

EA1415-01 Round 2 Information Requests Review Comment Table (except U#7, GNWT letter information requests)

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| Board: | MVEIRB |
| Review Item: | EA1415-01 All-season Road - Second Round Information Requests |
| File(s): | |
| Proponent: | CanZinc Corporation |
| Document(s): | Undertaking response list with hyperlinks (1 MB) CanZinc letter re: undertaking #7 (1 MB) GoC letter re: undertaking #7 (1 MB) Tech session transcripts June 16 (1 MB) Tech session transcripts June 15 (1 MB) Tech session transcripts Jun 14 (1 MB) Tech session transcripts June 13 (1 MB) Commitments table (1 MB) |
| Item For Review Distributed On: | Aug 29 at 15:30 Distribution List Aug 31 at 11:44 Distribution List Sep 1 at 11:30 Distribution List |
| Reviewer Comments Due By: | Sep 23, 2016 |
| Proponent Responses Due By: | Oct 24, 2016 |
| Item Description: | <p>CanZinc and other parties submitted responses to technical session undertakings in July and August 2016. The next phase in the EA of the Prairie Creek Mine All-season Road is second round information requests.</p> <p>Parties and the developer are asked to prepare information requests using the Online Review system.</p> <p>Due date: September 23, 2016</p> |
| General Reviewer Information: | <p>The purpose of information requests is to give parties and the Review Board the information needed to help reach conclusions on whether or not the project could have potentially significant adverse impacts on the environment or people.</p> <p>The Review Board is using the ORS and Excel spreadsheet format for information requests from parties and responses from CanZinc.</p> <ul style="list-style-type: none"> • the "topic" column includes your reference to the public registry document that your information request is based on • the "comment" column contains the preamble and rationale for your information request • the "recommendation" column contains your information request |
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CPAWS NT Round 2 Information Requests

| ID | Topic | CPAWS NT Chapter Comment/Recommendation | Government of Canada Responses |
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| 1 | <p>General Comment/Question: UNESCO Designation Compliance</p> | <p>Comment The United Nations Educational, Scientific and Cultural Organization named Nahanni National Park Reserve (original boundary) one of the first 12 World Heritage Sites in 1978. Expansion to include the entire watershed had been a consideration starting as early as 1987, and was supported and encouraged by UNESCO. UNESCO World Heritage Sites are representative of the world’s most important natural areas. A UNESCO designation provides a framework which is intended to secure the conservation of the area, but without communicating about the cumulative impacts from industrial developments, it is difficult to keep track of the actual state of conservation within the site. The Prairie Creek All Season Road would contribute to an expanded industrial footprint that will negatively impact Nahanni National Park Reserve. We are concerned that there has been little consideration of how this proposed all-season road will pose risk to Nahanni National Park Reserve in the context of maintaining a UNESCO World Heritage Site designation. During the 30th Session of World Heritage Committee in Vilnius, Lithuania (July, 2006), UNESCO declared their growing concern about resource extraction and industrial activities in and around NNPR and stated their request clearly. “Requests the State Party to keep the World Heritage Centre and IUCN informed of the mining developments around the property and any other important changes in the state of conservation of the property.” (link - Decision 30 COM 7B.22, page 66) Has the Government of Canada or Parks Canada made submissions to the UNESCO World Heritage Center and IUCN regarding the Prairie Creek All Season Road project, or of any other industrial activities, including the Prairie Creek mine and other developments, that would impact the UNESCO World Heritage Site status for Nahanni National Park Reserve?</p> <p>Recommendation It is recommended that the Board ensure any reports to the UNESCO World Heritage Center (after the 2006 request from UNESCO) from either Parks Canada or the Government of Canada be shared with parties.</p> | <p>Oct 25: GOC RESPONSE to CPAWS IR 1 UNESCO Designation Compliance (for PCA): Parks Canada (representing Canada) reports regularly to the World Heritage Centre on the state of conservation of our World Heritage sites. These are typically either responses to direct inquiries by letter from the World Heritage Centre or as part of larger reports that roll up information from various Canadian World Heritage Sites on an annual basis. We have attached the 4 letters that have been sent to the World Heritage Center since 2006 regarding the World Heritage Site in Nahanni National Park.</p> |
| 2 | <p>General Comment/Question: Ecological Integrity of NNPR</p> | <p>Comment The <i>2010 Nahanni National Park Reserve of Canada Management Plan</i> thoroughly covers the importance of maintaining NNPR and its ecological integrity intact for current and future generations. With its multiple designations, both international and national (UNESCO World Heritage Site, Canadian Heritage River), and the importance of this area for the people who live there, the 2010 NNPR MP states; “... thus, NNPR must work with others to help maintain the highest possible standards of quality for the waters, lands, air and wildlife of Naha Dehe.” (Pg 19, <i>NNPR Management Plan</i>). Objective 2 under Key Strategy 1 is; “Natural ecological processes remain the primary forces shaping the ecosystem.”. Objective 2 under Key Strategy 2 (<i>Waters for Life</i>) is: “The waters of Naha Dehe are high quality and unimpaired by activities inside and outside park boundaries.” This section directly mentions concern for impacts from “regional industrial development in close proximity to the park.” and lists an action of completing a South Nahanni Watershed Study, and having the resulting recommendations be implemented for stream monitoring throughout the watershed. When will the South Nahanni Watershed Study be completed, or will it be completed in time to have baseline data for monitoring impacts of the proposed all-season road? How will the baseline and water</p> | <p>Oct 25: GOC RESPONSE to CPAWS IR2 Ecological Integrity of NNPR (for Parks Canada): The South Nahanni Watershed Study referred to in the 2010 NNPR Management Plan was completed in 2013 and an interim report has been prepared. The purpose of this study was to develop and apply a reference condition model for the assessment of the ecological integrity of streams in the South Nahanni Watershed. The reference condition developed during the South Nahanni Watershed Study is the basis of ongoing stream quality assessment within NNPR. on Prairie Creek, and the South Nahanni and Flat rivers. The reference condition developed during the South Nahanni Watershed Study is the basis of this ongoing stream quality assessment using the national standard CABIN protocols and analyses. Collaboration between Parks Canada and Fisheries and Oceans Canada has been ongoing to develop monitoring protocols specific to fish populations, and has focussed largely on the Prairie Creek watershed.</p> <p>During the current environmental assessment for the proposed All Season Road, it is the responsibility of the proponent to provide baseline information on stream water quality, fish and fish habitat in the project area. Furthermore, the proponent must assess the potential impacts, their significance, and</p> |

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| | <p>monitoring data be used to ensure that impacts within and adjacent to the park do not impact ecological integrity within the park?</p> <p>Recommendation It is recommended that, if complete, the South Nahanni Watershed (SNW) Study be shared with parties. It is also recommended that if the SNW Study has not been completed, that Parks Canada identify to parties the gaps that exist in their current baseline data that the SNW Study was intended to fill. This information would go a long way to resolve future questions around baseline data and what else may be required before construction is to proceed.</p> | <p>mitigation measures proposed to reduce or eliminate potential impacts of the proposal. Parks Canada is actively engaged in the review of these reports, requesting additional information where required, commenting on the proposed mitigations of the developer, and making recommendations. The potential impacts to water quality as a result of the project would be subject to mitigations and monitoring requirements that may be outlined during the EA and subsequent permitting process. Parks Canada will be the regulator for the portion of the road within NNPR, should the project be approved, and will develop conditions for land use permits and water licenses which will include a requirement to review all operational plans. As a regulator, Parks Canada will be responsible to monitor and enforce all permits and licenses issued within NNPR including any water protection provisions. References Scrimgeour G.J., Bailey J.L., Reynoldson T.B., Haggarty, D., Thomas K., Hall R., Tate D. 2013. An assessment of the ecological integrity of streams in the South Nahanni Watershed: development and application of a reference condition model. Internal report produced by the Office of the Chief Ecosystem Scientist, Protected Areas Establishment and Conservation, Parks Canada Agency, Calgary, Alberta. 59 pp. iii (link).</p> |
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Dehcho First Nations Round 2 Information Requests

| ID | Topic | Dehcho First Nations Comment/Recommendation | CanZinc Corporation Responses |
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| 1 | Technical Advisory Committee | <p>Comment CZN has proposed a controlled checkpoint station along the proposed access road to control access. This also provides an opportunity to track road use activities. The proposed access road provides the only road access into the area, and all road traffic entering the area must pass through the checkpoint station. CZN's checkpoint monitoring program, when combined with the Wildlife Observation Logs and other monitoring programs, will allow a quantitative analysis relating road traffic levels with wildlife observations along the road over time. Results from the Wildlife Harvest Questionnaire, including total number of voluntary responses collected at the manned checkpoint, will be discussed annually by the proposed Technical Advisory Committee, and possible adaptive management strategies, if required, will be determined collectively.</p> <p>Recommendation DFN requests that CZN outline who will be included on CZN's Technical advisory committee. DFN also requests that CZN provide more information regarding the Technical Advisory Committee (i.e. roles and responsibility of the committee).</p> | <p>Oct 24: A terms of reference for the Technical Advisory Committee (TAC) was developed previously during EA0809-002. It was submitted as Appendix J to the IR2 reply. A copy is attached, "TOR - TAC ref. IR2 DFN#1". The TAC is meant to be inclusive, and not intended to exclude parties.</p> |
| 2 | Checkpoint | <p>Comment CZN indicated that will monitor and record non-mining traffic activity on the all-season road, including through the establishment of a checkpoint, and report this information annually.</p> <p>Recommendation Will the checkpoint be manned 24/7? Is there any chance that a checkpoint will not be manned for part of the year? If the checkpoint will be unmanned for periods of time, has CZN considered using a remote camera or other method to record vehicle traffic?</p> | <p>Oct 7: The precise location of a checkpoint, and the hours of manning, will be determined collaboratively with the NBDB. We anticipate that the checkpoint will be manned during daylight hours, but not at night when road use by non-mine traffic is unlikely. The checkpoint will also not be manned during spring break-up and fall freeze-up when the Liard River is difficult to cross, both for non-mine traffic and checkpoint staff, assuming the checkpoint is west of the Liard River. We agree that use of a remote camera is worthy of consideration for periods when the checkpoint is not manned.</p> |
| 3 | Archaeological Work | <p>Comment 1. CZN has engaged Lifeways of Canada to undertake an Archaeological Overview Assessment (AOA) for the all season road, building on the existing database developed for the winter road. CZN expects that the results of the AOA will be available during the course of the current EA. The results will also be used to guide and focus an Archaeological Impact Assessment (AIA) to be conducted during field studies associated with detailed design of the road, which will include survey crews laying out the precise road alignment on the ground, and investigating and delineating borrow sources.</p> <p>Recommendation When will the AOA be completed? When will the detailed design of the road and associated AIA be completed? Could the results of the AOA and AIA impact the routing of the road?</p> | <p>Oct 7: We expect the AOA to be issued in time for parties to consider it in their Technical Reports. The detailed design of the road and associated AIA will be completed after permitting and before road construction. The AOA and AIA are not expected to alter the routing of the road.</p> |
| 4 | Monitoring slope stability | <p>Comment CZN states "Although the proposed physical mitigations described above are expected to help enormously in reducing problems related to the described types of risks, it is not possible to completely eliminate the hazards, and so the residual risks must be dealt with in other ways, for example, using administrative mitigations (administrative controls). Such controls could include signage, personnel procedures and training, inspection and maintenance schedules, and notification and reporting protocols. Site-specific contingencies for high-risk areas are as follows: Carry out at least monthly visual</p> | <p>Oct 24: Areas at high-risk due to potential slope stability or ground stability issues were determined previously by Tetra Tech EBA. Their report dated May 4 is posted on the Registry as received May 9 (PR#187). Further investigation is to be completed in these areas during detailed design. At that time, a professional engineer will determine a monitoring frequency and specify the required qualifications of the inspector. It is</p> |

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| | | <p>inspections for areas designated high-risk due to potential slope stability or ground stability issues until seasonal baselines for behaviour of the area are established; When the baselines are established, carry out regular visual inspections for areas designated high-risk due to potential slope stability or ground stability issues. A suggested schedule for inspection of those areas would include at least one inspection prior to spring freshet to confirm that culverts are free-draining, then monthly during the thaw season, and at least once during the winter for areas with hazards that exist also in winter (for example, for rock fall that is freeze/thaw-related); and Carry out inspections for high-risk areas within 24 hours of major rainfall events, abnormally high spring thaw events or significant seismic events, and/or prior to mine traffic travelling the road.”</p> <p>Recommendation How will Canadian Zinc determine what areas are high-risk due to potential slope stability or ground stability issues or has this work already been completed? Who will be doing these inspections of high-risk areas? What does CZN consider to be a major rainfall event, abnormally high spring thaw event or significant seismic event? How will CZN determine if the highway is safe or unsafe to travel?</p> | <p>expected that monitoring will be undertaken by local monitors under the guidance and instruction of an engineer, with inspection by the engineer on a pre-determined frequency. A major rainfall event or abnormally high spring thaw event is considered to be one that causes runoff sufficient to create erosive force, indicated by highly turbid water in local streams. A significant seismic event is considered to be one that is clearly felt either at the Mine or in neighbouring communities, and is recorded by the Geological Survey. CZN will have maintenance crews and monitors operating on the road. After a significant runoff or seismic event, all sections of the road will be checked by proximal staff before the 'all clear' is given for travel.</p> |
| 5 | Monitoring slope stability | <p>Comment CZN response to Undertaking #40, “As for rockfall/slides, debris slides, thaw flows, slumps; confirm suspect areas at time of detailed design. Tracking: check for widening/lengthening of tension cracks, more tension cracks progressing further upslope or to the sides indicating enlargement of distressed area. Some areas may be amenable to repair if dealt with promptly, e.g. cutslopes that can be buttressed, fillslopes that can be reconstructed into horizontally-layered fill (if they were originally built as sidecast fills). Optimize cross-drainage provisions for tension cracks likely to be affected by water crossing road. Monitor slope to track movements that might require additional mitigation.”</p> <p>Recommendation How will CZN monitor slope to track movements that might require additional mitigation? Who will be conducting the monitoring? What outcomes of the monitoring will trigger additional mitigation? How frequently will the monitoring occur?</p> | <p>Oct 7: The answers to this IR are given in the preamble and answers to DFN IR 4. The manner of the monitoring and outcomes will be specified by an engineer during detailed design. This will include defining what action to take given the observation of certain circumstances.</p> |
| 6 | Tetcela Transfer Facility | <p>Comment It is DFN’s understanding that CZN will no longer be using the Tetcela Transfer Facility as a temporary containment area for concentrate.</p> <p>Recommendation What facilities (if any) will be located at the Tetcela Transfer Facility Location?</p> | <p>Oct 7: CZN is not proposing to develop the Tetcela Transfer Facility at all. A construction camp is proposed in the area, to be located within a borrow pit at approx. Km 87. A much reduced camp is proposed to be retained at this location to support on-going road maintenance. The camp will consist, at most, of a single trailer, small genset and fuel tank, laydown area for equipment, and parking area for plant.</p> |
| 7 | Monitoring slope stability | <p>Comment CZN states that they will carry out at least monthly visual inspections for areas designated high-risk due to potential slope stability or ground stability issues until seasonal baselines for behaviour of the area are established.</p> <p>Recommendation DFN requests that CZN explain the rationale for monthly inspections rather than weekly inspections to determine seasonal baselines for behaviour of the area are established.</p> | <p>Oct 7: An initial monthly inspection frequency was specified by Tetra Tech EBA. Bear in mind that instabilities develop on a time scale somewhere between normal time and geological time. Hence, a monthly frequency is a very short period of time relative to the frequency of instability events.</p> |

GNWT – Lands Round 2 Information Requests

| ID | Topic | GNWT – Lands Comment/Recommendation | CanZinc Corporation Responses (unless otherwise indicated) |
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| 1 | <p>Rare Plant Surveys - Undertaking # 11; Undertaking response letter - 11Aug2016 - Section2.2, Figure 1 and Figure 2; Vegetation and Wildlife Baseline Survey - 17Aug2016 - Sections 2.1.2, 2.1.3, Appendix D</p> | <p>Comment Undertaking #11 required Canadian Zinc to provide a map showing where the road alignment crosses unglaciated areas and describe if and how this information affects predictions of impacts on species at risk and rare plant assemblages. In response to Undertaking #11, Canadian Zinc stated that “These [rare plant] surveys, including the most recent event conducted in 2016, <i>did not detect any SARA-listed species or species ranked by the GNWT</i>” and “As the surveys conducted to date included assessments of previously unglaciated areas, the predictions of impacts to species at risk and rare plant assemblages, as presented in the DAR and supporting documentation (including the latest field survey results from 2016), have not changed. GNWT notes that the surveys referred to in the response to Undertaking #11 include surveys conducted in June 2009 and August 2010. The 2009 rare plant and wildlife survey report states on pages 3-4 that 8 rare plant species were found, two ranked by the GNWT as “May be at risk” and 6 ranked as “Sensitive”. This appears to contradict Canadian Zinc’s statement in response to Undertaking #11. Section 2.1.3 of the August 2016 Vegetation and Wildlife Baseline Survey report states that “Tetra Tech EBA obtained a list of rare plant species that are known to occur within the Taiga Plain”. ENR notes that more than half of the road alignment, an in particular unglaciated areas identified in Undertaking #11, occurs within the Boreal Cordillera ecozone. In 2015 Tetrattech-EBA, on behalf of Canadian Zinc requested data from GNWT-ENR’s Virtual Herbarium on rare plants recorded within a 50 km buffer around the road alignment. This data request, and the list of rare plant species contained in the data provided, is not acknowledged in the 2016 vegetation baseline survey report. It is further stated that a list of 217 plants ranged as “At Risk”, “May Be At Risk”, or “Sensitive” from the GNWT General Status database was compiled, but this list was not provided with the 2016 report. As such it is not possible for reviewers to know which rare plants had the potential to occur in the area and were being searched for during the 2016 surveys. Section 2.1.2 states that “Plants that were documented at each ground inspection location were identified to species, where possible. <i>Plants that could not be readily identified in the field were collected for further inspection and subsequent genus or species confirmation. In cases where the plant could have been listed as rare, specimens were only collected if collection did not appear to threaten the immediate population (as per the guidelines presented by the Alberta Native Plant Council [ANPC] 2012).</i>” Section 2.1.3 also states that “Plants were identified to species in the field whenever possible. <i>Voucher specimens of suspected rare plants were almost always collected, provided the collection did not appear to threaten the immediate population (as per the guidelines presented by ANPC [2012]). Specimens were also collected (under the same restrictions) if a definitive identification to species in the field was not possible.</i>” These sections seem to suggest that specimens of suspected rare plants may have been collected in the field, but it is not made clear how many specimens were collected, and whether they were sent to a specialist for identification.</p> <p>Recommendation a) Where are the results of the August 2010 field survey referred to in response to Undertaking #11 reported? b) Provide the list of rare plants that had the potential to occur in the areas surveyed in 2016. c) Clarify whether any plant specimens were collected in the field for further identification and whether any had to be sent to a specialist for identification. d) Clarify if any of the same areas surveyed in 2009 were resurveyed in 2016. e) If any specimens that were collected are later identified as rare plants, Canadian Zinc is encouraged to share this information with the GNWT so that it may be included in the Virtual Herbarium.</p> | <p>Oct 24: Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> <p>Oct 24: Att.</p> |

