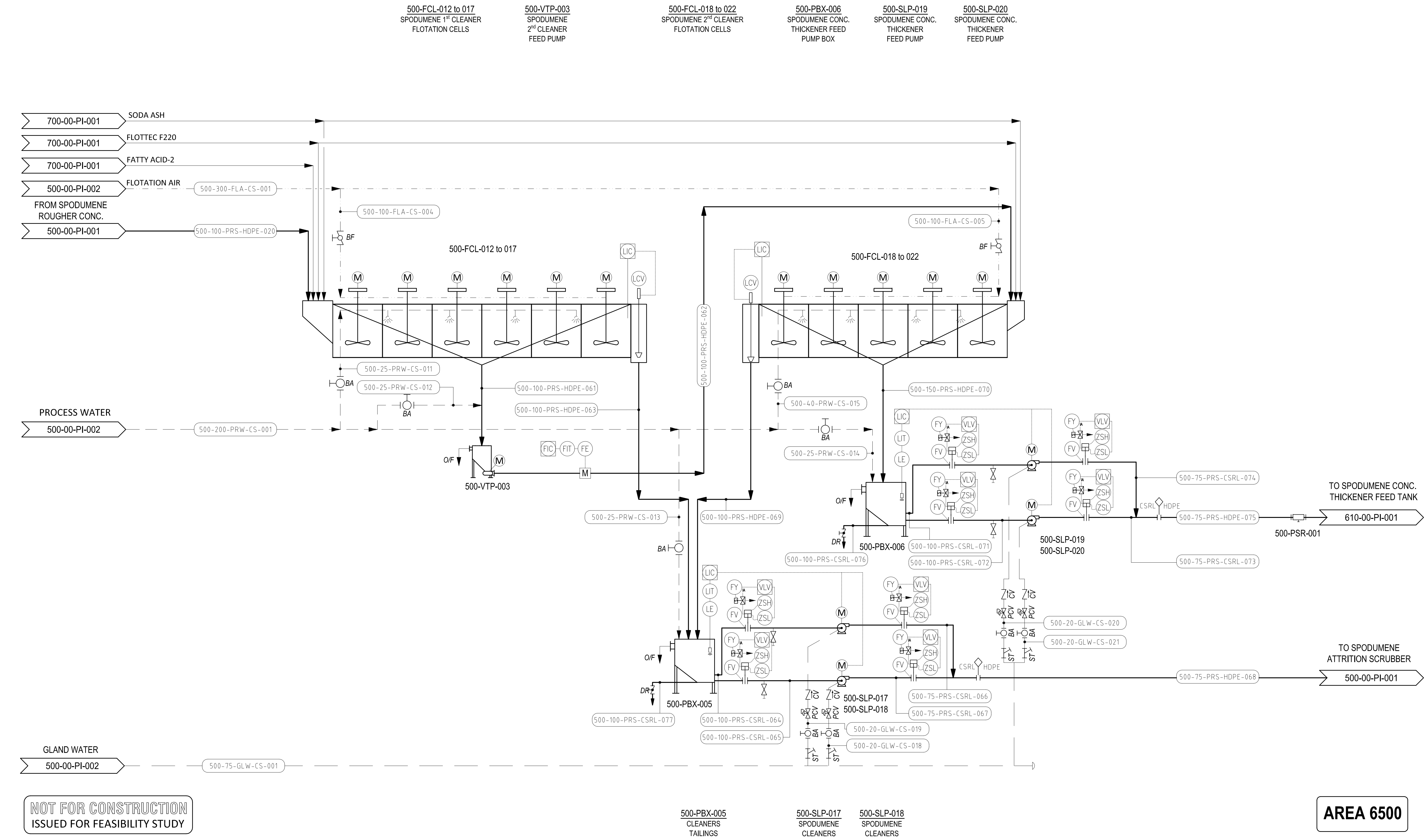
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 500 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) | C (REV.)



NOT FOR CONSTRUCTION
ISSUED FOR FEASIBILITY STUDY

AREA 6500

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
SPODUMENE FLOTATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

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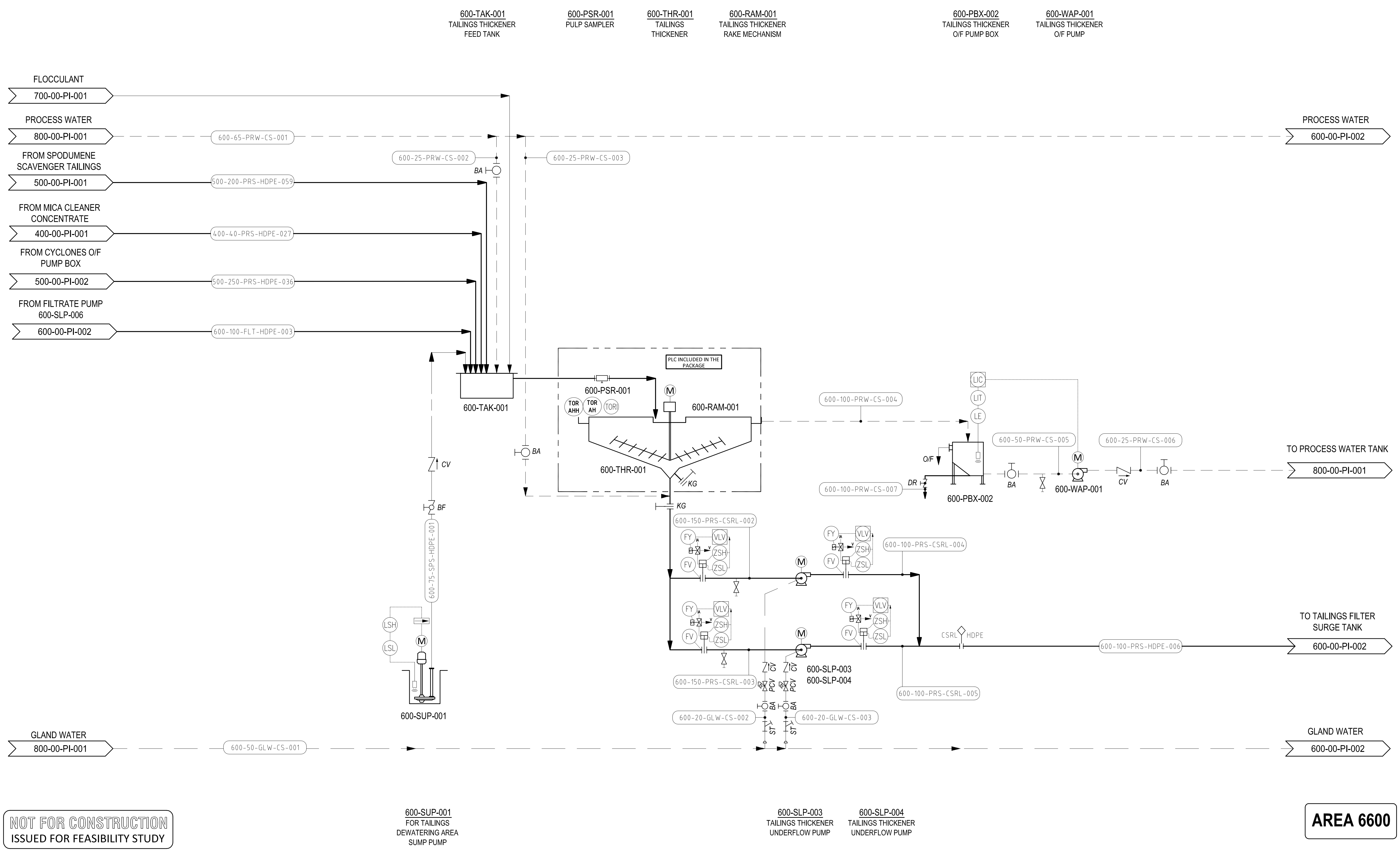

