

## Reviewer Comments and Proponent Responses

Project: Prairie Creek Mine  
 Board: Mackenzie Valley Land and Water Board  
 Organization: CanZinc Corporation (CZN)

No.	Topic	Reviewer Comment	Reviewer Recommendation	Proponent Response	Board Decision
<b>GNWT-ENR - EAM (Environmental Assessment and Monitoring) - Erin Goose</b>					
1	Section 2d) – Timed Bucket Fill Tests	Section 2d) of the Prairie Creek Mine 2021 Annual Report (the Report) states that “The flow of water from the underground mine workings is measured after the Polishing Pond at SNP Station 3-4 via a calibrate weir which has been used since 2006 and has been checked with timed bucket fill tests.” ENR notes that it is not clear how often these timed bucket fill tests are carried out, nor when the most recent test was performed.	ENR recommends that Canadian Zinc Corporation (CZN) confirm how often the timed bucket fill tests are performed and when the most recent test was completed.	Bucket fill tests have not been continued as there is no reason to believe that the weir has changed. It is a metal structure.	Board direction to: 1) provide the results of previous bucket tests, and 2) clarify in future reports when CZN stopped conducting the tests and that they haven't been done since
2	Section 2e) – Engagement Dates	Section 2e) of the Report includes details on engagement with the Nahᓵ Dehé Dene Band (NDDB) and the Łíídlı́ Kúé First Nation (LKFN). Dates when engagement occurred are provided from 2020 for both groups, however dates from 2021 are only provided for LKFN. ENR notes that it is not clear if there is a typo and some of the 2020 dates should be 2021, or if no engagement with NDDB is being reported for 2021.	ENR recommends that CZN clarify whether some of the 2020 dates for NDDB engagement should actually be in 2021, or if no engagement with NDDB occurred in 2021.	Yes, it is a typo. All dates are 2021.	Adequate.
3	August/September Spill – EQC Exceedance	Section 2 k)i) of the Report outlines a spill event involving readings of 2.69 and 3.3 mg/L dissolved zinc in Polishing Pond outflow between August 30th and September 1st. Table 1 shows that samples for SNP station 3-4 (Polishing Pond Discharge) around the time of the elevated dissolved zinc readings were only collected on August 24th and September 4th. This is a deviation from the regular weekly sampling as per the Water Licence MV2019L2-0006 and ENR notes that no discussion is provided to explain why sampling at SNP station 3-4 was delayed until September 4th instead of	ENR recommends that CZN provide an explanation for the delay of weekly sampling at SNP station 3-4 from August 31st to September 4th and comment on whether or not the August 30th to September 1st spill event could have represented an exceedance of EQC.	This was an oversight by site staff, who were concentrating on returning Polishing Pond discharge to compliance. the colourimetry results were reported which reliably (because of the established correlation) indicate that EQC were exceeded during the spill event. Samples	Although on-site colourimetry data for SNP 3-4 were available and additional sampling was completed downstream at SNP 3-5, CZN is reminded that adherence to the sampling requirements as per Annex A of the licence is required

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		<p>adhering to the weekly sampling schedule. Continuing weekly sampling would have resulted in a sample being collected on August 31st, which, if containing dissolved zinc levels similar to those reported in Section 2k)i) for Polishing Pond outflow during that time period, would have exceeded the maximum grab EQC of 0.8 mg/L for dissolved zinc. However, Section 2m) and Table 1 both report that the June 17th dissolved zinc concentration was the only EQC exceedance in 2021.</p>		<p>were taken at station 3-5 for off-site testing of chemistry and toxicity, per instructions from ECCC.</p>	
4	<p>CCME Guideline Exceedances at SNP station 3-13</p>	<p>Section 2m) of the Report indicates that on June 29th and July 27th dissolved zinc concentrations at SNP station 3-13, located on Prairie Creek 100 m downstream of the confluence with Harrison Creek, exceeded the CCME guideline values. The Report indicates that an assessment of the effects of Polishing Pond discharge on water quality at SNP station 3-13 was not possible because of other significant sources of zinc to the catchment pond. However, ENR notes that there is no discussion of plans to further investigate or address the other sources of dissolved zinc that may be contributing to elevated dissolved zinc levels downstream of the discharge point.</p>	<p>ENR recommends that CZN discuss whether any action was taken to further investigate and mitigate the elevated dissolved zinc concentrations measured at SNP station 3-13 on June 29th and July 27th.</p>	<p>As the report explains, there are other sources of zinc to the Catchment Pond, notably the Coarse Ore Stockpile from the Cadillac era. Mitigation of this source will occur during site development for operations when this pile will be removed.</p>	<p>CZN indicates that site surveillance is demonstrating that historic site features are resulting in elevated zinc concentrations in the receiving environment.</p> <p>CZN argues their responsibility for these historic site features is limited by Surface Lease 95F/10.</p> <p>LWB staff are working to clarify CZNs argument through the project's CRP, though, it would be beneficial to require CZN to clarify this information as part of annual reports as well.</p> <p>The Board directs CZN to submit this information as part of future reports:</p> <p>1) Identify all of the components associated with the Prairie Creek mine site and differentiate between those that apply to mineral exploration and other existing components that will subsequently</p>