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| 2 | Collared Pika - Vegetation and Wildlife Baseline Survey - 17Aug2016 - Section 4.2, 5.3; WMMP Table 3 and section 5.1.1. | <p>Comment Evidence of active collared pika sites were observed at borrow source 33 and 34, and evidence of inactive pika sites were observed at borrow source 38, as well as 40 m from borrow source 16. Tetra Tech EBA has recommended that borrow sources 33 and 34 should not be developed and that further pre-construction surveys be conducted from kilometers 23-39 and at borrow sources 35 and 38.</p> <p>Recommendation a) Is Canadian Zinc willing to commit to either (i) not develop, or (ii) relocate the 2 borrow sources (33 & 34) where collared pika were found? b) What other borrow sources are available to replace borrow sources 33 & 34 that would avoid suitable talus habitat? Please indicate their location along the road alignment. c) If future pre-construction surveys indicate that collared pika are present at any borrow sources including 35 and 38, has Canadian Zinc identified sufficient alternative borrow source options that could replace these two borrow sources and avoid talus habitat?</p> | <p>Oct 24: We believe this IR relates to an issue that does not have the potential to cause effects on territorial land. Nevertheless, we have provided a reply.</p> <p>a) CZN will commit to not disturbing occupied pika locations at borrow sources 33 and 34. CZN will borrow from these locations if this can be done without such disturbance (the talus fans and borrow sites are large relative to pika locations which are sporadic), as directed by a survey biologist. Failing this, CZN will borrow from other sources in the area.</p> <p>b) Borrow sources 35, 37 and 38 are available in talus, although these will be checked again for pika absence before disturbance. Non-talus sources 39 and 40 are also available.</p> <p>c) All talus habitat need not be avoided. Pika appear to be present only at some locations. Borrow sources 39 and 40 are substantial in size and would be sufficient alternatives, although more distant.</p> |
| 3 | Black Bears and Pre-construction Bear Den Surveys; Vegetation and Wildlife Baseline Survey - 17Aug2016 - Section 5.2, Wildlife Mitigation and Monitoring Plan - Updated Draft - 31Aug16 - Section 5.1.3 | <p>Comment Section 5.2 of the 2016 Vegetation and Wildlife Baseline Survey states that “There is the potential to move the Liard Camp to Borrow Source BP159a (KP 158), which is located in an area predicted to be low Black Bear feeding habitat.” Section 5.1.3 of the updated WMMP states that “Canadian Zinc’s current winter road permit does not include a requirement for a bear den survey or monitoring, nor was it considered during the EA or permitting process for that permit. For the all-season road, the first part of the development will include construction of a winter road <i>within the all-season road alignment. That road alignment and borrow sources</i> will be accurately surveyed in the field, likely in the summer. As part of that process, survey crews, together with local and environmental monitors, will be tasked to identify previously used Black Bear dens <i>proximal to road sections that will deviate from the winter road originally constructed in the 1980’s</i>. Old dens that are located during this ground-based reconnaissance will help focus the search area for a more thorough survey in the late fall, prior to denning, as bears are commonly known to re-den in the same general area (Clarkson 1993).” and “The survey will encompass an area within 800 m of Project related footprints that significantly diverge from the current winter road alignment and 1.5 km from borrow sources planned for blasting during the winter period”. “The bear den monitoring surveys are to be conducted in areas of high and moderate predicted denning habitat, within 800 m of the Project footprint where it <i>deviates from the current winter road alignment</i>, and within 1.5 km of borrow sites requiring blasting. The Black Bear hibernating model (Tetra Tech EBA 2016) has identified high, moderate, and low predicted denning habitat and will be used to determine the survey area.” These sections of the WMMP appear to imply that Canadian Zinc is assuming that no bear dens will occur along the current winter road alignment. Canadian Zinc should be aware that the permit for the existing winter road does not constitute a permit to disturb or destroy bear dens that may occur along it. Figures 5a – 5j in the Vegetation and Wildlife Baseline Survey report (17Aug2016) suggest there is ‘High’ potential black bear hibernating habitat along many sections of the current winter road alignment and new alignment areas. Much of the proposed road alignment dated 160422 (which includes portions of the original winter road alignment) and preferred alignment option 160405 pass do not appear as currently disturbed habitat on maps of habitat disturbance produced by Environment and Climate Change Canada (~2010) and the Dehcho Land Use Planning Commission (~2002) (See Figure 1-3 - Appendix 1 attached). This suggests that portions of the existing permitted winter road alignment may be revegetated to a point where it is no longer visible on satellite imagery and will likely require vegetation clearing to accommodate the winter road and upgrade to an all-weather road. Given that most of the existing alignment has not been used since the 1980’s, it is possible that bears could den along or adjacent to the existing winter road alignment in areas where</p> | <p>Oct 24: Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> |

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| | | <p>vegetation along the alignment has recovered.</p> <p>Recommendation</p> <p>a) Please clarify which sections (by providing kilometer posts or a map) of new road alignment Canadian Zinc currently intends to survey for bear dens ahead of construction</p> <p>b) Please clarify whether Canadian Zinc will conduct pre-construction bear den surveys along portions of the current winter road alignment that fall in areas ranked as High potential black bear denning habitat in the 2016 Vegetation and Wildlife Baseline Survey report</p> | |
| 4 | <p>Boreal Caribou Habitat Disturbance Calculations; IR Response 16.1 (April 28, 2016)</p> | <p>Comment (doc)</p> <p>In response to IR #16.1 – Boreal Caribou, Canadian Zinc estimated that the project would contribute approximately 1,700 ha of new buffered disturbance to the overall disturbance footprint within the NT1 boreal caribou population range.</p> <p>It is unclear how Canadian Zinc arrived at this number, which of the alignment options (160405 or 160422) this figure was based on, and whether it included 500 m buffers around borrow pits and borrow pit access roads.</p> <p>Based on the shapefiles provided by Canadian Zinc ENR has calculated that new buffered disturbance from the project would be about 5,515 ha for the 160422 alignment + borrow sources, and about 5,590 ha for the 160405 alignment + borrow sources (including the portion of alignment 160422 + borrow sources from ~KP124 onwards). The new buffered footprint from the 2 alignment options is shown in Figure 4 (Appendix 1 attached). These calculations exclude areas of overlap with the existing buffered anthropogenic disturbance mapped by Environment and Climate Change Canada based on 2008-2010 Landsat imagery and fires = 40 yrs old (1975-2015).</p> <p>Recommendation</p> <p>a) Please clarify how Canadian Zinc arrived at the estimate of 1,700 ha of new buffered disturbance from the project within boreal caribou range</p> <p>b) Please clarify which of the two alignment options west of Grainger Gap is the currently the preferred option</p> <p>c) Please clarify, for the entire length of the proposed all-season road, how many kilometers of the all-season road alignment differ from the currently permitted winter road alignment, and how many kilometers of the all-season road differ from the original winter road.</p> | <p>Oct 24: (doc) Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> |
| 5 | <p>Sundog Creek Realignment</p> | <p>Comment</p> <p>Channel diversions/realignments inherently carry a degree of complication giving the dynamic nature of streams, particularly in mountainous environments. A variety of factors must be taken into account to ensure the realigned channel can support the discharge from the existing channel. If any of these factors are miscalculated or underestimated, there is a potential for wash-outs, slumping and overtopping of the realigned channel which could potentially result in water quality issues downstream. The significance of these events will depend on the design standards for the realigned channel and the return period of future flows in the realigned channel.</p> <p>At the June 2016 technical sessions, there was a line of questioning initiated by the Review Board regarding the rationale to select the Sundog Creek realignment as the preferred option for water/creek management along that section of road (June 15, 2016, pp. 65-67). Further, the proposed method to address sedimentation from diverting the stream to the realigned channel is pressure washing. GNWT is concerned with potential effects related to the diversion (to assist construction and stability of the road) and the proposed pressure washing of the realigned channel prior to connection.</p> <p>Recommendation</p> <p>a) GNWT requests that Canadian Zinc describe how the proposed approach to realigning Sundog Creek realignment will not result in negative effects to the downstream aquatic environment during preparation (e.g. pressure washing), initial flush and operation. This should include information on the design standards for the channel such that a flood would not escape the realignment and cause erosion to the road. Note the channel migrated from the realigned channel naturally and could do so again if not properly designed and constructed.</p> | <p>Oct 24: We believe this IR relates to an issue that does not have the potential to cause effects on territorial land. Nevertheless, we have provided a reply. Re the preamble to this IR - "there is a potential for wash-outs, slumping and overtopping of the realigned channel", it should be noted that these risks already exist for the natural channels present. a) The realignment has been designed to mimic the existing channel in terms of size and hydraulic capacity. It has also been designed to pass the 1:100 year flood. There is no reason to suspect it will perform any less than the existing channel. The existing channel migrated from the realignment channel due to sediment deposition at the inlet to the latter, and the absence of a barrier to the former. Hydraulic assessment of the realignment design indicates that sedimentation will not occur, and there will be a barrier to the existing channel. Hence, migration is highly unlikely. Channel preparation is discussed in our IR6 reply below.</p> |

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| 6 | <p>Sundog Creek Response to Undertaking 26, 2.4.2 Response to Undertaking 32</p> | <p>Comment Regarding the management of sediment during the initial operation of the Sundog Creek realignment, it is noted in 2.4.2 of Undertaking 26 related to the initial construction of the realignment: <i>“The reconstructed channel within the natural streambed material would be washed with pressurized water to allow fine sediments to settle into the reconstructed porous rock stream bed, or collect in a sump at the downstream end of the excavation for subsequent removal. This will minimize suspended solids release when the diversion becomes active.”</i></p> <p>It is unclear as to the extent of pressure washing that will occur in the stream bed or what the anticipated end result will be. Referencing the photo included with Undertaking 32 there appears to be an abundance of silt and sand within the realignment channel. Based on a cursory review, it is not clear how pressure washing will alleviate potential Total Suspended Solids (TSS) issues downstream during an initial flush. In addition, should pressure washing occur, there is limited information on how this water will be managed. Canadian Zinc states that sediment laden waters percolate into porous rock bed or would be collected in a sump for subsequent removal. Quantities of water, its anticipated quality or discharge location have not been provided in any detail. Further, there is no information on how water encountered as the diversion channel is being excavated will be handled.</p> <p>Recommendation</p> <p>a) GNWT requests that Canadian Zinc provide additional detail on the amount of pressure washing required at the and outline the anticipated end result of this work. This should include water use volumes, water source, resultant water quality, resultant waste stream volume, resultant waste stream disposal method and location(s).</p> <p>b) GNWT requests that Canadian Zinc describe any other alternative methods to flush the newly constructed realignment channel such as controlled flushing from the main channel.</p> <p>c) GNWT requests that Canadian Zinc discuss the feasibility of controlling water flows during the first year of the alignment operation by allowing a limited portion of Sundog Creek water through the realignment during the initial flush in comparison with pressure washing.</p> | <p>Oct 24: We believe this IR relates to an issue that does not have the potential to cause effects on territorial land. Nevertheless, we have provided a reply.</p> <p>a) It is our belief that no mitigation is necessary to minimize suspended sediment after realignment channel construction. This is because our observations of these mountainous streams are that turbidity is entirely dependent on stream flows. When flows are gently, the streams are clear. When flows are substantial, there is significant bed load movement and water is turbid. We expect no different in the realignment channel, and no significant difference from areas upstream and downstream. One concern raised was that channel excavation might expose fine material which could then be susceptible to aerosion. Our recent site investigation indicates that abundant fine material is already exposed in the area (see photo), lending further credence to our comments above. We proposed flushing using pumped water as an additional mitigation measure to provide assurance that there would not be significant, additional sediment suspension over background after construction. We would not call this 'pressure washing', which involves very little water. The intent would be to cause a water flow to mobilize and transport any readily erodible fines. The washing would continue until the surface is no longer producing significant fines. The amount of washing will therefore be dependent on the amount of erodible fines present. Similarly, the volume of water required will be dependent on this. The water source has been defined as an off-channel sump in the historical floodplain. The floodplain is huge and the quantity of water in storage can be assumed to be the same. Waste water will be of the same quality as wash water, apart from sediment content. Waste water will be pumped to another sump in the adjacent historical floodplain for infiltration.</p> <p>b) Realignment channel construction will occur at a time when there is no surface flow in the creek in that area. Therefore, controlled flushing from the main channel would not be possible. Further, it is not practical to consider doing this during the following spring since a berm to divert flow into the realignment channel will need to be in place beforehand, and the original channel will be partly occupied by the road. The proposed flushing using pumped water is considered to be the most practical and effective approach with a very low risk.</p> |
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| | | | c) As discussed in b), this is not practical. Further, there would be fish passage concerns by splitting the flow in this manner, since water depth in the split channels would be less than a single channel. |
| 7 | Tetra Tech EBA Memos, Developer's Commitments | <p>Comment The Canadian Zinc responses to undertakings from the Technical Session include several memos from Tetra TechEBA. These memos include several recommendations from EBA (among other references see public registry item #294). As an example, the July 5th memo regarding sediment transport in Sundog Creek makes this recommendation:</p> <p>Our recommendation is for CZN [Canadian Zinc] to commit that the final design will be developed to provide hydraulic/sediment capacity equivalent to the geometry of the existing channel, defined by its geometry, and to mimic the substrate characteristics of the existing channel. Once constructed and commissioned, the realigned channel is expected to be in balance with its hydrologic and sediment inputs, and to convey sediment through the reach in a sustained manner similar to the existing channel, without need for recurring dredging or other planned maintenance.</p> <p>It is unclear whether any or all of the recommendations outlined by Tetra TechEBA in the memos provided have been committed to by Canadian Zinc.</p> <p>Recommendation a) GNWT requests that Canadian Zinc provide a summary of recommendations provided by Tetra TechEBA within responses to the undertakings and clarify which of these have been accepted as commitments and incorporated into Canadian Zinc's project plans.</p> | <p>Oct 7: All recommendations by consultants have been accepted by CZN and will be assumed as commitments. See our reply to Board IR2 which provides a detailed commitments table. We also note that the subject matter in the preamble to this IR does not relate to territorial land.</p> |
| 8 | Permafrost | <p>Comment Throughout the EA process to date, there have been several lines of dialogue regarding permafrost. While GNWT appreciates commitments that Canadian Zinc has made to date regarding development of a monitoring plan and applying best practices to borrow areas when permafrost is encountered (Canadian Zinc Working Commitments Table, September 1, 2016), additional information is still required at the environmental assessment stage to ensure there are no significant adverse environmental effects related to permafrost from all road construction activities. Prior to making formal recommendations on this topic, GNWT requests that Canadian Zinc provide a summary table of all proposed mitigation measures related to reducing or eliminating impacts associated with permafrost.</p> <p>Recommendation a)GNWT requests that Canadian Zinc provide a summary table of all potential permafrost areas and proposed permafrost mitigation measures. This should include a commitment(s) related to reducing or eliminating impacts to permafrost from all road construction activities.</p> | <p>Oct 24: A reply from Tetra Tech EBA is attached, "TT EBA IR2 GNWT#8 MMO4". CZN will undertake a suitable site investigation program to further investigate permafrost issues during the detailed design process, and will implement appropriate mitigations during road construction activities to address those issues.</p> <p>Oct 24: Att.</p> |
| 9 | Winter road crossing | <p>Comment In DAR Appendix 1A, text page 62 (pdf. page 71/198), Canadian Zinc presents two photographs of the Liard River crossing area. The top photograph depicts a downstream routing of the winter ice road and appears to also capture a portion of IAB lands on the east shore of the Liard River. Canadian Zinc has labeled this downstream routing with a red line as the 'primary crossing.' The bottom photo shows a yellow line that is labeled as the 'proposed summer crossing.' GNWT takes this to be the route that the barge would follow to cross the Liard River in summer in either direction.</p> <p>Recommendation 1. GNWT requests that Canadian Zinc clarify if the winter road crossing at the Liard River will converge on and use the barging ramp as identified in DAR Appendix 1E on the north shore, or if the winter road would use a route that does not use the barge ramp. 2. The winter routing appears to be very near the water. Considering the transportation of fuel, explosives and concentrates, what risks does road stability pose with respect to safety? Given that the winter road appears to traverse near-shoreline areas, and given the nature of substances (concentrate) that Canadian Zinc proposes to transport along this path, GNWT also requests a rationale for this downstream</p> | <p>Oct 24:</p> <p>1. The intent is that the summer and winter crossing locations will converge in terms of the banks of the Liard River. The winter road alignment will likely use a portion of the upper part of the barge ramps, which will extend up the exposed river banks above the high water mark.</p> <p>2. The downstream deviation is necessitated by the presence of an open bead of water over a deep channel in early winter on the summer crossing alignment (see DAR Appendix 1, Figure 8 (PR#59)), which likely also means thin ice cover at the same location later in the winter. River water levels are very low in winter, with substantial, gently sloping exposed</p> |