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
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				A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
TAILINGS DEWATERING AREA

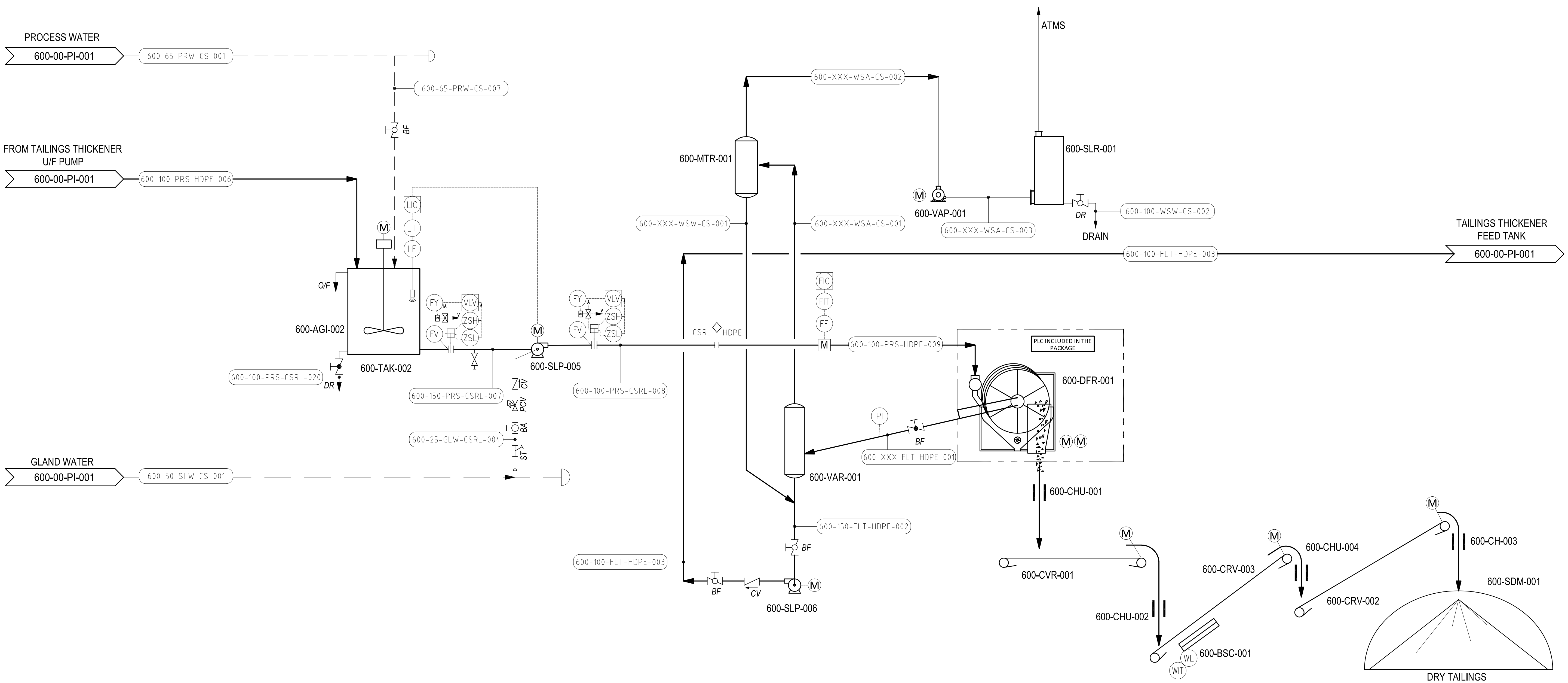
SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 600 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) | C (REV.)

600-MTR-001 MOISTURE TRAP

600-VAP-001 VACUUM PUMP FOR DISC FILTER

600-SLR-001 SILENCER



AREA 6600

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600-TAK-002	600-AGI-002	600-SLP-005	600-SLP-006	600-VAR-001	600-DFR-001	600-CHU-001	600-CVR-001	600-CRV-003	600-CHU-004	600-CHU-002	600-BSC-001	600-CRV-002	600-CH-003	600-SDM-001
TAILINGS FILTER FEED SURGE TANK	AGITATOR FOR TAILINGS FILTER SURGE TANK	TAILINGS FILTER FEED PUMP	TAILINGS FILTRATE RELEASE PUMP	VACUUM RECEIVER	TAILINGS DISC FILTER	DISC FILTER DISCHARGE CHUTE	CONVEYOR No.10	TAILINGS STORAGE TRANSFER CONVEYOR	TRANSFER CONVEYOR DISCHARGE CHUTE	CONVEYOR No.10 DISCHARGE CHUTE	BELT SCALE	TAILINGS STORAGE DOME CONVEYOR No.11	CONVEYOR No.11 DISCHARGE CHUTE	DRY TAILINGS STOCKPILE DOME

REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY
				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
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ROSE LITHIUM TANTALUM PROJECT
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DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
TAILINGS DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 600 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) | C (REV.)

