



Tantalum Mining Corporation of Canada – Bernic Lake Mine

External Ore Processing Notice of Alteration Report (2023)



Date: August 2, 2023



August 2, 2023

Ms. Agnes Wittmann Director Environmental Approvals Branch Manitoba Environment and Climate 14 Fultz Boulevard Winnipeg, MB R3Y 0L6

Re: Tantalum Mining Corporation of Canada Bernic Lake Mine – External Ore Processing Notice of Alteration Report (2023)

Dear Ms. Whittmann:

Tantalum Mining Corporation of Canada (TANCO) is submitting this report describing proposed changes at the Bernic Lake Mine (BLM). The proposed alteration includes accepting lithium-bearing ores for processing at the BLM from local junior mining companies which do not currently have milling capabilities. The addition of these external ore sources to the processing stream at the BLM will further extend the Mine's life by providing operational flexibility and additional job security for the Mine's workforce.

The processing of lithium-bearing ore is already allowed within current conditions of the Mine's *Environment Act* Licence (EAL; No. 973). Lithium-bearing ores from external sources will be from the same general mineralization as the BLM and the granitic pegmatites are expected to have a similar mineral composition as the TANCO Pegmatite Deposit consisting of varying quantities of up to 16 minerals. External ore will undergo a number of tests to confirm this assumption prior to processing. This will assure the milling process utilized at the BLM is capable of extracting the elements of interest efficiently without requiring any significant alterations to the current processing circuit. Along with these processing bench tests, representative samples of ore and tailings will be sent to SGS Mining and Mineral Services (SGS; Lakefield ON) for laboratory testing. Samples will be first subjected to static testing to identify the chemical characteristics of the external ore and its tailings. If samples show any potential to affect effluent quality or tailings storage in the BLM Tailings Management Areas (TMAs), then the samples will be subjected to kinetic test work to better quantify these effects. Once any potential additional environmental effects above pre-alteration levels are identified either a mitigation plan will be developed to address these effects which will be sent to the Environmental Approvals Branch (EAB) for approval prior to accepting the ore or the ore will be refused for processing and sent back to the supplier.

Please find enclosed, the information required for the regulatory process that details TANCO's proposed alteration to processing activities at the Mill. Please note that no external ore will be accepted for processing at the BLM if there are any negative environmental effects identified during our test plan that



cannot be mitigated. Therefore, it is anticipated that the potential environmental effects from this alteration will be insignificant.

If you have any questions, or require further information on the report, please do not hesitate to contact me.

Sincerely,



Date: August 2, 2023

Joey Champagne Operations Director Tantalum Mining Corporation of Canada Limited



TANCO Bernic Lake Mine External Ore Processing Notice of Alteration Report (2023)

Prepared and reviewed by:



Date: August 2, 2023

Jerry White, B. Sc., M.Sc. Environmental Specialist Tantalum Mining Corporation of Canada

Prepared and reviewed by:



Date: August 2, 2023

Claude Deveau, P.Eng Head Metallurgist Technical/ Ore Reserve Manager Tantalum Mining Corporation of Canada



Executive Summary

This report is intended to notify the Director of proposed changes to the source of lithium-bearing ores to the Mill at the TANCO Mine in Bernic Lake, Manitoba as required under the Environment Act (S.14(1)). This document also contains sufficient information for the Director to determine the significance of the environmental effects associated with these proposed alterations.

Lithium products remain in high demand globally. In order to meet this demand, the TANCO BLM continuously works on developing plans to secure additional resource supplies to meet these demands. There are a number of ore bodies outside the boundaries of the TANCO Pegmatite Deposit that have commercially viable lithium reserves that are currently being investigated by a number of small mining companies. These Junior Mining Companies have contacted the TANCO BLM to assess the feasibility of partnering with TANCO in the processing of these minerals as these sites do not currently have milling capabilities.

There are two factors that must be assessed with each potential supplier of external ore before production can proceed. Firstly, the efficiency of the mineral extraction process at the Mill must be assessed for each external ore to ensure that the milling partnership is economically feasible. The BLM has already developed a process to assess the viability of milling external ore within its processing circuit. Secondly, there must be a series of tests developed to ensure that potential additional environmental effects from the introduction of tailings produced from external ore into the TMAs at the BLM are negligible or can be mitigated.

