



October 21, 2016

Mr. Mark Cliffe-Phillips
Executive Director
Mackenzie Valley Environmental Impact Review Board
5102 50th Avenue,
Yellowknife, NT
X1A 2N7

Dear Mr. Cliffe-Phillips

**RE: Environmental Assessment EA1415-01, Prairie Creek Mine All Season Road
September 30, 2016 Parks Canada Letter re Baseline Information Gaps**

We refer to the letter from Parks Canada (Parks) to the Review Board (the Board) dated September 30, 2016 regarding what are described as “Baseline Information Gaps”.

Parks suggests that “there are specific baseline information requirements within the Prairie Creek All Season Road Environmental Assessment (EA1415-01) that have not been met and which are necessary to allow full examination of the potential for significant adverse effects”.

Canadian Zinc Corporation (CZN) agrees that, based on the results of our studies and assessments, there are some baseline information gaps that should be addressed prior to all season road construction (so that we can determine if any effects actually occur during the project and respond to them adaptively if they do), however, we believe that the very substantial baseline information that has been generated and is currently available is more than sufficient for a proper and thorough assessment of the potential for project adverse effects. CZN submits that we have completed such an assessment.

In the discussion below, we explain our engagements with Parks regarding their points, provide technical details in support of our position, and comment on the environmental assessment (EA) process.

Engagements with Parks Canada

Attached to their September 30 letter, Parks provided a copy of a July 7 email they sent to CZN. Below we explain our engagement with Parks in more detail on this matter, of which their email was a part.

CZN noted Parks’ concerns regarding baseline information in their initial information requests and comments they made at the Technical Session. Prior to the Technical Session, CZN was of the opinion that sufficient baseline information was available for a suitable effects assessment.

During the Session on June 14, we approached Parks to explore whether we could resolve their concerns. Parks undertook to consider our approach and get back to us.

On June 27 we contacted Parks to inquire on their progress. A copy of the email sent is provided in Attachment A. CZN indicated that the Company was willing to consider Parks' concerns, and was prepared to undertake additional fieldwork, in a spirit of cooperation. During a conference call on June 28, CZN informed Parks of the Company's plans to undertake additional fieldwork in the next few weeks with the objective of addressing Parks' concerns.

CZN proceeded with plans and research permit applications (issued by Parks) to undertake the work. On the morning of July 7 we received the email from Parks that is attached to their September 30 letter, and which set out their expectations regarding additional data. We replied midday that same day with the email provided in Attachment B, which was a partial reply and inquiry regarding the issue of research permits. That evening we sent a further email, copied in Attachment C, which was a more detailed response to Parks' email of that morning, and provided the scope of work for the proposed fieldwork.

Following the fieldwork, we provided Parks with a verbal summary of results during a conference call on July 28. A fieldwork report documenting the additional baseline data collected was subsequently produced by our consultant, Tetra Tech EBA (Tetra Tech), dated August 17 which is posted on the Registry, #289.

Technical Details

Parks Canada contends that additional baseline data are required to fully examine adverse effects in connection with vegetation, birds (including waterfowl), pikas and rare plants. Tetra Tech has provided detailed commentary on this in a letter report dated October 18, 2016, a copy of which is provided in Attachment D. Tetra Tech has concluded that sufficient baseline data are currently available for the purposes of effects assessment, and development of appropriate mitigation.

In their September 2015 effects assessment (DAR Addendum, Appendix E), Tetra Tech predicted that the magnitude of project effects to birds (including waterfowl), pikas and rare plants is low, and that the overall significance of effects is low.

Therefore, we do not believe additional baseline data are needed at this time, and in any event, that data are unlikely to alter the predicted low significance of effects.

Tetra Tech has made recommendations with respect to the acquisition of additional baseline data prior to all season road construction. CZN has committed to follow through on those recommendations, as we noted in our email of June 27 to Parks, which stated: "CZN recognizes the need for a suitable baseline before construction of the all season road occurs. We are amenable to discussing the scope, timing, arrangements and funding of such surveys, and we are willing to consider commitments. We would hope such surveys would be collaborative in terms of content and completion."

EA Process

Regarding the existing environment and baseline conditions, Sections 5.1.4, 5.1.6 and 5.1.7 of the EA Terms of Reference (TOR) ask for a description of a number of items. We interpreted the requirements of these and, along with our consultants, provided what we considered to be the necessary information. The scope and content of that information is a matter of judgement. The Board judged that more information was needed during Adequacy, and once this was provided, the Board determined that there was enough information available for the EA to proceed.

