

Sent by Mail and by Email

May 5, 2017

Mackenzie Valley Land and Water Board
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jmorse@mvlwb.com

Attention: Mr. Julian Morse

Dear Mr. Morse

Re: NATCL Water License MV2015L2-0003 SNP Alteration Request

North American Tungsten Corporation Ltd. (NATCL) is writing to request the Mackenzie Valley Land & Water Board's (MVLWB or the Board) approval to alterations to the Surveillance Network Program (SNP) described in Annex A of Water License MV2015L2-0003.

NATCL has identified Surveillance Network Program (SNP) amendments that it feels appropriately reflect the reduced operational activities and discharges on site, as well as personnel safety concerns, during interim care and maintenance. The following provide details of the rationale for the amendments to the SNP at the Cantung mine.

1. Suspension of SNP Station 4-44

SNP Station 4-44 is a water sampling station located on the Flat River and is located approximately 180 m downstream of the final discharge point (FDP) from Cantung's Wastewater Treatment Facility (WWTF), SNP Station S4-20. SNP Sampling Station 4-44 (S4-44) was implemented on January 14, 2013 in anticipation of the initial effluent discharge from the WWTF which was commissioned in August 2013.

In April 2014, NATCL was granted an amendment to their former Type A Water License (MV2002L2-0019) which permitted increased effluent discharge (up to 8,000 m³/day) during periods of 'high flow' (50,000+ m³/day) in the Flat River. As a condition of this amendment, NATCL was required under Section F, Item 22 of water license MV2002L2-0019 to complete an assessment report designed to evaluate NATCL's ability to meet specific water quality objectives at S4-44 (Annex B of License MV2002L2-0019). In 2015, NATCL submitted the S4-44 Water Quality Assessment Report as required by the 2014 amendment and determined that the water quality objectives outlined for Flouride, Nitrite and Selenium in Annex B of MV2002-0019 required some revisions.

A new Water License (MV2015L2-0003) was issued to NATCL by the Board in January, 2016, and included an updated table of water quality objectives for S4-44 (Table 1 below and Annex A Part B in the Water License).

Table 1. Water quality objectives to be met at SNP4-44 (mixing zone boundary in the Flat River)

Parameter	Water Quality Objective (mg/L)
Total Suspended Sediments	6
Ammonia as N	1.27
Nitrite-nitrogen	0.06
Nitrate-nitrogen	3.0
Sulphate	-
Chloride	120
Fluoride	1.03
Total Aluminum	0.3
Total Arsenic	0.005
Total Boron	1.5
Total Cadmium	0.00021
Total Chromium	0.001
Total Copper	0.0032
Total Iron	1.3
Total Lead	0.005
Total Mercury	0.000026
Total Molybdenum	0.073
Total Nickel	0.125
Total Selenium	0.001
Total Silver	0.0001
Total Thallium	0.0008
Total Uranium	0.015
Total Zinc	0.03
pH	6.5 - 9

The river at this site is relatively deep in comparison with other Flat River monitoring stations. At other sites, knowing the river is less than a few feet deep, environmental personnel are able to stand on the ice and break through using manual tools. There is also a small but steep bank directly adjacent to the sampling point and during ice-on conditions, it is either very difficult, or impossible to safely access the ice and create a hole from which to sample the water. At times, presumably due to a sharp bend in the river that creates a localized area of high flow, there is a small opening at this location allowing staff to use a long sampling pole for collection. However, in some instances during ice-on conditions, such as in March 2017, it is not possible to safely collect water at this location.

There have been very few exceedances of the Water Quality Objectives for any parameter outlined in Table 1, and none since the Cantung WWTF ceased operating in late 2015. Figures 1-3 display the Water Quality trends for fluoride, nitrite and selenium from January 2013 to December 2016. A summary of the trends for all the water quality objectives and data collected at SNP4-44 have been reported to the Board in the monthly SNP reports since its implementation.

Figure 1. Water quality results for Fluoride at S4-44 between January 2013 and January 2016. The black line represents the value of the Water Quality Objective outlined in Annex A, Part B of the License MV2015-0003.