In collaboration with SGS, the BLM has developed a two-step process for assessing potential additional environmental effects compared to pre-alteration levels with regard to the processing of external ore. The first step involves static test work used as a preliminary screening tool. These tests include Inductively Coupled Plasma (ICP) Optical Emission Spectroscopy (OES) and/or Mass Spectrometry (MS) trace elemental analysis, X-ray Diffraction (XRD) analysis with Reference Intensity Ratio (RIR) refinement, Whole Rock Analysis, 24-hour Short-term Leach Tests and Modified Acid Base Accounting (ABA). If tests completed in the first stage of testing suggest that there may be a potential to negatively impact the BLM TMAs compared to pre-alteration levels then a second set kinetic tests will be completed to further assess the risk. Kinetic testing will follow EPA Method 1314 which involves an up-flow subaqueous column operated at low-flow with periodic sample collection and testing to determine the chemical characterization of the leachate produced from the tailings of external ore.

It is recommended that static tests be completed in triplicate on three representative ore and three representative tailings samples (6 tests total) to ensure that no change in effluent quality will occur. It is also recommended these tests be rerun as significant changes in the grade of ore occur over the life of mine at the supplier. If kinetic testing is required then these tests will be completed in duplicate but only on tailings samples. Static tests will also be completed in triplicate on representative ore and tailings currently milled from the TANCO Pegmatite Deposit. If any external ore requires kinetic testing then two representative samples for tailings the TANCO Pegmatite will be completed. Tests on ore and tailings



from the TANCO Pegmatite will be used to define pre-alteration conditions for the assessment of potential environmental effects.

Once the assessment is completed and it is determined that the environmental effects are negligible or can be mitigated, a notification will be sent to the EAB regarding the proposed plan to mill material from the external source along with a report completed by SGS interpreting the results of the tests and the risk to the BLM TMAs with regard to the tailings produced from the external ore.

Environmental effects associated with the physical environment, emissions, water resources and ecological aspects remain virtually unchanged as the proposed alteration will not proceed for external ore sources unless laboratory tests confirm that potential effects are negligible or they can be mitigated. Once the risk has been assessed, effluent quality will continue to be monitored to ensure it remains within regulatory limits outlined in the *Metal and Diamond Mining Effluent Regulations* (Government of Canada 2002) and the Mine's current *Environmental Act* Licence through treatment in the TMAs at the facility.

The proposed alteration in this report is believed to be minor in nature because the potential negative environmental effects resulting from the alteration will be thoroughly assessed prior to implementation to ensure that any effects are insignificant when compared to pre-alteration conditions.



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1. Introduction

1.1 Objectives

TANCO's vision is to be a prosperous mining, milling and chemical processing facility through the development of our people, our resources and our community. Site objectives focus on strategic priorities of building strong foundations, striving for operational excellence and development of our site resources. As the North American market demand for lithium products continues to grow, TANCO continues to explore ways to maximize returns from its and other resources and increase sustainability. TANCO believes milling lithium-bearing ore from local external sources provides a unique opportunity for growth and development that aligns with our company's vision and site objectives.

This Notice of Alteration (NoA) is intended to notify the Director of proposed alterations to *Environmental Act* Licence No. 973 for the TANCO BLM Mine as required under the *Environment Act* (S.14(1); Government of Manitoba 2012). This report provides details regarding the BLM's plans to provide milling services to Junior Mining Companies that currently do not have the capability to mill their own resources. This document also describes any potential environmental effects that are anticipated in relation to the proposed changes in comparison to pre-alteration levels.

1.2 Proposed Alterations

The proposed change includes accepting Run-of-Mine (ROM) ore from Junior Mining Companies for milling at the BLM. The accepted ore will undergo crushing and grinding and mineral extraction through flotation. No physical or process flow changes are anticipated with respect to production from the external ore sources. Reagents and consumables will remain the same and the ore and processing waste will be assessed to ensure that no significant change in environmental effects will occur in association with stockpiling and milling ROM ore from external sources or that any changes can be mitigated.