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| | | deviation from a direct route across the Liard River. | river banks. The road alignment would be on the upper part of the exposed banks. Given these conditions, and snow and ice cover, the risk of a spill is considered to be very low and in the unlikely event one occurred, it would be readily contained without migration to the river. |
| 10 | Barging and dredging | <p>Comment DAR Appendix C states on pdf. page 17/63 that “It is anticipated that dredging will not be needed at the Liard Crossing.” On June 16 2016 during the technical sessions (June 16 transcripts page 164), GNWT asked Canadian Zinc if the Liard River would need to be dredged for barging operations. Canadian Zinc reiterated that no dredging would be required.</p> <p>In DAR Appendix 1A, text page 62 (pdf. page 71/198), Canadian Zinc presents two photographs of the Liard River crossing area. The top photograph depicts a downstream routing of the winter ice road and appears to also capture a portion of IAB lands on the east shore of the Liard River. The bottom photo shows a ‘proposed summer crossing.’ GNWT takes this to be the route that the barge would follow to cross the Liard River in summer in either direction. GNWT notes that in the bottom photograph a sand bar runs midstream of the Liard River, parallel to the south shore.</p> <p>In light of the photographs in Appendix 1A on page 62, it appears to the GNWT that the Liard River in this crossing location and at other locations will likely require dredging for crossing given the nature of sand bar formation on this river in this area.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. In light of this apparent need for dredging, GNWT requests the likely required frequency and timing of dredging at the Liard River at the summer crossing. 2. To better understand the volumes of material from the bed of the body of water that the dredging may affect, GNWT requests further information on the model, make and dimensions and maximum load capacity of the barges that Canadian Zinc proposes to use to cross the Liard River. This will also indicate the consequence and probabilities associated with potential spillage of hazardous materials and/or concentrate on the barge landing ramps. 3. GNWT requests that Canadian Zinc revise its impact predictions and mitigations related to barging to include impacts and mitigations related to dredging. | <p>Oct 24:</p> <ol style="list-style-type: none"> 1. The bottom photo on text page 62 shows an open bead of water, not a sand bar. See Also DAR Appendix 11, Figure 3 (PR#125), which provides bathymetry of the area. This shows a single deep channel and no bars. No dredging is expected to be necessary. 2. Dredging requirements are not a factor in barge selection since there won't be any dredging. A low draught vessel will be selected, big enough for one loaded tractor-trailer unit. Further barge details are not available at this time. However, selection specifications will include provision for safe and easy loading/unloading and integration with the proposed ramps. We do not foresee significant risks in terms of spills. 3. No revision is necessary as there will be no dredging. |
| 11 | Aviation-related activities at Wolverine Pass and Grainger Camp | <p>Comment GNWT is aware of the MVEIRB’s explicit scoping out of Canadian Zinc’s proposed airstrip alternatives in the Nahanni National Park Reserve, as stated in Notes to File dated June 19, 2015 and January 8, 2015. GNWT is seeking clarification on Canadian Zinc’s current plans regarding historic airstrips and aviation-related activities outside the Park Reserve. Canadian Zinc’s July 8, 2014 cover letter for the amended land use permit and water licence applications (PR #28) states that Canadian Zinc intends to:</p> <p>... potentially use airstrips, used historically by Cadillac Explorations, to support the project, including road construction, maintenance/monitoring and restoration/closure. Cadillac used three airstrips at the following locations: one at Cat Camp; one just east of Wolverine Pass; and, one at Grainger Camp. [emphasis added]</p> <p>The accompanying land use permit application form describes the operation as including “Reactivation of historical airstrips at Cat Camp and just east of Wolverine Pass to support the project,” but does not mention Grainger Camp.</p> <p>In section 6.3.3 of the DAR (PR #55) and in the DAR Addendum (PR #100), Canadian Zinc discusses flight frequency information in a context largely related to Canadian Zinc’s proposed airstrip within Nahanni National Park Reserve. The DAR Addendum includes brief discussion of using an historic airstrip at Wolverine Pass, but does not mention using an historic airstrip at Grainger Camp.</p> | <p>Oct 24:</p> <ol style="list-style-type: none"> 1. The old winter road and related facilities were developed by Cadillac in the early 1980's. After CZN applied for a LUP in 2003, the application was subsequently ruled to be exempt from environmental assessment by virtue of a Supreme Court of the NWT ruling (May 2005) the undertaking is 'grandfathered' under the MVRMA according to Section 157.1. CZN received the LUP (MV2003F0028), and also holds a new winter road LUP (MV2012F0007). In this EA, CZN has said that we may use the old Wolverine airstrip to support winter activities, as it did previously, subject to agreement by the NBDB since the new winter road alignment was moved to avoid traversing up the valley centre where wetlands exist. We do not consider those activities to be within the scope of assessment for this EA. If the airstrip is |

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| | | <p>The June 15, 2016 technical session transcript (page 44/343) contains discussion regarding what Canadian Zinc identifies as the “Wolverine airstrip,” which led to technical session undertaking #21: Canadian Zinc will provide a map indicating the location of the old winter access road to the old Wolverine airstrip (winter use airstrip)... [emphasis added]. Canadian Zinc’s undertaking response is unclear because the map is not labelled.</p> <p>Recommendation</p> <p>1. What are Canadian Zinc’s current plans for aviation-related activities at Wolverine Pass and Grainger Camp? For each site, please include the following:</p> <ul style="list-style-type: none"> • predicted air traffic at each site during project construction, operations and maintenance, and closure.; • frequency of use, type of aircraft, estimated number of passengers, and volume of material transported; • any changes in predicted frequencies due to the scoping out of airstrips within Nahanni National Park Reserve; • quantities of aviation fuel and related supplies (glycol/de-icing fluid, etc.) proposed to be stored; • any new roads that would be required to connect the historic airstrips to the all-season road; • any seasonal variations in site use – i.e describe winter, spring, summer and fall activities. <p>2. What is the current condition of the historic airstrip at each site? Please provide a labelled map of existing and proposed roads and the historic airstrip at each site. At each site, what activities does Canadian Zinc intend to carry out to make the site suitable for aviation-related use? For example, Canadian Zinc may need to clear overgrowth from the historic airstrips.</p> <p>3. If Canadian Zinc is intending to conduct aviation-related activities at Grainger Camp, how would such use affect when and how Canadian Zinc fulfills its commitment from the Prairie Creek Mine EA to reclaim the site? The commitment is the first one listed on p. 100 of the EA0809-002 Report of Environmental Assessment and Reasons for Decision and reads: “The existing Cat and Grainger Camp sites will be reclaimed. A small tote road to Grainger Camp from the new road alignment would be built for temporary access.”</p> | <p>used, it would only be in winter with a short snow road along the historical winter road alignment to connect it to the all season road. Most likely, the strip will not be used. However, the option remains if there is an urgent need for parts/supplies, or personnel transport, and road access isn't available for some reason, such as a landslide or Liard River crossing issues. The strip would only be suitable for a small plane, such as a 206. Certainly, there is no intention to use the strip as we had proposed for the strip in the Ram area. There are no plans to use the Grainger strip, and therefore this strip will not be discussed further.</p> <p>2. The Wolverine airstrip is still clearly visible on the land, with limited regrowth of shrub vegetation due to the lowland swamp-terrain location. A labelled version of a map provided with our reply to Undertaking 21 is attached showing the Wolverine strip and roads, "Wolverine strip access with labelled roads, ref. IR2 GNWT#11". Limited brush cutting may be needed to use the strip.</p> <p>3. See 1. above.</p> <p>Oct 24: Att.</p> |
| 12 | GNWT - cover Letter | <p>Comment (doc) GNWT cover letter - round 2 information requests EA1415-01</p> <p>Recommendation n/a</p> | <p>Oct 20: (doc) REVIEW BOARD RESPONSE: In response to GNWT’s Round 2 IR Cover Letter, the Review Board will release an updated scope of development and scope of assessment for EA1415-01 prior to the technical report preparation phase. The updated scoping document will address changes to the project that have occurred since submission of the DAR and provide clarity to all parties on scope of development and scope of assessment.</p> |

Government of Canada Round 2 Information Requests

| ID | Topic | Gov of Canada Comment/Recommendation | CanZinc Corporation Responses (unless otherwise indicated) |
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| 1 | GOC - Letter | <p>Comment (doc) Government of Canada information requests cover letter and federal contact list.</p> <p>Recommendation Submission cover letter and federal contact list attached.</p> | <p>Oct 25: (doc) GOV OF CANADA information requests cover letter and federal contact list: See attachment.</p> |
| 2 | GoC - PCA - 1 To: CZN Subject: Camps References: DAR s.6.0 Project Description, Table 6-1: Project Components and Activities, Box 10, p 140, Table 6-2 Equipment Requirements, p 141, s.6.5 Construction Phases, p 152, s.8.4 Temporary Camps, p 169, s.11.5.2 Water Quality, p 243, Benefi | <p>Comment CZN has indicated that TTF as described in the DAR will not be built, rather a long term maintenance camp may be constructed at the proposed TTF (km 86) location or at the camp proposed for km 87.5 and Cat Camp (km 40).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Identify the activities, infrastructure, precise location and footprint for the long term maintenance camp proposed in place of the TTF. 2. If this long term maintenance camp is proposed to be used for human occupation, describe the capacity, water use, sewage and waste disposal methods. 3. Identify and assess all potential impacts to wildlife, vegetation, water quality, and cultural resources that could result from the construction, operation and decommissioning of this proposed long term maintenance camp. 4. Identify the proposed mitigations to effectively manage the potential impacts to wildlife, vegetation, water quality and cultural resources. | <p>Oct 24:</p> <ol style="list-style-type: none"> 1. The Cat Camp and Tetcela Camps will be locations to support road maintenance, and potentially refuge areas in the event of adverse driving conditions. Facilities would include potentially a single trailer, small genset and fuel tank, a laydown area for construction materials (e.g. culverts), and space for the parking of plant. A footprint of approximately 2,000-3,000 m² will likely be adequate, less than the current Cat Camp area, and the permitted TTF. 2. The camps are not intended for occupation, only for periodic visits by maintenance and monitoring crews during shifts (numbering 31 m from surface water, occasional lime addition). At Cat Camp, water supply will be from a tank or the off-floodplain pit already defined for water supply. At the Tetcela Camp, water supply will be from a tank. 3. The potential impacts from long-term camps will be substantially less than those for the temporary camps, which have been assessed. The footprint will also be much less, and in previously disturbed areas. Impacts to water quality will be avoided by following the approach and guidelines noted above. Specifically, the pit privies will be sited to be distant from surface water, and the pits dug in pervious but not highly permeable material above the water table to avoid potential for rapid migration of fecal matter and bacteria. Impacts to all potential receptors will be minimal. 4. Appropriate mitigations are noted above. No additional mitigations are considered necessary over and above those for borrow pits and temporary camps during construction, other than following established guidelines (e.g. NLUG). |
| 3 | GoC - PCA - 2 Source: PCA IR 10 To: CZN Subject: Right of Way Reference: DAR Appendix 2, s.2.2, DAR Appendix 1, s.2 TOR s.6.1 | <p>Comment In response to Parks Canada's IR10, CZN indicated at the technical sessions that the alignment should be within the +/- 50m corridor or at most a deviation of up to 100m. However, no specific locations were identified by CZN as requiring a wider assessment area. In the DAR a geographic scope of assessment is provided for each valued component, based on the location of the project. As a result, the location of the project is essential in the assessment of impacts.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Can CZN please identify the sections of the road for which the proponent is currently not confident to a +/- 50m level of placement accuracy | <p>Oct 11: Before we reply to the requests, we wish to note that we do not agree that so precise a location of the project is necessary in order to assess impacts. A difference in alignment of 50-100 m in terms of location is not considered significant.</p> <ol style="list-style-type: none"> 1. From the western park boundary at Km 17 to Km 24, the road follows the old winter road alignment, except where it crosses Sundog Creek at Km 23. The crossing and approaches are not likely to change significantly. From Km 24 to 29, a new section is to be built. Its alignment is not likely to vary by more than 50 m. From Km 29 to Km 33, the road follows the old winter road. From Km 33 to Km 39, the road alignment is located along the south side of the valley, and is unlikely to vary by more than 50 m. From Km 39 to Km 41, a new section departing from the old winter road |

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| | | 2. If the accuracy remains greater than +/- 50m, what potential footprint is being used for the effects assessment of these specific segments? | <p>is to be built, avoiding terrain issues. Ground confirmation is needed, and there is potential for the alignment to vary by 100 m. From Km 41 to Km 48, the road essentially follows the old winter road, apart from some minor deviations. From Km 48 to Km 63, micro-site terrain issues may lead to alignment modifications on the order of 50 m, except where the road crosses Polje Creek. From Km 63 to Km 80, the road essentially follows the old winter road. From Km 80 to Km 86, the road traverses forest on higher ground and the alignment may vary by up to 50 m. From Km 86 to Km 90, the road follows the old winter road, except at the revised crossing at Km 87. From Km 90 to Km 95, the road crosses a series of low hills on higher ground and the alignment may vary by up to 50 m. From Km 95 to Km 102, the road initially follows the old winter road, but then follows a new alignment to minimize grade. This section has been extensively ground-truthed and is unlikely to change by more than 50 m.</p> <p>2. The footprint of the road will not change significantly, even if alignment accuracy is greater than 50 m. The effects assessment remains the same.</p> |
| 4 | <p>GoC - PCA - 3A Source: PCA IR To: CZN Subject: Borrow Sources- number and type Reference: DAR Appendix 2 and Appendix 1 s.7, DAR Appendix D of Appendix 1, DAR Addendum s.4, and DAR Addendum, Appendix A and F, Parks Canada Management Directive 2.4.7 Sand, Gravel, and Other Earth Material: Excavation</p> | <p>Comment The proponent has provided information on the potential locations of borrow sources and identified which borrows will be within the ROW of the proposed all season road (Allnorth Response to Information Requests, Section 3.2 (p 8), Appendix B, Table 14, Updated Borrow Pit Summary). The response to Information Request # 11 also describes some of the criteria which will be considered in a Detailed Borrow Site Plan and Design for each borrow site. While the borrow table update has been helpful, Parks Canada would like to better understand the proposed borrow sources in terms of their proximity to both ground water and flood plain and how the proponent will deal with any borrow interactions with water. In general Parks Canada describes a "borrow pit" as a below grade style pit, whereas a 'landscape borrow' would be free draining and more of a widening of the corridor and/or flattening of backslopes.</p> <p>Recommendation 1. Identify which proposed borrow sources may be excavated below grade or ditch elevation and if there will be free draining pits or ponds. 2. Describe the estimated depth of excavation to the road/ditch grade. 3. Provide a detailed borrowpit management and reclamantion plan. This plan must include a commitment to managing and reclaiming borrow sources excavated below grade to prevent the accumulation of water.</p> | <p>Oct 24: Refer to the document "Allnorth IR2 PC#3A3B3C MVEIRB1,8" attached. Oct 25: Att.</p> |
| 5 | <p>GoC - PCA - 3B Source: PCA IR To: CZN Subject: Borrow Sources- number and type</p> | <p>Comment Refer to GoC - PCA - 3A comment</p> <p>Recommendation 4. For proposed borrow sources located in or near water courses describe: • which borrow sources are in the floodplain (active, inactive, historic) or the distance to the floodplain • the proposed depth of excavation relative to the adjacent watercourse including the high water mark • the depth of the excavation relative to the water table • the horizontal setback proposed for the site and any natural or constructed buffer characteristics</p> | <p>Oct 24: Refer to the document "Allnorth IR2 PC#3A3B3C MVEIRB1,8" attached.</p> |

