

REVIEW COMMENT TABLE

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MVEIRB Draft Terms of Reference for CanZinc's Proposed All Season Road and Airstrip Project (MVEIRB)

File(s):**Proponent:** CanZinc Corporation**Reviewer Comments Due By:** Aug 15, 2014**Proponent Responses Due By:** Aug 27, 2014**Documents:** [MVEIRB Draft Terms of Reference for CanZinc's Proposed All Season Road and Airstrip Project](#) 1.2MB**Item For Review Distributed On** July 31 at 16:28 [Distribution List](#)**Item Description**

This document is the Review Board's Draft Terms of Reference for the Prairie Creek All Season Road and Airstrip.

Files related to EA1415-01 can be found on the Review Board public registry:

http://www.reviewboard.ca/registry/project.php?project_id=680

General Reviewer Information

The Review Board has reviewed the

- *Developer's Proposed Terms of Reference,*
- comments on the *Developer's Proposed Terms of Reference,* and
- comments gathered during the scoping sessions in Nahanni Butte, Fort Liard, Fort Simpson, and Yellowknife.


Using this information, the Review Board has produced a *Draft Terms of Reference* for the proposed Prairie Creek all season road and airstrip project. Reviewers are asked to provide comments on the *Draft Terms of Reference*. Party comments are due by **Friday August 15, 2014** and comments from Canadian Zinc are due by **Wednesday August 27, 2014**. (The comment deadline date for Canadian Zinc has been extended from Friday August 22 to Wednesday August 27 based on a request by Canadian Zinc to accommodate its consultants' schedules). The comments on the *Draft Terms of Reference* will be considered by the Review Board before it issues its final *Terms of Reference* for the proposed project.

All information for this project will be placed on the Review Board public registry. Please sign up to the Review Board's email subscription to receive a link to new documents for EA1415-01.

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The lead contact is Sachi De Souza, (867) 766-7054 sdesouza@reviewboard.ca

Contact Information Sachi De Souza**Comment Summary**

CanNor NWT Region: Marie Adams				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
16	General File	Comment  Environment Canada Cover letter (as part of Govt of Canada submission) Recommendation GENERALFILE		
1	Government of Canada: Comments on MVEIRB Draft Terms of Reference, Canadian Zinc Corporation Environmental Assessment (File: EA1415-01)	Comment None Recommendation None		
2	Fisheries and Oceans Canada ("DFO") General: DFO has reviewed the Draft Terms of Reference and have determined that it adequately addresses points related to fish habitat and fishery	Comment None Recommendation None		

	productivity and that DFO has no further comments.			
3	Environment Canada ("EC") EC-1: Cover Letter from Environment Canada	Comment None Recommendation None		
4	EC-2: Migratory BirdsSection 3.2.2: Effects Assessments - Valued ComponentsSection 3.2: Geographic ScopeSection 5.1.4: Species at RiskSection 5.1.6: Wildlife and Wildlife HabitatSection 7.3.8 : Wildlife and Wildlife Habitat	Comment Environment Canada notes that in the Terms of Reference (ToR), the term "wildlife" includes resident and migratory bird species but there is inconsistency in this definition throughout the ToR. In Section 3.2.2, "birds" are listed as a valued component distinct from "wildlife and wildlife habitat"; however, birds are later listed under Section 5.1.6 Wildlife and Wildlife Habitat. Later in the document, it is mentioned that wildlife includes birds (either in brackets or as a footnote). Additionally, birds are not listed as a Valued Component in Table 2, 'Minimum Geographic Range' or mentioned in the section 'Species at Risk' within Description of the Existing Environment and Baseline Conditions. Recommendation Environment Canada recommends that consistency with regards to the use of the term "wildlife" and the definition of "birds" (as either a stand-alone valued component or associated with the term "wildlife") be used throughout the document.		Sep 12: In section 3.2.2, removed birds from list. Added reference to birds, in brackets, in Table 2 (minimum geographic scope), 5.1.4, and 7.3.6.
5	EC-3: Migratory Birds Section 7.3.6: Species at Risk and;Section 7.3.8: Wildlife and Wildlife Habitat	Comment In these two sections, items 11 and 12, respectively, list "attraction of predators to birds and birds eggs". Recommendation Environment Canada recommends that the wording be revised to "attraction to predators of birds and birds eggs" to reflect that the purpose of this section is to identify and evaluate impacts of the project on the predators, not the predators on the birds and bird eggs.		Sep 12: the recommended wording has been included in Section 7.3.6 and 7.3.8.
6	Natural Resources Canada ("NRCan")General: NRCan has reviewed the Draft Terms of Reference (Sections: 5.1.1, 7.3.1, 8.0) and find that these are sufficiently detailed and include key elements related to permafrost/terrain stability and hazards and that NRCan has no further comments.	Comment None Recommendation `		
7	Parks Canada Agency ("PCA") PCA-1: Section 3.1.1: Consideration of an Airstrip within the Nahanni National Park.	Comment Parks Canada initially indicated to the Review Board and the proponent that an airstrip cannot be authorized under the CNPA for the purposes of the mine. CZN has since provided Parks Canada with additional information to support their application and Parks Canada is currently conducting a review and analysis to determine if the airstrip can be authorized. Recommendation Parks Canada's evaluation of the new information from the developer on the airstrip is ongoing. Our intention is to complete the review and provide a response to the proponent and the Board as soon as possible		
8	PCA-2: Section 3.1.2: Assessment of Different Project	Comment The developer is asked to clearly describe in its DAR any varying conditions, impacts and proposed mitigations between the		

	Phases, 3.5 Consideration of alternatives to the development	two project phases. Additional guidance can be provided to the proponent. Recommendation In addition to the assessment considering the potential impacts of the different project scenarios (Phase 1 on its own, Phase 1 and 2 together), we recommend the proponent provide quantitative evidence to evaluate the benefits of Phase I on its own in comparison to the currently permitted winter road. For example, the proponent has indicated that the potential exists for Phase 1 to be built without Phase 2 ever being completed. Phase 1 should be able to be justified on its own.		
9	PCA-3: Section 6.1: Project Components and Activities	Comment The developer is asked to provide a commentary on the alternative means to complete each of the 3 distinct components of the project i.e. road, transfer facilities and airstrip, but "Alternative means" is described as the potential realignments and airstrip locations. For consistency we recommend that "transfer facilities" is included in the alternates description in the last sentence. Recommendation As the best approach to mitigation is avoidance, relocation can be an appropriate way to avoid impacts. Therefore where it is necessary, we recommend alternate locations be considered in greater detail than what could be provided in commentary. e.g. an analysis of alternate means for the project components (road and Tetcela Transfer Station) and the implications of these alternate means for Phase 1 and Phase 2 impacts.	Aug 27: Relatively small changes to the existing road alignment and transfer facility location will be considered to minimize impacts and reduce construction requirements, but greater changes simply aren't feasible. There is no better overall road alignment. Cadillac picked the present alignment after extensive review of very challenging terrain. The winter road location mostly exists and is permitted. There is no logic or justification for considering a radical change. Likewise, the transfer facility location was selected to be in an area where impacts are unlikely i.e. off of karst, distant from watercourses and lower in wildlife habitat value. Further west puts it on karst. Further east puts it in lowlands which are more difficult to get to in early winter, and more expensive in summer. As only minor relocations are possible, this section is appropriate as is.	Sep 12: Transfer facilities has been included.
10	PCA-4: Section 6.1: Project Components and Activities	Comment The impacts to traditional harvesting as well as the effects of potential accidents and malfunctions could be significant issues. Therefore an analysis of alternative means under these topics could provide appropriate mitigative measures for consideration. Recommendation We recommend that in the alternate means analysis in section 6.1, impacts to i) traditional harvesting and ii) potential accidents and malfunctions are added to the 29 listed activities for consideration.	Aug 27: We're not sure section 6.1 is the appropriate location to consider impacts.	Sep 12: The description in the key line of inquiry for both these items (sections 7.2.1 and 7.2.2) includes consideration of the potential impacts for the preferred and alternate routes.
11	PCA-5: Section 6.2: Road Design Considerations, Section 7.2.2: Effects of Potential Accidents and Malfunctions and;Section 9: Potential Accidents and Malfunctions	Comment These sections provide adequate detail for road design considerations and standards. However there are sections of the road that pass through rugged and technical terrain, these areas should be specifically highlighted for further evaluation. Recommendation We recommend these sections of the TOR to highlight specific locations of the road that pass through rugged and technical terrain e.g. Funeral/Sundog Creek, the Ram Plateau Karst and the Silent Hills as well as any proposed realignments through steep terrain. These locations suggest a higher potential for significant challenges in engineering and road safety, therefore detailed information about hazards and risk mitigation at these locations are important.	Aug 27: This level of detail is appropriate for, and will be included in, the DAR, but we do not think it necessary to include it in the TOR.	Sep 12: Specifically challenging areas do need to be highlighted; however, they should be described in the DAR not the ToR.
12	PCA-6: Section 7.2.3: Impacts to Nahanni National Park Reserve	Comment We recommend a subsection to be added in section 7.2.3 to include the full scope of the proposed TTF. Recommendation We recommend the proponent provide a quantitative summary of the increased footprint and environmental impacts of the new proposal in comparison to the current TTF design. The potential for changes to the design if Phase I were on its	Aug 27: The TTF would be expanded for Phase 1 if it proceeds before Phase 2, as planned. If Phase 2 occurs, the TTF footprint would reduce to that already permitted. If the two phases are developed together, TTF expansion would not be needed. However, what Parks propose re footprint would seem to be appropriate for Section 6.	Sep 12: Consideration of the change in footprint of the TTF and the associated impacts is to be included in Section 3.1.2. No change required.