Baseline data are a fundamental requirement for any EA. Such data are normally collected over several years and seasons, and require planning, an extended time period and significant capital outlay. It would have been preferable to have agreement on baseline data requirements at the Scoping stage, since it is problematic to now consider additional baseline data acquisition during the analysis phase because of the implications with respect to a timely EA process.

In conclusion, we point out that there would be a significant delay in the EA if it is now deemed that additional baseline data are needed immediately, because data collection would only be possible next spring. CZN is strongly of the opinion that such additional baseline data is not required at this time for an appropriate effects assessment, and any such delay in the EA is not justified. We also note that in their October 14, 2016 letter to the Board, the Nahanni Butte Dene Band (NBDB) indicated that they are in favour of expediting regulatory processes related to the road, and addressing any baseline data gaps as part of a land use agreement currently being negotiated between the NBDB and CZN.

We appreciate your consideration of the above. If you have any questions, please contact us at 604 688 2001.

Yours truly,
CANADIAN ZINC CORPORATION



David P. Harpley, P. Geo.
VP, Environment and Permitting Affairs

ATTACHMENT A

RE: Baseline

David Harpley

Sent: June-27-16 1:06 PM

To: Allison.Stoddart@pc.gc.ca

Cc: Jon.Tsetso@pc.gc.ca; audrey.steedman@pc.gc.ca; McLenaghan, Amy [Amy.McLenaghan@tetrattech.com]; Alan B.. Taylor; adrian.paradis@cannor.gc.ca; Rick Hoos [RHoos@eba.ca]; Karla.Langlois@tetrattech.com

Allison,

I refer to your IR's and technical session comments regarding additional wildlife and vegetation baseline studies Parks believes CZN needs to complete. You will remember our informal meeting on June 14, during which CZN asked that Parks consider if we can come to an agreement on a path forward. We have awaited your response to this request, and while I appreciate time is required for internal discussion, tomorrow will be 2 weeks since the request was made, and as you know, the EA is proceeding.

Regarding wildlife, the main concern appears to be related to forest and wetland birds, and waterfowl. You noted the optimal time for surveys for many species to be mid-June to mid-July. However, JF Dufour of ECCC has advised that such surveys should commence earlier, with the installation of acoustic recorders. As such, the 'window' for surveys this year is closing, and would be closed by the time of mobilization. CZN recognizes the need for a suitable baseline before construction of the all season road occurs. We are amenable to discussing the scope, timing, arrangements and funding of such surveys, and we are willing to consider commitments. We would hope such surveys would be collaborative in terms of content and completion.

Regarding vegetation, my understanding is that you believe additional fieldwork may or is required to confirm the vegetation assemblage, determine the presence/absence of rare plants, and document existing conditions on the old winter road to predict reclamation outcomes. We are due to discuss the latter at 10 PDT tomorrow. Might I suggest we also discuss the former during that call.

It is our hope that we can come to an agreement on future wildlife and vegetation surveys expediently in order to avoid disagreement and uncertainty.

David Harpley
VP, Environment and Permitting Affairs
Canadian Zinc
Home Office 604 594 3855, Office 604 688 2001

ATTACHMENT B

RE: Parks Canada Baseline Expectations

David Harpley

Sent: July-07-16 1:09 PM

To: Allison.Stoddart@pc.gc.ca; Alan B.. Taylor

Cc: Jon.Tsetso@pc.gc.ca; laura.james@pc.gc.ca; Jonah.Mitchell@pc.gc.ca

Allison, we have no problem providing a response to your itemized expectations, and we will do, probably later today. We also have no problem consulting with your specialists re study design. Please provide the names, numbers and area of research for the relevant people, and confirm they are available today and tomorrow. However, I see no point in writing to the Board, other than to place the details on the record. That can be done in due course along with results. There would be no action item for the Board at this stage.

It is clear that next week's work will not allow a complete response to your listed items, use of ARU's for example. It is also clear that next week's work will allow useful information to be collected which should go a long way to fulfilling expectations, or at least provide a basis for doing this in follow-up work. What that would entail will to some extent be based on what we find next week. However, resolution of these matters should not delay the issue of research permits, which we understood were imminently to be issued.

We are always available to talk, however Alan will not be in the office tomorrow. Later this afternoon or early tomorrow may be options.