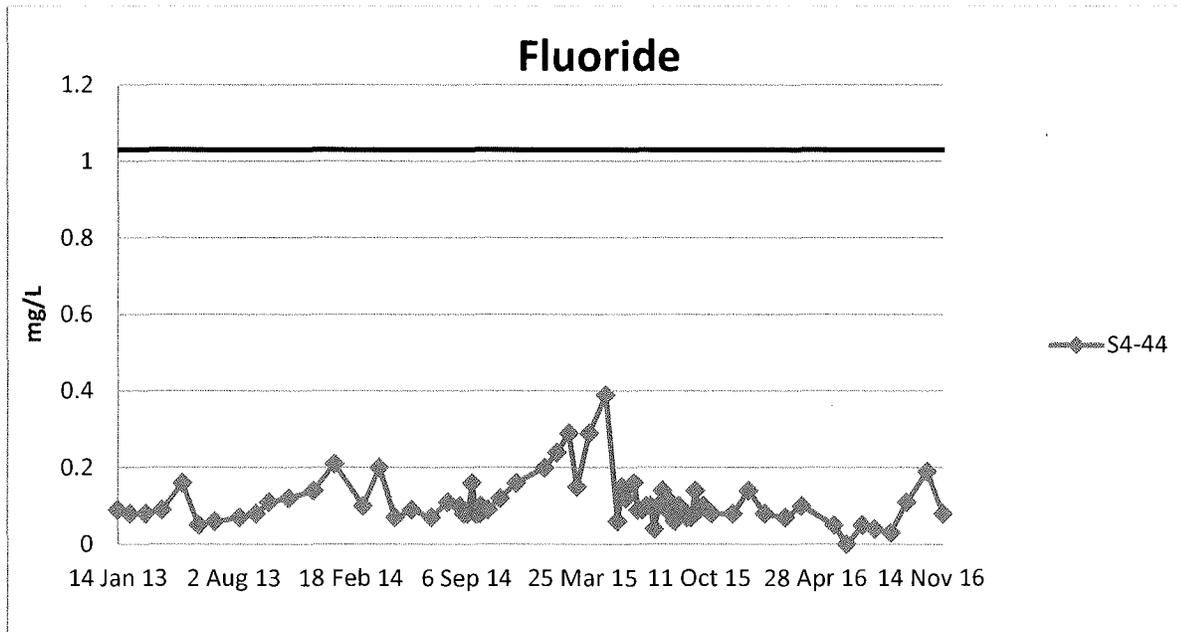


Figure 2. Water quality results for Nitrite at S4-44 between January 2013 and January 2016. The black line represents the value of the Water Quality Objective outlined in Annex A, Part B of the License MV2015-0003.