		own or if Phase I and II are together.		
13	PCA-7: Section 7.3.10: Cultural & Heritage Resources	<p>Comment The proponent is asked to describe activities taken with community members to ensure that all cultural sites along the route have been identified and the developer's degree of confidence that it has identified all such sites. Additional guidance can be provided to inform the evaluation and community engagement process.</p> <p>Recommendation Rather than "describe activities", we recommend the proponent develop an archeological overview study with community members and determine moderate to high potential locations for cultural resources and conduct an archeological impact assessment in these areas with new realignment, borrow sources or tote roads. It is recommended that CZN has a qualified archeologist to assist in facilitating community engagement.</p>	Aug 27: We believe this section is appropriate as written. What Parks describe was completed previously.	Sep 12: New footprint areas will be assessed, as described in section 1.5. The Board encourages the use of Traditional Knowledge throughout the DAR and encourages CanZinc to continue to communicate with Parks Canada to ensure that cultural and heritage resources are appropriately assessed. Section 7.3.10 now states: "Describe activities taken with community members to ensure that all cultural and archaeological sites along the route have been identified..."
14	Transport Canada ("TC")TC-1: Section 7.3.12: Impacts on Existing Transportation Infrastructure	<p>Comment Does not address Transport Canada's mandate</p> <p>Recommendation Describe any change in the environment which may in turn impact navigation on navigable waterways</p>		Sep 12: changed the wording of item 2, section 5.2.6 to include "navigable waters" and section 7.3.12 to include "navigation on navigable waters."
15	TC-2: Section 7.3.10: Culture and heritage resources	<p>Comment Does not address Transport Canada's mandate</p> <p>Recommendation Describe the results of Aboriginal consultation specifically related to navigation in the project area</p>		Sep 12: Public engagement is outlined in Section 2.3. The Board recommends that CanZinc work with CanNor/NPMO to ensure that appropriate consultation for federal interests is completed.

CPAWS - NT Chapter: Shannon Moore

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
2	Management & Monitoring of Road Access	<p>Comment As increased access to the area the all-season road will travel through is stated as a concern for numerous reasons (increased potential for hunting, greater access to previously inaccessible hunting areas, road mortality due to increased traffic, impacts from disturbance to wildlife, etc), the question of managing the accessibility of the road was brought up in the scoping meeting. More specifically, the question of how Parks Canada and CZN will work together to manage access at the border of Nahanni National Park Reserve was brought up, but was left as a process that will occur at a later date, and therefore has been left out of the Terms of Reference (TOR).</p> <p>Recommendation As access is a basic issue in determining other major factors within this Environmental Assessment (examples listed in our comment), CPAWS recommends that the developer is also required to state in the TOR how they plan on controlling access at the all-season road entrance as a mitigation measure, how monitoring of road access and use will be executed, and how the developer and Parks Canada will work together to ensure controlled access at the Nahanni National Park Reserve boundary.</p>		Sep 12: Access control is considered a project component (section 6.1, item 27) and should be described in this section. Ongoing talks regarding access control are encouraged and should help inform the DAR and the EA process.

Dehcho First Nations: Carrie Breneman

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	Letter detailing DFN's Response	<p>Comment See letter.</p> <p>Recommendation See letter.</p>		

GNWT - Lands: Shafic Khouri

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
1	General File	Comment 08-15-14 - GNWT Cover		

		Letter and Recommendations in PDF format Recommendation		
2	Topic Title: Minimum Geographic Scope for Species at Risk and Wildlife and Wildlife Habitat. Geographic Scope – Section 3.3, Table 2, page 10	<p>Comment Comment(s): • The draft TOR requires the minimum geographic scope for both Species at Risk and Wildlife and Wildlife Habitat to be at the species-specific range. This could be interpreted to mean the range over which a species is found within Canada or within the Northwest Territories (NWT), which in some cases may represent a very large area relative to the geographic extent of the proposed project. Instead, it may be more relevant to require the Developer to define geographic scope on a species-specific basis. This area should be large enough to assess potential impacts at a local population level, taking into consideration seasonal movements, migratory movements, and life cycle requirements of each species. • It is unclear why the description of the minimum geographic scope for Species at Risk differs from that of Wildlife and Wildlife Habitat. Notably the geographic scope for Wildlife and Wildlife Habitat only mentions consideration of seasonal movements, whereas the scope for Species at Risk also requires consideration of migratory movements and life cycle requirements. The requirements for Species at Risk and Wildlife and Wildlife Habitat should be consistent, or further explanation should be provided to justify why the requirements would differ.</p> <p>Recommendation Recommendation(s): 1) Revise the requirements for minimum geographic scope for Species at Risk and Wildlife and Wildlife Habitat to read "Defined on a species-specific basis as an area large enough to assess potential impacts at a local population level, taking into consideration the seasonal movements, migratory movements, and life cycle requirements of each species."</p>		Sep 12: The recommended changes have been reflected in Table 2.
3	Topic Title: Description of the Existing Environment and Baseline Conditions – Sections 5.1.1, 5.1.2, 5.1.3, pages 13-16	<p>Comment Comment(s): • Baseline information (e.g., terrain type, elevation and grade, permafrost temperature, condition-continuous; discontinuous; ice content; etc., soil type, water quality, water quantity, climate, etc.) is critical in EAs as the information is needed to assess the potential scope and scale of impacts from the development. • The collection of baseline information is critical to the timeliness and completeness of the EA process, thus, if little or no baseline information is collected and presented, delays to the EA are likely to occur.</p> <p>Recommendation Recommendation(s): 2) The TOR should include more specific requests for the type and amount of baseline data that is distinctly being requested/required (regional vs. local; annual vs. seasonal; etc.) for the various biophysical components described above and in Section 5.1.1 (terrain, geology, soils and permafrost), 5.1.2 (climate) and 5.1.3 (water quality and quantity).</p>	<p>Aug 27: Section 5.1 was imported in its entirety from the TOR for the Wrigley to Inuvik all season road, a public road with much higher design standards extending to high northern latitudes. As such, section 5.1 in its present form is not appropriate in scope and content for this EA. Therefore, we will be recommending that the section be further reviewed to ensure it is appropriate for this EA. In addition, being too prescriptive in terms of baseline data requirements introduces significant risk of collecting unnecessary data, and at significant cost. In any event, we believe the necessary specific requests are already contained in the TOR, i.e. seasonal water quality data. The author also implies that little baseline data currently exists, which is not the case as a considerable amount of data already exists.</p>	<p>Sep 12: Details about the type and amount of baseline data should be discussed between GNWT and CanZinc to ensure adequate data is collected. The detail within Sections 5.1.1, 5.1.2, and 5.1.3 will remain as is. The content in section 5.1 to be representative of the information needed to assess the potential impacts of the proposed project. Content was drawn from the Mackenzie Valley Hwy project as it is also a linear development in the north. Regarding previous baseline information, section 1.5 states that previous baseline studies can be included in this DAR to support the baseline presented. If the studies are not adequate with respect to addressing the change in footprint, the change in seasonality, and the locality of the project, additional studies will be needed.</p>
4	Topic Title: Water Quality and Quantity – Section 5.1.3, pp.15-16	<p>Comment Comment(s): • The hydraulic characteristics of the various watercourses that will be crossed need to be described in order</p>	<p>Aug 27: In general we agree with these recommendations since this is the basic approach in the engineering of crossing</p>	<p>Sep 12: See changes to Section 5.1.3: item 1 now includes consideration of the</p>

		<p>to assess if the road is being constructed and designed properly to protect the natural environment. • A description of major drainages and watercourses has been included in the TOR but the hydraulic characteristics of each drainage may be unique based on drainage size and terrain type (e.g., bog, karst, spring, river valley, etc.). • Further, the variation in flow over the season is critical to ensure that the road is constructed and designed properly. Constructing in late summer or fall without understanding the river hydraulics could result in bridge or culverts impeding on the channel when spring freshet occurs and the water is at its highest level and velocity. • Understanding the changes in the river channel over the seasons is critical to ensure road construction (e.g., road protection, culvert and bridge sizing, abutment placement, etc.) is appropriate to prevent erosion and washout events in wet seasons or extreme events.</p> <p>Recommendation Recommendation(s): 3) The TOR include specific requirements to assess the total number and stream order of watercourse crossings and include information on the changes to the river channel at each proposed crossing during peak and low flow. 4) The TOR specify sufficient baseline hydrologic data be presented to rationalize the proposed crossing type and structure design (e.g., culvert number or size, bridge size and clearance, etc.).</p>	<p>structures. However, the word "baseline" should be deleted from 4) because this implies field measurements which may or may not be appropriate for design. We think it best to leave the selection of appropriate data requirements to qualified engineers.</p>	<p>total number of stream crossings and the stream order at those crossings, item 7(ii) specifically asks for consideration of the differences between low flow and peak flow conditions. Section 6.2, Road Design Considerations, item 6, has been amended to address watercourse crossings and the design considerations given the hydrologic and hydraulic characteristics of the watercourse and the proposed road design standards</p>
5	<p>Topic Title: Description of the existing environment and baseline conditions, biophysical information requirements, Species at Risk, Section 5.1.4, page 16 and Wildlife and Wildlife Habitat, Section 5.1.6, page 17</p>	<p>Comment Comment(s): • Determining contaminant concentrations in wildlife species often requires destructive sampling, i.e., animals are captured and killed to obtain tissue samples. The GNWT would like to emphasize that no new existing baseline wildlife contaminant concentrations studies should be carried out for this EA until it is determined whether sufficient data on this topic exists. • The Developer should be aware that the following COSEWIC-assessed and federally/territorially-listed species at risk have ranges that overlap with the proposed road: o Boreal caribou o Collared pika o Grizzly bear o Little brown myotis o Mountain woodland caribou o Northern myotis o Wolverine o Wood bison o Bank swallow o Barn swallow o Canada warbler o Common nighthawk o Horned grebe o Olive-sided flycatcher o Peregrine falcon o Rusty blackbird o Short-eared owl o Yellow rail o Bull trout o Western toad o Gypsy cuckoo bumble bee o Western bumble bee</p> <p>Recommendation Recommendation(s): 5) Wording of the first sentence under Section 5.1.4 be changed to "For species at risk, provide a description of:" 6) Wording for Section 5.1.4 – bullet 9 and Section 5.1.6 – bullet 10 on page 16 be changed to "baseline contaminant concentrations in harvested species that may change as a result of the all season road using existing data".</p>	<p>Aug 27: We agree. In fact, we would go a step further and suggest that it should first be confirmed that there is a significant risk of baseline contaminant concentrations changing before samples are required for ANY biota.</p>	<p>Sep 12: The recommended changes to Section 5.1.4 have been included.</p>
6	<p>Topic Title: Assessment of Environmental Impacts and Cumulative Effects to Species at Risk and Wildlife and Wildlife Habitat, Sections 7.3.6 and 7.3.8</p>	<p>Comment Comment(s): • There is inconsistency between the requirements in Sections 7.3.6 and 7.3.8. The first bullet included in Section 7.3.6, Species at Risk, was not included in Section, 7.3.8, Wildlife and Wildlife Habitat, but is equally relevant to both sections.</p> <p>Recommendation Recommendation(s): 7) Add a new bullet to Section 7.3.8, Wildlife and Wildlife Habitat, that reads "methods to</p>		<p>Sep 12: The recommendation has been included in Section 7.3.8.</p>