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| 6 | GoC - PCA - 3C Source: PCA IR To: CZN Subject: Borrow Sources- number and type | <p>Comment Refer to GoC - PCA - 3A comment</p> <p>Recommendation 5. Specifically related to KP 39.8: In response to GNWT's IR 18 CZN indicated that the borrow source at KP 39.8 is located on part of the old floodplain that is now stabilized and above the HWM and that a buffer would be maintained between the borrow and the channel, and precautions taken to limit sediment release from the borrow. • Parks Canada would like CZN to further describe the HWM? Is this an annual mean level? • What flood return event would result in the water level to interact with the borrow source? • Has hydro-technical analysis been completed?</p> | <p>Oct 24: 5. CZN considers the HWM to be approximated by the Q2 level. Hydro-technical analysis was conducted for Sundog Creek at Km 33-38. The Q2 projections match very well the outline of wetted areas and immediately adjacent ground as shown on the 2012 LiDAR images. This was also ground-true and verified in July 2016. The proposed borrow pit would be some further distance from the Q2 line. Measures would be implemented to minimize the risk of flood-borrow interaction, as necessary (i.e. blocking low spots to above a flood level of ~1:10). Note, borrow activities would occur in either summer or winter during periods of low or no surface water. Also refer to the document "Allnorth IR2 PC#3A3B3C MVEIRB1,8" attached.</p> |
| 7 | GoC - PCA - 4 Source: PCA IR To: CZN Subject: Borrow Sources- Development and Management Reference: DAR Appendix 1, DAR Addendum Appendix A, Indian and Northern Affairs Canada (2009) Northern Land Use Guidelines: Pits and Quarries, Price, W.A. (2009) Prediction manual for drainage chemistry from su | <p>Comment Canadian Zinc has committed to testing for ARD/ML potential during detailed design phase on representative samples based on the guidance of a professional ML/ARD geochemist (Response to IR # 12, Commitment #3). They have indicated that any borrow with a positive identification of ARD/ML potential will not be used. However, they have also indicated that any borrow with marginal ARD/ML potential will either not be used, or used based on mitigation procedures defined by a professional ARD/ML geochemist. They have indicated that if material will be borrowed that has marginal ARD/ML potential, procedures for use will be defined by a professional ARD/ML geochemist to avoid significant impacts, and this may include monitoring, as necessary. Parks Canada is unclear what "marginal" ARD/ML potential means. Parks Canada notes that metal leaching and/or acid rock drainage has the potential to impact water quality, vegetation and wildlife health and mortality.</p> <p>Recommendation 1. Please describe what indicators will be used to determine if borrow material has "marginal" ARD/ML. Indicate the thresholds that will be used to determine a "marginal" result for ARD/ML. 2. Please describe the criteria that will be used to determine if a borrow pit with a "marginal" ARD/ML result will be used. 3. Please outline the assessment of impacts for the potential use of borrow with "marginal" ARD/ML including potential impacts, mitigations and monitoring program.</p> | <p>Oct 11: 1. The threshold for determining ARD/ML absence will be low (strict), based on static testing (ABA), and if necessary, kinetic testing (shake flask). It is possible that a professional geochemist may determine that some material may fall into a 'grey' area, but that the ARD/ML potential is still likely low. Therefore, the geochemist may determine that the material can be safely used with mitigations. We are not going to pre-judge the geochemist's opinions or recommendations, except to say that whatever they decide will be protective of the environment and will be followed. 2. Geochemical criteria will be determined by a geochemist. CZN will then decide whether to follow those criteria in terms of the applicable mitigations, or simply use a different borrow. 3. Impacts and mitigations will be determined by a geochemist to render use of the material low risk, if it is to be used at all. Monitoring is unlikely to be necessary since it would imply a level of risk CZN would not want to incur, but we will await the recommendations of the geochemist.</p> |
| 8 | GoC - PCA - 5 Source: PCA IR To: CZN Subject: Borrow Sources- Development and Management Reference: DAR Appendix 1, DAR Addendum Appendix A, Indian and Northern Affairs Canada (2009) Northern Land Use Guidelines: Pits and | <p>Comment CZN has indicated that each borrow source will be evaluated for permafrost and ground ice during a detailed borrow site plan and design and that where permafrost is encountered, the borrow source will not be used or if used the development, monitoring and reclamation of the borrow pit will be guided by a geotechnical engineer. Parks Canada remains concerned over the potential for long-lasting effects to the delicate ground thermal regime if permafrost is allowed to degrade, and the effects to the surrounding terrain if massive ground ice was allowed to melt.</p> <p>Recommendation 1. Please provide a draft permafrost mitigation and monitoring plan for borrow sources and identify specific reclamation strategies for situations where permafrost could be encountered. 2. Please describe the criteria that will be used to determine if a borrow pit where permafrost is encountered will be used as borrow.</p> | <p>Oct 24: Refer to the document "TT EBA IR2 PC#5 MMO2" attached. Oct 24: Att.</p> |

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| | Quarries, Price, W.A. (2009) Prediction manual for drainage chemistry from s | | |
| 9 | GoC - PCA - 6 Source: PCA IR 16 To: CZN Subject: Road Operations Standards | <p>Comment In response to Parks Canada IR16 CZN indicated that they have no objection to revising the Road Operations Plan (ROP) with a commitment to abide by and enforce GNWT commercial truck loading restrictions, and adequately justify any variance from these allowances with respect to truck and trailer configurations. They proposed to make these revisions at a later date prior to operations which is further reflected in Commitment #16: CanZinc commits to updating the road operations plan to incorporate GNWT Road Operation Guidelines, for review and approval by the regulator(s) prior to relevant operations. Parks Canada recommends that CZN revise their ROP to meet GNWT restrictions and provide this revised plan during the EA phase. Justifications for any known variances from these allowances should also be provided.</p> <p>Recommendation 1. Please revise the ROP to meet GNWT restrictions and provide this revised plan during the EA phase. Provide justifications for any known variances from these allowances.</p> | <p>Oct 24: The ROP will be subject to further review and revision, likely as a condition of LUP's. CZN has made the commitments noted in the comment. The Review Board previously noted that it is acceptable to provide either the framework of a management plan, or a draft of the plan itself. Therefore, CZN will provide a revised version of the ROP for further review subsequent to the permitting phase. However, for clarity, the GNWT rules and restrictions are applicable to highways and other roads under their jurisdiction, such as the Nahanni access road, for safety and the protection of the road bed against excessive damage. The latter is a maintenance concern. Since CZN will be responsible for maintenance on the all season road, the 'damage' issue for the GNWT relates to only the Nahanni access road and the Liard Highway. CZN will be discussing with DOT the potential for obtaining an exemption for a higher GVW. If CZN obtains such an exemption, we would operate higher GVW trucks on the all season road also. Note that the increased weight would only be in connection with trucks out-bound from the Mine carrying concentrate.</p> |
| 10 | GoC - PCA - 7 Source: PCA IR 17 To: CZN Subject: Road Maintenance Standards Reference: DAR Addendum, Appendix A s.2.4 and 2.6, DAR s.6.3.4, Appendix A-Road Operations Plan s.7 and 5.1, Road Construction and Maintenance Plan, PWGSC Bridge Inspection Manual (2010), Parks Canada Bridge Maintenance and | <p>Comment In commitment #7 CZN commits to developing a suitable inspection and monitoring plan regarding drainage patterns along the road alignment to maintain natural drainage and to inform adaptive management actions (including location of equipment required for these management actions such as backhoes and steamers). The maintenance of natural drainage patterns throughout the project area is a critical component of the current impact assessment. A draft of the proposed inspection and monitoring plan regarding drainage patterns is required for review in the EA phase to determine if the proposed mitigations and monitoring will be effective in preventing significant environmental effects.</p> <p>Recommendation Please provide a draft inspection and monitoring plan regarding drainage patterns.</p> | <p>Oct 24: In our first IR round reply to Parks #17, we said "For Bridge and Major Culverts Inspection, Allnorth proposes: (1) A road permit holder must (a) ensure that a qualified person such as a road maintenance supervisor carries out a visual inspection of each bridge or major culvert associated with the road at least once every year after the bridge or major culvert is constructed, and (b) make a record of the inspection. (2) A road permit holder must (a) ensure that a qualified person under the direction of qualified Professional Engineer carries out a detailed inspection of each bridge or major culvert associated with the road, and (b) make a record of the inspection, (i) subject to subparagraph (ii), at least once every 3 years after the bridge or major culvert is constructed, or (ii) at such intervals as specified in writing by a professional engineer." We also noted that this information would be included in a revised Road Construction and Maintenance Plan (RCMP). We have previously stated that certain camps will be retained to support road maintenance during operations, with camp locations at approximately Km 40, 87 and 122. Maintenance equipment would be stationed at the camps when not in use. This will include graders, loader, dump truck, backhoe and steamer, the location of which will be based on location of most frequent use. This information will be fleshed out when the RCMP is revised. For now, it is considered a suitable framework for inspection and monitoring for drainage control, and as for our reply to Parks IR6 above, is satisfactory for the EA phase and considering that further review and details will be added prior to road construction.</p> |
| 11 | GoC - PCA - 8A Source: PCA To: CZN Subject: Water quality - Use of soak-away | <p>Comment (doc) Release of grey and brown water into soak away sumps has the potential to affect local surface and shallow ground water through the release of nutrients, pathogenic bacteria, heavy metals and pharmaceutical compounds. These compounds have the potential to migrate into surface water bodies (lakes, rivers, and streams) and can negatively affect aquatic life. Further, even with the addition of lime to sumps, odours that</p> | <p>Oct 24: (doc) CZN had a conversation with Parks Canada on October 17, 2016. We confirmed that the main issue of concern re temporary camps is brown water (sewage). Grey water will be disposed of via sumps. This water will consist of wash water from a kitchen, showers and laundry. Only environmentally friendly and phosphate free products will be used. The GNWT Northern Land Use Guidelines for</p> |

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| | <p>sumps Reference: DAR 11.5 (pages 242-244), DAR Addendum s.4.17 (Page 44), Indian and Northern Affairs Canada. Northern Land Use Guidelines, Camps and Other Support Facilities. 2010, p 23. CZN Response to Undertaking 1 (J</p> | <p>attract wildlife may be produced and potentially result in human wildlife conflict incidents. CZN has indicated sumps may be used for the disposal of grey and brown water at camps proposed at km 65 and 87 (July 3, 2016). Ground water flow in these areas is characterized as low, which allows for a long time before sump seepage would reach a surface water body. CZN asserts that organic matter and bacteria will degrade completely prior to entering a surface water body. Soak-away sump locations need to be carefully evaluated so that they do not contribute deleterious substances to either surface or shallow ground waters. Enough information has not been provided to date to determine the environmental risk from the use of sumps in these locations.</p> <p>Recommendation For all proposed sumps processing brown water (sewage) please provide the following:</p> <ol style="list-style-type: none"> 1. Describe the likely chemical composition of water that will be discharged, anticipated discharge volumes expressed as daily, weekly, or if appropriate, monthly loadings 2. Identify and assess any environmental impacts associated with treatments to grey and brown water. 3. Describe the depth of the shallow water table and the depth of the buffer between the shallow water table and sump. 4. Provide designs for all soak-away sumps, their use and maintenance. 5. Provide the septic field standards which will be applied to sump development. 6. Discuss potential for transport of sewage off site to an approved facility including the potential for community contracts and employment. | <p>Camps indicates that, for 'large' camps, sewage should be disposed of in a portable sewage treatment plant or engineered lagoon (p. 21). The latter is considered impractical for the proposed camp locations. Therefore, we propose either a treatment plant or off-site disposal in a suitable treatment/disposal location. If on-site treatment is used, plant effluent will be sent to the grey water sump. Therefore, there will be no brown water sumps servicing the temporary camps.</p> <ol style="list-style-type: none"> 1. The grey water will only contain residual soap and grease from kitchen washing. Sewage effluent, if disposed to the sump, will not contain pathogens but will have an elevated level of BOD. The typical rule-of-thumb for water consumption and therefore wastewater is 270 L/person/day. For a 50 man camp, this equates to 13.5 m3/day. 2. There should be no environmental impacts from sump water if siting and construction guidelines are followed. The deleterious organic compounds in the water should degrade long before reaching surface water. The sumps will be sited as distant from surface water as possible. 3. Sumps can only be effective in terms of water dissipation and organic matter decay if they are sited in pervious material a sufficient distance above the water table. A variety of guidelines are available for sump siting and construction. One such document is "Design Specifications for Sewage Disposal Systems, A Guide to their Design and Maintenance" issued by the Yukon Govt. (attached). This document specifies a minmum distance of 1.2 m between the sump bottom and the water table. Some relaxation of this requirement may be acceptable since raw sewage is not being disposa of. The depth to water table will need to be determined at the proposed sump locations. 4. Sump design and maintenance will follow established guidelines, such as the Yukon guidelines noted above, with consideration of the type of water being disposed of, i.e. not sewage. 5. Septic field standards are not considered to be applicable since sewage will not be disposed of in this manner. 6. Off-site sewage disposal is an option. If this occurs, CZN's sewage plant at the Mine would be the first choice, if accessible. If not, the road construction contractor will need to arrange for disposal as part of their contract. |
| 12 | <p>GoC - PCA - 8B Source: PCA To: CZN Subject: Water quality - Use of soak-away sumps Reference: DAR 11.5 (pages 242-244), DAR</p> | <p>Comment The INAC Guidelines for Camps and Associated Facilities (2010) states that the use of sumps is only appropriate for small camps while for larger camps on site treatment or removal is required (INAC Guidelines for Camps and Associated Facilities, 2010). Similarly, Parks Canada discourages the use of soak away sumps for brown water and would require an extensive field monitoring plan that quantifies the lateral and vertical diffusion of sewage adjacent to soak away sumps. Parks Canada remains concerned with the potential for significant and long term effects of the proposal to use sumps for sewage and grey water in the park. Parks Canada will carefully consider and evaluate additional information provided by the proponent as outlined in the</p> | <p>Oct 24: Water quality monitoring is not considered to be necessary since sewage from temporary camps will not be disposed of in sumps.</p> |

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| | Addendum s.4.17 (Page 44), Indian and Northern Affairs Canada. Northern Land Use Guidelines, Camps and Other Support Facilities. 2010, p 23. CZN Response to Undertaking 1 (J | <p>corresponding recommendation.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Provide details of a water quality monitoring program designed to document that the use of soak-away sumps is not adversely affecting surface water and shallow ground waters (example sampling design has been provided) 2. Identify the water quality effect thresholds that will be used to determine if discharge of brown water is likely to affect aquatic life 3. Discuss potential for transport of sewage off site to an approved facility including the potential for community contracts and employment. | |
| 13 | GoC - PCA - 9 Source: PCA IR29 To: MVEIRB Subject: Water quality - Monitoring Reference: DAR s.11.0, DAR Addendum, Section 14.0, Appendix A. Undertaking #8 Tech Sessions (June 13, 2016), Canadian Zinc Letter to the Board (June 22, 2016) TOR s. 7.3.5, 7.3.7, 11 | <p>Comment</p> <p>Undertaking #8 was developed in the Tech Sessions to ensure that CZN, PCA, ECCC and the GNWT meet and report back tot he Board regarding appropriate water monitoring approaches including parametres, frequency, sampling locations and adaptive management approaches. It was PCA's understanding that the intent of this undertaking was to ensure that a robust and effective water quality monitoring approach be developed to monitor impacts on water quality for the whole road. Shortly after the tech sessions it was indicated that Undertaking #8 had been moved to a commitment. Currently, commitment #4 and #10 deal with the issue of water quality. Commitment #4 commits CZN to implement sediment and erosion control, however it does not include a commitment for water quality monitoring. Commitment #10 commits CZN to conducting water quality monitoring upstream and downstream of areas where water will be allowed to top the raod including the approach tot he Casket Creek crossing, but does not refer to any other crossings. Unfortunately these existing commitments are limited in scope and do not fully capture the intent of Undertaking #8.</p> <p>Recommendation</p> <p>Re-establish undertaking #8 with the following wording: CanZinc, Parks Canada and ECCC (and possibly the GNWT) will meet and report back, prior to the technical report phase, regarding appropriated water monitoring approaches including parameters (turbidity, pH, DO, conductivity), frequency, sampling locations and application of an adaptive management approach. This information will then be used by the proponent to develop a water quality monitoring and management plan for the entire proposed all season road.</p> | <p>Oct 20: See attached CanZinc letter to the Review Board.</p> <p>Oct 20: REVIEW BOARD RESPONSE: The Review Board has requested additional information and commitments around fish and fish habitat monitoring as well as monitoring at crossings in round 2 MVEIRB IRs 7 and 8. Although sufficient information around monitoring is required during the EA process to complete an effects assessment, many of the details are dealt with during the regulatory/permitting phase following the EA. By turning undertaking #8 into a commitment, CanZinc has agreed to work with Parks Canada and ECCC, and possibly also the GNWT, in establishing appropriate water monitoring approaches. This commitment will continue to be applicable in the regulatory and permitting phases.</p> |
| 14 | GoC - ECCC - 1 Boreal Caribou IR#16 Response | <p>Comment</p> <p>In their response to IR#16, the Proponent estimated 1,700 ha of new disturbance within the NT1 boreal caribou range. Consistent with the Boreal Caribou Recovery Strategy, the proponent also states in Table 1 that considerations were given to minimize the footprint of development by including disturbed habitat where possible. Based on location of the proposed all-season road alignment, preferred alignment option, possible borrow sources and access roads, the majority of the proposed footprint within NT1 is considered new disturbance by Environment and Climate Change Canada (ECCC) and the disturbance estimate should be greater. It is unclear which alignment scenario the Proponent used to estimate habitat disturbance, and what the areal difference is between the alignment options. ECCC also notes an area where the preferred alignment option closely parallels, but does not overlap, existing disturbance (kms 111-120). No rationale, in the context of minimizing boreal caribou habitat disturbance where possible, is provided for this particular alignment choice. To aid the Proponent with their response, the ECCC disturbance layers used to inform the boreal caribou recovery strategy are available here: http://open.canada.ca/en/open-data</p> <p>Recommendation</p> | <p>Oct 24: Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> <p>Oct 24: Att.</p> |

