

Report to:



**TANTALUM MINING
CORPORATION OF CANADA
LIMITED**

**TANCO Mine
Notice of Alteration #19**

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TETRA TECH

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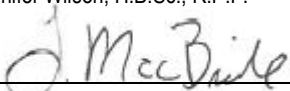



TANTALUM MINING CORPORATION OF CANADA LIMITED


TANCO MINE NOTICE OF ALTERATION #19

SEPTEMBER 2011

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REVISION HISTORY

REV. NO	ISSUE DATE	PREPARED BY AND DATE	REVIEWED BY AND DATE	APPROVED BY AND DATE	DESCRIPTION OF REVISION
00	30-Jun-11	LM 30-Jun-11			Draft report for TANCO's review
01	02-Sep-11	LM 02-Sep-11			Final report for Manitoba Conservation
02	16-Sep-13	AG 12-Sep-13			Removal of proprietary information and name/phone numbers of individuals.

EXECUTIVE SUMMARY

Tantalum Mining Corporation of Canada Ltd. (TANCO), a wholly owned subsidiary of Cabot Corporation, currently operates the TANCO Mine under Manitoba Environment Act Licence No. 973. Manitoba Conservation has approved 18 minor alterations to this Licence; the majority of these Notice of Alteration (NOA) approvals were related to TANCO's cesium products facility. As a condition of the approval of NOA No. 5, TANCO was directed to apply for a new licence. In discussing fulfillment of this requirement with the Branch it was determined by the Director that the requirement would be satisfied through the submission of a comprehensive NOA. This document has been prepared to address the comprehensive NOA requirement, providing a complete description of the operation, including all emissions to the environment, through to the end of mine life and an assessment of the environmental impact of the operation through to final closeout.

The TANCO Mine is located approximately 160 km by road northeast of Winnipeg, Manitoba on the northwest shore of Bernic Lake, Manitoba, at 326039 E 5589610 N (Zone 15) on National Topographic System map sheet 52 L (Figure 1.1). The TANCO Mine is unique in that three distinct mineral products, tantalum, pollucite, and spodumene, are mined concurrently from the same deposit and that in addition to producing mineral concentrates, the facility includes a chemical plant for the production of cesium chemical products. The mine formed in 1967 and by September 1969 the plant was in full production of tantalum and pollucite. The production of ceramic grade spodumene concentrate was piloted in 1979 and in 1986, the spodumene mill was completed and commissioned. In 1995, TANCO received conditional approval to construct and operate a Cesium Products Pilot Facility (CPPF) to produce a cesium formate brine drilling fluid from pollucite. The plant was converted to a commercial facility in 1998, renamed the Cesium Products Facility (CPF). The operation's mining and milling production capacities are each 1000 tonnes per day, with typical daily targets of 545 tonnes per day tantalum, 300 tonnes per day spodumene, and 100 tonnes per day pollucite. The mine and mill are not currently operating at full capacity.

Operations at the mine are forecast to continue for a minimum of seven years, based on remaining mine reserves and current production rates (pollucite mining at 9% feedgrade). Planning to extend the pollucite mine life continues. Resumption of tantalum and/or spodumene production may also warrant extensions to the mine life. This NOA includes the continuing operation and decommissioning of the entire TANCO facility, including: the mine, the tantalum and spodumene milling facility, the cesium products facility, tantalum and spodumene tailings management, CPF residue management, product storage facilities, and the TANCO Mine Road.

The NOA examines the effects of the Project on the physical, terrestrial, aquatic, and human environments within the project site, the local study area, and the region.

The TANCO Mine has now been in operation for over 40 years. The physical footprint of the operation is established and there are no plans to expand that footprint beyond what has been developed to date. The environmental setting, detailed in Section 4.0, documents the current state of the natural and human environment as they have been affected by the facility from the start of operations in 1969 to the present. This section assesses the environmental impacts of the facility that are associated with the continuing operation of the facility through to the end of mine life and then in the post-closure state.

In the absence of planned changes to the operation, mine effluent quality and annual volume are not expected to change markedly over the remaining period of mine operations and, therefore, the effects of the continuing operations on Bernic Lake water quality and on fish and fish habitat are also expected to be similar to those documented. The present mesotrophic condition is expected to continue through to the end of operations. Although this represents a measurable change from the pre-mining condition of Bernic Lake, the changes that have occurred are not considered to be adverse. Primary productivity, as indicated by algal standing crop, has increased but not to the extent that water quality degradation has occurred. The water column of the lake remains well-oxygenated and available for use by the resident secondary and tertiary producers. Zoobenthos abundance has increased in response to the increased primary production and increased fish growth rates and condition would be expected to occur as well. Further, these effects are limited to Bernic Lake. No measurable effects extend beyond the outflow of Bernic Lake.

Studies of the CPF residue and residue leachate conducted in the East TMA over the past 9 years have considerably expanded the understanding of CPF residue and residue leachate behaviour. These studies have demonstrated that the drystack capacity of the East TMA is limited by physical space and not by the assimilative capacity of the TMA to accommodate residue leachate. The CPF residue functions as an essentially impervious cap and the residue drystack creates an isolated groundwater depression beneath the stack. Any migration of the residue leachate signature parameters away from the drystack is result of surface runoff and not groundwater transport. On this basis it is now possible to plan residue drystack through to the end of mine life. We now know the capacity of the East TMA to accommodate residue is not limited by the dilution capacity of the groundwater system but by physical space within the East TMA. With progressive re-vegetation of the dry stack, the full life of mine CPF residue production can be accommodated without adversely affecting the quality of the receiving environment.

The TANCO facility complies with the monitoring requirements incorporated in Manitoba Environment Act License No. 973, in the various approvals of minor changes that have been issued since 1992, and with the *Metal Mining Effluent Regulations* (MMER), which came into effect on December 6, 2002 . Compliance includes routine effluent quality

monitoring for specific parameters, and periodic effluent characterisation, acute toxicity testing, chronic toxicity testing, receiving area and reference area water quality sampling, and Environmental Effects Monitoring (EEM).

TANCO implemented a public engagement program during preparation of this Notice of Alteration for the Bernic Lake Facility. The program involved identifying potential stakeholders and conducting activities to ensure that the public was meaningfully engaged. This included an open house held in Lac du Bonnet on 28 April 2010, as suggested by Manitoba Conservation.