		minimize the effect of the project on the species including strategies for mitigation and monitoring"		
7	Topic Title: Description of the Existing Environment and Baseline Conditions and Assessment of Environmental Impacts for Birds – Sections 5.1.4, 5.1.6, 7.3.6 and 7.3.8	<p>Comment Comment(s): • There is inconsistency among sections 5.1.4, 5.1.6, 7.3.6 and 7.3.8 with respect to the bird valued components addressed within each section. Section 5.1.4 (Species at Risk) mentions only raptors and Section 5.1.6 mentions only birds protected by the Migratory Birds Convention Act, 1994 (MBCA), whereas sections 7.3.6 and 7.3.8 mention both raptors and birds protected by the MBCA. Furthermore, not all raptors are considered as species at risk as implied in Section 5.1.4. • The GNWT notes that under Section 38(1)(d) of the current NWT Wildlife Act and Section 51(1) of the new NWT Wildlife Act that will come into effect in November 2014, it is prohibited to destroy, disturb or take the eggs or nests of any birds. These prohibitions pertain to species that are not protected by the MBCA (e.g., birds of prey, upland game birds and non-game birds as listed in the 2011 Wildlife Act Regulations). As such, resident and migratory birds that are not protected by the MBCA but are protected by the Wildlife Act should also be considered in the Developer's Assessment Report (DAR). • Section 5.1.4 – bullet 11 only requires the Developer to assess impacts to raptors nesting within 1 km of the road, whereas raptors nesting within 1 km of borrow sources, the Tetcel Transfer Facility and the airstrip may also be impacted. It would be more appropriate for the EA to focus on raptors nesting within 1 km of the project footprint, to ensure that all project components are addressed. • Section 5.1.4 – bullet 11 requires the Developer to describe the location of raptor nesting sites within 1 km of the proposed road. Unless the Developer has already completed a raptor nesting survey along the proposed road alignment, this information would not be obtainable until summer 2015. Furthermore, the GNWT may already have current information on the location of raptor nesting sites within 1 km of the project footprint. It may be more appropriate to require the Developer to describe the location of known raptor nesting sites and/or potential raptor nesting habitat within 1 km of the project footprint. • Section 7.3.6 – bullet 15 and Section 7.3.8 – bullet 14 require the Developer to assess changes to location of raptor nesting sites within 1 km of the road. This pre-supposes that raptor nesting locations are known and that raptors may change the location of their nests in response to the road, but productivity of nesting raptors may be affected by sensory disturbance or changes to habitat surrounding the nest without resulting in a change to nest-site location. The wording of this bullet should be changed to "potential disturbance to raptors nesting within 1 km of the project footprint".</p> <p>Recommendation Recommendation(s): 8) Change the wording of Section 5.1.6 – bullet 12, Section 7.3.6 – bullet 16, and Section 7.3.8 – bullet 15 to "use of the project area by resident and migratory birds" to ensure that birds protected under both the Migratory Birds Convention Act, 1994, and the NWT Wildlife Act are considered in the EA. 9) Similarly, add a</p>	Aug 27: We agree.	Sep 12: All of the proposed recommendations have been included.

		new bullet to Section 5.1.4 that reads "use of the project area by resident and migratory birds". 10) Change the wording of Section 5.1.4 – bullet 11 to "location of known raptor nesting sites or potential raptor nesting habitat within 1 km of the proposed project footprint" 11) Add a new bullet to Section 5.1.6 that reads "location of known raptor nesting sites or potential raptor nesting habitat within 1 km of the proposed project footprint" 12) The Developer contact the Department of Environment and Natural Resources (ENR), GNWT, to determine whether ENR has information on the location of raptor nesting sites that can be shared. 13) Change the wording of Section 7.3.6 – bullet 15 and Section 7.3.8 – bullet 14 to "potential disturbance to raptors nesting within 1 km of the project footprint".		
8	Topic Title: Crossing Design Specifications. Development Description, Project Components and Activities and Road Design Considerations, Section 6.1 and 6.2.	<p>Comment Comment(s): • The TOR describe that the development description is to include the intended design standards for the road. Presumably this would include the standards for all road crossing (e.g., the return period flow standard). • The design standards should be determined for the entire length of the road. Only then should the specifics of each crossing be evaluated using the hydrological information to determine the appropriate type and structure of the crossings and their specifications (e.g., length, width, height, etc.). • The TOR should be clear on the design standard requirements.</p> <p>Recommendation Recommendation(s): 14) The TOR specify that the design standards for road crossings must be determined in the DAR. 15) The TOR be clear that the DAR is to provide supporting information and rationale for all crossings. The DAR should demonstrate that the proposed crossing type and structure will meet the design standard without causing damage to the road infrastructure itself (i.e., erosion, washout, etc.) or the environment (i.e., upstream flooding, downstream erosion, etc.).</p>	<p>Aug 27: We agree with 14). Re 15), we agree that the DAR should provide supporting information and rationale for all crossings. However, there is a need to be careful regarding the level of detail required at this stage. We accept that there is a need to know the proposed crossing type, and that the structure will meet the design standard. But details that would be expected at the detailed design stage should not be expected. This would come later, likely as a condition of a permit. For example, many crossings are likely to be small and not considered to be fish habitat. Culverts may suffice for these. It should not be necessary to size culverts at this stage, only to expect that appropriate design, including sizing, will occur subsequently.</p>	<p>Sep 12: Section 6.2 now includes "design standards" as a road design consideration. As stated in the response to GNWT 4, section 6.2, Road Design Considerations, item 6, has been amended to address watercourse crossings and the design considerations given the hydrologic and hydraulic characteristics of the watercourse and the proposed road design standards. Detailed design of the structures (e.g. culvert sizing) will occur outside of the EA; however, it is important that during the EA the design is considered with respect to potential environmental impacts (e.g. what flows will be passable to ensure fish passage) and the structural integrity of the crossing.</p>
9	Topic Title: Cumulative Effects Assessment, Section 10, page 34, bullets 1 and 2	<p>Comment Comment(s): • In the second sentence of each of the first two numbered bullets in Section 10, page 34, reference is made to "reasonably foreseeable future developments." However, other human activities could also contribute to cumulative effects, as reflected in wording used elsewhere in the TOR and in the MVEIRB Environmental Impact Assessment Guidelines (March 2004).</p> <p>Recommendation Recommendation(s): 16) The quoted wording, for each of the two sentences noted above, be changed to "reasonably foreseeable human activities and developments."</p>		<p>Sep 12: Agreed and amended accordingly.</p>
10	Topic Title: Guidelines for Monitoring and Management Plans, Appendix C, page 39	<p>Comment Comment(s): • Appendix C lists documents for the Developer's information, which include the "Northwest Territories Cumulative Impact Monitoring Program" under the subtitle Aboriginal Affairs and Northern Development Canada. As of April 1, 2014, the NWT Cumulative Impact Monitoring Program is now part of the GNWT. It should also be noted that the program is not a single document, as the other items listed in Appendix C appear to be, but a program that coordinates, supports, and conducts monitoring-related initiatives in the NWT.</p>		<p>Sep 12: Amended as recommended.</p>