David Harpley

VP, Environment and Permitting Affairs

Canadian Zinc

Home Office 604 594 3855, Office 604 688 2001

ATTACHMENT C

Parks Canada Baseline Expectations

David Harpley

Sent: July-07-16 7:44 PM

To: Allison.Stoddart@pc.gc.ca

Cc: Jon.Tsetso@pc.gc.ca; Alan B.. Taylor

Allison,

Tetra Tech has provided details (below) of their proposed program next week re wildlife and vegetation in response to your email. Some comments from me. We're comfortable with our database in terms of effects assessment for this EA. Where we don't have data re presence/absence (i.e. birds), we've assumed presence for mitigation. I agree a more detailed baseline may be required to determine actual project effects, and allow adaptive management to be applied. Hence, we will be receptive to reasonable expectations post-EA.

We decided after the technical session that it was appropriate to respond to comments, and show a willingness to compromise. Hence our change in position re additional fieldwork now. We are attempting to address your concerns, to the extent we are able to.

Regarding wildlife, black bear baseline seems to be a new request. We can incorporate this into the program, but it raises 'shifting goal-post' concerns. We will not be disturbing potential pika habitat to any significant degree. We are now avoiding the talus slopes on the north side of upper Sundog with the all season road. The only potential disturbance is in a few toe areas in lower Sundog, and a borrow source. Note, a borrow source in talus is already permitted in connection with the winter road, and no pika concerns were raised at that time. However, we can include pika survey considerations.

Regarding cultural resources, I believe the AOA we commissioned includes all of the listed items, but I will confirm. We have already agreed to an AIA as described prior to construction, directed by a professional, and with First Nations input.

We are available for a call tomorrow morning. Either 10 or 11 PDT is good for us. Please confirm time and dial in details.

David Harpley

VP, Environment and Permitting Affairs

Canadian Zinc

Home Office 604 594 3855, Office 604 688 2001

Wildlife:

1. Yes, bird surveys to collect the listed parameters will be completed next year during the appropriate timing windows. The current research permit application (July 2016) includes recording incidental bird observations and habitat assessments for bird species at risk. This information will be used to help design the 2017 studies. If I remember correctly from the technical session, ECCC kindly offered use of their recording units, which will be utilized if available.
2. Black bear habitat was not originally identified in the Information Requests, but Parks Canada did indicate concern about the temporary camp locations within black bear foraging and movement corridors during the technical session. Yes we will identify black bear foraging, denning, and travel potentials near camp locations. Next weeks anticipated vegetation ground-truthing survey (using the BC MOE/MOK 2010 Field Manual for describing terrestrial ecosystems as a guide; see vegetation responses below) collects appropriate data to understand black bear habitat potentials (e.g., forage, forage cover, soil type). Similarly, observation of black bears (e.g., visuals and sign) will be recorded at each camp location and stratified by habitat type following the BC presence/not detected inventory methods for bears (1998) as a guide.
3. Since vegetation and rare plant surveys are the current focus, collared pika surveys may be completed opportunistically within the project footprint (i.e., borrow sources within collared pika range) during this July's program. A collared pika survey will be completed using the BC inventory methods for pika and sciurids (1998)

presence/not detected point counts as a guide. If not detected during the point count, a random transect will be completed across the talus to search for the presence of hay piles.

Vegetation:

1. Yes, ground-truthing will be done for this anticipated July program using Ponomarenko and Quirouette (2015) Ecotype Mapping Report for Nahanni National Park Reserve as a guide. In the absence of a formal survey protocol for the NWT, the field data collection approach identified in the BC MOE/MOF 2010 Field manual for describing terrestrial ecosystems- 2nd ed. will be used as a guide. Percent cover by species and site characteristics (slope, aspect, elevation, geographic location in UTM) will also be collected.
2. Yes, a rare plant survey will be conducted using Alberta Native Plant Council . 2012. ANPC Guidelines for Rare Vascular Plant Surveys in Alberta – 2012 Update as a guide.
3. Yes, we can link rare plant habitat requirements to ecotypes identified in Ponomarenko and Quirouette (2015) in tabular form.

ATTACHMENT D

October 19, 2016

Canadian Zinc Corporation
Suite 1710, 650 West Georgia Street
PO Box 11644
Vancouver, BC V6B 4N9

ISSUED FOR USE
FILE: ENG.YARC03070-01
Via Email: david@canadianzinc.com

Attention: David Harpley
VP Environmental & Permitting Affairs

Subject: Response to Parks Canada Letter dated September 30, 2016,
Environmental Assessment, EA1415-01
Proposed All Season Access Road to Prairie Creek Mine, NT

1.0 INTRODUCTION

Related to the Environmental Assessment process for Canadian Zinc Corporation's (CZN) proposed Prairie Creek Mine all-season road (EA1415-01), Parks Canada issued a letter to the Mackenzie Valley Review Board (MVRB) on September 30, 2016 with comments on the adequacy of baseline studies to allow an assessment of potential environmental effects. This letter provides responses from Tetra Tech EBA Inc. (Tetra Tech) on issues that pertain to vegetation and wildlife.

