

**GOVERNMENT OF THE NORTHWEST TERRITORIES
ENVIRONMENT AND NATURAL RESOURCES**

INTERVENTION

FOR

**NORTH AMERICAN TUNGSTEN CORPORATION LIMITED –
CANTUNG MINE
WATER LICENCE RENEWAL APPLICATION
MV2015L2-0003**

Submitted to:

Mackenzie Valley Land and Water Board
4922 – 48th Street
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LIST OF ACRONYMS

Aboriginal Affairs and Northern Development Canada	AANDC
Aquatic Effects Monitoring Program	AEMP
Canadian Council of Ministers of the Environment	CCME
Committee on the Status of Endangered Wildlife in Canada	COSEWIC
Companies' Creditors Arrangement Act	CCAA
Inhibiting Concentration	IC _x
Interim Closure and Reclamation Plan	ICRP
Effects Concentration	EC _x
Effluent Quality Criteria	EQC
Environment and Natural Resources	ENR
Environmental Effects Monitoring	EEM
Government of the Northwest Territories	GNWT
Mackenzie Valley Land and Water Board	Board
North American Tungsten Corporation Limited	NATCL
Site Specific Water Quality Objectives	SSWQO
Species Sensitivity Distribution	SSD
Water Quality Guideline	WQG

SUMMARY OF RECOMMENDATIONS

1. *ENR supports a licence term of 10 years for the Cantung mine.*
2. *ENR recommends that a SSWQO for fluoride of 1.03 mg/L be applied to the Flat River. The EQC for fluoride should be assessed as appropriate to ensure the SSWQO is maintained at the edge of the mixing zone (180 m downstream).*
3. *ENR recommends that a low action level for fluoride of 0.52 mg/L be incorporated into the AEMP and/or water licence as appropriate.*
4. *ENR recommends that the AEMP Study Design be submitted within sixty (60) days of issuance of the water licence.*
5. *ENR recommends that the ICRP be submitted within sixty (60) days of issuance of the water licence.*

1. INTRODUCTION

The following concerns and issues have resulted from the Government of the Northwest Territories - Department of Environment and Natural Resources (GNWT-ENR) review of plans, proposed schedules and submissions as part of North American Tungsten Corporation Limited's (NATCL) water licence renewal application MV2015L2-0003 for the Cantung mine. This technical intervention explains the Department of Environment and Natural Resources' (ENR) concerns and provides recommendations for the Mackenzie Valley Land and Water Board's (Board) consideration. This submission takes into consideration all of the documents provided with the renewal application up to and including the June 25, 2015 responses to information requests, as well as relevant submissions provided under the existing water licence.

ENR appreciates the opportunity to express its concerns and provide recommendations and suggestions to the Board for this water licence renewal. The Department is of the opinion that given the very recent amendment process associated with the construction of Dry Stack Tailings Facilities, and the fact that significant changes to the licence are not currently proposed, a written process would be sufficient moving forward. To this end, a Public Hearing would not be required.

2. WATER LICENCE TERM

NATCL has requested a term of 10 years for the renewal of their water licence.

ENR is not opposed to a term of 10 years for the renewed water licence. Should NATCL propose any substantive changes to the renewed water licence prior to its expiry, an amendment process would be required. Further, the Board has the authority to amend the water licence on its own merit or at the request of an intervener, should changes be warranted. Through these processes, opportunities for external parties to provide input to the Board would be available.

RECOMMENDATION:

ENR supports a licence term of 10 years for the Cantung mine.

3. SITE SPECIFIC WATER QUALITY OBJECTIVE - FLUORIDE

As noted in ENR comments dated May 26, 2015, NATCL has provided an evaluation report for SNP Station S4-44 (180m downstream of the effluent discharge from Stinky Pond). Within that report, NATCL outlined that they are of the opinion that the current SSWQO for fluoride of 0.12 mg/L is too conservative and unachievable, given naturally occurring fluoride levels in the Flat River.

NATCL has provided additional information, in their responses to review comments, which provide additional detail into the various fluoride sources into the Flat River and additional rationale for the development of a new SSWQO based on conditions at the mine site. Of note, the existing fluoride SSWQO of 0.12 mg/L is based on an interim water quality guideline developed by CCME based on the application of a safety factor to the most sensitive median lethal concentration (LC₅₀) from the results of acute exposure tests (specifically, the reported 144-h LC₅₀ estimate for the caddisfly, *Hydropsyche bronta*, from Camargo et al. of 11.5 mg/L was divided by a safety factor of 100) which resulted in an interim WQG of 0.12 mg/L (Sinclair and MacDonald, 2015).