		<p>Recommendation Recommendation(s): 17) “Northwest Territories Cumulative Impact Monitoring Program” be listed under the sub-title for GNWT, and the following internet link be provided for program and contact information: http://www.enr.gov.nt.ca/programs/nwt-cimp</p>		
11	Topic Title: Cultural and Heritage Resources (Section 7.3.10; page 30)	<p>Comment Comment(s): • The final sentence of Section 7.3.10 states: “Describe activities taken with community members to ensure that all cultural sites along the route have been identified, and the developer’s degree of confidence that it has identified all such sites.” It is important to clarify that the EA of cultural and heritage resources will also require archaeological research.</p> <p>Recommendation Recommendation(s): 18) The following wording change be implemented to replace the above-quoted sentence: “Describe activities taken with community members to ensure that all cultural sites along the route have been identified, describe archaeological research undertaken to ensure that all archaeological sites along the route have been identified, and the developer’s degree of confidence that it has identified all such sites.”</p>	<p>Aug 27: The TOR identifies three items to be addressed in section 7.3.10. The author is intending to prescribe the process to be undertaken to answer these, which we don’t believe is appropriate. Archaeological research was completed previously and defined locations which had a higher potential for hosting cultural resources. These locations were subsequently investigated. No amount of investigation will ensure that all archaeological sites have been identified. We believe the text should remain as is.</p>	<p>Sep 12: The wording of the last sentence has been amended to include archaeological sites. As stated in Section 1.5, previous studies can be used during this EA to support the DAR; however, any new footprint areas should be assessed and compared to past studies. Any areas that were not considered in the previous studies should be screened for the need of additional archaeological studies and if identified studies are to be conducted.</p>
12	Topic Title: Section 6.1 – Project Components and Activities; Section 7.3.12 - Impacts on Existing Transportation Infrastructure	<p>Comment Comment(s): • It is anticipated sections 6.1 and 7.3.12 will be used to further communicate information regarding the effects that Project activities – specifically, but not limited to traffic volumes and weights – will have on the valued component of existing transportation infrastructure. This information is vital to determining whether GNWT will be able to continue to carry out its mandate along Highway #7, now and going forward, while further supporting social and economic growth in the Dehcho Region.</p> <p>Recommendation Recommendation(s): 19) Numbered bullet 22, Section 6.1, be modified to: “expected traffic volumes and weights during all phases”. 20) New numbered bullet be added under Section 7.3.12 (1)(iv) as: “v. highway integrity”. 21) The Developer consult with the Department of Transportation, GNWT, directly when developing the DAR with the information requested above as well as with the information requested within the rest of the TOR as it relates to impacts on existing transportation infrastructure.</p>		<p>Sep 12: The wording recommendations have been included. The Board encourages CanZinc to continue to consult with GNWT Department of Transportation.</p>
13	Topic Title: Section 7.3.11 Employment and Benefits to the Community (Page 31)	<p>Comment Comment(s): • Measureable changes in population and demographics can have adverse effects on community life and community services. This is dependent on the extent of interactions between the local populations and temporary populations.</p> <p>Recommendation Recommendation(s): 22) Numbered bullet 5, Section 7.3.11, have the following wording appended to the end of it: “and size of crews (number of individuals) working at each camp”.</p>		<p>Sep 12: Amended as recommended.</p>
14	Topic Title: Geographic Scope of Assessment – Employment and Business Opportunities, Section 3.3, Table 2	<p>Comment Comment(s): At the Technical Scoping Session in Yellowknife on July 8, 2014, the GNWT confirmed its agreement with the Developer’s proposed change to the GNWT’s recommended definition of the geographic scope for employment and business opportunities, to read the following: “The developer will assess the potential impacts of the Prairie Creek All-Season Road and Airstrip Project on the economy of the Mackenzie</p>		<p>Sep 12: Agreed and amended accordingly.</p>

		Valley, with a focus on the Dehcho region." However, the definition of the geographic scope for employment and business opportunities in Table 2, Section 3.3, states: "The Dehcho region as a whole with particular attention to Nahanni Butte, Fort Liard, Fort Simpson, Wrigley and Lindberg Landing." Recommendation Recommendation(s): 23) MVEIRB change the definition for geographic scope for employment and benefits to the community to that agreed upon by the Developer and GNWT, which reads as: "The economy of the Mackenzie Valley, with a focus on the Dehcho region."		
15	Topic Title: Employment and Benefits to the Community, Section 7.3.11	Comment Comment(s): • The GNWT would like to include a specific reference to the potential for "increased" tourism opportunities in the project region from all-season access. Recommendation Recommendation(s): 24) Numbered bullet 12, Section 7.3.11, be revised to "effects on tourism activities (including potential opportunities for increased tourism) in the region from all season access".	Aug 27: We agree.	Sep 12: Amended as recommended.
16	Topic Title: Guidelines for Monitoring and Management Plans, Appendix C, AANDC page 40	Comment Comment(s): GNWT notes the 2007 Mine Site Reclamation Guidelines listed under the Aboriginal Affairs and Northern Development Canada heading in Appendix C has been superseded by the 2013 Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories, which is listed under the Mackenzie Valley Land and Water Board heading in Appendix C. Recommendation Recommendation: 25) Reference to the 2007 Mine Site Reclamation Guidelines be removed from the TOR.		Sep 12: Amended as recommended.
17	Topic Title: Encouragement to Review Certain Key Documents in Development of DAR	Comment Comment(s) only: When developing the DAR, GNWT encourages the Developer to review the Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories (2009), Mine Site Reclamation Policy for the Northwest Territories (2002), and Guidelines for Spill Contingency Planning (2007). Recommendation Comment only; no recommendation.		
18	Topic Title: Tetcela Transfer Facility and Surrounding Territorial Areas	Comment Comment(s) only: Environment Canada, in its review of the TOR, has made a recommendation for a subsection to be added to Section 7.2.3 to include the full scope of the proposed Tetcela Transfer Facility and require a summary of any changes to footprint and environmental impacts in comparison to the already-assessed facility design. While the Tetcela Transfer Facility is within federal jurisdiction, any changes to its design and/or use have the potential to affect areas within GNWT jurisdiction. As a result, GNWT supports the Environment Canada above-noted recommendation. Recommendation Comment only; no recommendation.		
Mackenzie Valley Environmental Impact Review Board: Sachi De Souza				
ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
13	General File	Comment  This letter was written by BGC Engineering Inc to CanZinc, and it pertains to the content in the Draft Terms of Reference, specifically section 5.1.1. Recommendation GENERALFILE		

1	The following comments were submitted by Canadian Zinc Corporation	Comment None Recommendation None		
2	Section 1.4, information sources	Comment The section does not provide an information source to explain the origin of the contents of section 5.1. Recommendation Provide an information source to explain the origin of the contents of section 5.1.		Sep 12: The Board has expectations regarding certain information for projects of a similar nature. The level information and detail is dependent on the geographic scope, temporal scope, and scale.
3	Section 1.4, legal context	Comment The extensive legal and regulatory history of the access road in the Developer's version was deleted in its entirety. This included a Supreme Court decision, and a Review Board ruling regarding scope in the winter road EA. This provides relevant context to the current EA. Recommendation Re-insert the extensive legal and regulatory history of the access road from the Developer's TOR.		Sep 12: Please refer to the Reasons for Decision on Scoping which will be released shortly.
4	Section 5.1	Comment The content of section 5.1 was changed radically from that contained in the Developer's TOR, and after detailed review, comment and response, including during the Technical Session in Yellowknife. It appears that the original section was deleted and replaced completely by the section 5.1 contained in the TOR for the Wrigley to Inuvik all season road EA. That road would be a public highway, and would extend to high northern latitudes, much further north than the Prairie Creek access road. As such, we have significant concerns regarding both the manner in which the change in the section was made, and in the appropriateness of the scope and content of the new section. Recommendation The Review Board should review the process taken to completely change section 5.1 at such a late stage in the scoping process, and should review in detail the scope and content of the section to ensure it is appropriate for the Prairie Creek access road which will be very different from the Wrigley to Inuvik road, and will be close to the 60th parallel.		Sep 12: The Board has expectations regarding certain baseline information for projects of a similar nature. The level information and detail is dependent on the scale and scope of the development.
5	Section 5.1.1	Comment We are particularly concerned that this section, drawn from the Wrigley to Inuvik all season road TOR, is not appropriately scoped for this EA. We asked BGC Engineering to review the scope of this section and provide recommendations. Their letter of review is attached. Recommendation BGC provided the following recommendations: precede the descriptions of items 6, 14 and 15 with the word "probable"; reword item 12 to read "probable distribution on land, water, shoreline and slope crossings". In addition, we recommend that the BGC letter be referred to in the section as a source of additional context for the assessment, and be included in the TOR as an appendix.		Sep 12: The information provided by BGC is appreciated and should be submitted as evidence with the DAR to support the findings. The word "probable" has been added as requested.
6	Section 5.1.2	Comment Item 7 is a repeat of item 1. Recommendation Delete item 7.		Sep 12: Amended as recommended.
7	Section 5.1.3	Comment Item 12 is the same as item 12 in section 5.1.1 Recommendation Delete item 12.		Sep 12: Deleted item 12 from Section 5.1.3 and it is now listed in Section 5.1.1
8	Section 5.1.4 item 9, section 5.1.5 item 7, section 5.1.6 item 10,	Comment We have a number of concerns regarding the request for baseline contaminant concentrations in biota. First, we don't believe		Sep 12: "Existing data" has been added.