2. Physical Alterations

There will be no physical changes occurring at the BLM in association with the alteration.



3. Process Alterations

3.1 Process Flow

There will be no modifications to the existing processing flow through the Mill with respect to processing ore from external sources.

3.1 Raw Materials

The only change in raw materials is the source of the ore. The BLM initially expects to accept approximately 200,000 tonnes of ROM ore annually from local suppliers with the volume increasing to approximately 1,000,000 tonnes once the new mill associated with the Tailings Reprocessing Facility becomes operational.

Lithium-bearing ores from external sources will be from the same general mineralization as the BLM and the granitic pegmatites are expected to have a similar mineral composition as the TANCO Pegmatite Deposit consisting of varying quantities of up to 16 minerals (Table 3-1). External ore will undergo a number of tests to confirm this assumption prior to processing. This will assure the milling process utilized at the BLM is capable of extracting the elements of interest efficiently without requiring any significant alterations to the current processing circuit. Along with these processing bench tests, representative samples of ore and tailings will be sent to SGS for laboratory testing to determine the mineralogy and chemical characteristics of the ore.

The BLM wants to ensure that the acceptance of external ore to its facility will not have an adverse effect on the TMAs at the facility while the ore is stockpiled waiting for processing and after the material has been subjected to processing to extract the minerals of interest and the milling waste is transferred for permanent storage in the TMAs. In order to meet these objectives, SGS has recommended that initially 3 representative samples of ore and tailings (6 tests total) undergo static tests which include ICP-OES/MS trace element analysis, XRD analysis with RIR refinement, whole rock analysis, 24-hour short-term leach tests using a 3:1 liquid-to-solid ratio with deionized water and modified acid base accounting to assess the potential for acid rock drainage.

Static tests will determine that accepting ore from the supplier is satisfactory as long as:

- The material elemental analysis does not add a significant deleterious element load to the TMAs compared to pre-alterations conditions based on ICP analysis;
- XRD characterization does not show phases that could lead to solubilization and release of deleterious elements in the TMAs that is significantly different than current release rates;
- Shake flask extraction does not show contaminants that would negatively impact the TMAs' water quality compared to current conditions; and,
- Ore and tailings do not add significant potential acid generation (AP) without a requisite increase in neutralization potential (NP).



If the static tests indicate a propensity to negatively impact the TMAs and final effluent quality, then samples will undergo additional kinetic testing in which duplicate tailings samples will undergo subaqueous kinetic release tests following U.S. E.P.A. Method 1314. These tailings will be subjected to testing in an up-flow subaqueous column operated at low-flow with periodic sample collection as a function of liquid to solid ratio. This will determine the liquid-solid partitioning of inorganic contaminants in the tailings material as a function of liquid-to-solid ratio under percolating conditions.

Kinetic tests will determine that accepting ore from the supplier is satisfactory as long as there is no significant difference in the deleterious element load in the leachate from tailings produced from external ore compared to loads released in tailings produced from the TANCO Pegmatite Deposit.

Baseline or pre-alteration conditions will be defined by subjecting representative samples of ore and tailings from the TANCO Pegmatite Deposit to the same tests as the ore from the external supplier. One set of static tests as described above will be completed on TANCO ore and tailings at the same time the first sets of samples are tested from an external supplier. Kinetic testing will be completed on TANCO tailings the first time there is a need to conduct kinetic tests on ore from an external supplier.

3.2 **Processing Reagents and Consumables**

There will be no change in processing reagents or consumables used to process ore from external sources.

3.3 Processing Waste

There is no anticipated change in processing waste associated with the alteration as it is expected that the mineralogy of external ore will be comparable to the TANCO Pegmatite Deposit and reagents and consumables used to process ore will remain the same. These assumptions will be verified through testing (See Section 3.1) prior to accepting ore from any external supplier to prevent any negative impacts on the BLM TMAs and final effluent quality.



Table 3-1 TANCO Pegmatite mineralogy.