ENR agrees with NATCL that any amended SSWQO for fluoride must appropriately reflect naturally occurring water quality in the area. During the technical session held on June 17, 2015, ENR outlined to the proponent that the preferred method for the derivation of SSWQOs involves the development of a Type A Guideline which establishes a Species Sensitivity Distribution (SSD) curve.

A SSD is described in CCME (2007) and, in general, is a model of the continuous distribution of the variability across species to a contaminant, contaminant mixture, or stressor. Typically, the HC₅ concentration of an SSD is determined, which is the effects concentration which corresponds to the modeled 5th percentile of the distribution. The values within the SSD should consist of the same endpoint estimated (e.g., EC₁₀, EC₂₀), but can be generated for any endpoint group (e.g., EC₁₀, IC₁₀, IC₂₀, EC₅₀). To clarify, the HC₅ provided is the value at which 5% of the species in a receiving body would experience an effect equivalent to the effects endpoint being assessed (EC_x).

To provide additional context, the EC_x is the effective concentration for x% of the individuals in a toxicity test. This endpoint describes binomial responses to individual organisms (e.g., mortality, hatching, etc.) (Environment Canada, 2007). That is to say, for example, an EC₂₀ describes the concentration at which 20% of the individuals in a toxicity test show effect, and so on. The IC_x is the inhibitory concentration, causing an x% reduction relative to the negative control. This endpoint is used to describe reductions (i.e., continuous responses) in growth, reproduction, etc.

Recent work has been done by De Beers Canada Incorporated in deriving a SSWQO for fluoride which they estimated to be 1.94 mg/L for Snap Lake (McPherson et al., 2014). However, additional work done by Sinclair and MacDonald (2015) questioned some of the methodology and conclusions reached by McPherson et al. and proceeded to complete a revised SSD curve based on the literature available, ultimately recommending a SSWQO for fluoride of 1.03 mg/L. Based upon the work completed by Sinclair and MacDonald, ENR is of the opinion that a fluoride SSWQO of 1.03 mg/L for the Flat River would be appropriately protective of the downstream aquatic environment.

However, it should also be noted that when deriving SSWQOs, the resident species of the receiving water body must also be considered. Bull Trout are present within the Flat River and their current status is at risk which warrants additional consideration (*Federal Species at Risk Act*: Under Consideration; COSEWIC Assessment: Special Concern, NWT General Status Rank: May Be At Risk) (<http://www.nwtspeciesatrisk.ca/en/content/bull-trout>).

The literature review provided in McPherson et al. (2014) indicates that Rainbow Trout appear to be most sensitive species to fluoride based on lethal toxicity testing (LC₁₀s of 4.1, 2.2, and 1.8 mg/L; and, LC₅₀s of 6.6, 3.9, and 4.8 mg/L at 7.5, 13, and 18°C, respectively). Rainbow Trout are potential surrogates for other salmonids such as Bull Trout as well as Arctic Grayling. As such, additional attention should be taken regarding fluoride levels in the Flat River given the apparent sensitivity of Rainbow Trout to fluoride.

To this end, ENR proposes that an action level of approximately 50% of the suggested SSWQO (1.03 mg/L * .50 = 0.52 mg/L) be implemented as a low action level within the upcoming Aquatic Effects Monitoring Program (AEMP), to ensure any increase in fluoride levels would be identified and addressed in time to prevent levels from exceeding the SSWQO within the Flat River. Based on water quality data provided by NATCL, it does not appear that fluoride levels in the Flat River have exceeded 0.52 mg/L to date.

RECOMMENDATIONS:

ENR recommends that a SSWQO for fluoride of 1.03 mg/L be applied to the Flat River. The EQC for fluoride should be assessed as appropriate to ensure the SSWQO is maintained at the edge of the mixing zone (180 m downstream).

ENR recommends that a low action level for fluoride of 0.52 mg/L be incorporated into the AEMP and/or water licence as appropriate.