2.0 VEGETATION – RESPONSE

To date, three rare plant surveys have been conducted, June 2009, August 2010, and July 2016. No federally listed rare plant species have been documented, however, in 2009, one plant species, Few Flower Meadow Rue (*Thalictrum sparsiflorum*) listed as being rare in McJannet et al. (1995) was documented along the Prairie Creek winter road and an adjacent wetland. The status of this species has since changed, and the Government of the Northwest Territories (GNWT) does not list this species as being rare. Also in 2009, two plant species ranked as 'May Be At Risk' by the GNWT were identified along the existing winter access road [Hornemann willowherb (*Epilobium hornemannii*) and linear-leaved willowherb (*Epilobium leptophyllum*)]; these species have also been delisted. Six plant species ranked as 'Sensitive' by the GNWT in 2009 [alpine anemone (*Anemone drummondii*), bog birch (*Betula pumila*), lesser black-scaled sedge (*Carex atosquama*), one-glume spike rush (*Eleocharis uniglumis*), alpine groundsel (*Packera pauciflora*) and yellow mountain heather (*Phyllodoce glanduliflora*)] that were identified adjacent to the Prairie Creek winter road have now all been delisted with the exception of one-glume spike rush which remains listed as 'Sensitive'. It was concluded that potential effects to these local occurrences can be avoided or reduced by limiting the amount of additional land disturbance required for upgrades and operation of the all access road.

As the surveys conducted to date did not cover the early flowering period (mid-June), there is a possibility that some of the currently listed species are present in the project area but were not detected. As a result, Tetra Tech has recommended conducting further rare plant surveys in mid-June as part of the pre-construction phase of the all season road, and CZN has committed to do this.

The additional surveys are proposed after the winter road corridor has been cleared, which will facilitate access for further rare plant survey coverage. In the event that rare plants are found, appropriate mitigation measures, such as avoiding locations or minimizing the size of the disturbance, will be developed.

Prior to the conduct of pre-construction surveys, a desktop mapping exercise will be carried out to identify areas with a higher potential to support rare plant habitat as well as rare vegetation assemblages (locally significant ecological communities). This information will be used to target field survey efforts.

The surveys conducted to date, and the recent delisting of rare plants across the NWT as more information becomes known, suggest a lower potential for Project-related effects on rare plants.

3.0 WILDLIFE – RESPONSE

Migratory Birds

Parks Canada suggests that it is impossible to assess potential environmental impacts of the proposed all-season road without forest bird, waterfowl, migratory birds, and avian species at risk baseline surveys.

It is important to clarify and restate the proposed project in context with known research to date on road-related effects on birds. To reduce any potential preconceptions relating to road-related effects, it must be noted that much of the literature that discuss “low traffic” road effects on birds represent traffic volumes as high as 5,000 – 10,000 vehicles a day.

In a scientific review of over 120 papers, Kociolek and Clevenger (2009)¹ concluded that “traffic volume is believed to be the most important factor affecting breeding bird population densities near roads” and “the number of affected species increases with traffic volume”. Therefore, low traffic volume roads have less effect on breeding bird populations and affect fewer species than compared to high traffic roads.

The proposed annual traffic along the all-season road ranges from as low as 5.3 trucks/day to 20.0 trucks/day depending on conservative (192 hauling days) and projected (221 hauling days) estimates. Therefore, throughout the length of the project period, haul truck traffic volumes average between 10.9 to 15.3 trucks/day. The environmental assessment was completed based on 15 haul trucks/day throughout the entire project operating life.

Reijnen et al (1995)² studied 43 woodland bird species along a 10,000 vehicle/day (traffic speeds 120 km/hr) road and indicated that density-related effects were found 40 – 1,500 m from the road depending on the species. Similarly, it is suggested in the literature that paved roads with “>10,000 average annual daily traffic volumes, [is the] traffic volume above which effects of roads on birds are regularly found” (Summers et al. 2011)³. A “light traffic volume” of 3,000-8,000 vehicles/day were found to have no significant effect on grassland bird distribution over a 5 year period in an outer suburban and rural landscape (Forman et al. 2002)⁴.

¹ Kociolek, A.V. and A.P. Clevenger. 2009. Effects of Paved Roads on Birds: A Literature Review and Recommendations for the Yellowstone to Yukon Ecoregion. Prepared for the Yellowstone to Yukon Conservation Initiative Society. 35 pp.