Mineral Name	Mineral Colour ²	Chemical Formula
Amblygonite -Montebrasite	creamy-white, yellow medium grey	LiAIPO4(OH,F)
Amphibolite	greenish-black	mafic rock
Cookeite	pale yellow to cream mica, (silky luster)	Li ₂ Al ₈ [Al ₂ Si ₆ O ₂₀ (OH) ₁₆]
Eucryptite	white, light rose	LiAI(Si ₂ O ₄)
K-feldspar	white to grey	K(AlSi₃O ₈)
Lepidolite ¹	purple	K ₂ Li ₃ Al ₃ (AlSi ₃ O ₁₀) ₂ (OH,F) ₄
Lithiophilite - Triphylite	mottled browns to orangey-brown	Li(Fe,Mn)PO ₄
M.Q.M ¹	greenish-yellow, black, brownish	$K_2Li_3AI_3(AISi_3O_{10})_2(OH,F)_4$
Na-feldspar	pale blue, white, grey	Na(AlSi₃O ₈)
Petalite	white, grey	Li(AISi ₄ O ₁₀)
Pollucite	very light to medium grey, pinkish- grey	(Cs>>Na)AlSi₂O ₆ • xH₂O
Quartz	white to brownish, occ. smoky to black	SiO ₂
Spodumene	white	LiAI(Si ₂ O ₆)
SQUI	white	LiAI(Si ₂ O ₆)
Tantalite	black	(Fe,Mn)Ta ₂ O ₆
Tourmaline	black, dark green,	Na(Fe,Li,Al) ₃ Al ₆ (BO ₃) ₃ (SiO ₃) ₆ (OH) ₄

² Mineral Colours listed in decreasing order of abundance.



4. Environmental Assessment

Significance is commonly considered in the context of its magnitude, geographic extent, duration, frequency, degree of reversibility and possibility of occurrence or any combination of these factors.

The significance criteria used in this analysis are defined in Table 4-1, as well as a description of the significance level (I to III) for each criterion. Although presented as distinct levels in Table 4-1, significance can be a gradient between not significant (Level I) to potentially significant (Level II) to very significant (Level III).

4.1 Physical Environment

The no changes required to the physical infrastructure at the BLM, therefore, no negative change in environmental effects from current conditions with respect to topography, soils or geology are anticipated with the proposed alteration compared to pre-alteration levels (Table 4-2). The level of significance associated with the propose alteration with respect to the physical environment is deemed to be no higher than Level I. Accordingly, the summary evaluation for this potential impact is deemed to be not significant.

4.2 Emissions

There is no anticipated increase in air, water of land emissions associated with the proposed alteration as compared to pre-alteration conditions. The quantity of air, water and land emission is expected to be equivalent to the quantity of emission that would be generated and released if the BLM only milled ore from the TANCO Pegmatite Deposit. Therefore, it is deemed that the alterations are insignificant with respect to emissions and assigned Level I significance (Table 4-2).

4.1 Ecological

There are no environmental effects with regard to flora and fauna anticipated with the proposed alteration as processing of external ore will not alter the physical environment at the Mine. There will be no increase in noise levels as the operation of heavy equipment used to move ore into Mill will be comparable to the noise generated by heavy equipment used to move material around the site currently.

Because there is no anticipated increase in habitat disturbance and noise levels will be comparable to pre-alteration levels, it is deemed that the alterations are insignificant with respect to ecological environmental effects and assigned Level I significance (Table 4-2).



0	Co	ntext			Likelihood	Reversibility	
Significance Level	Ecological / Biophysical	Socio-Cultural	Magnitude / Geographic Extent	Duration / Frequency	of Occurrence		
I	No meaningful adverse biophysical effects	No meaningful adverse effects to socio-economic interests	Magnitude and/or geographical extent of impact(s) considered to be minor, and primarily or solely confined to Mine site	Construction phase of Mine, or during closure phase(s)	Unlikely to Occur	Readily reversible	
II	Adverse effects involve commonplace species or communities	Adverse effects would involve meaningful inconvenience to local residents or land users	Magnitude and/or geographical extent of impact(s) have the potential to meaningfully affect off- property residents, lands or receiving waters	Life of Mine	Could reasonably be expected to occur	Can be reversed with difficulty	
Ш	Adverse effects involve locally or regionally important species or communities	Adverse effects to livelihoods and/or property values	Magnitude and/or geographical extent of impact(s) expected to meaningfully affect off- property residents, lands or receiving waters	Extends beyond life of Mine	Will occur, or is likely to occur	Not reversible	

Table 4-1 Significance Criteria and Levels of Significance.