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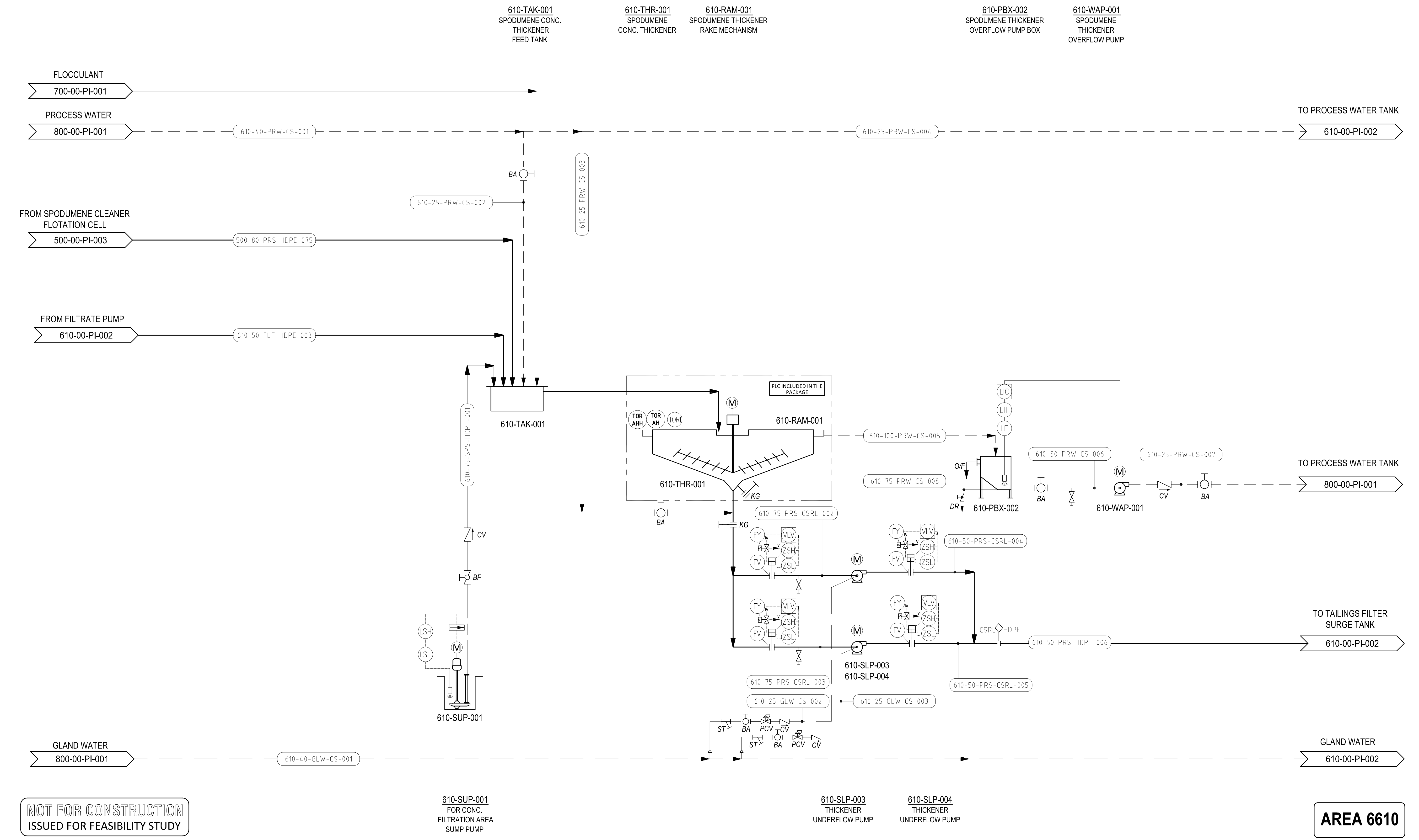

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AREA 6610

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REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN:	M.L. AMIR, ing.	06-02-2017
DRAWN:	A. CRISTEA	06-02-2017
VERIFY:	S. KOPPALKAR	06-02-2017
APPROVED:	F. BARIL ing.	06-02-2017

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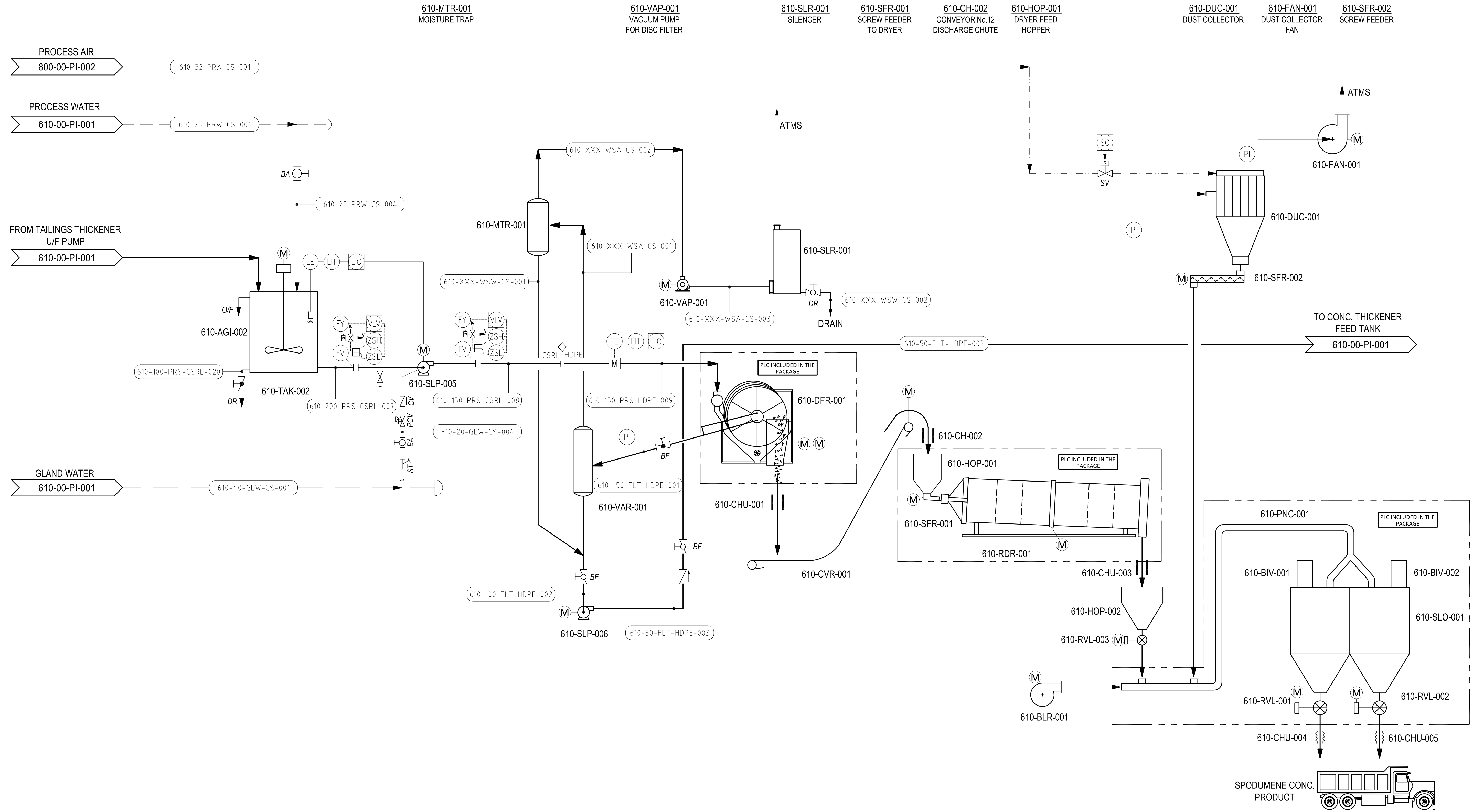
CLIENT: CriticalElements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
SPODUMENE DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 610 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) | C (REV.)