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| | | <p>ECCC requests that the Proponent provide:</p> <p>A) A revised boreal caribou habitat disturbance estimate for a) the proposed all-season road alignment and b) preferred alignment option. Estimates should include areas currently proposed as borrow sources and access roads and the methods should be consistent with those outlined in the Recovery Strategy.</p> <p>B) A map focused on the NT1 portion of the proposed project showing the proposed and preferred alignment options, the new NT1 habitat disturbance created by the proposed project and the existing anthropogenic and fire disturbance layers used to inform the Recovery Strategy.</p> <p>C) A rationale for the selection of preferred alignment option, near kms 111-120, instead of using existing disturbance.</p> | |
| 15 | <p>GoC - ECCC - 2 Migratory Birds Undertaking #14 response All North Response to IRs, Appendix G TOR</p> | <p>Comment</p> <p>A) In their response to undertaking #14, the Proponent confirmed that during EA 0809-002 the effects from habitat loss and fragmentation for migratory birds and avian species at risk were not assessed for the winter road alignment. The Proponent further states that as the winter road is permitted, it is appropriate to only consider potential effects from those sections of the proposed all-season road alignment that “diverge significantly” from the winter road.</p> <p>B) The effects assessment underestimates the direct and indirect loss of habitat and fragmentation for migratory birds, including avian species at risk for several reasons. The updated route maps (Appendix G; All North Response to IRs) show little spatial overlap between the permitted winter road alignment and the proposed all-season road alignment, particularly in the eastern portion. It is unclear which areas of the footprint were assessed for habitat loss and fragmentation, how the Proponent defines “diverge significantly” and whether the use of the term has an ecological basis (e.g. home ranges) or is a measurement of distance. The permanent loss of habitat and the indirect effects on migratory bird habitat from an all-season road are not comparable to those of a winter road. Although a winter road may change the avian species assemblage and abundance, usually sufficient substrate and vegetation remains available as habitat for nesting birds. In addition, the current status of vegetation along portions of the permitted winter road alignment is described as having naturally regenerated due to the winter road not being used since the early 1980’s. Regardless of which baseline condition (i.e. early successional or mature forest) the Proponent uses in its effects assessment, the habitat along the entire alignment of the road represents valuable habitat for migratory birds, including species at risk. Direct and indirect alteration of habitat including direct road footprint impact on wildlife and wildlife habitat is also included in the Terms of Reference Section 7.3.8.2 as an effect to be evaluated in the DAR.</p> <p>Recommendation</p> <p>ECCC requests that the Proponent provide:</p> <p>A) Clarification on the definition and use of “diverge significantly” and the basis for which it is appropriate in the effects assessment.</p> <p>B) A revised effects assessment of habitat loss and fragmentation for the entire proposed all-season road alignment and preferred alignment options for migratory birds including avian species at risk.</p> | <p>Oct 24: Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> |

MVEIRB Round 2 Information Requests

| ID | Topic | MVEIRB Comment/Recommendation | CanZinc Corporation Responses (unless otherwise indicated) |
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| 1 | MVEIRB #1: Scope of development update (DAR Section 6, DAR Addendum Section 4) (for CanZinc) | <p>Comment The scope of development for the Prairie Creek All-season Mine Road has changed since the submission of the original DAR and DAR Addendum. For example, airstrips within the Nahanni National Park Reserve (NNPR) are not part of the scope of development, borrow sources along Sundog Creek have been removed to avoid wildlife impacts, and use of the Tetcela Transfer Facility (TTF) for concentrate storage has been removed from the scope of development.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Please update maps: Remove locations that are no longer part of the scope, such as the Tetcela Transfer Facility and the airstrips within NNPR, and add any additional known locations of project facilities (e.g., known camps, borrow pits, etc). This is particularly requested for the following figures: <ul style="list-style-type: none"> o PR#102 DAR Addendum Appendix E Figures 1 and 2. o PR#121 DAR Appendix 7 Figures 1 and 2; and o PR# 55 Figures 1-2; 2. Please update scope of development: Submit a written updated scope of development (suggest table format) that includes all structures and project components along the final road route re-alignment, including updated kilometre post. Please also include any known locations of: <ul style="list-style-type: none"> o any other proposed facilities or structures during construction or operations phase. o any planned airstrip outside NNPR; and o watercourse crossings, creek re-alignments, bridges and culverts; o updated borrow pit locations (exclude sites already identified to be removed to mitigate adverse impacts); o camps during road construction; | <p>Oct 24: Refer to the document "Allnorth IR2 PC#3A3B3C MVEIRB1,8" attached. Also refer to "Updated figs from DAR Addendum Appendix E" attached for updated figures showing the proposed whole road development.</p> <p>Oct 24: Att.</p> <p>Oct 25: Att.</p> |
| 2 | MVEIRB #2: Commitments table update (DAR Table B) (for CanZinc) | <p>Comment Although the Review Board has amalgamated commitments made by CanZinc during the first round of information requests and the technical sessions, any commitments made by CanZinc during other phases of the project are not included in the Commitments Table document.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Please provide an updated Commitments Table that includes all commitments that CanZinc has made to date. For example, add commitments made from the time of the DAR submission through completion of DAR Adequacy review, including DAR Addendum, appendices, and other submissions. | <p>Oct 24: An updated commitments table is attached. The table includes commitments made in the DAR, and in all EA phases since, including IR2. Many commitments were made relating to the design of structures or construction elements, and in the frameworks of, or drafts of, management plans. These designs and plans will be subject to regulatory review as conditions of permits before construction. As a result, rather than include all of those commitments in the commitments table, a general commitment has been made in the table to follow through on the design and management plan commitments. At the conclusion of EA0809-002, CZN compiled a full list of commitments, which were summarized in Table 3-1 of the Consolidated Project Description (CPD) dated February 2012 and submitted to the MVLWB. A copy of the document is attached. CZN will adopt those commitments related to the winter as commitments for this EA, as appropriate.</p> <p>Oct 24: Att.</p> <p>Oct 24: Att.</p> |
| 3 | MVEIRB #3: Access management | <p>Comment Access control was discussed during the technical sessions June 13. Maps were provided by CanZinc, NBDB, and GNWT regarding Indian Affairs Branch (IAB) Lands as a possible location to set up an access control</p> | <p>Oct 24: CZN participated in a community meeting in Nahanni Butte on October 13, 2016 (see posted Meeting Record). During the meeting, land tenure and access control was discussed using maps. CZN informed the Band that CZN intends to apply to INAC for a</p> |

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| | and control (Tech Session transcripts June 13 p66-73) (for CanZinc) | <p>mechanism to limit vehicle traffic along the all-season road to mine traffic only and use by residents of Nahanni Butte.</p> <p>Recommendation</p> <p>1. Please provide an update on discussions with NBDB and Government of Canada on use of the Indian Affairs Branch lands (km165 – km 160) to construct controlled access.</p> | <p>'Permission to Occupy' (PTO) for that portion of the road crossing IAB Lands. The basis and requirements for this application are described in INAC's letter to the NBDB dated June 10, 2016 (PR#228). CZN explained that the NBDB would retain rights to the land and would be able to control access via a gate. CZN also repeated a commitment to operate a checkpoint west of the Liard River to address a concern that unauthorized road users could gain access via the river, by-passing the IAB Lands gate. CZN is currently negotiating a Traditional Land Use Agreement with the NBDB, which when concluded, will be a basis for a Band Council Resolution supporting the PTO, as prescribed by INAC. CZN also informed the Band of its intention to contact the GNWT Dept. of Aboriginal Affairs. The dept. is involved in negotiations related to land claims (the Dehcho Process). The purpose of the contact is to inform the dept. of the land tenure situation with respect to the IAB Lands, and a need to ensure that CZN's rights of access and NBDB's ability to control access are maintained in the land claims agreement.</p> |
| 4 | MVEIRB #4: Rare plant field survey and management plan (PR#289 p20) (for CanZinc) | <p>Comment</p> <p>The July 2016 Wildlife and Vegetation baseline survey noted that the timing of the survey was too late to identify flowering plants. "An early season rare plant survey is recommended prior to construction" and "if rare plants are found, measures such as avoidance or mitigation may be implemented."</p> <p>Recommendation</p> <p>1. Would CanZinc commit to the following:</p> <ul style="list-style-type: none"> o to conduct an early season rare plant survey prior to construction for the project footprint; and o to develop a rare plant management plan. | <p>Oct 24: CZN commits to conducting a suitable early season rare plant survey prior to construction of the all season road for the all season road project footprint, and to developing a rare plant management plan.</p> |
| 5 | MVEIRB #5: Collared pika survey and site avoidance (PR#289 p22) (for CanZinc) | <p>Comment</p> <p>The July 2016 field survey demonstrated that collared pikas are present in or have occupied talus habitat as far east as km 38 along road route.</p> <p>Recommendation</p> <p>1. Does CanZinc commit to the following:</p> <ul style="list-style-type: none"> o to avoid talus areas with identified collared pika habitat, especially in the Sundog Creek area; and o to conduct collared pika surveys in potential habitat within realigned areas and any potential collared pika habitat within borrow sites, including borrow sites 16, 35, and 38. <p>2. If there are locations where avoidance/realignment is not possible, what mitigation measures will be in place to minimize impacts to pika or pika habitat?</p> <p>3. Please also confirm whether borrow sources 33 and 34 have been removed from the scope of development in order to avoid active collared pika sites.</p> <p>4. Please add any agreed upon commitments to the Commitments Table (See IR 2).</p> | <p>Oct 24: Refer to the document "TT EBA IR2 Wildlife and Veg Responses GNWT1,3,4 EC1,2 RB5" attached.</p> <p>Oct 24: Att.</p> |
| 6 | MVEIRB #6: Road length calibration (related to undertaking #37) (for | <p>Comment</p> <p>CanZinc was asked to confirm whether road length calibration was completed in preparing Table A1 of the landslide risk analysis report. It seems from the response prepared by CanZinc that CanZinc misunderstood what was being asked for with respect to this undertaking. It was not suggested that the route should be subdivided into 1 km-long increments and the risk analysed for every increment. There is no need to make any changes to the lengths of the segments as presented in Table A1. What is required is for CanZinc to ensure that</p> | <p>Oct 24: Refer to the document "TT EBA IR2 MVEIRB#6 MMO3" attached.</p> <p>Oct 24: Att.</p> |

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| | CanZinc) | <p>frequency values presented account for the varying lengths of the segments. It is suggested that all frequency values are calibrated to an equivalent value for a 1 km-long segment length. This approach is considered to be consistent with standard professional practice. If this approach is taken there should be no reason for local ‘loss of detail’ or local over or under exaggeration of landslide frequency as suggested by CanZinc in the response to the IR. There is no objection to CanZinc calibrating to a larger length (say 3 km) if 1 km is considered to be too short considering the broad natures of slope instabilities in some areas. If the differences in the lengths of the segments can be shown to be negligible, it would be justified to make no further changes.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. CanZinc to provide a revised response to the Undertaking. | |
| 7 | MVEIRB #7: Fish and fish habitat monitoring (related to Sundog Creek Re-alignment and undertakings #26 and #32) (for CanZinc) | <p>Comment</p> <p>Tetra Tech (July 5, 2016 and August 10, 2016) and Allnorth (August 10, 2016 and August 17, 2016) provided additional details on the proposed Sundog Creek realignment as well as a high level commentary on monitoring that will be undertaken. Canadian Zinc provided a response to Undertaking #32. These documents provide a clear description of the proposed works. However, design of river channels that are intended to mimic natural processes (hydrology, sediment transport and channel evolution) is challenging. Even more so when the existing morphology is braided. These natural processes contribute to the physical attributes of the channel and downstream reaches that support the biologic productivity (flora and fauna) of the system. Due to the risk to biologic productivity and to the natural character of the watercourse, monitoring with potential for adaptive management is recommended.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Would CanZinc commit to developing a detailed monitoring plan for fish and fish habitat that includes adaptive management prior to construction? This plan should include the following: <ul style="list-style-type: none"> o describe which proposed activities would be monitored; characterize existing conditions, post-construction conditions, and future conditions; o review and consider the document “Long-term Aquatic Monitoring Guidelines for New and Upgraded Hydroelectric Projects (Lewis et. al., 2012)”, which provides some stream channel morphology monitoring techniques that might be applicable (with adaptation), including aerial and ground based photo documentation, bed material sampling and cross section surveys; o and implement a before-after-control-impact (BACI) sampling approach (an upstream reach may provide an appropriate control site) because the morphology of braided rivers is not static (rather a dynamic equilibrium is expected) and could change naturally, even without the proposed realignment. | <p>Oct 24: Refer to the document "Hatfield reply IR2 MVEIRB#7" attached.</p> <p>Oct 24: Att.</p> |
| 8 | MVEIRB #8: Stream crossing monitoring (related to Undertaking #27) (for CanZinc) | <p>Comment</p> <p>Locations where the road alignment crosses watercourses (creeks, streams or rivers) can potentially affect stream hydraulics (water depths, speeds and directions) and therefore sediment transport, channel morphology and fish habitat. During the June 2016 Technical Sessions, Canzinc and their consultants noted that bridge abutments would be kept outside the 2-year flood level and that floodplain crossings would be designed to avoid constriction of the 100-year flow. These commitments will limit the impact of the road crossing on channel morphology and fish habitat at stable crossings. However, at crossings where the channel is less stable and has potential to migrate or avulse this commitment is more difficult to meet. Allnorth (August 17, 2016) provide a table of major stream crossings ranked by risk (Table 3). This table notes that the crossings will be “monitored annually and following unseasonal heavy rainfall periods”.</p> <p>Recommendation</p> | <p>Oct 24: Refer to the document "Allnorth IR2 PC#3A3B3C MVEIRB1,8" attached.</p> |

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| | | <ol style="list-style-type: none"> 1. Would CanZinc commit to developing a monitoring plan for crossings and describe what parameters will be monitored prior to construction? This plan should include the following: <ul style="list-style-type: none"> o assessment of impacts to channel morphology and fish habitat, as well as risk to road structures; o Table 3 ranks the crossings from highest to lowest risk - it is expected that the monitoring plan would reflect this ranking, with a higher level of effort directed at the higher risk crossings; o and potential adaptive management options. | |
| 9 | MVEIRB #9: Delineation of potentially stable and unstable terrain (for CanZinc) | <p>Comment</p> <ol style="list-style-type: none"> 1. Km 84 to Km 85: Multiple landslides and tension cracks have now been added to the map in this area. 2. Km 157: Several landslides are mapped upslope from the alignment between Km 158 and 159. 3. Figures A13 and A24: In places where the original Rutter and Boydell mapping has been edited, the original mapping boundaries still appear on the maps. This means that some features (e.g. fans) are now essentially shown by two polygons. In addition, there are some areas where it is unclear what the terrain unit is, for example several areas in the vicinity of the Tetcela River Crossing. <p>Recommendation</p> <ol style="list-style-type: none"> 1. Km 84 to KM 85: Please explain why the area has not been highlighted as ‘potentially unstable’ or ‘unstable’? 2. Km 157: Please explain why the area has not been highlighted as ‘potentially unstable’ or ‘unstable’? 3. Figures A13 and A24: Please ensure that there is complete polygon coverage of the mapping area and no duplication of polygons on Figures A13 and A24. | <p>Oct 24: Replies to this and IR10 from Tetra Tech EBA. Revised map sheets attached. Refer to the document "TT EBA Updated Terrain maps KP0-159 ref. IR2 MVEIRB#9,10" attached. 1. and 3. Additional mapping has been completed between KP 76 and KP 91 2. Additional mapping has been completed between KP 158 and KP 159.2 3. Conflicting Hawes mapping has been removed from Figure A24 as Hawes mapping is at a different scale and was done using hard copy air photos. It is therefore not as accurate as the current mapping.</p> <p>Oct 24: Att.</p> |
| 10 | MVEIRB #10: Permafrost features on figure 13 of the DAR (for CanZinc) | <p>Comment</p> <p>Figure 13 of the DAR states ‘possible thermokarst’ in 2 locations, one on either side of the alignment, in the vicinity of Km 122. This anomaly was not reconciled in the Round 1 IR response. According to the legend for the Rutter and Boydell mapping that has been provided, the cross-hatching represents patterned ground. If the proponent has interpreted there is no patterned ground in this area, the cross-hatching should be removed.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Please update Figure 13 based on thermokarst and patterned ground locations. | <p>Oct 24: Refer to the document "TT EBA Updated Terrain maps KP0-159 ref. IR2 MVEIRB#9,10" attached for revised map sheets. There is no cross hatching on the most recent Figure A19 which shows this area. These features are very small and may or may not be thermokarst. The areas (one in a creek and one a very small wetland) are wetter on the 2012 LiDAR image than they are on the 1994 air photos, which show them as only slightly wetter in 1994 than they were on the 1971 air photos. The 1949 air photo is too low quality to see the features. It is possible that 2012 was a wetter year, but as it is possible that these features could represent thermokarst, thermokarst symbols have been added to Figure A19.</p> |
| 11 | MVEIRB #11: Terrain instability and avalanche mitigation (related to undertaking #40) (for CanZinc) | <p>Comment</p> <p>CanZinc was asked to provide general information regarding the appropriate mitigations for the range of instability conditions that are expected along the route. CanZinc has highlighted a range of mitigations, including the need for inspections, monitoring, and maintenance - these play a key role in risk management. One reservation with respect to the highlighted mitigation methods relates to areas where there is the possibility of deep-seated instability, either in soil or bedrock, in the terrain directly upslope from the alignment. Road drainage control has limited effect in this case. The scale of instability may make it challenging to buttress the slope without adding adverse loading. CanZinc has highlighted the importance of avoiding exposing ice-rich permafrost in order to mitigate potential adverse effects associated with permafrost degradation. This is an important strategy and for this strategy to be successful, additional ground truthing /site</p> | <p>Oct 24: 1. Refer to the document "TT EBA IR2 MVEIRB#11 MMO1" attached. 2. As noted previously, avalanche path mapping was completed by Alpine Solutions for the winter road in May 2012 (see their report attached to PR #178). None of these paths interact with realignments proposed for the all season road (e.g. Km 24-29). As proposed by Alpine Solutions, we will following up on their recommendations prior to road construction, including further reconnaissance, a risk and impact assessment if necessary, and an avalanche hazard management plan. Alpine Solutions did note that "If avalanche risk is determined to be unacceptable, options for mitigation should be considered. Mitigation measures for industrial roads typically includes an avalanche management plan which would specify weather and snowpack monitoring (to determine if avalanche</p> |