Classification of Potential Effect	Alteration Phase	Potential Effect	Magnitude of Effect	Direction of Effect	Duration of Effect	Frequency of Effect	Scope of Effect	Mitigation Measures	Residual Effects	Reversibility	Significance
<i>Physical</i> Topography	Operation	Modification in topography	Negligible	Negative	Long-term	None	Project Site	No changes in topography are required for the alteration.	Negligible	Reversible	Not significant
Soils	Operation	Soil contamination	Negligible	Negative	Long-term	Rare	Project Site	No change in risk of soil contamination compared to pre-alteration levels.	Negligible	Reversible	Not significant
Geology	Construction/ Operation	Bedrock excavation	Negligible	Negative	Long-term	None	Project Site	No changes in geology are required for the alteration.	Negligible	Reversible	Not significant
Emissions Air	Operation	Dust	Minor onsite and negligible offsite	Negative	Long-term	Intermittent or continuous	Project Site	Use current Best Management Practices for Control of Fugitive Dust/ Use dust suppression, if required.	Negligible	Reversible	Not significant
	Operation	Noise	Minor onsite and negligible offsite	Negative	Long-term	Intermittent or continuous	Project Site	Noise levels similar to other equipment currently operated at the Mine/Remote location limits socio-cultural effects.	Negligible	Reversible	Not significant
	Operation	Exhaust Emissions	Minor onsite and negligible offsite	Negative	Long-term	Intermittent or continuous	Project Site	Exhaust emissions including GHG, will be minimal as ore transfer will only occur for brief periods. Equipment required for ore transfer is the same as the equipment used to transport material around the site currently.	Negligible	Reversible	Not significant
Groundwater											
	Operation	Groundwater Quality	Negligible	Negative	Long Term	Rare	Project Site	No change in risk of groundwater contamination compared to pre- alteration levels.	Negligible	Reversible	Not significant
Surface Water	Operation	Surface Runoff	Negligible	Negative	Long-term	Intermittent	Project Site	No change in risk of surface water contamination compared to pre- alteration levels. Surface water runoff will continue to be redirected into the TMAs for treatment prior to its release into the environment.	Negligible	Reversible	Not significant
	Operation	Surface water usage	Negligible	Negative	Long Term	Continuous	Project Site	The quantity of water used will be comparable to the volume of water used to mill ore from the TANCO Pegmatite Deposit.	Negligible	Reversible	Not significant
	Operation	Surface water quality	Negligible	Negative	Long Term	Intermittent	Project Site	Chemical characteristics of external ore and tailings produced will be tested to ensure no adverse effects on the BLM's TMAs. Effluent will continue to be treated to meet guidelines in current licence and the <i>MDMER</i> .	Negligible	Reversible	Not significant
Land	Operation	Surface Runoff	Negligible	Negative	Long-term	Continuous	Project Site	All tailings produced will be transferred into the TMAs for permanent storage as permitted under the Mine's Environment Act License. Chemical characteristics of external ore and tailings produced will be tested to ensure no adverse effects on the BLM's TMAs.	Negligible	Reversible	Not significant

Table 4-2 Summary of potential effects associated with the proposed alteration at the TANCO Bernic Lake Mine.

