



Parent Company of Canadian Zinc

April 2, 2019

Julian Morse
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor, 4922 48th St.
PO Box 2130
Yellowknife, NT
X1A 2P6

Dear Mr. Morse:

**Re: Updates to Effluent Treatment Options Plan and Minewater Contingency Plan
Exploration Water Licence MV2001L2-0003, Prairie Creek Mine**

Canadian Zinc Corporation (CZN), is providing this letter to present an updated Effluent and Treatment Options Plan (ETOP) and Minewater Contingency Plan (MCP), attached.

Updates to the plans were made in response to conformity comments provided by the Water Board on March 6, 2019 a copy of which is also attached.

With reference to the conformity comments, responses are provided below:

ETOP

- b) *Identify how CZN plans to incorporate the recommended improvements to mixing and the polishing pond retention and identify alternative treatment systems if Applied Water Treatment Inc.'s laboratory treatment dated October 31, 2017 cannot be applied on site*

The conformity comment was that alternative treatment systems have not been identified. As we have previously noted, the primary step in water treatment is effective. It is only the secondary step, the settling of sediment, that has been troublesome. We refer you to our 2018 Water Licence Annual Report in which we describe recent testing by Univar and the development of a revised flocculation approach to promote the settling of sediment, which will be adopted in 2019. We also referred to recommendations by Tetra Tech to revise the arrangement of the baffles in the Polishing Pond. We believe these changes will result in compliant effluent.

We would also like to remind reviewers that CZN has a limited liability surface lease for the site, limiting responsibility for pre-existing conditions. Water Licence MV2001L2-0003 was intended primarily to regulate mine water from a new decline accessed from the 905 m level. The Decline was subsequently developed from the pre-existing 870 m level. As a result, decline water blends with pre-existing 870 level water and both are treated. We have previously provided data

April 2, 2019
MVLWB

showing that decline water does not need to be treated to be in compliance. Nevertheless, we have continued to treat the blended stream.

- c) *Using real data as evidence, clearly outline how the recommended treatment options (i.e. chemical dosing and filtration) on-site will treat the observed and expected quality and quantity of water to meet EQC.*

and

- d) *The sand filtration method tested by Applied Water Treatment Inc. (October 31, 2017) is not proven to be effective. CZN should seek alternative methods or provide more testing and evidence that the sand filtration will be effective.*

The original and conformity comments relate to the demonstrated effectiveness of sand filtration. Laboratory testing was inconclusive regarding the effectiveness of sand filtration. However, we believe this was because the testing was conducted on treated samples in which sediment settling had already occurred. Therefore, sand filtration could still be effective on site if satisfactory sediment settling does not occur. However, since that testing, further testing has defined a superior secondary treatment approach, as described above, which should mean that other sediment removal techniques are not needed.

MCP

- f) *A description of the Response Framework that will be implemented by the Licensee to link the results of monitoring to those corrective actions necessary to ensure that the objectives listed in Part D Item 11 are met including:*
- (1) definitions, with rationale for Action Levels applicable to the performance of the Polishing Pond with respect to geotechnical stability, thermal characteristics, seepage quality and quantity, and run off; and*
 - (2) for each action level, a description of how exceedances of the Action Level will be assessed and what actions may be taken if the Action Level is exceeded.*

The conformity comments revolve around a response framework and action levels. It seems to us that there is a fundamental misconception as to what the Polishing Pond structure is, how it functions, and what we do in response to a need for corrective action. As a result, the review comments are lacking in context. We recommend that reviewers make a site visit to familiarize themselves with the structure and operation. In simple terms, if any part of the pond is not functioning optimally, it is fixed immediately. We have made adjustments to the plans in response to the comments.

For example, regarding geotechnical stability, reference is made to inspections of the liner and outlet pipe. These inspections are made, but in our opinion, they do not relate to geotechnical stability which we believe relates to the pond dykes.

There continues to be reference to “in case of a catastrophic in-rush of water, and the volume of mine water exceeds the capacity of the treatment system”. This concern stems from comments

April 2, 2019
MVLWB

made during the original licencing stage. We now know that mine drainage is not unpredictable or significantly variable. We have seen that over a 13 year period. The largest flows have occurred during periods when the Decline was being dewatered. The flows were still well within the capacity of the treatment system.

i) *The contingencies and response framework require improvement beyond adjusting dosage, as per the requirements of Part D, Condition 12 of MV2001L2-0003. If holding water is not a viable option, please investigate alternative options that are viable that will prevent the release of effluent that does not meet EQC.*

See ETOP, b) above regarding water treatment and releasing an effluent that meets EQC. Regarding alternatives to prevent this, the 870 level was built as an adit. Water drains from it by gravity. There is no way to stop the flow short of completely sealing the tunnel. This is clearly beyond the terms of our limited liability surface lease.

We trust the above comments are helpful. Should you have any questions related to this letter, please contact us.

Yours truly,



David P. Harpley
VP Environment and Permitting Affairs