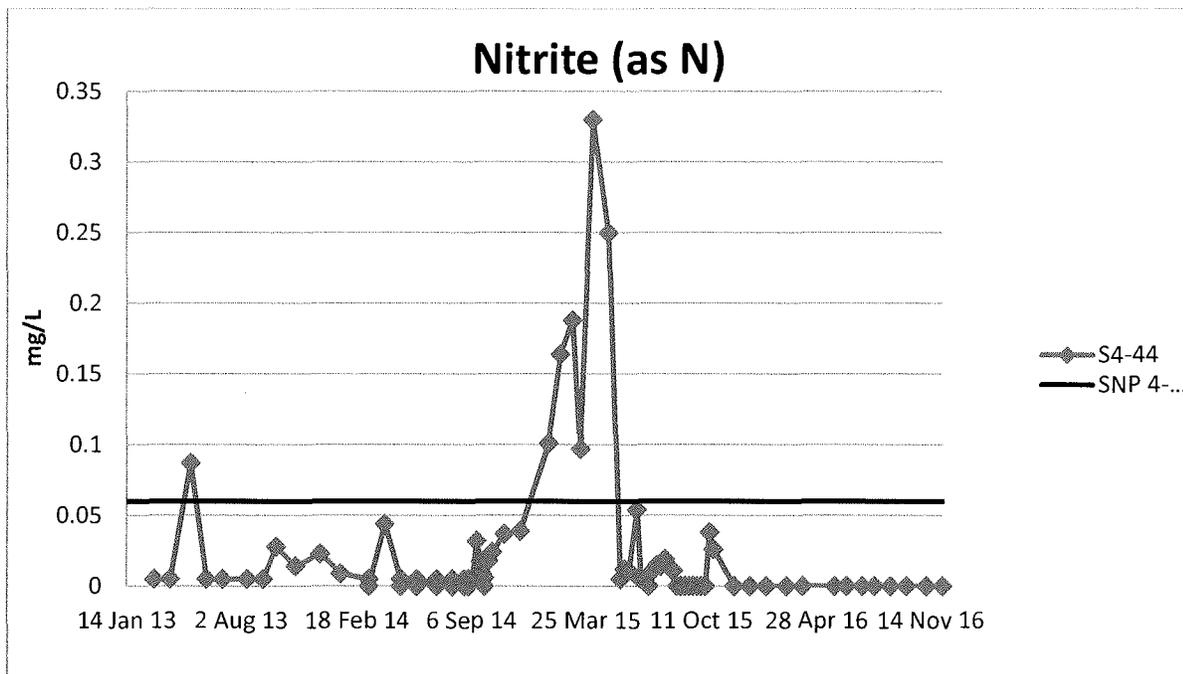
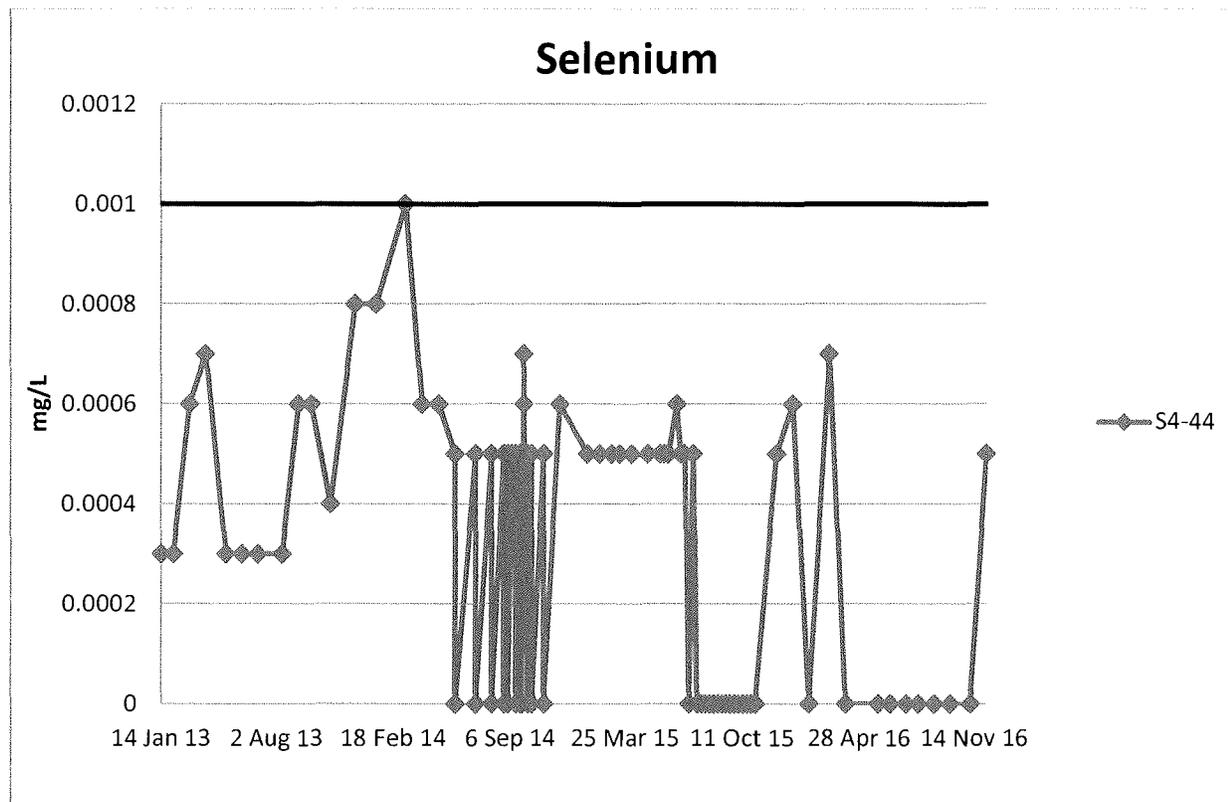


Figure 3. Water quality results for Total Selenium at S4-44 between January 2013 and January 2016. The black line represents the value of the Water Quality Objective outlined in Annex A, Part B of the License MV2015-0003.



