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### Staff Report

<b>Applicant:</b> Canadian Zinc Corporation	
<b>Location:</b> Prairie Creek Mine, NT	<b>File Number:</b> MV2019L2-0006
<b>Date Prepared:</b> October 23, 2020	<b>Date of Board Meeting:</b> November 13, 2020
<b>Subject:</b> Request to Extend Submission Deadline – Effluent Treatment Plan V3 and Minewater Treatment Contingency Plan V3	

#### 1. Purpose

The purpose of this Report is to present to the Mackenzie Valley Land and Water Board (MVLWB/the Board) a request to extend the submission deadline for Canadian Zinc Corporation’s Effluent Treatment Plan (ETP) Version 3 (V3) and Minewater Treatment Contingency Plan (MTCP) V3, which are required under Part E, Conditions 4 and 5, respectively, of Water Licence MV2019L2-0006.

#### 2. Background

- September 9, 2019 – Issuance of Water Licence MV2019L2-0006;
- April 27, 2020 – ETP V2 and MTCP V2 submitted to the Board;
- April 28 – Public review commenced;
- May 26, 2020 – Reviewer comments and recommendations due and received;
- June 9, 2020 – Responses due and received;
- June 25, 2020 – Board approves ETP V2 and MTCP V2 and directs CZN to submit an ETP V3 and MTCP V3 by October 25, 2020;
- October 21, 2020 – CZN submits a request to extend the submission deadline for the ETP V3 and MTCP V3; and
- **November 13, 2020 – CZN’s request presented to the Board for decision.**

#### 3. Discussion

##### Project History

On September 9, 2019, the Board issued Licence MV2019L2-0006 (attached). This authorization replaced Licence MV2001L2-0003 for mineral exploration activities at Prairie Creek Mine. The activities authorized under MV2019L2-0006 include the development of a second underground decline, and treatment of mine water emanating from an existing portal at the mine. On September 2, 2020, the Board approved CZN’s July 21, 2020 Application to amend Licence MV2019L2-0006 to also include surface exploration in the scope of the Licence (attached). The original Licence was issued in 2003 and was subject to Environmental

Assessment (EA) EA01-003. CZN currently holds several active authorizations for activities related to the Prairie Creek Mine.

### Description of Request

An Effluent Treatment Plan (ETP) and Minewater Treatment Contingency Plan (MTCP) are required to be submitted as per Part E, Conditions 4 and 5, respectively, of Water Licence MV2019L2-0006. CZN had submitted Version 2 (V2) of the ETP and MTCP on April 27, 2020 (attached), and the Plans had subsequently been sent for review. Although the Board approved the ETP V2 and MTCP V2, the Board's decision from June 25, 2020 required CZN to submit ETP V3 and MTCP V3 no later than October 25, 2020 (attached). According to the Board's decision letter (attached), V3 of the Plans were to incorporate the comments and recommendations made during the public review of the ETP V2 and MTCP V2 (or provide rationale why these comments were no longer relevant), as well as include any additional updates as required.

CZN has had difficulty meeting the effluent quality criteria (EQC) for total zinc at Prairie Creek Mine required by Licence MV2019L2-0006. In the MTCP V2, CZN proposed certain measures to be applied to the water treatment system to lower total zinc being discharged from Prairie Creek Mine, including revising the baffle orientation in the Polishing Pond, and additional sediment filtering through use of a sand filter or other suitable device. CZN indicated in MTCP V2 that if these changes did not result in decreased total zinc, they would convert the treatment plant to a lime-based system, as lime is effective at removing metals, including zinc.

During the public review of the ETP V2 and MTCP V2, Environment and Climate Change Canada (ECCC) recommended that CZN provide a timeline for obtaining and commissioning an alternative lime-based water treatment system (see ECCC-1 in attached Staff Report and Comments). Government of the Northwest Territories Environment and Natural Resources (GNWT-ENR) recommended that if sampling at Prairie Creek Mine indicates that an average total zinc concentration result indicates non-compliance, additional treatment measures should be implemented (sediment filtering), and once a similar sampling period has elapsed with the additional measures in place (i.e. four weeks), should the water still indicate that concentrations are non-compliant, conversion to a lime-based system should commence (See GNWT-ENR-4 and 5 in attached Staff Report and Comments). CZN had discussed in their response to the review comments that they plan to evaluate treatment plant changes going forward, and simultaneously collect data with which to possibly support a future application to change the zinc EQC from total to dissolved.