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					<p>apply to mine operations.</p> <p>2) Include a table identifying the requirements of Surface Lease 95F/10 with descriptions of how each item has or will be addressed. For those that have not been addressed, provide an indication as to when CZN plans to do so.</p> <p>3) Identify how fulfilling the requirements of Surface Lease 95F/10 could mitigate zinc generation and transportation from historic site features, including but not limited to the Coarse Ore Stockpile</p>
5	SNP Station 3-11 – Sampling Frequency	<p>Table 2 of the Report indicates that Surveillance Network Program (SNP) station 3-11 was only sampled on July 27th and September 29th. ENR notes that based on Water Licence MV2019L2-0006, SNP station 3-11 is to be sampled monthly during site operations, and no explanation is provided for the reduced sampling frequency at SNP station 3-11 compared to what is required in the Water Licence. ENR acknowledges that the sampling frequency for SNP station 3-11 was previously bi-monthly during site operations, however this was updated to the current monthly frequency in a Water Licence Amendment dated April 15th, 2021.</p>	<p>ENR recommends that CZN provide an explanation for the reduced sampling frequency at SNP station 3-11 compared to the Water Licence requirement of sampling monthly during site operations.</p>	<p>Station 3-11 should have been sampled in August, but wasn't.</p>	<p>CZN has acknowledged the sampling at SNP 3-11 was missed in August but has not provided any indication of why this occurred. Although it is understood that errors and omissions can occur, CZN should review monitoring practices to verify if changes in procedures are required to avoid these sampling omissions in the future.</p> <p>The Board requires CZN, as part of future annual water licence reports, to demonstrate how their sampling and monitoring practices and procedures will achieve SNP requirements, including not exceeding hold times (see ECCC 1</p>

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					below)
6	Spill Reports – Responsible Party	The two spill reports included in Appendix A of the Report list the responsible party as “Canadian Zinc and GNWT”. ENR notes that it is not appropriate for CZN to include the GNWT as a responsible party on its spill reports.	ENR recommends that CZN remove GNWT as a responsible party on the spill reports included in Appendix A of the Report and that the GNWT not be included as a responsible party on any future CZN spill reports.	The spill reports have long since been filed, so it would not be appropriate to amend them now. We have not included the noted reference subsequently.	Adequate.
7	Cover Letter	Comment Letter	N/A		
<b>Environment and Climate Change Canada (ECCC) - Mrs. Stephinie Mallon</b>					
1	Topic: Toxicity Testing Results Reference: Prairie Creek Mine, Water Licence MV2019L2-0006, 2021 Annual Report	Samples were collected twice in 2021 from the Polishing Pond discharge at SNP 3-4 for rainbow trout and Daphnia magna toxicity tests. Both tests passed with no mortality. ECCC notes that in both cases the holding time for samples were exceeded by several days, which is a test method deviation.	ECCC recommends that samples to be used for toxicity testing be timed with available transport such that the 5 day holding time is not exceeded prior to test initiation.	The problem is not available transport from site, it is transport to the laboratory in Calgary. Holding times are considered to be 'recommended' times. We do not believe the deviation renders the samples unsuitable.	The test methods specify that testing should commence as soon as possible after sample collection. The test should begin within three days and must commence no later than five days after termination of sampling. Delays in sampling hold time may result in changes to the sample chemistry, which can impact the testing and interpretation of the results.  Although it is understood that there are logistical challenges associated with submitting samples from remote areas, it is highly recommended that a conversation occurs with the testing laboratory to resolve this delay in sample submission.  See GNWT-5 for recommended direction