	section 5.1.7 item 6.	<p>this request is appropriate given the Prairie Creek access road will not be a public highway with high traffic load. Second, the request implies that there is an expectation of contamination associated with the road which is not credible. The concentrates CZN proposes to haul on the road will be in sealed bags inside truck boxes with sides and tarpaulin covers. This is the commitment stemming from the winter road EA. In addition, CZN committed to sampling road bed soils at regular time intervals to confirm that soil quality is not being negatively affected i.e. confirm no concentrate losses. Assuming this is the case, then there is a very low potential for biota to be affected. Simply put, there is no need for, and it is premature to require, the collection of this baseline data. Thirdly, collection of the data creates impacts in itself. This has been noted by the GNWT for wildlife. The same is true for fish which are in low abundance in the low productivity streams being crossed. We believe the correct approach, as suggested by the GNWT, is to only require the presentation of EXISTING data on baseline contaminant concentrations. At the conclusion of the EA, if the project is approved, the Board, if it desires, can still require the collection of this data prior to project initiation.</p> <p>Recommendation In section 5.1.4 item 9, section 5.1.5 item 7, section 5.1.6 item 10 and section 5.1.7 item 6, insert the words "existing data on" at the start of each item.</p>		
9	Section 5.1.5, item 9	<p>Comment We provided Review Board staff with aerial imagery to show that the proposed all season road alignment does not cross any wetlands associated with Bluefish Creek, nor any tributary of the creek itself. The alignment remains entirely within the Grainger River system as it crosses the lowlands between the Silent Hills to the west and the Front Range to the east.</p> <p>Recommendation Delete Bluefish Creek.</p>		Sep 12: Potential impacts to Bluefish creek are required to be assessed.
10	Section 6.1, 2nd line	<p>Comment The Tetcela Transfer Facility is already permitted, and the Liard Transfer Facility is not part of the scope of development.</p> <p>Recommendation Reword the start of the line to read "construction and operation of an expanded Tetcela Transfer Facility".</p>		Sep 12: Amended as recommended.
11	Section 6.1, bullets starting on p. 19	<p>Comment Item 29 is the same as item 2.</p> <p>Recommendation Delete item 29.</p>		Sep 12: Amended as recommended.
12	Section 7.3.7, item 8	<p>Comment See comment for section 5.1.5 above.</p> <p>Recommendation Delete Bluefish Creek.</p>		Sep 12: Potential impacts to Bluefish creek are required to be assessed.

Naha Dehe Dene Band: Peter Redvers

ID	Topic	Reviewer Comment/Recommendation	Proponent Response	Board Staff Response
9	General File	<p>Comment  (Submitted after Due Date)</p> <p>Supporting Letter</p> <p>Recommendation</p>		
1	Naha Dehe Dene Band Comments on August 14th, 2014 Draft Terms of Reference for CZN DAR for All Season Road and Airstrip -- EA1415-01	<p>Comment None</p> <p>Recommendation None</p>		
2	Overall Scope of Terms of Reference	<p>Comment NDDDB is generally satisfied with the overall scope of the terms of reference and the fact that it will result in a 'stand-alone' DAR</p>		

		in relation to the proposed activities. Recommendation None		
3	Section 3.1.2 Assessment of Different Project Phases; p. 8	Comment NDDB supports assessing the project as separate phases but also continues to state that Phase 2 is unacceptable to the First Nation. Recommendation None	Aug 27: Mr Redvers should refrain from making statements regarding the lack of Band support for Phase 2. There is an engagement meeting record signed by the Band supporting the whole project. We accept that some members of the Band were not at that meeting and have concerns. CZN will do its best to address those concerns, and will meet with the community to present its case. Until CZN has had an opportunity to do so, and the full Band membership has considered our proposals, Mr Redvers should not offer comments re acceptability which are likely not representative of the opinions of the full Band membership.	Sep 12: Guidelines for public engagement are outlined in Section 2.3.
4	Section 3.2.3 Key Lines of Inquiry; p. 9-10	Comment A inter-related key line of inquiry that has not been specifically captured in this section is "Impacts to water quality, fish, and fish habitat". NDDB harvesters have expressed considerable concern about impacts to wetlands and wetland habitat, including fish habitat, from road construction and operations, not just from "potential accidents and malfunctions". Recommendation A fourth key line of inquiry needs to be construction and operational impacts on water, wetlands, and fish/fish habitat, as related subjects.	Aug 27: Crossing structures appropriate for each stream will need to be properly designed and installed. These should not pose a significant risk to water quality or fish. The road crosses the Fishtrap Creek wetland close to its headwaters where the wetland is narrow, water quality is poor, and fish have not been found. The road does not cross the Bluefish Creek wetland, and impinges only slightly on the wetland area feeding into the Grainger River system. As such, a 4th key line of inquiry is not supported, and we agree with the Review Board that the main issue in terms of water quality and fish is potential accidents and malfunctions i.e. spills.	Sep 12: The Board has determined the three key lines of inquiry. The impacts to water, wetlands, and fish/fish habitat will be addressed in Sections 7.3.
5	Section 3.5 Consideration of Alternatives to the Development; p. 11	Comment NDDB supports the approach the MVEIRB is taking in this section and agrees that this detailed analysis of the alternatives to the development must be included. Recommendation None		
6	Section 6.1 Project Components and Activities	Comment The extent, timing, and duration of gravel crushing needs to be included in the project description, as noise impacts can disturb wildlife depending on the time of year and extent of operation. Recommendation The terms of reference should make specific reference to gravel crushing as it would be a significant construction activity.		Sep 12: Gravel crushing has been included in Section 6.1, item 8.
7	Section 7 Assessment of Environmental Impacts and Cumulative Effects; p. 22	Comment One cumulative impact that needs to be specifically assessed as a 'reasonably foreseeable development and activity' is increased mine production with the conclusion of a Phase 2 development. It is unreasonable to assume that CZN could finance Phase 2 without increasing mine production to offset construction and operation costs. Increased mine production could significantly increase traffic flow and impacts associated with that flow, thereby undermining some of the assumptions made in the previous EA for the winter road operation and for mine operations themselves. Recommendation The terms of reference need to include an assessment of the potential cumulative impacts of increased mine production with the conclusion of a Phase 2 development and the degree to which increased production would impact current operational assumptions, including water management and balance at the mine site.	Aug 27: As noted previously, CZN has no plans to expand mine production, and in any event, it would be financially prohibitive to do so because it would mean expanding the Mill and all of its components.	Sep 12: This assessment is focussed solely on the proposed all season road and airstrip, and CanZinc has committed to no expansion of mine production.
8	Section 7.3.3 Noise	Comment Gravel crushing can generate significant amounts of noise, so the timing, duration, and extent of crushing needs to		Sep 12: Gravel crushing has been included in Section 7.3.4, item 1.

		assessed from a noise perspective. Recommendation The terms of reference should make specific reference to the noise generated from gravel crushing, its impact on wildlife, and how impacts will be mitigated.		
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Environmental Protection Operations (EPO) Directorate
Prairie and Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife NT X1A 2P7

August 15, 2014

EC file: 5100 000 014/012
MVEIRB file: EA1415-01

Sachi De Souza, Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
5102-50th Avenue
PO Box 938
Yellowknife NT X1A 2N7

via online registry

RE: Environment Canada's Comments- Prairie Creek All Season Road and Airstrip Project, Canadian Zinc Corporation.

Please find attached Environment Canada's (EC) submission to the Mackenzie Valley Environmental Impact Review Board on the Draft Terms of Reference for Canadian Zinc Corporation's proposed Prairie Creek All Season Road and Airstrip Project. This information is provided in accordance with EC's mandated responsibilities arising from the *Canadian Environmental Protection Act, 1999*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

For further clarification on any aspect of the submission, please contact Erika Marteleira at (867) 669-4746 or erika.marteleira@ec.gc.ca.

Sincerely,

Erika Marteleira
Senior Environmental Assessment Coordinator

cc: Carey Ogilvie, Head Environmental Assessment North (NT & NU) EPO
EC Review Team



DEHCHO FIRST NATIONS

Box 89, Fort Simpson, N.W.T. X0E 0N0
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Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
5102-50th Ave Yellowknife, NT X1A 2N7
sdesouza@reviewboard.ca

August 13, 2014

Re: Canadian Zinc Corporation (CZN) Proposed Terms of Reference, Prairie Creek All Season Road Project

The Mackenzie Valley Environmental Impact Review Board (MVEIRB) has requested comments on July 31, 2014 draft Terms of Reference (ToR) for the Prairie Creek all season road project. This latest draft of the ToR reflects comments from reviewers, particularly comments arising from the July 8, 2014 issues and scoping session. Dehcho First Nations supports this latest draft ToR drafted by MVRB. Although, not explicitly mentioned in the ToR, we expect CZN will complete seasonal wildlife surveys as part of the Developer's Assessment Report.

Dehcho First Nations (DFN) supports letters or comments from Dehcho members and member communities regarding the terms of reference for the proposed all-season road.

Mahsi Cho,

Dahti Tsetso



August 15, 2014

VIA REGISTRY UPLOAD

Sachi De Souza
Environmental Assessment Officer
Mackenzie Valley Environmental Impact
Review Board
200 Scotia Center
P.O. Box 938, 5102-50th Avenue
Yellowknife, NT
X1A 2N7

Dear Ms. De Souza:

**Comments and Recommendations on the Mackenzie Valley Environmental Impact
Review Board Draft Terms of Reference for the Canadian Zinc Corporation
Prairie Creek All-Season Road and Airstrip Project (File Number: EA1415-01)**

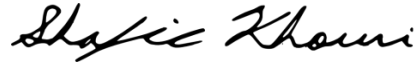
On July 31, 2014, the Mackenzie Valley Environmental Impact Review Board (MVEIRB) requested review comments and recommendations on its draft terms of reference (TOR) proposed for the environmental assessment of the Canadian Zinc Corporation (CZN) Prairie Creek All-Season Road and Airstrip Project (the Project).