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FILTER FEED SURGE TANK	DISC FILTER FEED PUMP	SPODUMENE CONC. FILTRATE RELEASE PUMP	VACUUM RECEIVER	DISC FILTER DISCHARGE CHUTE	CONVEYOR No.12	SCREW FEEDER TO DRYER	ROTARY DRYER	DRYER DISCHARGE CHUTE	HOPPER / ROTARY VALVE	BLOWER FOR PNEUMATIC CONVEYOR	SPODUMENE CONC. SILO	BIN VENT / BIN VENT	RETRACTABLE CHUTE WITH DUST REMOVAL	RETRACTABLE CHUTE WITH DUST REMOVAL	ROTARY VALVE / ROTARY VALVE

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AREA 6610

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REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
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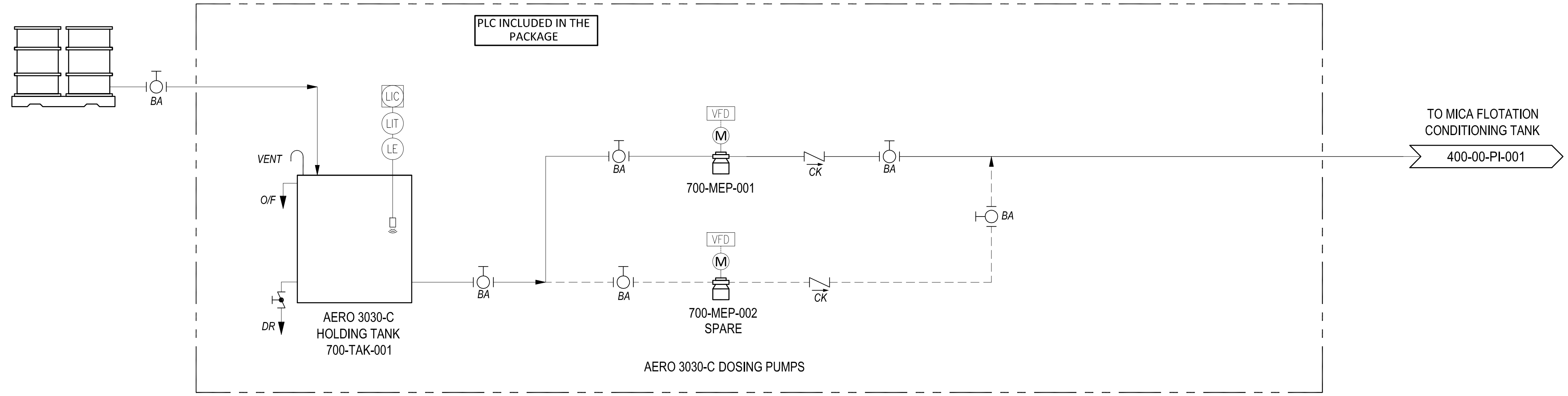
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
SPODUMENE DEWATERING AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) | 610 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) | C (REV.)



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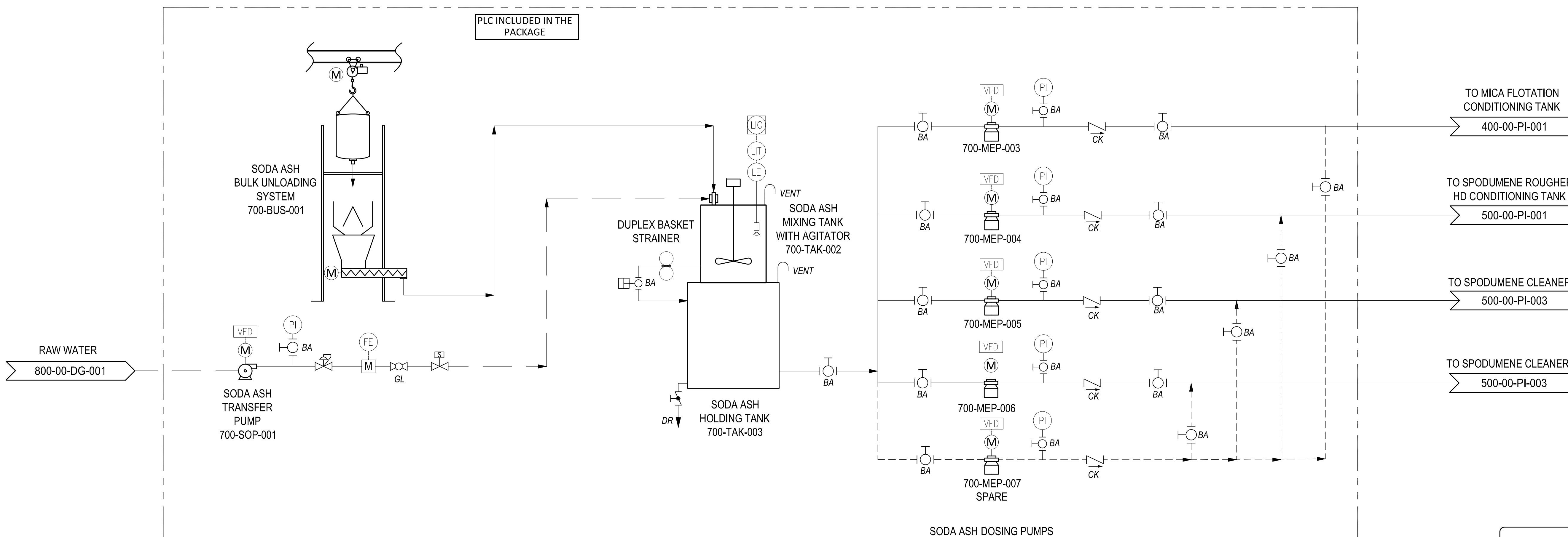

SODA ASH PREPARATION AND DISTRIBUTION

AREA 6700

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				C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
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REV	DATE	DESCRIPTION	BY	REV	DATE	DESCRIPTION	BY

DESIGN:	M.L. AMIR, ing.	06-02-2017
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PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
REAGENTS PREPARATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 700 (AREA) - 00 (DISC.) - PI (TYPE) - 001 (SEQ.) C (REV.)