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<b>Parks Canada - Alexandra Taylor</b>					
1	Spill reporting at Catchment Pond June 11 to Sept 1	A few unauthorized discharges of non-EQC compliant water occurred between June 11 to Sep 1, resulting from breaching of an ice plug in the portal in June and associated impacts to the water treatment system, as well as heavy rainfall in late August that the treatment system had issues treating stemming from a broken pump and use of a gravity fed system of adding treatment chemicals instead. Corrections and adjustments to the water management approach appear to have been made or proposed that should prevent similar occurrences in the future. No exceedances of EQC appear to have been measured at the final discharge to Prairie Creek or within the creek. Canadian Zinc notes for the June 11 spill a colourimetry test exceeded EQC, but its not clear if this was measured from the spill water flowing into the Catchment Pond, or from the Catchment Pond discharge to Prairie Creek.	Parks Canada recommends that Canadian Zinc clarifies if the colourimetry test was measured from the spill water flowing into the Catchment Pond or from the Catchment Pond discharging to Prairie Creek	The test was on Polishing Pond overflow (station 3-4) since this is the compliance point in the current Water Licence.	Adequate.
2	Spill reporting at SNP 3-4 on June 27, 2021	A June 27 EQC exceedance at the Polishing Pond discharge station SNP 3-4 was identified in the Appendix B August 15th SNP report, however no corresponding spill report was provided nor is one listed on the NWR spill registry for this date.	Parks Canada recommends that Canadian Zinc clarifies if there was an EQC exceedance at SNP 3-4 on June 27, 2021 and if so provide the missing spill report	There was an exceedance on June 27 and a spill report was filed and copied to the Board, ENR and ECCC.	Adequate. It is noted that this is the third EQC exceedance CZN has noted during this review, though only the June 17 exceedance is noted in the Annual report. All EQC exceedances must be listed in the annual report .
3	Catchment Pond discharges	It is noted that the Catchment Pond discharge samples are typically elevated in dissolved Zn relative to the Polishing Pond. Canadian Zinc notes that “clearly there are other more significant sources of zinc to the Catchment Pond. Seepage from the pre-existing Coarse Ore Stockpile is one of those.” The average Catchment Pond concentration for the season was 0.37 mg/L dissolved Zn, based on 5 samples, which is close to the average EQC limit of 0.4 mg/L. Prairie Creek downstream water quality also exceeded	Parks Canada recommends more frequent colourimetry testing of Catchment Pond discharge could be considered as a more precautionary measure to mitigate against potential non-compliant discharges.	CZN is currently regulated at station 3-4, Polishing Pond discharge, not 3-5. This is because the other sources to 3-5 pre-date CZN's tenure, and are currently not the responsibility of CZN. Therefore, there is no point to colourimetry testing at	The point of compliance is at SNP 3-4 and reporting of EQC exceedances at this station has been completed by CZN, as required.

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		<p>calculated CCME guideline values in two instances. In Appendix B, Canadian Zinc propose sampling the Catchment Pond discharge anytime Polishing Pond discharge water exceeds 0.8 mg/L. However, given the nearness of the Catchment Pond to exceeding EQC, and the clear influence of other contributing sources to elevated Zn than just mine water, more frequent sampling using colourimetry of the Catchment Pond might be more prudent to identify potential non-compliant discharges.</p>		<p>3-5 as there is no compliance obligation, other than for toxicity in relation to the Fisheries Act. In this regard, it has been demonstrated that elevated zinc concentrations corresponding to those normally occurring at 3-5 do not result in toxic water due to the naturally very high hardness.</p>	
4	<p>Spill reporting at SNP 3-4 and SNP 3-5</p>	<p>Elevated dissolved Zn concentrations in the Polishing Pond were identified on June 17, June 27, August 30 and Sep 1. Water from the plug breach was also high in Zn and flowed into the Polishing Pond and Catchment Pond on June 11. Between these, 4 spill reports were generated. However, a lab sample was only taken for the Polishing Pond discharge at Station 3-4 for June 17. It is unclear to Parks Canada why the Polishing Pond discharge was not sampled when Canadian Zinc detected EQC exceedances within or entering the pond. The spill reports also state samples of the Catchment Pond discharge were taken on Aug 30 and Sep 1, but these results do not appear to be reported in the report.</p>	<p>Parks Canada recommends Canadian Zinc provide rational why lab samples are not collected from SNP 3-4 from same dates when EQC exceedances occurred.</p> <p>Parks Canada also recommends Canadian Zinc provide the missing sample results for SNP 3-5 (Catchment Pond discharge) for Aug 30 and Sep 1 as identified the respective spill reports.</p>	<p>It has been demonstrated that colourimetry can accurately determine dissolved zinc concentrations in 3-4 water when concentrations exceed 0.1 mg/L.</p> <p>Sample results for 3-5 taken on Aug 30 were provided to ECCC. This sample was not considered to be an SNP sample.</p>	<p>Although CZN has provided some information to support the application of colourimetry to accurately determine elevated dissolved Zn concentration at SNP 3-4, and the Board recognized that there was a measure of uncertainty still associated with this method. As such, the Board issued a directive on October 14, 2022, requiring the Effluent Treatment Plan Version 6.0 be updated to continue to assess the relationship between laboratory and on-site colourimetry results for dissolved zinc. While the on-site colourimetry results are timelier, the field meter cannot be accredited and, therefore, does not replace samples analyzed by an accredited laboratory. As a best practice, CZN should confirm EQC exceedances detected by colourimetry with samples analysed by an accredited</p>