Please find the result of Government of the Northwest Territories (GNWT) review attached, where all GNWT departments with responsibilities related to the Project considered the TOR. Attached to this cover letter are comments and 25 total recommendations from the departments of Environment and Natural Resources; Justice; Transportation; and Industry, Tourism and Investment; as well as from Prince of Wales Northern Heritage Center.

GNWT looks forward to continued and active participation and dialogue with CZN, other parties, and MVEIRB throughout the environmental assessment of the Project.

If you have any questions, please contact me at shafic_khouri@gov.nt.ca or (867) 765-6634.

Sincerely,

A handwritten signature in black ink, appearing to read 'Shafic Khouri', written in a cursive style.

Shafic Khouri
Project Assessment Analyst
Land Use and Sustainability
Department of Lands
Government of the Northwest Territories

Attachments:

GNWT Comments and Recommendations on MVEIRB TOR

Attachment:
Government of the Northwest Territories
Comments and Recommendations on Mackenzie Valley Environmental Impact Review Board
Draft Terms of Reference

Environmental Assessment of the Canadian Zinc Corporation
Prairie Creek All-Season Road and Airstrip Project
(File Number: EA1415-01)

15 August 2014

Acronyms

Developer	Canadian Zinc Corporation
DAR	Developer's Assessment Report
EA	environmental assessment
ENR	Department of Environment and Natural Resources
GNWT	Government of the Northwest Territories
MBCA	<i>Migratory Birds Convention Act, 1994</i>
MVEIRB	Mackenzie Valley Environmental Impact Review Board
NWT	Northwest Territories
Project	Prairie Creek Mine All-Season Road and Airstrip Project
TOR	Terms of reference

1. Introduction

This submission represents Government of the Northwest Territories (GNWT) comment and recommendation on the Mackenzie Valley Environmental Impact Review Board (MVEIRB) July 31, 2014, Draft Terms of Reference (TOR) for the Canadian Zinc Corporation (the Developer) Prairie Creek Mine All-Season Road and Airstrip Project (the Project) environmental assessment (EA), file number EA1415-01.

2. Comments and Recommendations

**Topic Title: Minimum Geographic Scope for Species at Risk and Wildlife and Wildlife Habitat.
Geographic Scope – Section 3.3, Table 2, page 10**

Comment(s):

- The draft TOR requires the minimum geographic scope for both Species at Risk and Wildlife and Wildlife Habitat to be at the species-specific range. This could be interpreted to mean the range over which a species is found within Canada or within the Northwest Territories (NWT), which in some cases may represent a very large area relative to the geographic extent of the proposed project. Instead, it may be more relevant to require the Developer to define geographic scope on a species-specific basis. This area should be large enough to assess potential impacts at a local population level, taking into consideration seasonal movements, migratory movements, and life cycle requirements of each species.
- It is unclear why the description of the minimum geographic scope for Species at Risk differs from that of Wildlife and Wildlife Habitat. Notably the geographic scope for Wildlife and Wildlife Habitat only mentions consideration of seasonal movements, whereas the scope for Species at Risk also requires consideration of migratory movements and life cycle requirements. The requirements for Species at Risk and Wildlife and Wildlife Habitat should be consistent, or further explanation should be provided to justify why the requirements would differ.

Recommendation(s):

- 1) Revise the requirements for minimum geographic scope for Species at Risk and Wildlife and Wildlife Habitat to read “Defined on a species-specific basis as an area large enough to assess potential impacts at a local population level, taking into consideration the seasonal movements, migratory movements, and life cycle requirements of each species.”

Topic Title: Description of the Existing Environment and Baseline Conditions – Sections 5.1.1, 5.1.2, 5.1.3, pages 13-16

Comment(s):

- Baseline information (e.g., terrain type, elevation and grade, permafrost temperature, condition-continuous; discontinuous; ice content; etc., soil type, water quality, water quantity, climate, etc.) is critical in EAs as the information is needed to assess the potential scope and scale of impacts from the development.
- The collection of baseline information is critical to the timeliness and completeness of the EA process, thus, if little or no baseline information is collected and presented, delays to the EA are likely to occur.

Recommendation(s):

- 2) The TOR should include more specific requests for the type and amount of baseline data that is distinctly being requested/required (regional vs. local; annual vs. seasonal; etc.) for the various biophysical components described above and in Section 5.1.1 (terrain, geology, soils and permafrost), 5.1.2 (climate) and 5.1.3 (water quality and quantity).

Topic Title: Water Quality and Quantity – Section 5.1.3, pp.15-16

Comment(s):

- The hydraulic characteristics of the various watercourses that will be crossed need to be described in order to assess if the road is being constructed and designed properly to protect the natural environment.
- A description of major drainages and watercourses has been included in the TOR but the hydraulic characteristics of each drainage may be unique based on drainage size and terrain type (e.g., bog, karst, spring, river valley, etc.).
- Further, the variation in flow over the season is critical to ensure that the road is constructed and designed properly. Constructing in late summer or fall without understanding the river hydraulics could result in bridge or culverts impeding on the channel when spring freshet occurs and the water is at its highest level and velocity.
- Understanding the changes in the river channel over the seasons is critical to ensure road construction (e.g., road protection, culvert and bridge sizing, abutment placement, etc.) is appropriate to prevent erosion and washout events in wet seasons or extreme events.

Recommendation(s):

- 3) The TOR include specific requirements to assess the total number and stream order of watercourse crossings and include information on the changes to the river channel at each proposed crossing during peak and low flow.
- 4) The TOR specify sufficient baseline hydrologic data be presented to rationalize the proposed crossing type and structure design (e.g., culvert number or size, bridge size and clearance, etc.).

Topic Title: Description of the existing environment and baseline conditions, biophysical information requirements, Species at Risk, Section 5.1.4, page 16 and Wildlife and Wildlife Habitat, Section 5.1.6, page 17

Comment(s):

- Determining contaminant concentrations in wildlife species often requires destructive sampling, i.e., animals are captured and killed to obtain tissue samples. The GNWT would like to emphasize that no new existing baseline wildlife contaminant concentrations studies should be carried out for this EA until it is determined whether sufficient data on this topic exists.
- The Developer should be aware that the following COSEWIC-assessed and federally/territorially-listed species at risk have ranges that overlap with the proposed road:
 - Boreal caribou
 - Collared pika
 - Grizzly bear
 - Little brown myotis
 - Mountain woodland caribou
 - Northern myotis
 - Wolverine
 - Wood bison
 - Bank swallow
 - Barn swallow
 - Canada warbler
 - Common nighthawk
 - Horned grebe
 - Olive-sided flycatcher
 - Peregrine falcon
 - Rusty blackbird
 - Short-eared owl
 - Yellow rail
 - Bull trout
 - Western toad
 - Gypsy cuckoo bumble bee
 - Western bumble bee

Recommendation(s):

- 5) Wording of the first sentence under Section 5.1.4 be changed to “For species at risk, provide a description of:”
- 6) Wording for Section 5.1.4 – bullet 9 and Section 5.1.6 – bullet 10 on page 16 be changed to “baseline contaminant concentrations in harvested species that may change as a result of the all season road using existing data”.

Topic Title: Assessment of Environmental Impacts and Cumulative Effects to Species at Risk and Wildlife and Wildlife Habitat, Sections 7.3.6 and 7.3.8

Comment(s):

- There is inconsistency between the requirements in Sections 7.3.6 and 7.3.8. The first bullet included in Section 7.3.6, Species at Risk, was not included in Section, 7.3.8, Wildlife and Wildlife Habitat, but is equally relevant to both sections.

Recommendation(s):

- 7) Add a new bullet to Section 7.3.8, Wildlife and Wildlife Habitat, that reads “methods to minimize the effect of the project on the species including strategies for mitigation and monitoring”

Topic Title: Description of the Existing Environment and Baseline Conditions and Assessment of Environmental Impacts for Birds – Sections 5.1.4, 5.1.6, 7.3.6 and 7.3.8

Comment(s):

- There is inconsistency among sections 5.1.4, 5.1.6, 7.3.6 and 7.3.8 with respect to the bird valued components addressed within each section. Section 5.1.4 (Species at Risk) mentions only raptors and Section 5.1.6 mentions only birds protected by the *Migratory Birds Convention Act*, 1994 (MBCA), whereas sections 7.3.6 and 7.3.8 mention both raptors and birds protected by the MBCA. Furthermore, not all raptors are considered as species at risk as implied in Section 5.1.4.
- The GNWT notes that under Section 38(1)(d) of the current NWT *Wildlife Act* and Section 51(1) of the new NWT *Wildlife Act* that will come into effect in November 2014, it is prohibited to destroy, disturb or take the eggs or nests of any birds. These prohibitions pertain to species that are not protected by the MBCA (e.g., birds of prey,

upland game birds and non-game birds as listed in the 2011 Wildlife Act Regulations). As such, resident and migratory birds that are not protected by the MBCA but are protected by the *Wildlife Act* should also be considered in the Developer's Assessment Report (DAR).

- Section 5.1.4 – bullet 11 only requires the Developer to assess impacts to raptors nesting within 1 km of the road, whereas raptors nesting within 1 km of borrow sources, the Tetcela Transfer Facility and the airstrip may also be impacted. It would be more appropriate for the EA to focus on raptors nesting within 1 km of the project footprint, to ensure that all project components are addressed.
- Section 5.1.4 – bullet 11 requires the Developer to describe the location of raptor nesting sites within 1 km of the proposed road. Unless the Developer has already completed a raptor nesting survey along the proposed road alignment, this information would not be obtainable until summer 2015. Furthermore, the GNWT may already have current information on the location of raptor nesting sites within 1 km of the project footprint. It may be more appropriate to require the Developer to describe the location of known raptor nesting sites and/or potential raptor nesting habitat within 1 km of the project footprint.
- Section 7.3.6 – bullet 15 and Section 7.3.8 – bullet 14 require the Developer to assess changes to location of raptor nesting sites within 1 km of the road. This pre-supposes that raptor nesting locations are known and that raptors may change the location of their nests in response to the road, but productivity of nesting raptors may be affected by sensory disturbance or changes to habitat surrounding the nest without resulting in a change to nest-site location. The wording of this bullet should be changed to “potential disturbance to raptors nesting within 1 km of the project footprint”.