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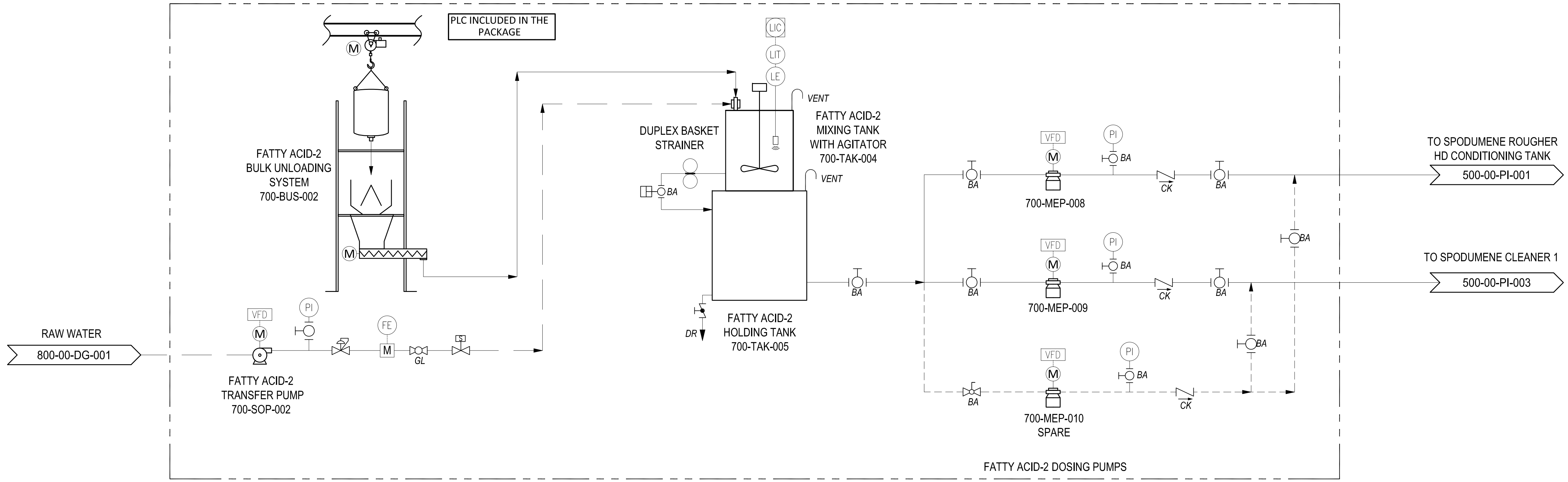
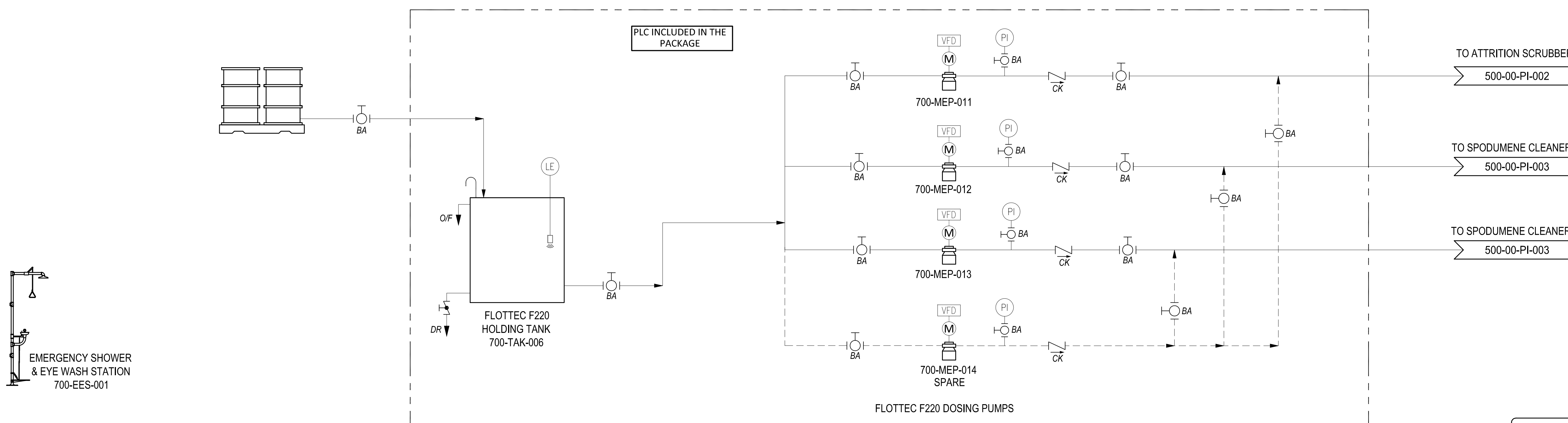


FATTY ACID-2 PREPARATION AND DISTRIBUTION



FLOTTEC F220 DISTRIBUTION

AREA 6700

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C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
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ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
REAGENTS PREPARATION AREA

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DRAWING NO.: C20203 (PROJECT) 700 (AREA) - 00 (DISC.) - PI (TYPE) - 002 (SEQ.) | C (REV.)