Classification of Potential Effect	Alteration Phase	Potential Effect	Magnitude of Effect	Direction of Effect	Duration of Effect	Frequency of Effect	Scope of Effect	Mitigation Measures	Residual Effects	Reversibility	Significance
<i>Ecological</i> Flora and Fauna	Operation	Habitat disturbance	Negligible	Negative	Long- term	None	Project Site	No physical changes required at the mine for the alteration.	Negligible	Not applicable	Not significant
	Operation	Noise	Negligible	Negative	Long- term	Intermittent or continuous	Project Site	Operational noise levels similar to other equipment currently located in the area.	Negligible	Not applicable	Not significant
	Transportation	Habitat disturbance	Negligible to Major	Negative	Long- term	None	Project Site/Local Highways	No additional increase in the quantity of final products requiring transport anticipated.	Negligible	Reversible depending on incident	Not significant
Sociological Employment	Operation	Increased Job Stability	Minor	Positive	Long- Term	Continuous	Project Site	Increased raw materials for processing will provide greater job security for current employees at the Mine.	Minor	Not applicable	Significant
Health and Safety	Operation	Safety of workers	Negligible to Major	Negative	Long- term	Rare	Project Site	All work conducted in accordance to Manitoba's <i>Workplace Safety and Health Act/</i> All workers receive appropriate training/ Workers must wear appropriate PPE at all times and follow all TANCO Health and Safety guidelines associated with proposed alteration during commissioning and operation of the new infrastructure	Negligible to Major	Reversible depending on incident	Not significant
	Transportation	Safety of workers and community	Negligible to Major	Negative	Long- term	None	Project Site/Local Highways	No additional increase in the quantity of final products requiring transport anticipated.	Negligible to Major	Reversible depending on incident	Not significant

Table 5-2(cont'd) Summary of potential environmental effects associated with the proposed alteration at the TANCO Bernic Lake Mine.



4.2 Sociological

4.2.1 Employment

Positive potential sociological effects will be associated with the proposed alteration (Table 4-2). No additional labour is expected due to the alteration as current staff will continue to oversee operations. Although no increases in employment are associated with the alteration, the current labor force at the facility will benefit from long-term job stability as the additional supply of raw material extends mine life for a number of years. Increased jog security is a positive and significant effect as a result of the proposed alteration.

4.2.2 Health and Safety

There is a potential for negative effects to worker safety during milling operations at the BLM but these effects remain unchanged as compared to pre-alteration conditions when milling ore from the TANCO Pegmatite Deposit. These effects can range from negligible to major depending on the severity of the incident; however, the potential for these effects to occur are minimal as Health and Safety Guidelines at the TANCO Bernic Lake Mine are strictly adhered to and enforced. These guidelines include:

- All construction and operational activities will be carried out in accordance with the *Workplace Safety and Health Act*,
- All workers associated with the construction and operation of the new processing circuit will receive appropriate training for the activities being undertaken including activities undertaken by outside contractors,
- TANCO's Best Management Practice for the Control of Fugitive Dust will be followed to limit worker exposure to dust emissions,
- Appropriate personal protective equipment will be worn by workers during all phases of the project to limit exposure to noise and dust of or any additional negative effects.

Continued use of TANCO's Health and Safety Guidelines should result in no increased risk of negative effects regarding worker safety compared to pre-alteration levels. For this reason, the change in environmental effects associated with health and safety is deemed not significant (Table 4-2).

5. Conclusions

Because there are no physical or process alterations required at the BLM and all potential sources of raw materials will be thoroughly accessed prior to acceptance for storage and milling, there are no anticipated additional environmental effects above pre-alteration levels with respect to the proposed alteration. Production rates will remain within limits described in the Mine's Environment Act Licence and therefore, there will be no increases in emissions to air, water or land associated with the proposed development compared to current levels resulting from the processing of ore extracted from the TANCO Pegmatite Deposit.



There is no anticipated increase in environmental effects expected with regard to water usage or effluent quality anticipated. Effluent quality will continue to be monitored and will remain within regulatory limits outlined in the Mine's current *Environmental Act* Licence and the *MDMER* (Government of Canada 2002) through treatment in the TMAs at the facility and therefore, possess no additional potential environmental effects to the receiving environment.

The proposed alteration which involves accepting ore from external sources for milling at the TANCO BLM are believed to be minor in nature because the potential negative environmental effects resulting from the alteration are expected to be insignificant when compared to pre-alteration levels.



6. References

Government of Canada. 2002. *Metal and Diamond Mining Effluent Regulations*. Retrieved March 2, 2021 from <u>https://laws-lois.justice.gc.ca/eng/Regulations/SOR-2002-222/index.html</u>.