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					laboratory.
<b>Fisheries and Oceans Canada (DFO) - Dana Harris</b>					
1	Document as a whoo	DFO has reviewed the document in accordance with our mandate and has no comments at this time.	DFO has no recommendations at this time.		Noted.

Environmental Protection Operations Directorate  
Prairie & Northern Region  
5019 52<sup>nd</sup> Street, 4<sup>th</sup> Floor  
P.O. Box 2310  
Yellowknife, NT X1A 2P7

ECCC File: 5100 000 0014/017  
MVLWB File: MV2019L2-0006



September 6, 2022

via online review system

Jen Potten  
Regulatory Coordinator  
Mackenzie Valley Land and Water Board  
7th Floor, 4922 48th Street  
P.O. Box 2130  
Yellowknife, NT X1A 2P6

Dear Jen Potten:

**RE: MV2019L2-0006 – Canadian Zinc Corporation – Prairie Creek Mine– 2021 Annual Report**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Mackenzie Valley Land and Water Board (MVLWB) regarding the above mentioned 2021 Annual Report.

ECCC is providing technical, science-based information and knowledge based on our mandate pursuant to the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*. These comments are intended to inform the assessment of this project's potential effects in the receiving environment and on valued ecosystem components. Any comments received from ECCC in this context does not relieve the proponent of its obligations to respect all applicable federal legislation.

If you need more information, please contact Stephinie Mallon at [Stephinie.Mallon@ec.gc.ca](mailto:Stephinie.Mallon@ec.gc.ca).

Sincerely,

*[original signed by]*

Stephinie Mallon  
Environmental Assessment Officer

Attachment: ECCC Comments Excel Sheet

cc: Jody Small, Acting Head, Environmental Assessment North (NT and NU)







September 6, 2022

Jen Potten  
Regulatory Coordinator  
Mackenzie Valley Land and Water Board  
P.O. Box 2130 4922-48<sup>th</sup> St.  
7<sup>th</sup> Floor YK Centre Mall  
YELLOWKNIFE, NT X1A 2P6

Dear Jen Potten,

**Re: Prairie Creek Mine 2021 Annual Report (MV2019L2-0006)**

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The Department of Environment and Natural Resources, Government of the Northwest Territories based on its mandated responsibilities under the *Waters Act* has included comments and recommendations for the consideration of the Board at this time.

Should you have technical questions, please contact Celena Hoeve, Intern-Pollution Control Specialist, Water Management and Monitoring Division at email: [Celena.Hoeve@gov.nt.ca](mailto:Celena.Hoeve@gov.nt.ca).

If you have any general questions, please contact Erin Goose in the Environmental Assessment and Monitoring unit at email: [gnwt\\_ea@gov.nt.ca](mailto:gnwt_ea@gov.nt.ca).

Sincerely,

Erin Goose  
Environmental Regulatory Analyst  
Environmental Assessment and Monitoring Section  
Environmental Stewardship and Climate Change Division  
Department of Environment and Natural Resources  
Government of the Northwest Territories