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| | | <p>investigation will be needed prior to site disturbance.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. CanZinc to describe additional mitigations options for locations of potential deep-seated instability in soil or bedrock. Please consider the following mitigative options, as appropriate: <ul style="list-style-type: none"> o utilization of full-bench/ end-haul construction technique to mitigate the risk of debris slides in un-compacted fill; o raising design bridge deck elevations and modifying culvert designs to accommodate the passage of debris floods and debris flows; o utilization of enlarged drainage ditches or barriers/fences to mitigate rock fall risks; o installation of rock bolts to mitigate the rock slide risk; o construction of deflection berms to mitigate the risk from debris flows/floods; o and at the crossing points of creeks that are susceptible to debris floods/flows, if the road is routed towards the fan apex, ensure the road is designed such that it can't become a conduit for flow in the event of a channel avulsion. 2. Please also note possible mitigation methods for snow avalanche hazards. | <p>threshold has been reached), safety measures for travelling the road, training for road users, and avalanche explosive control if required. Mitigation measures may also include structural protection or diversion earthworks for high risk areas or for structures such as bridges."</p> <p>Oct 24: Att.</p> |
| 12 | MVEIRB #12: Earthquake safety (related to undertaking #43) (for CanZinc) | <p>Comment CanZinc was asked to provide return-periods for earthquakes of similar magnitude to the 1985 and 1987 events. CanZinc confirmed that in the region of the project, earthquakes with a magnitude of 6 to 7 have a return frequency of approximately 10 years. It is therefore conceivable that a large landslide could be triggered by an earthquake in the project area during its design-life.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. CanZinc incorporate risk mitigation measures into the construction and operation management plans in order to limit the risk to workers from an earthquake triggered landslide. | <p>Oct 24: This has already essentially been addressed in the Road Operations Plan (Section 6) and Road Construction and Maintenance Plan (Section 8) (which can be found in PR#101 Appendix C) with respect to rockfall and avalanches, which by extension covers earthquake - triggered landslides, but we will make this clearer in subsequent drafts of these plans.</p> |
| 13 | MVEIRB #13: Terrain effects assessment significance definitions (for CanZinc) | <p>Comment With respect to the incorporation of the findings of the terrain hazards work into the effects assessment:</p> <ol style="list-style-type: none"> 1. The definitions of the 'Low', 'Moderate' and 'High Significance' terms, as used in Table 7-5 of the DAR Addendum, are unclear. 2. The effects matrix (Table 7-5), presented in the DAR Addendum, considers fuel and concentrate spills. In the case of a landslide, the risk posed to fish habitat and water quality results from a localized large influx of sediment into a watercourse. The risk will vary depending upon the size of the landslide type. This should be addressed in the detailed terrain stability assessments that are to be undertaken during detailed design. <p>Recommendation</p> <ol style="list-style-type: none"> 1. Please provide the definitions of the terms 'Low', 'Moderate' and 'High Significance' terms, as used in Table 7-5 of the DAR Addendum. 2. Please consider large influx of sediment into watercourses during detailed terrain stability assessment. | <p>Oct 24:</p> <ol style="list-style-type: none"> 1. Significance definitions for rankings in DAR Addendum Table 7-5: Fuel - Water: High - Product temporarily on water column, some dissolved phase Moderate - Some dissolved phase Fuel - Fish: High - Potential short-term chronic effects Moderate - Potential for limited short-term chronic effects Low - Chronic effects not likely Concentrate - Water: Low - Very little leachate, no recordable increase in metals content Concentrate - Fish: Moderate - Some long-term effect on sediment and/or benthos metal content Low - Minor long-term effect on sediment and/or benthos metal content. 2. The comment refers to landslides. These are considered to be natural events not triggered by road construction, and therefore it is not relevant in this context to consider sediment influx into watercourses during terrain assessment. If, however, a broader view of terrain instability is taken, a risk of sediment influx is possible from say thaw-induced slumps or erosion of landslides. In this context, we can consider the potential for sediment influx to watercourses as part of detailed terrain stability assessment, and we commit to do so. |
| 14 | MVEIRB #14: Socio-economic | <p>Comment CanZinc has an existing Socio-economic Agreement (SEA) with the GNWT for the approved Prairie Creek</p> | <p>Oct 24: 1. and 2. The simple answer to 1. is yes because pre-employment preparation and skill-development training, as outlined in the SEA, has already been initiated, to the extent</p> |

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| | agreement with GNWT (for CanZinc) | <p>Mine Project. CanZinc confirmed that the all season road Project, “<i>if approved and permitted, will become a part of the broader Prairie Creek Mine Project, and that the definition of “Project” in Appendix A of the SEA would encompass the all season road.</i>” Section 4.3 of the SEA provides for pre-employment preparation and skill development training for NWT residents in general, and Nahendeh Aboriginal Economic Council (NAEC) communities in particular. It seems that for Section 4.3 of the SEA to apply to the all season road, permitting for the all season road must first be in place.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Will there be sufficient time for NAEC communities to access and complete pre-employment preparation and skill-development training outlined in the SEA if those provisions are not in effect until the road is permitted? 2. What pre-employment preparation and skill development training has already occurred for NAEC members specific to the all-season road project? | <p>possible. CZN partnered with the Mine Training Society (MTS) and Aurora College to run two 'Environmental Monitor' training courses. Also, CZN and MTS collaborated to run a road construction course on the access road near the Mine involving hands-on use of heavy machinery, including back-hoe, loader and dump truck, and a timber felling/chain-saw course on the access road. Further training programs can be undertaken during the permitting phase and pre-construction detailed design period, and potential truck drivers will be encouraged to obtain the appropriate licence and experience. It should also be noted that many community members already possess skills that will be suitable for all season road construction and operation, including ice bridge construction, brush cutting and heavy equipment operation.</p> |
| 15 | MVEIRB #15: Employment opportunities (for CanZinc) | <p>Comment</p> <p>Small communities may have a limited pool of skilled workers. Demand for skilled workers may increase when new positions outside of the community become available. CanZinc’s DAR Addendum lists the skills/experience that CanZinc seeks for the all season road project (PR#100 p.73). CanZinc has identified that the all season road project may increase competition for skilled workers, which may constrain CanZinc’s ability to maximize the participation of local workers in their project (PR#293 p.1).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Which positions being sought by CanZinc compete with skilled positions within local communities? 2. What alternatives have CanZinc considered for maximizing the availability of skilled local workers, given the recognized constraint? 3. What alternatives have CanZinc considered to increase the participation rate of non-skilled labourers in local communities? 4. Will the competition described exacerbate any existing vulnerabilities within the community? | <p>Oct 24:</p> <ol style="list-style-type: none"> 1. Theoretically, all of the positions listed in Tables 1 and 2 of CZN's reply to Undertaking 12 are subject to competition between CZN and local communities, except those listed as zero availability in local communities. However, many of the skilled workers in the larger communities (Fort Simpson, Fort Liard) work for contractors (Nogha Enterprises, Rowe's Construction, Beaver Enterprises) who would hope to be involved in road contracts. Also, many other skilled workers currently leave the region because work isn't available locally. Competition is likely to be felt most in Nahanni Butte, but those in skilled jobs may prefer to stay in the village, and again, there are those who leave the community for work that might now be able to stay, including school children coming of age. 2. We believe the opportunity to work at or close to home will encourage skilled workers to return and not leave for jobs elsewhere. 3. See our reply to IR4 above. 4. See our reply to point 1 above. We believe there will be those that will want to stay and work in the community, and those that will prefer work on the access road. Overall, the increase in options is expected to grow the work force and encourage greater regional employment. |
| 16 | MVEIRB #16: Road capacity and infrastructure (for CanZinc) | <p>Comment</p> <p>Canadian Zinc wants to use Hwy 7 and portions of the Nahanni Butte access road for access to the all season road project. Residents and communities use these roads to access essential goods and services. Sections of these roads may require road improvements to accommodate the project, as they are currently not able to accommodate the larger payload vehicles that the project proposes to utilize (73.2T 9 axle).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Please provide details on any increased traffic volumes for the use of smaller axle number and vehicle weight trucks in the scenario that upgrades to Highway 7 are not completed prior to the commencement of ore/concentrate hauling. | <p>Oct 24: The premise for the recommendations is not correct. CZN would require an exemption from the GNWT in order to operate 72.3t GVW trucks on Highway 7 and the Nahanni access road. Such exemption would not be given unless DOT felt the roads could accommodate the higher payload vehicles, and are prepared to commit the necessary resources to maintain the roads for such use. Improvements to Highway 7 from the BC border (Km 0) to the Nahanni access road (Km 131) have recently been made. The road is chip-sealed from Km 0 to 21. Between Km 21 and Km 69, the road has been resurfaced with additional gravel. Repairs have also been made to problem sections between Km 69 and Km 131 by adding gravel. The Km 21-131 section is now in much better condition. Plans have also been made to add further gravel to the Km 87-99 section next summer.</p> |

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| | | <p>2. Provide an update to impact predictions or mitigations that would change due to the increased traffic volumes provided above.</p> | <p>1. CZN's transport plan is based on 63.5t GVW trucks, the numbers for which have been provided. The effects assessment considers a range of truck numbers and weights, including 63.5t and 72.3t GVW vehicles (see our April 1, 2016 letter to the Board). No road upgrades are required to operate these trucks, but both will be subject to constraints in the form of spring load reductions. DOT has advised that the Nahanni access road between the highway and the mine access road will need widening from 6 m to 8.5 m to accommodate mine trucks, and the bed improved. DOT has recently let a contract for gravel addition to the existing Nahanni access road.</p> <p>2. With 72.3t GVW trucks, the number of trucks will reduce. All potential traffic volumes have been included in impact predictions and mitigations.</p> |
| 17 | MVEIRB #17: Major accidents or spill planning (for CanZinc) | <p>Comment The project area, particularly areas within Nahanni National Park Reserve, represents an ecological and culturally important region for many groups, including NBDB and other First Nations.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Has CanZinc engaged with NBDB and Parks Canada in development of its spill management plans? 2. Has Can Zinc engaged with Parks Canada and NBDB on how they would like CanZinc to report of any accidents or spill incidents occurring along the access road and/or in the NNPR? | <p>Oct 24: 1. and 2. CZN engaged with both the NBDB and Parks Canada regarding spill response planning and the reporting of any incidents in connection with the winter road during EA0809-002. The spill response plans developed during this EA are based on the prior plans. The reporting of any incidents will be the same as before. As the Board is aware, Parks will be a regulator during permitting, and spill response and reporting will be a key issue. Also, in our recent discussions with the NBDB, CZN has agreed that the road will be co-managed with the Band, and that the Band will be involved in development and operation plans.</p> |
| 18 | MVEIRB #18: Engagement and traditional knowledge (for CanZinc) | <p>Comment The Liidlii Kue First Nation (LKFN) have identified that they have traditionally used territory within the project area. During the cultural impacts technical session in Fort Simpson on July 5, 2016, the LKFN noted they were currently looking for support from government agencies to fund a traditional knowledge study (PR#276). The LKFN indicated they did have a traditional knowledge policy in place that they would like to see respected and were not satisfied with the level to which they were engaged at the time. The LKFN indicated that they would like time to consult with the Dehcho Land Use Planning Board to consider the traditional knowledge within the <i>Draft Interim Dehcho Land Use Plan</i> (PR#276). The GNWT had commented that the <i>Draft Interim Dehcho Land Use Plan</i> has been updated since the development of the Developer's Assessment Report (PR#284). An oral history shared by an elder at the technical session indicated that the Caribou Flats area may have been a site where the land was used and important to the people and the animals. Grainger Gap and Wolverine Pass were also identified as important caribou range recognized by the community, as the community relies on caribou (PR#276).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. What efforts has CanZinc taken to engage with LKFN since the technical session held July 5, 2016? 2. Has CanZinc received a traditional knowledge report or traditional knowledge information from LKFN since the technical sessions? 3. How has CanZinc considered any received LKFN traditional knowledge in their mitigations and monitoring plans, including considerations for Grainger Gap, Wolverine Pass and any cumulative impacts to Caribou Flats? | <p>Oct 24: Re the IR comment, please refer to our letter to the Board dated August 12, 2016 (PR#285) in which we provide comments on the report of the Fort Simpson Cultural Session, upon which the IR comment is based. In our comments, we noted the existence of Caribou Flats 7 km north of the road, and that the caribou that congregate there do not venture south, apart from a few animals. Regarding Grainger Gap and Wolverine Pass, we disagree that this is important caribou range since we have not seen caribou there in any of our surveys, and it is not core range for either mountain or boreal caribou (trace occurrence for the former, and buffer to range for the latter). Further, our evidence is that local communities do not rely on caribou, rather they primarily traditionally hunt for and eat moose.</p> <ol style="list-style-type: none"> 1. After a number of attempts to meet with the LKFN, both before and after the Technical Session, a meeting was held in Fort Simpson on August 15, 2016. A record of the meeting is attached, however to date we have not been able to obtain a copy signed by LKFN. The meeting focussed solely on the existing IBA between the parties, and benefits. Traditional knowledge was not raised as an issue or discussed. 2. No. 3. The known occurrence of caribou proximal to Caribou Flats has been accounted for in the effects assessment completed by Tetra Tech EBA (DAR Addendum Appendix E, PR#102). That assessment also provided mitigation and monitoring plans for the likely wildlife species distribution and occurrence proximal to the road, as appropriate. Specific attention to Wolverine Pass and Grainger Gap was not considered to be necessary because of the absence of substantive information to indicate this is warranted. |

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| | | | Oct 24: Att. |
| 19 | MVEIRB #19: Tourism (for Parks Canada) | <p>Comment At the June 14, 2016, technical session, a member of the Nah?a Dehé Consensus Team was asked if they had any thoughts on visitor access and tourism into the Project area (PR#252 pp.58-59). At the time the Team had not discussed this topic, but it was intended to be on the agenda for future meetings.</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Has the Nah?a Dehé Consensus Team met since the technical session to discuss tourism development and visitor access to the Project area? 2. If so, please provide a summary of discussions relevant to the project area. | <p>Oct 25: GOC RESPONSE to MVEIRB IR19: Tourism (for Parks Canada):</p> <ol style="list-style-type: none"> 1. The Naha Dehe Consensus Team met on August 30 and October 21. The Consensus Team recommended that tourism development and visitor access on the proposed all season road is a discussion that should be had with the community of Nahanni Butte. Parks Canada agrees and has previously indicated that in addition to the community of Nahanni Butte and CZN, this is a discussion which requires other regulators and government departments and we will participate in those discussions when all parties are at the table. 2. In addition to the NDCT members there were several community members at the meeting in Nahanni Butte on August 30. During that meeting several members from the community expressed concerns with the mine and impacts to water quality, as well as the importance of having community members involved in environmental monitoring. Community members also spoke to the importance of caribou monitoring and research, and the incorporation of traditional knowledge. The community expressed a high degree of concern regarding people from outside of the region coming in to hunt, along the river and along roads in the area, and possibly going in to the park. They felt there was a need to increase monitoring of hunting in the area. Parks Canada also indicated that it did not believe there was sufficient baseline information on wildlife and vegetation to allow a determination of significance and that it was going to indicate this to the Review Board (this information has subsequently been provided to the Review Board in a letter from Parks Canada). At that time community members did not voice any concerns regarding this approach. NDCT members expressed concern over the proposal to move the bed of Sundog Creek in order to construct the road. |
| 20 | MVEIRB #20: NNPR management (for Parks Canada) | <p>Comment Parks Canada has a 2010 management plan for Nahanni National Park that describes park expansion (PR#193).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. How has Parks Canada, along with the Consensus Team, considered capacity within the Park since 2010, including any considerations for the expansion of the Park and the project area in particular? | <p>Oct 25: GOC RESPONSE to MVEIRB IR 20: NNPR management (for Parks Canada): In planning for the appropriate level of capacity in Nahanni, Parks Canada has taken into consideration its legal and mandated obligations to protect and present nationally significant examples of Canada’s natural and cultural heritage and to foster public understanding, appreciation and enjoyment in ways that ensure their ecological and commemorative integrity for present and future generations. Parks Canada has also considered capacity requirements for managing the permitting and monitoring of EA mining files in the park.</p> |
| 21 | MVEIRB #21: Road capacity and infrastructure (for GNWT) | <p>Comment Canadian Zinc wants to use Hwy 7 and the Nahanni Butte access road for access the all season road project. Residents and communities use these roads to access essential goods and services. Sections of these roads may require road improvements to accommodate the project, as they are currently not able to accommodate the larger payload vehicles that the project proposes to utilize (73.2T 9 axle).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Describe what upgrades would be required to Highway 7 to accommodate the increased axle number and vehicle weights proposed. 2. How long would these required upgrades take to complete? | <p>Oct 24: GNWT RESPONSE:</p> <ol style="list-style-type: none"> 1. Describe what upgrades would be required to Highway 7 to accommodate the increased axle number and vehicle weights proposed: Government of the Northwest Territories (GNWT) understands that the Project intends to use approximately 12 km of the Nahanni Butte Access Road in addition to approximately 130 km of NWT Highway #7 (Liard Highway). Based on currently available information, in order to accommodate the year-round increased axle number and vehicle weights that Canadian Zinc proposes Highway #7 would need to undergo a full rehabilitation for Km 20-130. Also, the Nahanni Butte Access Road would require a full re-design and construction. However, for a full assessment of the design requirements GNWT still requires a response to the following two points mentioned in GNWT’s response to |