S4-44 was added in 2013 specifically in preparation for the anticipated discharge from the WWTF later that year. During the care and maintenance period, there has been no discharge from the WWTF. There are other more accessible surface water sampling locations on the Flat River both upstream and downstream from the mine and the FDP associated with the WWTF (S4-20).

To accommodate the safety and logistical concerns surrounding the collection of water at this site, and in consideration of its redundancy when the WWTF is not operational, **NATCL is proposing that SNP Station 4-44 be temporarily suspended from the SNP until no later than three months prior to the expected discharge of effluent from the WWTF.**

If approved, this alteration to the SNP could be implemented during the first month following a response by the Board.

2. SNP S4-27-16

As described in Section 5.4 of the 2016 Annual Water License Report, SNP station S4-27-16, a groundwater monitoring well sampled tri-annually, had TSS exceedances observed on August 23rd and October 4th, 2016, with samples reporting values of 59 mg/L and 58 mg/L, respectively. Part G, Item 40 of the Water License defines 30 mg/L as the maximum acceptable concentration for a grab sample at this location.

Similar occurrences were reported in previous years, including in 2015 with TSS exceedances observed on both August 25th and October 13th (39 mg/L and 72 mg/L, respectively). These results are consistent with

historical TSS results dating back to 2009 when the well was installed in the floodplain of the Flat River within the historical tailings that were deposited in the 1960s.

The elevated TSS was originally believed to be a result of the production of gypsum within the well. Upon closer examination of the water chemistry, the water was not high in any deleterious metals or *in situ* TSS. Instead, elevated levels of iron in the water sample combined with exposure to oxygen are believed to have created a precipitate, subsequently contributing to elevated TSS levels post-collection. The sample appears transparent when first collected from the well.

On August 4, 2013, NATCL issued a memo to the Board outlining the issue and concluded that the water sampled at this location is not high in any deleterious metals or *in situ* TSS and that since the elevated TSS has been documented to occur several hours after being collected from the well, it is not sufficient grounds to necessitate the activation of the Groundwater Pumping Contingency Plan.

Following the exceedances observed in 2016, the INAC inspector further corroborated this interpretation and agreed that the Groundwater Pumping Contingency Plan, as described in Part G, Item 41 of MV2015-0003 would not require implementation. Please refer to the appended memo from August 4, 2013 which further addresses the issue (Attachment 1).

NATCL is proposing that SNP Station 4-27-16 be permanently removed from the Surveillance Network Program based primarily on the following grounds:

- The water at this location has not been demonstrated to contain any deleterious substances or characteristics, particularly *in situ*, that are affecting animals or the environment;
- Each time an exceedance occurs, it requires permission from the Inspector to forego the initiation of the Groundwater Pumping Contingency Plan, which is an extensive undertaking with the reduced capacity of the current Care and Maintenance crew; and
- It creates an incorrect perception that NATCL regularly exceeds groundwater Effluent Quality Criteria at this location.

3. Groundwater SNP Station Sampling Frequency Reduction

As part of the SNP outlined in Annex A of MV2015L2-0003, there are a total of 18 groundwater stations (including S4-27-16) that require sampling three times per year (approximately late June, August and October). On August 25th, 2016 the Board approved NATCL's request to suspend the sampling of six Groundwater Wells and two Surface Stations associated with TSF 6 and 7 until 3 months prior to the construction of TSF 6, leaving a total of 13 groundwater wells for sampling.