Recommendation(s):

- 8) Change the wording of Section 5.1.6 – bullet 12, Section 7.3.6 – bullet 16, and Section 7.3.8 – bullet 15 to “use of the project area by resident and migratory birds” to ensure that birds protected under both the *Migratory Birds Convention Act*, 1994, and the NWT *Wildlife Act* are considered in the EA.
- 9) Similarly, add a new bullet to Section 5.1.4 that reads “use of the project area by resident and migratory birds”.
- 10) Change the wording of Section 5.1.4 – bullet 11 to “location of known raptor nesting sites or potential raptor nesting habitat within 1 km of the proposed project footprint”
- 11) Add a new bullet to Section 5.1.6 that reads “location of known raptor nesting sites or potential raptor nesting habitat within 1 km of the proposed project footprint”

- 12) The Developer contact the Department of Environment and Natural Resources (ENR), GNWT, to determine whether ENR has information on the location of raptor nesting sites that can be shared.
- 13) Change the wording of Section 7.3.6 – bullet 15 and Section 7.3.8 – bullet 14 to “potential disturbance to raptors nesting within 1 km of the project footprint”.

Topic Title: Crossing Design Specifications. Development Description, Project Components and Activities and Road Design Considerations, Section 6.1 and 6.2.

Comment(s):

- The TOR describe that the development description is to include the intended design standards for the road. Presumably this would include the standards for all road crossing (e.g., the return period flow standard).
- The design standards should be determined for the entire length of the road. Only then should the specifics of each crossing be evaluated using the hydrological information to determine the appropriate type and structure of the crossings and their specifications (e.g., length, width, height, etc.).
- The TOR should be clear on the design standard requirements.

Recommendation(s):

- 14) The TOR specify that the design standards for road crossings must be determined in the DAR.
- 15) The TOR be clear that the DAR is to provide supporting information and rationale for all crossings. The DAR should demonstrate that the proposed crossing type and structure will meet the design standard without causing damage to the road infrastructure itself (i.e., erosion, washout, etc.) or the environment (i.e., upstream flooding, downstream erosion, etc.).

Topic Title: Cumulative Effects Assessment, Section 10, page 34, bullets 1 and 2

Comment(s):

- In the second sentence of each of the first two numbered bullets in Section 10, page 34, reference is made to “reasonably foreseeable future developments.” However, other human activities could also contribute to cumulative effects, as reflected in wording

used elsewhere in the TOR and in the MVEIRB Environmental Impact Assessment Guidelines (March 2004).

Recommendation(s):

- 16) The quoted wording, for each of the two sentences noted above, be changed to “reasonably foreseeable human activities and developments.”

Topic Title: Guidelines for Monitoring and Management Plans, Appendix C, page 39

Comment(s):

- Appendix C lists documents for the Developer’s information, which include the “Northwest Territories Cumulative Impact Monitoring Program” under the subtitle Aboriginal Affairs and Northern Development Canada. As of April 1, 2014, the NWT Cumulative Impact Monitoring Program is now part of the GNWT. It should also be noted that the program is not a single document, as the other items listed in Appendix C appear to be, but a program that coordinates, supports, and conducts monitoring-related initiatives in the NWT.

Recommendation(s):

- 17) “Northwest Territories Cumulative Impact Monitoring Program” be listed under the subtitle for GNWT, and the following internet link be provided for program and contact information: <http://www.enr.gov.nt.ca/programs/nwt-cimp>

Topic Title: Cultural and Heritage Resources (Section 7.3.10; page 30)

Comment(s):

- The final sentence of Section 7.3.10 states: “Describe activities taken with community members to ensure that all cultural sites along the route have been identified, and the developer’s degree of confidence that it has identified all such sites.” It is important to clarify that the EA of cultural and heritage resources will also require archaeological research.

Recommendation(s):

- 18) The following wording change be implemented to replace the above-quoted sentence:
“Describe activities taken with community members to ensure that all cultural sites along the route have been identified, describe archaeological research undertaken to ensure that all archaeological sites along the route have been identified, and the developer’s degree of confidence that it has identified all such sites.”

Topic Title: Section 6.1 – Project Components and Activities; Section 7.3.12 - Impacts on Existing Transportation Infrastructure**Comment(s):**

- It is anticipated sections 6.1 and 7.3.12 will be used to further communicate information regarding the effects that Project activities – specifically, but not limited to traffic volumes and weights – will have on the valued component of existing transportation infrastructure. This information is vital to determining whether GNWT will be able to continue to carry out its mandate along Highway #7, now and going forward, while further supporting social and economic growth in the Dehcho Region.

Recommendation(s):

- 19) Numbered bullet 22, Section 6.1, be modified to: “expected traffic volumes and weights during all phases”.
- 20) New numbered bullet be added under Section 7.3.12 (1)(iv) as: “v. highway integrity”.
- 21) The Developer consult with the Department of Transportation, GNWT, directly when developing the DAR with the information requested above as well as with the information requested within the rest of the TOR as it relates to impacts on existing transportation infrastructure.

Topic Title: Section 7.3.11 Employment and Benefits to the Community (Page 31)**Comment(s):**

- Measureable changes in population and demographics can have adverse effects on community life and community services. This is dependent on the extent of interactions between the local populations and temporary populations.

Recommendation(s):

- 22) Numbered bullet 5, Section 7.3.11, have the following wording appended to the end of it: “and size of crews (number of individuals) working at each camp”.

Topic Title: Geographic Scope of Assessment – Employment and Business Opportunities, Section 3.3, Table 2**Comment(s):**

At the Technical Scoping Session in Yellowknife on July 8, 2014, the GNWT confirmed its agreement with the Developer’s proposed change to the GNWT’s recommended definition of the geographic scope for employment and business opportunities, to read the following:

“The developer will assess the potential impacts of the Prairie Creek All-Season Road and Airstrip Project on the economy of the Mackenzie Valley, with a focus on the Dehcho region.”

However, the definition of the geographic scope for employment and business opportunities in Table 2, Section 3.3, states:

“The Dehcho region as a whole with particular attention to Nahanni Butte, Fort Liard, Fort Simpson, Wrigley and Lindberg Landing.”

Recommendation(s):

- 23) MVEIRB change the definition for geographic scope for employment and benefits to the community to that agreed upon by the Developer and GNWT, which reads as: “The economy of the Mackenzie Valley, with a focus on the Dehcho region.”

Topic Title: Employment and Benefits to the Community, Section 7.3.11**Comment(s):**

- The GNWT would like to include a specific reference to the potential for “increased” tourism opportunities in the project region from all-season access.

Recommendation(s):

- 24) Numbered bullet 12, Section 7.3.11, be revised to “effects on tourism activities (including potential opportunities for increased tourism) in the region from all season access”.

Topic Title: Guidelines for Monitoring and Management Plans, Appendix C, AANDC page 40**Comment(s):**

GNWT notes the 2007 Mine Site Reclamation Guidelines listed under the Aboriginal Affairs and Northern Development Canada heading in Appendix C has been superseded by the 2013 Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories, which is listed under the Mackenzie Valley Land and Water Board heading in Appendix C.

Recommendation:

- 25) Reference to the 2007 Mine Site Reclamation Guidelines be removed from the TOR.

Topic Title: Encouragement to Review Certain Key Documents in Development of DAR**Comment(s) only:**

When developing the DAR, GNWT encourages the Developer to review the Guidelines for Designing and Implementing Aquatic Effects Monitoring Programs for Development Projects in the Northwest Territories (2009), Mine Site Reclamation Policy for the Northwest Territories (2002), and Guidelines for Spill Contingency Planning (2007).

Topic Title: Tetcela Transfer Facility and Surrounding Territorial Areas**Comment(s) only:**

Environment Canada, in its review of the TOR, has made a recommendation for a subsection to be added to Section 7.2.3 to include the full scope of the proposed Tetcela Transfer Facility and require a summary of any changes to footprint and environmental impacts in comparison to the already-assessed facility design.

While the Tetcela Transfer Facility is within federal jurisdiction, any changes to its design and/or use have the potential to affect areas within GNWT jurisdiction. As a result, GNWT supports the Environment Canada above-noted recommendation.

Nahzga Dehé Dene Band

GENERAL DELIVERY, NAHANNI BUTTE, NT, X0E 0N0

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September 8, 2014

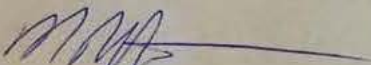
Sachi De Souza
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Box 938, 5102-50th Ave, Yellowknife, NT X1A 2N7

Dear Ms. De Souza,

This letter is to confirm that the comments on the Draft Terms of Reference for the Prairie Creek All Season Road and Airstrip submitted by our regulatory consultant, Peter Redvers, on August 14th, 2014 were submitted on behalf of the Nahzga Dehé Dene Band (NDDDB) and represent our interests.

I hope this clears up any concerns the Board or others may have had.