Board staff note that a Surveillance Network Program (SNP) Report submitted by CZN for July 23 to August 13, 2020 indicated that CZN had constructed two new baffles in the Polishing Pond over the summer 2020 water treatment season (attached). This SNP Report also indicated that CZN had introduced a new chemical flocculant to help settle particles in the Polishing Pond that could be contributing to high total zinc values. The SNP Report indicated two instances where the effluent from Prairie Creek Mine had exceeded EQC for total zinc. A second SNP Report was submitted by CZN for August 14 to September 17, 2020 (attached). This SNP Report indicated that the EQC for total zinc had been exceeded three more times. CZN discussed in this report that they had procured and acquired a sand filter. As per Part E, Condition 20, CZN submitted Spill Reports for the instances of EQC non-compliance (attached).

On October 22, 2020, CZN submitted a request to extend the submission deadline for ETP V3 and MTCP V3 (attached). The letter from CZN indicated that it is too soon for CZN to make conclusions about which management option they will choose (e.g., implementing a lime-based treatment system, applying to amend EQC for total zinc in Licence MV2019L2-0006, etc.) because water treatment and water sample collection is still on-going, and conclusions have not yet been drawn. CZN proposed that the submission date for the plans be amended to February 25, 2021 and suggested that this will provide enough time for

the review and approval process to be completed prior to early June when water treatment typically resumes.

Board staff agree that CZN's updated ETP V3 and MTCP V3 should include conclusions about which water management option CZN will employ going forward, so that reviewers can comment on the chosen option based on the sample results collected until the end of the 2020 water treatment period. However, Board staff are concerned that a submission deadline of February 25, 2021 may result in too tight of a timeline for CZN to update the Plans and possible management strategies based on review comments, if necessary. Board staff suggest that requiring CZN to submit the ETP V3 and MTCP V3 by January 11, 2021 could help alleviate this concern.

Given the EQC exceedances over the summer of 2020, Board staff recommend the Board could include wording in the decision letter that directs CZN to present the final option for water treatment at Prairie Creek Mine in the ETP V3 and/or MTCP V3, as appropriate, that will consistently achieve effluent discharge that meets EQC requirements at Prairie Creek mine going forward, including a timeline for implementation.

#### 4. Security

The status of security for this Project will not be affected by the Board's decisions related to the extension request for ETP V3 and MTCP V3.

#### 5. Conclusion

Board staff conclude that CZN's request to submit V3 of the ETP and MTCP by the end of February 2021 could leave too little time for a public review of the Plans before water treatment in 2021, but believe that an extension until January 11, 2021 would be appropriate.

#### 6. Recommendation

Board staff recommend the Board **make a motion to approve an 11 week extension to the submission deadline for the Effluent Treatment Plan V3 and Minewater Treatment Contingency Plan V3** required as per Part E, Conditions 4 and 5, respectively, of Water Licence MV2019L2-0006.

A draft decision letter is attached. Board staff recommend the following directive be included in the decision letter:

- The Board notes the six instances where the effluent quality criteria (EQC) for total zinc was exceeded between July 12 to September 10, 2020. CZN is to present the final option for water treatment at Prairie Creek Mine in the ETP V3 and/or MTCP V3, as appropriate, that will consistently achieve effluent discharge that meets EQC requirements. This should include a timeline for implementation.

#### 7. Attachments

- [Licence MV2019L2-0006](#)
- [Amended Licence MV2019L2-0006](#)
- [Effluent Treatment Plan Version 2](#)
- [Minewater Treatment Contingency Plan Version 2](#)
- [June 25, 2020 Board Decision on ETP V2 and MTCP V2](#)
- [Staff Reports for ETP V2 and MTCP V2](#)
- [Surveillance Network Report July 23 to August 13, 2020](#)
- [Surveillance Network Report August 14 to September 17, 2020](#)

- Spill Reports for EQC Exceedances: [July 12, 2020](#); [August 13, 2020](#); [August 20, 2020](#); [September 3, 2020](#); [September 10, 2020](#)
- [October 22, 2020 ETP V3 MTCP V3 Extension Request](#)
- Draft Decision Letter from the Board

Respectfully submitted,



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Regulatory Specialist



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