² Reijnen, R., R.B. Foppen, C.T. Braak, and J. Thissen. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. *Journal of Applied Ecology*, 32(1): 187-202.

³ Summers, P.D., G.M. Cunningham, and L. Fahrig. 2011. Are the negative effects of roads on breeding birds caused by traffic noise. *Journal of Applied Ecology*. 48: 1527-1534.

⁴ Forman, R.T., B. Reineking, and A.M. Hersperger. 2002. Road traffic and nearby grassland bird patterns in a suburbanizing landscape. *Environmental Management*. 29: 782-800.

In addition, “not all bird species densities respond negatively to traffic” (Kociolek and Clevenger 2009). Based on the results of nine studies, Reijnen and Foppen (2006) conclude that traffic volumes averaging 5,000 vehicles/day adversely affect population densities of 10% of species. This was the lowest traffic volume measured.

In the Northwest Territories (NWT), Male and Nol (2005)⁵ reported no measurable effect on Lapland Longspur territorial choice associated with the Ekati Diamond Mine. Roads associated with Male and Nol’s (2005) study were located in the tundra, with traffic volumes ranging from 30 to 200 vehicles per day (reaching 1,000 vehicles a day during construction) and speed limits at 60 km/hr. Similarly, clutch sizes, mean nestling masses, and daily nest-survival rates were similar to control sites (Male and Nol 2005). No measurable effects of heavy truck noise on territorial establishment or mate attraction were found, presumably since Arctic breeding passerines evolved in high wind conditions (Male and Nol 2005). Similarly, Male and Nol (2005) reported the use of dust suppression mitigation significantly reduced daily dust deposition rates within 50 m from the road.

Based on tape-recordings, each haul truck was audible for a mean period of 1 minute (Male and Nol 2005). As a comparison, the proposed all-season road travels primarily through the boreal forest with approximately 40 km in the Cordillera (assumed similar to tundra conditions). CZN proposes an average of 15 haul trucks per day, travelling at less than 50 km/hr, and using dust suppression mitigation. Assuming similar conditions at the Ekati Diamond Mine, the proposed all-season road with 15 haul trucks per day could potentially affect individuals for approximately 15 minutes a day.

In conclusion, known adverse road-related effects from “low traffic volume” roads in much of the research literature are not comparable to the traffic volumes proposed for the all-season road. Thus, the conclusions in the DAR indicating overall low residual effects on birds remain appropriate. These conclusions are valid with and without baseline surveys for birds, although Tetra Tech assumed the presence of the noted bird species for the purpose of mitigation. Further, CZN has made a commitment that appropriate baseline surveys for birds will be completed prior to the development of the all-season road in order to determine whether any changes in presence and distribution occurs during the project. The surveys are proposed to be completed after a winter road has been cleared to facilitate access.

Collared Pika

Collared Pikas are a proposed Special Concern species under the federal *Species at Risk Act* (SARA), and ranked as Sensitive in the NWT. If listed as a Special Concern species, special management action is required to avoid and/or minimize adverse effects. Subsequent to the July 2016 pika surveys, the road alignment along lower Sundog Creek was modified to avoid talus and potential Collared Pika habitat (refer to Tetra Tech’s reply to Round 2 Review Board IR5). In addition, certain borrow sites were found to host active pika sites. The GNWT WMIS data indicates pikas were recorded in 2012 from approximately KP 15.5 – 22.

It should be noted that an all season road already exists from the Mine to KP 23, and will undergo only minor modifications.

CZN has proposed a new road section from KP 24-29, but this will traverse predominantly shrub and coniferous forest habitats, which typically do not provide pika habitat. Nonetheless, CZN has committed to conducting presence/not detected Collared Pika surveys in all borrow sources selected for development and along the proposed all-season road alignment (that disturbs talus; including KP 12-39) prior to disturbance, and adopting mitigation as appropriate under the direction of a wildlife biologist. As such, the existing data on pika occurrence is considered suitable for the effects assessment we have completed, and appropriate mitigation has been developed.

⁵ Male, S.K. and E. Nol. 2005. Impacts of roads associated with the Ekati Diamond Mine™, Northwest Territories, Canada, on reproductive success and breeding habitat of Lapland Longspurs. *Can. J. Zool.* 83: 1286-1296.

4.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Canadian Zinc Corporation and their agents. Tetra Tech EBA Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Canadian Zinc Corporation or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech's Services Agreement. Tetra Tech's General Conditions are provided in Appendix A of this report.

5.0 CLOSURE

We trust this letter report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech EBA Inc.



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Attachments: Appendix A – Tetra Tech's General Conditions