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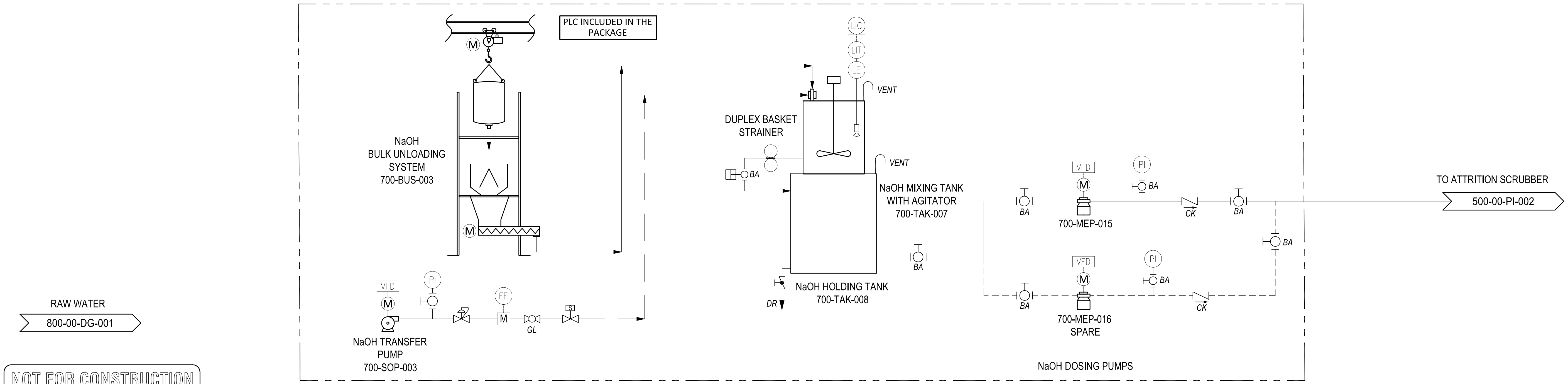
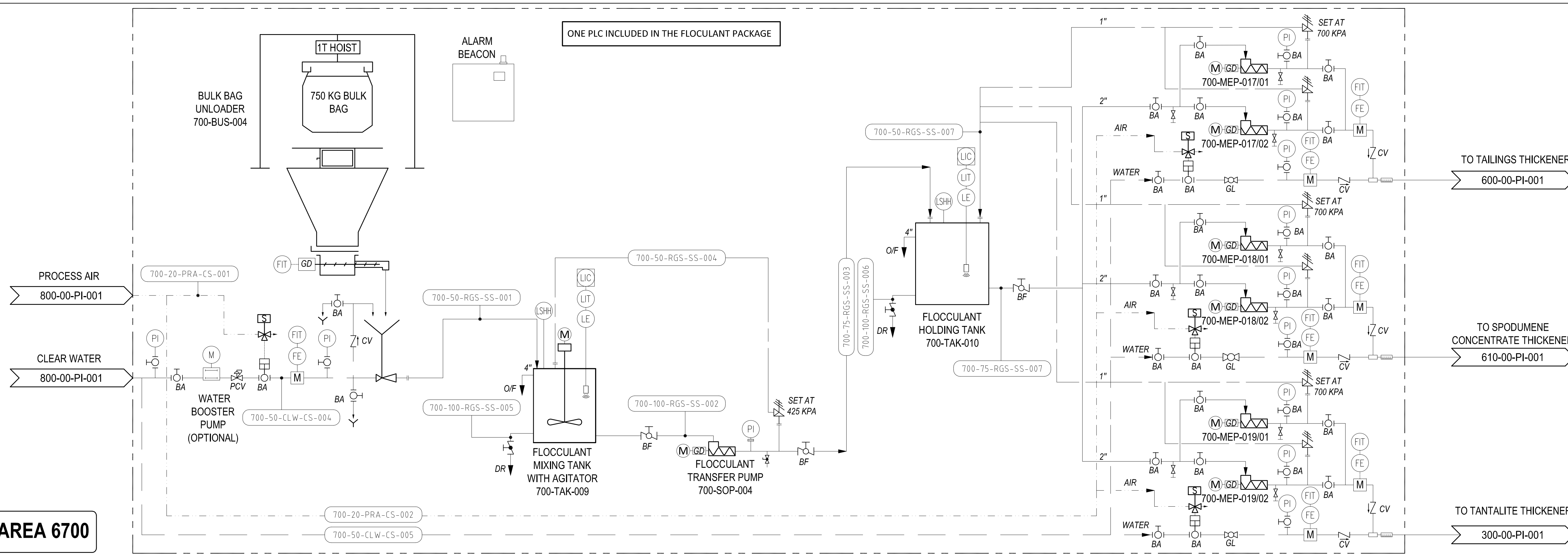


NaOH PREPARATION AND DISTRIBUTION



AREA 6700

FLOCCULANT SYSTEM

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

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ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
REAGENTS PREPARATION AREA

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

DRAWING NO.: C20203 (PROJECT) 700 (AREA) - 00 (DISC.) - PI (TYPE) - 003 (SEQ.) C (REV.)

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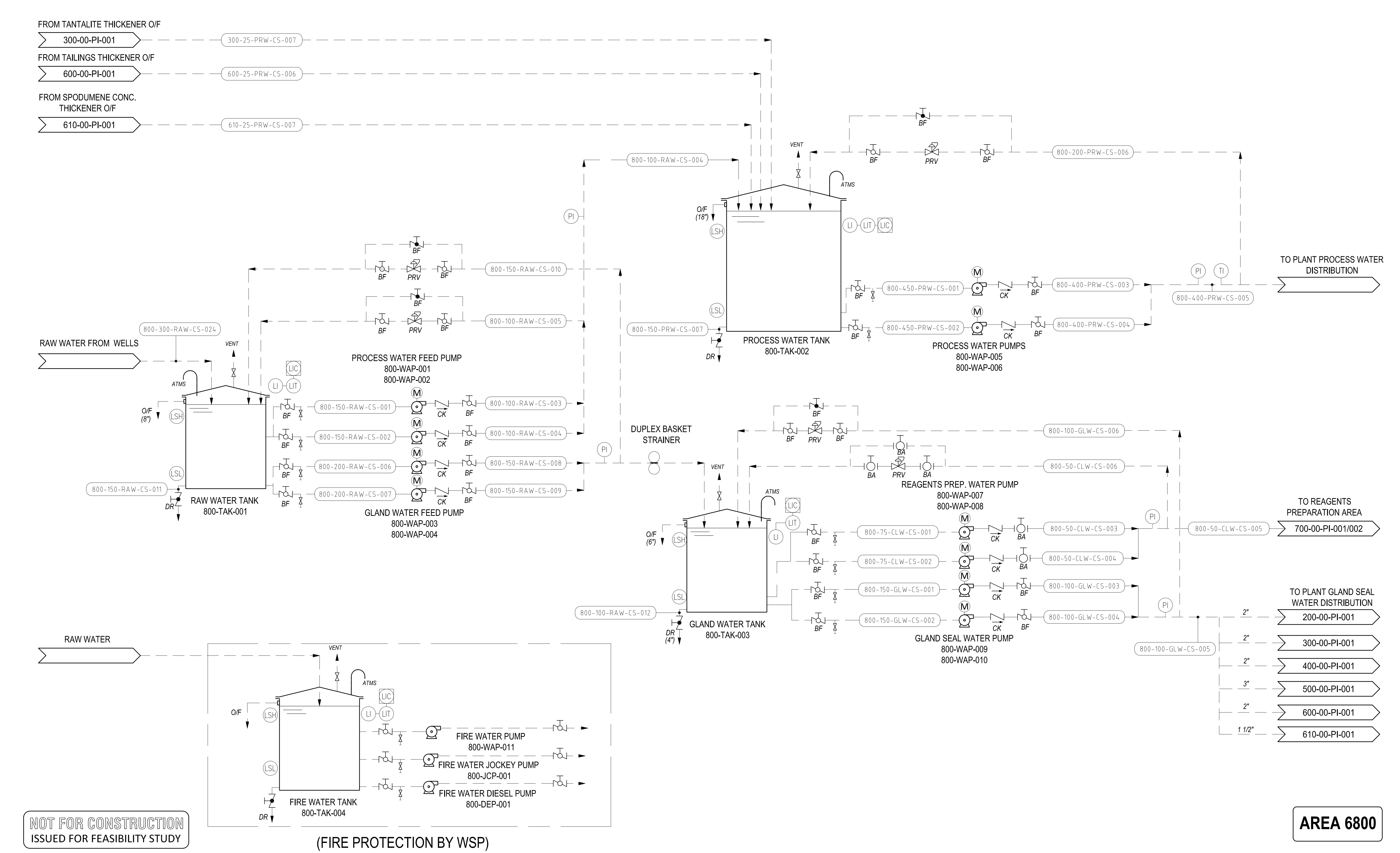

REV	DATE	DESCRIPTION	BY
C	27-07-2017	ISSUED FOR FEASIBILITY STUDY (DWG. REV.)	J.B.
B	22-03-2017	ISSUED FOR FEASIBILITY STUDY	M.L.A.
A	06-02-2017	ISSUED FOR COMMENTS	M.L.A.