4. AQUATIC EFFECTS MONITORING PLAN

While there are Environmental Effects Monitoring (EEM) requirements under the *Metal Mining Effluent Regulations* to which NATCL currently adheres, there has been no formal AEMP established for the Cantung mine. This is a unique situation, as AEMPs have been implemented and required for other active mining projects in the NWT.

NATCL has initiated steps to developing and implementing an AEMP for the Cantung site. Within the renewal application, NATCL has included a schedule outlining the completion dates for various activities related to the development of the AEMP study design. This schedule includes the submission of several drafts to allow input from the AEMP working group prior to the issuance of the final report in January 2016. This would coincide with the issuance of the water licence and ensure that the AEMP can be implemented during the 2016 field season. ENR suggests that the water licence include a condition outlining a specific timeline, ensuring that the AEMP Design Report is finalized prior to any required field studies during the 2016 field season. ENR notes that a recent AEMP workshop (July 10, 2015) was postponed by NATCL and no revised date has been proposed for the workshop at this time.

RECOMMENDATION:

ENR recommends that the AEMP Study Design be submitted within sixty (60) days of issuance of the water licence.

5. INTERIM CLOSURE AND RECLAMATION PLAN

Overall, ENR supports the development of an Interim Closure and Reclamation Plan as outlined in the *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites* (MVLWB/AANDC, 2013). To date, the Board has approved the closure objectives for the Cantung mine site and it is anticipated that specific closure options and criteria will be provided in subsequent versions of the plan.

Within the renewal application, NATCL has included an Interim Closure and Reclamation Plan (ICRP) Development Schedule outlining the completion dates for various activities related to the ICRP. Similar to the AEMP schedule, this schedule includes the submission of several drafts to allow input from the closure working group prior to the issuance of the final report in February 2016. This would occur shortly after the issuance of the water licence. ENR would suggest that the water licence include a condition outlining a specific timeline to ensure that the ICRP is submitted and finalized within an acceptable timeframe. The Cantung ICRP should be submitted in a timely manner to allow sufficient time to conduct any reclamation research (e.g. cover designs, vegetation studies, etc.) that may be necessary for selecting final closure options and criteria.

ENR has been an active participant in the preliminary meetings of the closure working group and will continue to do so as the closure process progresses and the ICRP becomes more refined.

RECOMMENDATION:

ENR recommends that the ICRP be submitted within sixty (60) days of issuance of the water licence.

6. FINANCIAL CAPACITY

During the technical session held on June 17, 2015 and again during the pre-hearing conference held on July 7, 2015, the Board requested that the GNWT, within its intervention, address the financial responsibility of the proponent as it relates to Paragraph 26 (5) (d) of the *Waters Act*. This was requested in order to assist the Board in satisfying its requirements in this regard prior to issuing a renewed water licence.

Paragraph 26 (5) (d) of the *Waters Act* states:

26. (5) *If an application for a licence is made, the Board shall not issue a licence unless the applicant satisfies the Board that:*

(d) the financial responsibility of the applicant, taking into account the applicant's past performance, is adequate for

(i) the completion of the appurtenant undertaking,

(ii) such mitigative measures as may be required, and

(iii) the satisfactory maintenance and restoration of the site in the event of any future closing or abandonment of that undertaking.

As the Board is likely aware, on June 9, 2015, NATCL commenced financial restructuring proceedings under the *Companies' Creditors Arrangement Act* ("CCAA"). The CCAA proceedings and outcome will provide information with respect to NATCL's financial capacity.

At this time, the GNWT is unable to say what the outcome of these proceedings will be, but NATCL continues to operate the Cantung Mine. The GNWT is not in a position to make submissions on NATCL's financial capacity at the present time, but may be able to do so at a later date, as the CCAA proceedings continue.

7. REFERENCES

CCME. 2007. A protocol for the derivation of water quality guidelines for the protection of aquatic life. In Canadian environmental quality guidelines, 1999. CCME, Winnipeg.

Environment Canada. 2007. Guidance Document on Statistical Methods. EPS 1/R/46 – March 2005 (with June 2007 Amendments) Method Development and Applications Section, Environmental Technology Centre.

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Mcperson, C., D. Lee, P. Chapman. 2014. Development of a fluoride chronic effects benchmark for aquatic life in freshwater. Environ Toxicol Chem.

Sinclair, JA, MacDonald DD. In Press. Letter to the editor. Environ Toxicol Chem.