Yours truly,


Chief Mike Matou



August 27, 2014

Mr. David Harpley
V.P. Environmental and Permitting Affairs
Canadian Zinc Corp.
Suite 1710, 650 West Georgia Street
Vancouver, B.C.
V6B 4N9

Dear Mr. Harpley,

Re: Prairie Creek Mine – Proposed All Season Road Application

1.0 Background

It is my understanding that Canadian Zinc Corporation (CZN) has applied for permits to build and operate an all season road between the Liard Highway, NT, and the Prairie Creek Mine. The application is in the Environmental Assessment (EA) stage and CZN has received a draft Terms of Reference (ToR), dated July 31, 2014, for the EA from the Review Board. Section 5.1.1 of the ToR sets out proposed requirements for *“Terrain, Geology, Soils, and Permafrost”*. In a telephone conversation on August 7, 2014, you asked me, on behalf of BGC Engineering Inc., to review this section of the ToR and comment on the appropriate scope of work.

My experience in the area of the proposed all season road began in 1973 when I was employed as a Research Assistant with the Geological Survey of Canada. I participated with Dr. N.W. Rutter in the surficial geology and permafrost mapping of most of the map sheets crossed by the proposed all season road. Beginning in 1995 and continuing to the present, I have been retained by CZN to review aspects of its water storage pond design as well as the current winter road route from the Liard Highway to the Mine, including several aerial inspections of the winter road during the summer periods of 1995 through 2000.

I am also familiar with all season road layout, design, and construction in NT and Yukon based on experience beginning in 1975 when I was retained jointly by the National Research Council of Canada and the Geological Survey of Canada to review backslope designs for the

Mackenzie Highway. I have flown and/or driven all of the major highways in NT and Yukon in the intervening time.

2.0 Route Description

I have reviewed the current winter road and proposed all weather road on digital mapping work completed by your design consultant, Allnorth of Prince George, B.C. Based on the GIS information assembled by this firm, I note there are several possible alignments in close proximity to the winter road alignment I last inspected. I also note the following three more substantive changes (from west to east):

- East of Cat Camp and Sundog Creek, the road now swings north and crosses a lowland area before climbing onto the Ram Plateau. This was to avoid the poljes
- East of the Silent Hills, the road now runs along the slopes of the hills instead of down the centre of the valley
- East of Grainger Gap, the road now runs along the slopes of the Front Range and crosses the Liard River near Nahanni Butte. This was to minimize wetland travel, and to bring the terminus closer to the village to allow better access control.

3.0 Suggested Scope of Work for “Terrain, Geology, Soils, and Permafrost”

My suggestions regarding the scope of work to address the draft ToR are as follows:

i. KM 0 (mine Site) to KM 41 (Sundog Creek)

This section is largely underlain by coarse alluvial soils and/or coarse colluvium. Although permafrost is common I expect the soils are largely ground ice poor. Terrain typing with airphoto interpretation followed by a relatively limited field checking program in the spring/summer period should be adequate for the Allnorth preliminary design requirements. The most challenging design requirements here will be bridge and culvert crossings to accommodate highly variable flows as well as variously aggrading and degrading stream thalwegs.

ii. KM 41 (Sundog Creek) to KM 184.4 (Terminus at Ft. Liard:

The Geological Survey of Canada surficial geology and permafrost mapping of this portion of the road is quite good. In my opinion, terrain typing across this section based on the available mapping, and correlation of terrain types with construction experience along the Mackenzie Highway from Ft. Simpson to Wrigley can do much to establish preliminary design information for Allnorth. The most difficult portions will be the areas underlain by glaciolacustrine soils (mainly CI according to the Unified Soil Classification System – USCS) which include considerable ground ice. These will require follow up field investigations with hand auger equipment (to depths of 3 to 5 metres), coring, sampling and lab testing, all guided by the terrain typing and with special attention to stream crossings and their approach fills. Elsewhere in this section, the subgrade materials and potential borrow areas will comprise till (CI-CL to lesser ML) which is largely unfrozen, or ice-poor if permafrost is present. Once again, a challenging portion

will also be the section through the Front Range of the Mackenzie Mountains (esp. Grainger Gap) where design requirements for bridge and culvert crossings to accommodate highly variable flows as well as variously aggrading and degrading stream thalwegs will be needed.

- iii. Finally, depending upon CZN's plans for winter utilization, avalanche assessment will be needed through the mountainous sections.

4.0 Comments on the ToR (Section 5.1.1)

4.1 General assessment of Relevance

It is my understanding that the ToR were not developed specifically for the CZN proposal. Rather, they are extracted from another NT project, the Wrigley to Inuvik all season road. In my opinion, this approach has limited relevance to the proposed CZN all weather road for two important reasons:

First, I assume the operational design standards for the Mackenzie Highway extension to Inuvik are to a higher caliber than the proposed all season road to the Mine, for example, design template, sight lines, maintenance, etc.

Second, the Mackenzie Highway between Wrigley and Inuvik traverses sporadic discontinuous, widespread discontinuous, and continuous permafrost zones, and variable ground ice contents regardless of the genetic origin of the subgrade soils (i.e. organic, glaciolacustrine, glaciofluvial, moraine, alluvial, colluvial, etc.). Although the proposed CZN all weather road also crosses soils of these genetic origins, permafrost and ice-rich conditions are generally limited to well-defined sections of organic and glaciolacustrine origin, the extents of which are already mapped in detail by Geological Survey of Canada surficial geology and permafrost maps. It is correct to note that permafrost distribution increases as a function of elevation along the proposed CZN routing, however, the genetic origins of soils at the higher elevation are predominantly colluvial materials with limited ground ice; and, where ground ice is present, the soils have limited thaw sensitivity.

Based on the foregoing two points, I offer the following comments on the draft ToR.

4.2 Item 6 – ice content; and, Item 10 – existence and extent of ice rich permafrost areas that may be excavated:

The terrain units in which most permafrost is present can be forecast as part of terrain typing. Further, the terrain units in which there is a high likelihood of permafrost can be further typed as regards excess ground ice. Both can be calibrated against the Mackenzie Highway experience as I describe above. This applies to general subgrade soils as well as borrow areas. To remove ambiguity in terms of requirements, I recommend the item descriptions to be preceded by the word “probable” to indicate that projections are adequate, and intrusive field investigations may be limited.

4.3 Item 12 – distribution (thickness and lateral extent) on land, water, shoreline and slope crossings:

Further to Section 4.2 above, the extent of permafrost and excess ground ice can be forecast with a high degree of reliability through terrain typing and correlations with the nearby Mackenzie Highway experience as described above. The ground truthing of glaciolacustrine soils where excess ground ice is forecast will require hand augering (to depths of 3 to 5 metres), core sampling and laboratory testing of field samples to further characterize the materials. However, as it is unlikely that these soils will be used as borrow, they do not require deep drilling and sampling investigations, nor lateral permafrost extent delineation with some combination of drilling, sampling and geophysical surveys. In my opinion moraine, glaciofluvial and colluvial soils are the most likely candidates for borrow sources. These can be evaluated on the basis of grab sampling from natural exposures and/or shallow hand excavated test pits and follow up lab testing as a supplement to terrain typing. Therefore, I recommend the item be reworded to be “probable distribution on land, water, shoreline and slope crossings”.

4.4 Item 13 – permafrost processes, features and landforms and their stability, including slopes and frost susceptibility:

This item is adequately dealt with through the methods described in Sections 3.0, 4.2 and 4.3.

4.5 Item 14 – ground ice conditions, temperature and ground thermal regime

This item is dealt with, in part, through the methods described in Sections 3.0, 4.2 and 4.3. Temperature and the ground thermal regime are most important where thaw sensitive glaciolacustrine soils are present, hence thermistor strings with automatic readout devices can be installed, as warranted, in the hand augered holes, and monitored for at least one year. I expect the ground temperatures in ice rich glaciolacustrine soils will be essentially at 0°C because the presence of permafrost is essentially maintained by the slow melting of the ground ice (i.e. latent heat). Therefore, I do not advocate delaying the EA while the monitoring proceeds. Indeed, as far as design is concerned, any geothermal modelling required should assume ground temperatures are at 0°C as a conservative approach to climate change impacts (see Sections 4.7 and 4.9 below). Again, I recommend the word “probable” be inserted at the beginning of the item.

4.6 Item 15 – active layer thickness, seasonal frost, penetration, thaw sensitivity and frost susceptibility

This item is adequately dealt with through the methods described in Section 4.5. Again, I recommend the word “probable” be inserted at the beginning of the item.

4.7 Item 16 – how fires may affect ground temperature regimes and permafrost

This item is adequately dealt with through the methods described in Section 4.5 supplemented by numerical modelling.

4.8 Item 17 – thaw slumps in the project area

This item is dealt with in Geological Survey of Canada mapping that was completed in the 1970s. Changes in the intervening time can be determined through GIS mapping using the resources already assembled by Allnorth.

4.9 Item 18 – how regional climate variation and documented warming of ground temperatures in the region may affect ground conditions

This item is an extension of the methods described in Section 4.5 and 4.7 above.

5.0 Closure

I trust these suggestions satisfy your current requirements. If you require further information please do not hesitate to contact the undersigned.

6.0 Statement of Limitations

BGC ENGINEERING INC. prepared this document for the account of CZN. The material in it reflects the judgment of BGC staff in light of the information available to BGC at the time of document preparation. Any use which a third party makes of this document or any reliance on decisions to be based on it is the responsibility of such third parties. BGC accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this document.

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Yours sincerely,

BGC ENGINEERING INC.

per



K. Wayne Savigny, Ph.D., P.Eng., P.Geo., F.E.I.C.

Principal and Senior Geotechnical Engineer/Engineering Geologist