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| | | <p>3. Consider how a potential upgrade to Highway 7 and higher payload vehicles might affect non project related traffic use, as well as road infrastructure.</p> | <p>Undertaking #41, sent to the board in July of this year:</p> <ul style="list-style-type: none"> • forecast Distribution of mine traffic along Highway 7 (north and south); and • maximum daily traffic forecasts during mine development (all vehicles) and production periods (trucks). <p>Once GNWT has received and reviewed Canadian Zinc’s information, GNWT will provide an update to the Review Board. GNWT has held a teleconference with Canadian Zinc on October 17 to discuss Highway #7 as well as the Nahanni Butte Access Road. GNWT notes that further discussion is warranted in relation to Canadian Zinc’s proposed use of these road sections. GNWT is committed to timely dialogue with Canadian Zinc on this matter, and remains available to provide further clarification to Canadian Zinc, the Review Board and other parties.</p> <p>2. How long would these required upgrades take to complete: The best-case scenario would include 1 year design and engineering, and 3-4 years of construction working from each end of the highway, completing 40 km/year (20 km each end).</p> <p>3. Consider how a potential upgrade to Highway 7 and higher payload vehicles might affect non project related traffic use, as well as road infrastructure: As described in GNWT’s response to Undertaking #41, impacts to local residents as a result of any road construction would be minimal. However, GNWT is not planning on doing any major reconstruction or realignments involving Highway #7 or the Nahanni Butte Access Road. Current maintenance plans consist of resurfacing (gravel) only. GNWT recommends that Canadian Zinc adhere to road restrictions for Highway #7 and the Nahanni Butte Access Road when determining available haul periods. Those described in the Canadian Zinc letter to MVEIRB dated April 1, 2016, are accurate but may require further refinement as conditions merit just prior to haulage: GNWT recommends that Canadian Zinc contact GNWT’s Department of Transportation before starting to haul.</p> |
| 22 | MVEIRB #22: Social issues (for NBDB) | <p>Comment The Review Board held a cultural impacts technical session in Nahanni Butte on July 4, 2016. During this session community members, particularly women, stated that they wanted an opportunity to consider the potential social impacts from the project, as a community, prior to public comment. The request arose from a lack of clarity regarding how potential social impacts were discussed between the leadership in Nahanni Butte and CanZinc. Concerns regarding the location of a construction camp and drug and alcohol control were raised. Several young women indicated they would like to hold a workshop focused on social issues (PR#275).</p> <p>Recommendation</p> <ol style="list-style-type: none"> 1. Did the community of Nahanni Butte hold a workshop to consider potential social issues and mitigations to any concerns? 2. If a workshop was held, is there a summary of the concerns raised or recommendations that can be provided? | <p>Oct 20: NBDB RESPONSE The community has not held a workshop specific to social issues subsequent to the Cultural Technical Session, however, a Community Meeting was held on October 13 with CZN in attendance, and one of the agenda items was follow-up to comments made in the Session. CZN advised that, during the mine and winter road EA, they committed to prohibiting the access of employees and contractors into the Nahanni Butte village, unless invited and accompanied by a resident or Band member. CZN further advised that in the same EA, they committed to implement controls to ensure that mine-related traffic is not a conduit for drugs or alcohol entry to the village. CZN said that these commitments would be extended to the all season road.</p> |

Oboni Riskope Round 2 Information Requests

| ID | Topic | Oboni Riskope Associates Comment/Recommendation | CanZinc Corporation Responses |
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| 1 | Oboni #1: Road standards and road classification | <p>Comment</p> <p>The proposed all-seasons road will reportedly be closed at various dates during the year due to a variety of meteorological and geotechnical conditions. In undertaking #20 Allnorth explained that four different reference manuals were reviewed to determine design parameters including the need for runaway lanes, safety railings, namely:</p> <ul style="list-style-type: none"> • B.C. FLRO Engineering Manual (also quoted during the technical sessions (link)) • Health, Safety and Reclamation Code for Mines in B.C.; • Geometric Design Guide for Canadian Roads (TAC) (used by MOT); • and Northern Land Use Guidelines. <p>Allnorth pointed out that none of the referenced material provided standards for runaway lanes and safety railings application and utilization. In particular the third reference only provides standards for public highway roads designed for speed higher than 50km/hr.</p> <p>Based on Northern Land Use Guidelines (link) the proposed road is an all season road with characteristics (see table 2.1 of the cited document) of an access/haul road (because the allowed speed will be over 40km/hr, which is the stated speed threshold for an access road). All seasons roads are classified by season of use, size and purpose (Table 2.1 of the reference above). The reference states that an all-season access road has a durable, all-weather surface that can be used by vehicles at any time of the year without damaging the land surface.</p> <p>Technical Canadian road engineering literature (link, PDF page 1) defines special roads as: “a category for roads that tends not to fit into the standard definition for either urban or rural roadways. In design guidelines and research publications, special roads are often referred to as “low-volume roads” (LVR), although volumes are only one criterion for designating a roadway as a special road. Other important criteria related to special roads include function, seasonality, traffic composition and roadway structure. Examples of special roads (besides LVR) include recreational roads (scenic and seasonal, including park, campground, winter lodge, cottage and beach access), resource access roads (including mining, petroleum and logging access) and winter roads (made of ice and snow), among others.”</p> <p>The Engineering Reconnaissance manual identifies various types of roads (link, Chapter 5, PDF page 9) and gives the following description for a road similar to the proposed project: “A limited, all-weather route that, with reasonable maintenance, is passable throughout the year but at times having a volume of traffic considerably less than maximum capacity. This type of route is normally formed of roads that do not have waterproof surfaces and are considerably affected by rain, frost, thaw, or heat. This type of route is closed for short periods (up to one day at a time) by adverse weather conditions during which heavy use of the road would probably lead to complete collapse.”</p> <p>Recommendation</p> <p>Question 1a: Is it true that the engineering of the road will exclude damages to the land surface as required by the cited references above and in compliance to the definition of an all-season road?</p> <p>Question 1b: Is it fair to conclude from the above that the proposed project constitutes an hybrid solution between a haul road and an access road (due to speed considerations (more than 40km/hr</p> | <p>Oct 11: See Allnorth report attached, section 2.1.</p> <p>Oct 13:</p> <p>Question 1a: As defined by the Northern Land Use Guidelines – Access: Roads and Trails under Section 2.1, Table 2.1 the Prairie Creek Access road would be considered an “All Season - Haul Road”. The engineering of the road will be completed so that the road subgrade, base course and surface course protect or exclude the land surface from traffic damage.</p> <p>Question 1b: As defined by the Northern Land Use Guidelines – Access: Roads and Trails under Section 2.1, Table 2.1 the Prairie Creek Access road would be considered an “All Season - Haul Road” as it is designated to carry heavy trucks and support the project beyond initial access. Seasonal limitations due to meteorological and geotechnical considerations are a function of Barge or Ice Bridge availability, Highway 77 seasonal load restrictions, and operational efficiencies. There will be a winter haul (Ice Bridge) and an ‘open water season’ haul. The latter would be supported by a barge on the Liard River. The open water season in the north covers parts or all of the spring, summer and fall seasons (the summer season is short). Hence, it is appropriate to consider the road to be an ‘all season’ road.</p> <p>Question 1c: Based on review of the TAC Document “Primer-Synthesis of Practices of Geometric Design for Special Roads”, the Prairie Creek Access road complies with the definition of a “Special Road” as a low volume resource access road with an Average Daily Traffic volume of 400 vehicles or less and design speed between 30 to 110 km/h. Additionally, the Engineering Reconnaissance definition of a “Type Y” road may not apply as heavy use during adverse weather would not lead to “complete collapse” of the road.</p> <p>Oct 24: Att.</p> |

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| | | <p>allowed)) and it is not exactly an all season road (due to meteorological and geotechnical considerations).</p> <p>Question 1c: Is there any reason to not identify the road as a special road and additionally to identify it with the definition given by the Engineer Reconnaissance, Chapter 5 quoted above?</p> | |
| 2 | <p>Oboni #2: Road width and traffic flow, obstructions and width mitigation</p> | <p>Comment (doc)</p> <p>The Engineer Reconnaissance manual cited above (Chapter 5, see Question1) defines what military consider route obstructions, i.e. road features which restrict the type, amount, or speed of traffic flow, in particular road widths as described in Table 1 (attached). Note that in the table, combination vehicles include multiple trailers and tractor trucks.</p> <p>Obstructions detected in the considered project include reductions in travelled-way widths that are below the standard minimums (these also include reductions caused by bridges) prescribed for the type of foreseen concentrate vehicles and grades above 7% (See Table 1, page 2-3 of the Allnorth Aug. 10 replies, Undertaking #20), namely the segments between km 10 and km 17, km 22 and km 24, km 96 and km 102.</p> <p>Recommendation</p> <p>Question 2a: Is it correct to assume that the high frequency of pull-outs foreseen in the project is proposed as a mitigation to the above referenced obstruction?</p> <p>Question 2b: What is proposed to mitigate the sections presenting a 4m width?</p> <p>Question 2c: Beside the segments approximately located at 5+400 and 6+200, and 23+000 to 23+700 (700 meters long); 24+900 to 26+100 (1200 meters long) will there be any other section presenting a reduced 4m width?</p> <p>Question 2d: If Canzinc do not agree with Table 1 (attached), could they provide a replacement from pertinent public literature describing road width and necessary mitigations for a special road travelled by multiple trailers and tractor trucks (combination vehicles)?</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.2.</p> <p>Oct 13: (doc)</p> <p>Question 2a: We are proposing at least 1 pullout per kilometre. Pullouts are a cost effective means to ensure efficient and safe transportation of goods on a single lane road. This approach greatly reduces the overall project cost compared to a 2 lane structure while reducing the environmental footprint of the road. This approach would be consistent with comparable resource roads operated in B.C. and other jurisdictions. The application of pullouts could be considered as mitigation to an obstruction such as two vehicles passing in opposite directions, or a vehicle passing another in the event of a slow moving maintenance vehicle. Note that haul operations is the main traffic, and will be essentially one-directional most of the day, and radio-controlled at all times to facilitate passing, when needed.</p> <p>Question 2b: A 5 m wide running surface is the primary and preferred design specification for the road. A 4 m wide running surface will only be utilized in locations which have terrain limitations, such as excessive rock excavation (blasting) and a few short sections which maybe tight or parallel to a stream channel. All bridges will use an industry standard 4.3 m running width.</p> <p>A number of approaches will be applied to mitigate the effects of a 4 m wide running surface:</p> <ul style="list-style-type: none"> • Opportunity exists in the detailed design stage to reduce the length of the 4 m sections, as proposed in the preliminary designs. • Any horizontal curves located in 4 m sections will be designed with the required widening as specified in the Engineering Manual, which will override and increase the 4 m wide prescription. • Speed restrictions will be placed and enforced on all narrower sections, tight corners, or line of sight limitations. • Appropriate signage will be placed either side. • Pullouts will be placed in close proximity at either end. • All mine traffic will follow strict use of radios, specifically important at critical sections such as speed reduced, narrow sections, and bridges. <p>Question 2c: Road located in challenging terrain such as heavy rock excavation, confining terrain, horizontal or vertical alignment challenges, significant stream crossings and bridges were identified early in the process. These locations became focus items during our field investigations, and full preliminary designs were completed reflecting the complexity of these locations. Below is a summary of sections identified to utilize a 4 m running surface:</p> <ul style="list-style-type: none"> • 5+400. An existing short road section tight to Prairie Creek. • 6+200 is a bridge location. • 23.0 to 23.7. Portions of this section will require significant rock excavation (blasting). Opportunity exists in the detailed road design to reduce the length of the 4 m running surface sections which contain significant rock excavation. • 25.0 to 26.0. Portions of this section will require significant rock excavation (blasting). Opportunity exists in the detailed road design to reduce the length of the 4 m running surface sections which contain significant rock excavation. • 28.0 to 28.6. Recent realignment to avoid slope stability issues and double crossing of Sundog |

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| | | | <p>Creek. The realigned section is located in close proximity to Sundog Creek and potential rock excavation.</p> <ul style="list-style-type: none"> • There will be no other sections that should require a reduced running surface of 4 m. <p>Question 2d: CZN would offer the following more detailed alignment control tables as published by the B.C. Ministry of Forests, Lands and Natural Resources in the Forest Road Engineering Guidebook.</p> <ul style="list-style-type: none"> • See attached Allnorth report, Section 2.2.1, Tables 2, 3, and 4. |
| 3 | Oboni #3: Kinetic energy, accidents, runaway and signage mitigations | <p>Comment</p> <p>Undertaking #20 (discussed in Response to Technical Review Undertakings Response to the undertakings outlined from June 13 to 16, 2016 Technical Review August 10, 2016) stated that CanZinc will describe the basis for the engineer’s conclusions that the road can be constructed without the use of run-away lanes and/or railings, with reference to sections of the road that have steeper grades, tighter curves, and narrower running surfaces. CanZinc will also provide examples of other resource roads that face similar circumstances and where similar design decisions have been made.</p> <p>Reportedly four manuals were reviewed and it was understood that they do not apply to the specific case. Additionally, it was noted that the “Health, Safety, and Reclamation Code for Mines in British Columbia” (standards typically used within active mine sites for 100 Ton Ore trucks (Cat 777 for example)) did state roads should utilize runaway lanes and/or retardation barriers with road grades in excess 5%, where conditions and/or risks warrant, as directed by (mine) manager.” Road grades in excess of 5% are present in the project (including grades above 7% which are considered an obstruction by the Engineering Reconnaissance manual (link - PDF page 9). The document cited above (page 1) states that the risk along a road depends on a number of geometric parameters (including, among others: speed, width and grade), traffic and environmental parameters. Table 1 of the same document highlights segments with steeper grades (making the distinction between direction and looking at concentrate trucks travelling loaded or empty). The same text then refers to „similar“ forestry roads before concluding that runaway lanes and railings will not be required (or may be at limited locations decided during detailed design stage by looking at geometric factors, but not considering the different type of cargo (logs vs. Concentrate, other hazardous cargo).</p> <p>It is common practice to analyze crashes based on kinetic energy (Ek) of the vehicles before an accident (link PDF page 273). Kinetic energy is a function of the mass -m- of the vehicle and its speed -v-. Kinetic energy (of an object) ($E_k = 1/2 * m * v * v$) is expressed in Joules (J).</p> <ul style="list-style-type: none"> • m= the mass which can be expressed in kg (1000kg=1tonne) • v =the velocity (speed of the vehicle) expressed in meters/second (m/s). <p>The speed of the vehicle may be the driving speed (selected by the driver) or an acquired speed (due to brake failures, skidding, falling, etc.). For example, a car with m=1500kg crashing at 72km/h (72000m/3600s=20m/s) has $E_k = 1/2 * 1500 * 20 * 20 = 300,000J$ or 300kJ.</p> <p>Accidents producing 300kJ of kinetic energy are generally considered high energy accidents. For example, side crash tests (link or 29Sep16 screenshot here: on PDF page 313) are performed with a 3300pounds (approx. 1500kg) weight ramming into the tested vehicle at 31mph (approx. 50Km/h or 14m/s), resulting in a kinetic energy Ek of approx. 150kJ. The tests are unanimously considered severe. It's unlikely that people in comparable real-world crashes would emerge uninjured and the side crash develops only half of the kinetic energy of the example above (150kJ vs. 300kJ).</p> | <p>Oct 11: See Allnorth report attached, section 2.3.</p> <p>Oct 13:</p> <p>Question 3a: As presented in CZN’s response to Undertaking 20, 4 different public reference manuals and guidebook publications were used including:</p> <ul style="list-style-type: none"> o B.C.FLRO Engineering Manual o Health, Safety, and Reclamation Code for Mines in British Columbia o Geometric Design Guide for Canadian Roads (TAC) (used by MOT) o Northern Land use Guidelines <p>As previously discussed, all four publications do not provide specific standards related to when and where runaway lanes and/or safety railings are to be applied and utilized.</p> <p>In addition, review of the TAC Document “Primer-Synthesis of Practices of Geometric Design for Special Roads shows the inconsistency and lack of jurisdictional guidelines with respect to “Special Road” Design and recommends that “Design guides must be non-prescriptive, as the needs of each Special Road are unique. These roads must be designed and treated holistically, on a project-by-project basis, using engineering judgement”.</p> <p>Within the Undertaking 20 response, Table 1 was provided describing three major sections of the Prairie Creek Access road alignment, where use of runaway lanes or barriers may be warranted due to alignment considerations, and indicated that further review and design would be required at the detailed design stage. CZN has committed to reviewing these sections in detail at the detailed design stage and if required and feasible, will include runaway lanes and barriers into the design.</p> <p>As previously stated, based on our review of the above documents, field investigations, completed road designs and road profiles, at this stage of the design, it is our professional opinion that runaway lanes are not required. CZN has not refined it’s analysis to specific types of cargo types or energy considerations as eliminating the hazard of errant vehicles is equivalent despite cargo type and energy rating. Also, all haul trucks will carry concentrate and fuel. It should also be noted that cargo risks were reduced by reducing the fuel tank size from 10,000 L to 5,100 L, and specifying that the tanks will be double-walled with a secondary containment capacity greater than the inner tank.</p> <p>Question 3b: For maximum effectiveness, signage along the Prairie Creek Access Road will be standardized as per the Province of BC, Ministry of Transportation and Infrastructure to ensure consistency in application and driver understanding. Typical signs may include some of the following:</p> <ul style="list-style-type: none"> • See attached Allnorth report, Section 2.3.1, Table 2C-1, 2C-2, 2C-5. • The design speed limit of the Prairie Creek Access Road for haul trucks is 40km/h, unless specific alignment curves, grades or narrow section warrant a speed reduction. • For the purpose of the Prairie Creek Access Road, the two barrier types that will be considered during detailed design are earthen berms and precast concrete barriers. |