DESIGN: M.L. AMIR, ing. 06-02-2017
DRAWN: A. CRISTEA 06-02-2017
VERIFY: S. KOPPALKAR 06-02-2017
APPROVED: F. BARIL ing. 06-02-2017

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CLIENT: Critical Elements Corporation

PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION: PIPING & INSTRUMENTATION DIAGRAM
SERVICES AREA - WATER

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

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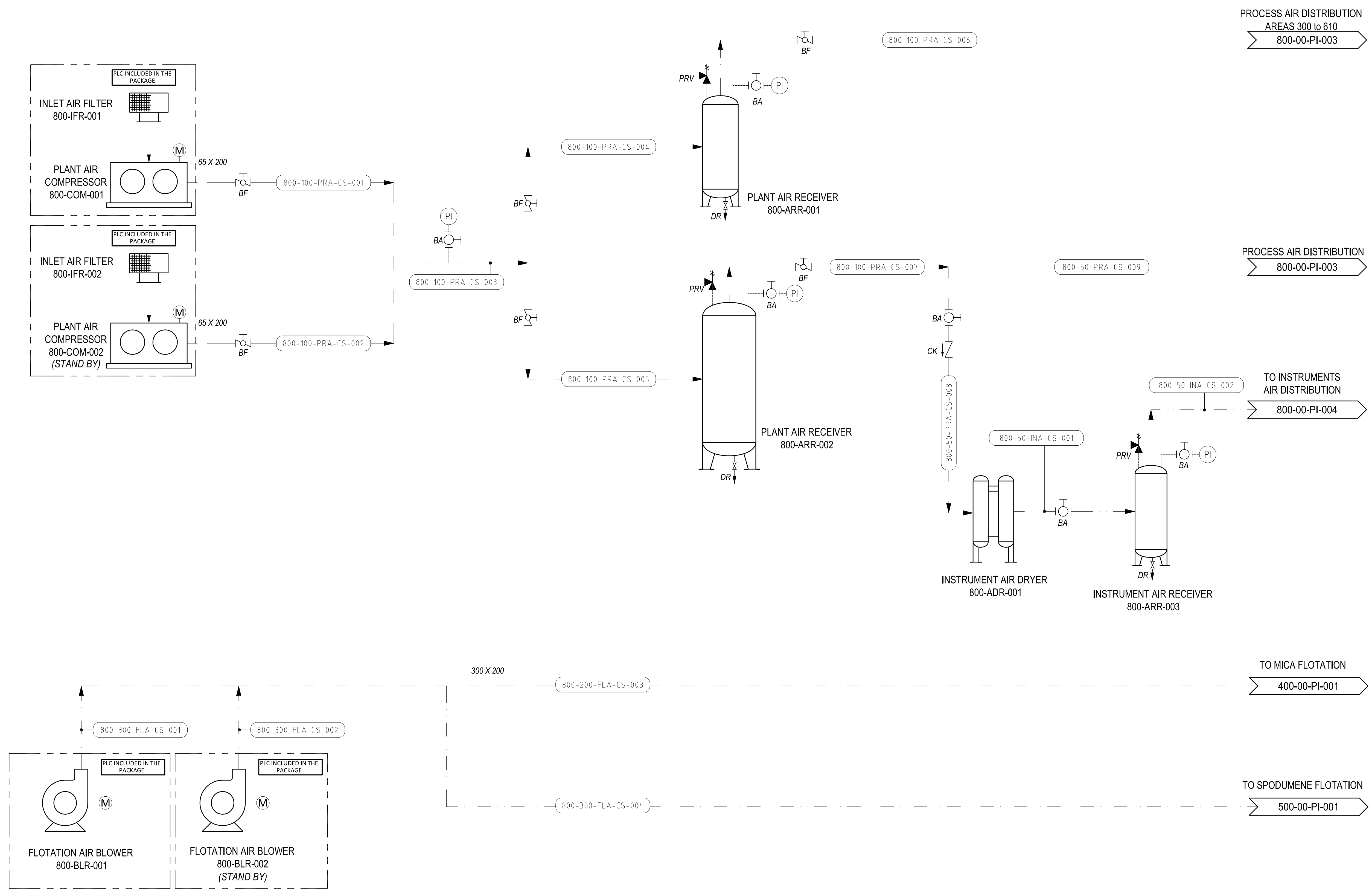

AREA 6800

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ROSE LITHIUM TANTALUM PROJECT
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DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
SERVICES AREA - AIR