Besides SNP station 4-27-16, which has a unique set of properties described above, there have been no exceedances from any groundwater well since sampling began in 2009. Many of these wells are quite deep and involve extensive time and equipment requirements such as pumps, hoses and portable power sources to sample. Sampling the remaining 13 wells within a period of one or two weeks is a challenging undertaking with the limited number of trained environmental personnel on site during care and maintenance (one at any given time). More frequent sampling of these wells three times within a few months is even more challenging.

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Water quality results from these groundwater wells have demonstrated zero exceedances of the values outlined in Part G Item 40 of MV2015L2-0003 since sampling began in 2009. Moreover, this sampling program is difficult to achieve with current staffing capacities. **For these reasons, NATCL is proposing that the frequency required for SNP Stations 4-27-4, 4-27-7 to 4-27-15, and 4-27-17 be reduced to once per year** (between late June and October) until the first ice-off season following the re-commencement of commercial operations.

NATCL requests that a reduction to the sampling frequency of S4-27-16 also be included as part of this request to reduce the sampling frequency for all groundwater wells, should the requirement to continue sampling it continue.

In conclusion, NATCL appreciates the Board's consideration of these important changes to the SNP. In an effort to streamline sampling and reporting requirements for the 2017 sampling season, NATCL would appreciate a decision on these changes prior to June 15, 2017 so that we can plan accordingly for groundwater sampling activities.

If you have any questions or require further information, please contact Callum Beveridge of Alvarez & Marsal (604-638-7447 or at cbeveridge@alvarezandmarsal.com) or the Environmental Department at the Cantung Mine Site (604-759-0913 ext. 275 or at enviro@natcl.ca).

NORTH AMERICAN TUNGSTEN CORPORATION LTD.
by its Monitor, Alvarez & Marsal Canada Inc.
acting in its capacity as Monitor of NATC and not
in its personal capacity



Todd M. Martin
Senior Vice President

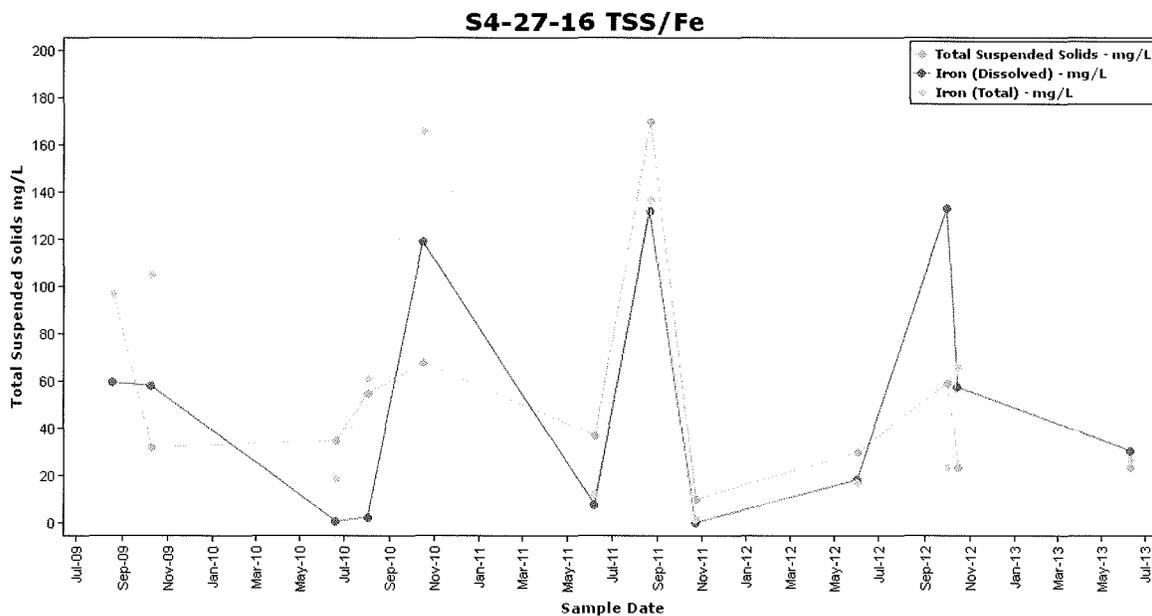
cc: B. Delaney, Steve Sherwood, Cantung Enviro (NATCL), Callum Beveridge (A&M), Permits (MVLWB);
Attachment: Attachment 1 – Memo on TSS Results for S4-27-16



Memo

To: File
From: Environment Department
Date: August 28, 2013
Re: S4-27-16 Well TSS Compliance

Water monitoring well S4-27-16 was placed in the floodplain of the Flat River within the historical tailings that were deposited back in the 1960's. As shown in the chart below, this shallow well (5.98 m) has had significant TSS issues since it was installed in 2009 with no definitive explanations as to why this has been occurring.