SCALE: NTS | UNITS: - | FORMAT: ANSI B | PAGE: 1/1

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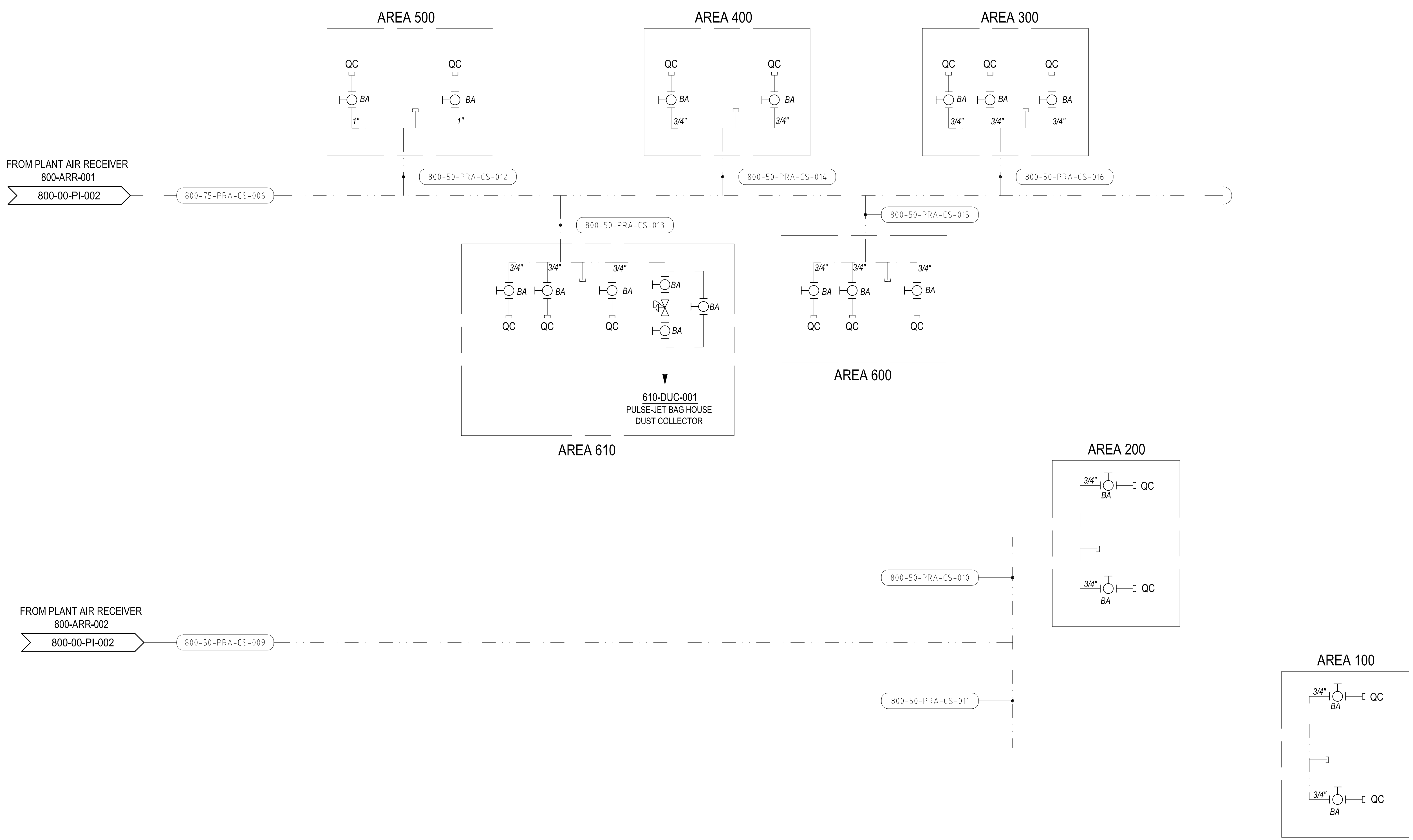

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PROJECT: BANKABLE FEASIBILITY STUDY
ROSE LITHIUM TANTALUM PROJECT
SPODUMENE PLANT

DESCRIPTION:
PIPING & INSTRUMENTATION DIAGRAM
PROCESS AIR DISTRIBUTION

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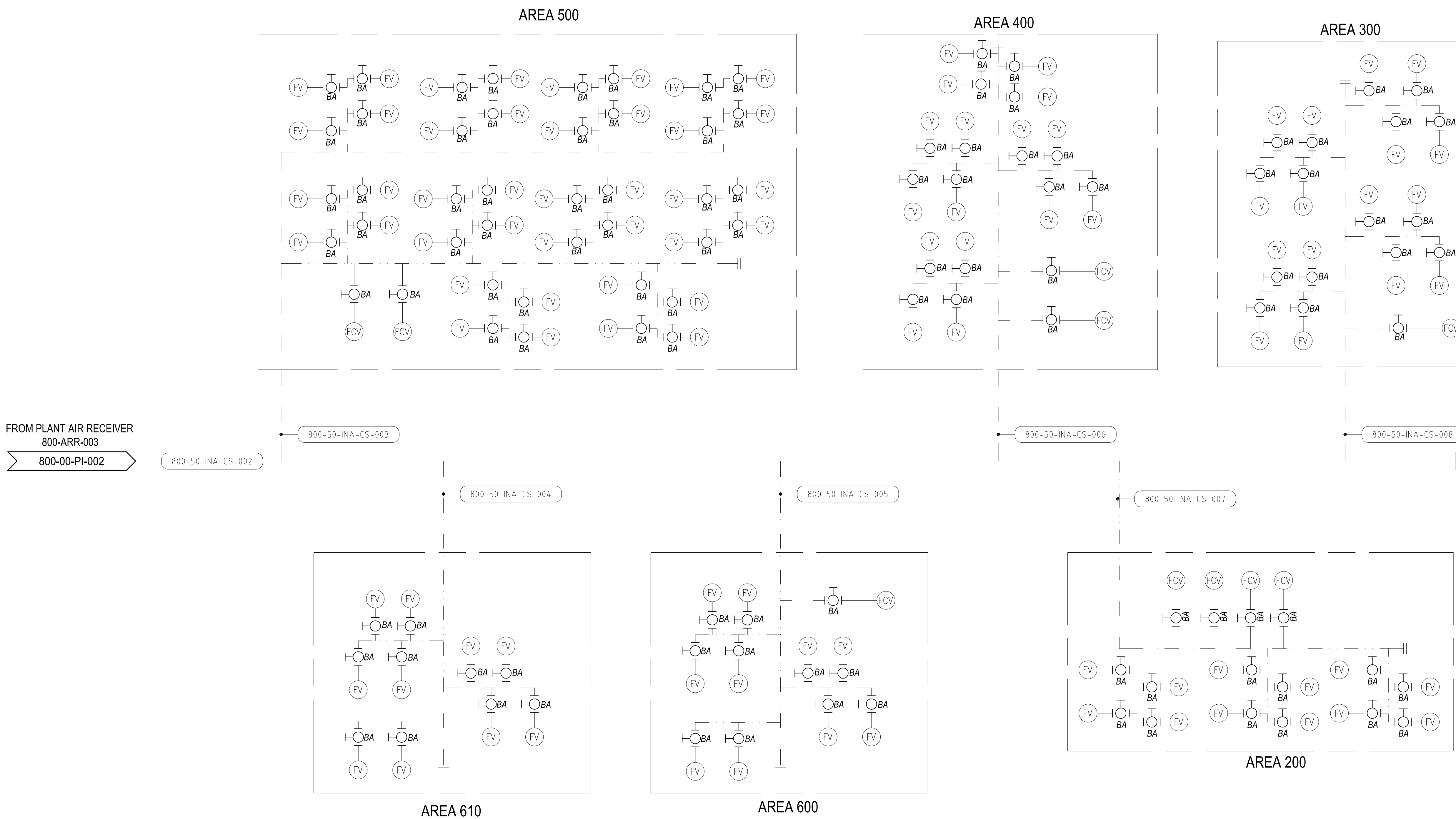

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INSTRUMENT AIR DISTRIBUTION

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