On August 4th, 2013 the well was purged of 3 times the wells water volume from 2/3 up the water column at 100 hertz pumping speed. As seen in the photo 1, the water sampled was clean and had no visible signs of TSS.



Photo 1: August 4 sample unpreserved immediately after collection.

As seen in photo 2 below, it was discovered that after the sample day there was signs of oxidation and a visible precipitate had developed.

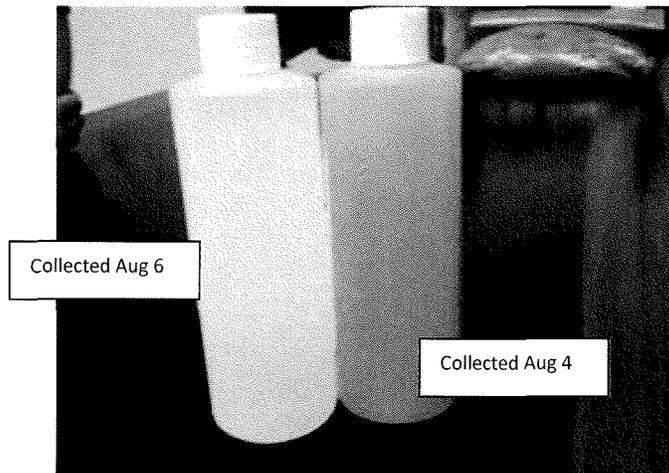


Photo 2: Left sample collect August 6th - 30 minutes prior to photo,
Right sample collected August 4th - 1 days prior to photo.

A second sample was taken 2 days later on August 6, 2013, and an in house TSS analysis was run on both samples 1 & 2 on August 6 and 9, 2013, with the following results:

Field Parameters:

	pH	EC	DO	Temp
August 4th	6.82	446	1.29	5.2
August 6th	7.44	397	1.31	4.9

TSS Results:

	August 6 th TSS (mg/L)	August 9 th TSS (mg/L)
August 4th 10:09	28	32
August 6th 11:10	4	16

The pH of both samples did slightly decrease as the precipitate developed and both stabilized between 6.50 and 6.58.



Photo 3: Samples collected August 4th, with the left bottles unpreserved and right bottles preserved upon sampling (photo taken August 6th).

Discussion

This problem was originally attributed to a pumping or a possible well screen problem. Input provided by EBA lead to the following explanation as provided in the 2012 MVLWB Annual Report.

“...the elevated TSS in the groundwater. Tom Dance indicated that the combination of hard water and SO₄ concentrations in the range of 1200 to 2000 mg/l would result in the production of gypsum in the groundwater. This gypsum would not result in changes to groundwater metals. He also indicated that the high levels of SO₄ could be due to oxidizing conditions in the tailings or natural springs or both.”

Although this could be a possible valid explanation for other conditions, it is not believed to be the case when considering the S4-27-16 well location and the surrounding environment (see photo 4 below).



Photo 4 – Residue of Historical Tails in the Flat River.

As you can see on the map provided the well location is within the historic tails deposit on the Flat River. The soil in this location has obvious iron oxide coated sands and fines (dark red, orange and yellow). The oxide rich sediments are believed to be the contributing factor in the elevated TSS at this specific well site.

Conclusions

The water in well S4-27-16 is not high in any deleterious metals or TSS in-situ, except for slightly elevated Iron (Fe) levels; the elevated TSS develops hours later after the sample has been exposed to oxygen during the sampling. The GWPCP will not be activated, as it is a post-removal reaction that is causing an apparent elevated TSS to develop. The water left in place is stable with low TSS.