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| | | <p>With the same formula one can evaluate the Ek of a concentrate truck (with known Gross Vehicle Weight (GVW in tonnes)) at various speeds if it collides an obstacle without braking. At 10km/hr the kinetic energy of a concentrate truck is slightly lower than the one developed by a simple car at 72km/hr, but at 20km/hr the truck has over three times that energy. Thus it can be considered that from 30km/hr up a concentrate truck develops high to extremely high kinetic energies. 30Km/hr is reportedly the average speed of the road traffic.</p> <p>Following the reference above a crash occurs in three chronological phases, namely: pre-impact, impact (engagement), and post-impact (link - PDF page 273). The basic events in the crash are listed below for added clarity; not every crash has all of these events, and the events may occur in a different order than stated, especially on a low volume road, access/haul roads, where natural hazards may be present:</p> <ol style="list-style-type: none"> 1. Point of first possible perception - the time and place where the dangerous or hazardous situation could first have been perceived. This could be an incoming vehicle or a natural hazard present/occurring on the road. 2. Point of actual perception - the time and place where the first perception of danger occurs. This point may be difficult to determine with any certainty. 3. Point of no escape - the point and time after which the collision cannot be avoided. This is intimately linked to sight and stopping distance. 4. Point of operator action - the point and time where the operator initiated some action such as braking or steering to try to avoid the collision. Immediately prior to this point is the perception-reaction time of the operator, which may be a hotly disputed point, based on fatigue, driving under influence, distractions and many other factors. 5. Point of initial engagement - the point where contact is first made during the crash, including the identification of the “point of impact” (POI) or “area of impact” (AOI). Could be against a vehicle or a natural hazard present/occurring on the road. 6. Final rest position (FRP) - the point where a vehicle comes to rest. The FRP, and how the vehicle got to the FRP (skidding, rolling, combination of the two) constitute what is called the post-impact trajectory of the vehicle, not necessarily ending on the road surface. <p>Recommendation Question 3a: Based on the specific type of cargo (concentrate and hazardous materials), pertinent literature sources and energy considerations developed above could the proponent clarify why runaway lanes and railings will not be required? Question 3b: Could the proponent expand on foreseen signage, speed limits and barriers that are foreseen for the all season road?</p> | |
| 4 | Oboni #4: Road stratification types | <p>Comment (doc) The proponent has delivered to date 10 stratification types sheets covering 19.92 km of the approximately 180km road (10.83%). Prior discussions have clarified that these stratification types are representative of the conditions to be found along the proposed layout, based on similar topography and extant data as retrievable from the records. Table 2 (attached) shows construction stratification types allotted to various segments, including beginning and end km, and the respective lengths. Quotation marks (?) indicate missing data. (Link)</p> <p>Recommendation</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.4.</p> <p>Oct 13: (doc) Question 4a: With reference to Allnorth’s submission “Response to Information Requests” dated May 10, 2016; Appendix E Updated Tables, Table 5, the 170 km plus road was segregated into 10 different construction categories plus six to seven unique individual segments (alternate vs original alignment). Preliminary road designs were completed on 1 to 2 km portions of each of the 10 construction categories and provide a comparable representation of what to expect regarding general ground conditions, earthwork calculations, and construction approach. The majority of the</p> |

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| | | <p>Question 4a: For the 13.00 to 13.76 segment and the other segments marked with «?» what is the construction stratification type?</p> <p>Question 4b: Is it possible to receive information on the stratification type classification for the remaining 89.07% of the road length?</p> <p>Question 4c: If additional longitudinal slopes, curves radii, widths, cross sections have been developed could they be made available?</p> | <p>road, roughly 165 km, was classified in this manner.</p> <p>The remaining road length was considered unique for a number of reasons including rock excavation (blasting), stream crossing alignment, and close proximity to stream channel (lower Sundog Creek). A preliminary road design was completed for the entire length of any section considered unique and challenging. This included segment 13.0 to 13.76. Therefore, these sections were not classified into the defined 10 road construction categories due to their unique characteristics.</p> <p>Question 4b: Refer to Allnorth’s submission “Response to Information Requests” dated May 10, 2016; Appendix E Updated Tables, Table 5. Table 5, submitted in our above response, does stratify the entire length of the road by either 10 defined road construction types (or categories) based on similar geographic/site conditions or segmented out if considered unique and challenging.</p> <p>Question 4c: All detailed road alignment data that has been developed has been provided. It is our opinion, at this stage of the process, that the approach taken toward analyzing/estimating earthwork volumes, construction approach, and road design parameters does provide a fair and reasonable assessment of the potential risks and requirements associated with road construction and operation. All sections considered unique and challenging have undergone a full preliminary design. CZN has committed to completing detailed final road designs prior to construction. At that time, all designs will be available and constructive suggestions would be considered.</p> |
| 5 | Oboni #5: Road design sight distance | <p>Comment (doc)</p> <p>The proponent has indicated reviewing various road engineering codes and stated that the road is not atypical of other resources roads in Canada (Link - REPLY TO RISKOPE IR1).</p> <p>The Canadian Low Volume Road (LVR) standard (Link - PDF page 317) defines for those roads (speed higher than 30km/hr) the following Stopping Sight Distances, then corrected for various favourable or adverse grades (Tables 510.B and 510.C, attached, have been copied from the referenced standard and guideline).</p> <p>Recommendation</p> <p>Question 5a: What is the design sight distance selected for the all season road? MIN? MAX? And on which code or assumption was it based?</p> <p>Question 5b: What is the design sight distance considered for the project? For each segment or Design Stratification type?</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.5.</p> <p>Oct 13: (doc)</p> <p>Question 5a and 5b: Refer to Allnorth’s submission “Response to Information Requests” dated May 10, 2016; Section 3.4 PCA #14 Design and Construction Standards, Item 1. MOFLNR Table 3-2.</p> <p>The B.C. Ministry of Forests, Lands and Natural Resources Operations Engineering Manual provides the primary design and construction standards which will govern the final road location and design. Line of sight distance is a combination of horizontal and vertical alignment. A safe line of sight distance also considers such things as speed, field conditions, road standards, and weather. Horizontal line of sight can be improved by increasing right of way clearing widths on the inside of a corner.</p> <p>The “minimum” line of sight (or stopping) distance is the shortest distance required to stop (which includes operator reaction time) a designated vehicle (in this case a heavy commercial truck) in a safe manner under typical operating conditions (in this case, gravel road). This distance would be considered a minimum requirement and it would be preferred to exceed this value. Maximum line of sight is not considered because the greater line of sight, the safer it is. MOFLNR Table 3-2 (in Section 2.2.1 above) provides the “Minimum Stopping Sight Distance” prescribed for a designated speed. A 20 km/hr speed requires a minimum 40 m, 30 km/hr requires 65 m, and 40km/hr requires 95 m. It is Allnorth’s professional opinion that these values are attainable throughout the length of the road and speed will be restricted by other design factors such as alignment and road widths. It is a normal process in the design process of the road to incorporate line of sight. At the detailed design stage, using the MOFLNR Engineering Manual standards, sections with restricted line of sight will be speed reduced accordingly and posted.</p> |
| 6 | Oboni #6: Trucks stopping distance | <p>Comment (doc)</p> <p>Both proposed concentrate hauling vehicles fit in the 45 to 91 GVW tonnes categories of US Information Circular 8758 from which the Table 3 (attached) has been extracted, including Note 1, reproduced below the attached table.</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.6.</p> <p>Oct 13: (doc)</p> <p>Question 6a: Various government agencies, federal, provincial and state, both in the U.S. and</p> |

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| | <p>Recommendation</p> <p>Question 6a: What are the stopping distance and brake fading data for the proposed concentrate vehicles?</p> <p>Question 6b: Have braking tests been performed on slippery (wet, muddy, icy, snowy) surfaces, grades, curves? What were the results?</p> | <p>Canada and other world jurisdictions, collectively work with engineers and institutions to study and analyze braking systems, materials, statistical braking data based on truck configurations and weights, and braking system failures due to heat (fading). This information is then used to develop industry standards and laws which are under the jurisdiction of provincial and territorial Ministry of Transportation. All vehicles, including commercial vehicles, sold and operating on public roads must meet these minimum standards. All commercial vehicles are required to complete annual certifications to ensure they conform to the standards. The stopping distance and brake fade data for the specific haul truck is not available. These units will be manufactured to the current government standard which includes the Canadian Motor Vehicle Safety Standard (CMVSS). The braking systems will be designed and tested to CMVSS 121 Air Brake Systems. The excerpt below is from the CMVSS 121 and is the specific portion of the performance and testing requirements of an airbrake system as tested on a dynamometer:</p> <ul style="list-style-type: none"> • S5.4.1.1 After burnishing the brake pursuant to S6.2.6, retain the brake assembly on the inertia dynamometer. With an initial brake temperature between 51.7°C and 93.3°C (125°F and 200°F), conduct a stop from 80.5 km/h (50 mph), maintaining brake chamber air pressure at a constant 137.8 kPa (20 psi). Measure the average torque exerted by the brake from the time the specified air pressure is reached until the brake stops and divide by the static loaded tire radius specified by the tire manufacturer to determine the retardation force. Repeat the procedure six times, increasing the brake chamber air pressure by 68.9 kPa (10 psi) each time. After each stop, rotate the brake drum or disc until the temperature of the brake falls to between 51.7°C and 93.3°C (125°F and 200°F). • S5.4.2 Brake power. When mounted on an inertia dynamometer, each brake shall be capable of making 10 consecutive decelerations at an average rate of 2.72 m/s² (9 fpsps) from 80.5 km/h (50 mph) to 24.2 km/h (15 mph), at equal intervals of 72 seconds, and shall be capable of decelerating to a stop from 32.2 km/h (20 mph) at an average deceleration rate of 4.27 m/s² (14 fpsps) 1 minute after the 10th deceleration. The series of decelerations shall be conducted as follows: <ul style="list-style-type: none"> ○ S5.4.2.1 With an initial brake temperature between 65.6°C and 93.3°C (150°F and 200°F) for the first brake application, and the drum or disc rotating at a speed equivalent to 80.5 km/h (50 mph), apply the brake and decelerate at an average deceleration rate of 2.72 m/s² (9 fpsps) to 24.2 km/h (15 mph). Upon reaching 24.2 km/h (15 mph), accelerate to 80.5 km/h (50 mph) and apply the brake for a second time 72 seconds after the start of the first application. Repeat the cycle until 10 decelerations have been made. The service line air pressure shall not exceed 689 kPa (100 psi) during any deceleration. ○ S5.4.2.2 One minute after the end of the last deceleration required by S5.4.2.1 and with the drum or disc rotating at a speed of 32.2 km/h (20 mph), decelerate to a stop at an average deceleration rate of 4.27 m/s² (14 fpsps). ○ S5.4.3 Brake recovery. Except as provided in S5.4.3(a) and (b), starting two minutes after completing the tests required by S5.4.2, a vehicle's brake shall be capable of making 20 consecutive stops from 48.3 m/h (30 mph) at an average deceleration rate of 3.66 m/s² (12 fpsps), at equal intervals of one minute measured from the start of each brake application. The service line air pressure needed to attain a rate of 3.66 m/s² (12 fpsps) shall be not more than 585.7 kPa (85 psi), and not less than 137.8 kPa (20 psi), for a brake not subject to the control of an antilock brake system, or 82.7 kPa (12 psi) for a brake subject to the control of an antilock brake system. <p>Question 6b: Braking tests will be performed to the standard required by CMVSS 121. This does</p> |
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| | | | <p>not include testing the units on slippery surfaces or grades. These units will be equipped with an anti-lock braking system that is compliant with the CMVSS 121. The Anti-lock system is to reduce the potential for a loss of control during a stopping situation. In addition to this, the units will be required to have a parking brake that is capable of holding the entire unit on a 20% grade facing uphill and facing downhill on a smooth, dry, portland cement concrete roadway.</p> <p>We recognize that braking is more difficult on slippery surfaces. This will be taken into account in the setting of speed limits. Also, during less than optimum haul conditions, the Road Supervisor always has the option to implement further specific or road-wide speed reductions by notification to haul drivers.</p> |
| 7 | Oboni #7: Topographical slopes | <p>Comment (doc) In order to avoid misunderstandings related to topographical slopes the risk assessment will use various widely published and known ratings to characterize topographical slopes expressed in degrees and qualitatively (with an adjective). These definitions (Table 4, attached) are used in question Q8.</p> <p>Recommendation Question 7: Is Table 4 (attached) agreeable with Canzinc ? If not please propose an alternative based on pertinent published literature.</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.7.</p> <p>Oct 13: (doc) Question 7: The table as presented is a reasonable segregation and description of slopes.</p> |
| 8 | Oboni #8: Road accidents perceived proponent's tolerance threshold | <p>Comment (doc) Any human endeavour can lead to accidents (possibly with unpleasant consequences). Hunting, fishing, driving a heavy truck, cooking in one's house are typical human endeavours which can generate accidents like encountering an aggressive bear, capsizing a boat, veering off road, burning the house.</p> <p>During the technical sessions it has been pointed out that statistics from BC resource roads accidents could be used as a proxy after ensuring that the numbers used are pertinent with the type of traffic and conditions of the proposed road (Link).</p> <p>Thus, over the life of the considered access road it is inevitable that some incidents will occur. Some will be benign, some might be more significant and evolve into accidents. Higher significance consequences will occur as a result of accidents featuring at least one of the following characteristics:</p> <ol style="list-style-type: none"> 1. Relative higher energy (careening over higher/steeper natural or man-made slopes, higher speeds) 2. Potential larger spread of contaminants (cargo, diesel fuel, etc.) 3. Increased relative difficulties in pollutants recovery (after spills). <p>At this stage of the studies, given the extant data and for the sake of simplicity, accidents involving concentrate trucks or environmentally significant loads will be considered equivalent from a consequence point of view. We will consider that each truck has a tank with diesel fuel also when it travels empty. Passenger accidents are not considered, as passenger traffic, if any, will be minimal and regulated on the access road.</p> <p>Accidents of various types will happen during the service life of the road. Zero risk is not achievable, neither in highly controlled industries like civil aviation (certainly not in traffic mishaps), nor in traditional life, including hunting, fishing, simply living in a house. Anyone of us, every-day makes a decision to undertake some activity and consciously or unconsciously assumes a risk that is considered acceptable/tolerable.</p> | <p>Oct 11: (doc) See Allnorth report attached, section 2.8 and Appendix A.</p> |

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| | | <p>Question 8 is geared toward understanding the proponent's accident tolerance toward road traffic accidents during the project's service life. In each project there are at least the proponent's risk tolerance (operational, in this case linked to the traffic accidents) and the public or societal tolerance (linked to the overall project). The two thresholds are completely different and the significance determination (of the overall project) always super-seeds any accident (operational, traffic) tolerance discussion.</p> <p>In order to complete Riskope's scope of work which demands verbatim “are the risks tolerable and acceptable without mitigations, are the risks tolerable and acceptable with mitigations, and what are the residual risks if mitigations are implemented and are the proposed mitigations appropriate and sufficient” the proponent's road accident risk tolerance threshold has to be understood.</p> <p>Question 8 asks the number of accidents of a certain type that Canzinc would consider acceptable, from their point of view, over the service life of the project. In order to facilitate the process we have dressed a list of accident scenarios and associated suggested frequencies (expressed in non technical language to enhance comprehension of all the parties in terms of number of accidents of a certain type during the road service life.) (Table 5, attached).</p> <p>Recommendation Question 8: As there are no right or wrong answers in this field, Canzinc is asked to express their opinion on the total tolerable number of accidents (of each class) during the road project's service life, by filling Table 5 (attached). The questions in Table 5 should be answered carefully.</p> <ul style="list-style-type: none"> • The first requested reply is: “do you agree with the proposed number?” YES, agreement/NO disagreement. <ul style="list-style-type: none"> ○ If the answer is YES, skip to the next line after adding a comment (if necessary). ○ If the answer is NO please indicate what the appropriate number (of tolerable accidents during the road service life) would be, based on Canzinc perception. ○ Ranges (not a single value) are of course possible as well as comments on the reasons driving the selection. | |
| 9 | Oboni #9: Trucks convoys | <p>Comment During the technical sessions it was stated that concentrate trucks will travel as convoys in winter (Link).</p> <p>Recommendation</p> <ul style="list-style-type: none"> • Question 9a: What are exactly the intended parameters of a convoy? Distance between vehicles? Will the vehicles travel in clusters? How many vehicles will travel in each cluster (min, max number of vehicles)? • Question 9b: Does the convoy concept apply to returning vehicles? To hazardous cargo vehicles? • Question 9c: How will concentrate trucks travel in summer? In convoy? Individually? | <p>Oct 7:</p> <p>9a: If we assume there are 15 concentrate trucks travelling daily, we can envisage the trucks departing in clusters of three or more vehicles at a time in winter, up to the total 15 vehicles in a single cluster. Vehicle separation would likely be in the order of 50-100 m.</p> <p>9b: The convoy concept will apply to returning vehicles in winter. It would not apply to special deliveries, such as explosives, unless more than one vehicle is involved for that delivery. However, for such deliveries, road monitors and maintenance crews will be alerted and the progress of the delivery tracked. It may also be possible to time the delivery so that it occurs in convoy with the concentrate trucks.</p> <p>9c: In summer, concentrate trucks will travel individually, spaced approximately 30 mins apart, in order to avoid delay crossing the Liard River.</p> |
| 10 | Oboni #10: Spills volumes | <p>Comment “CZN has stated that we would either transport concentrates in bulk using the ‘Convey Ore’ system, which is similar to the Red Dog Mine approach, or in bags in a truck box with a lid, which would be</p> | <p>Oct 7:</p> <p>10a: The estimated spill volumes provided in our reply to Undertaking 46 were based on logical</p> |

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| | | <p>secondary containment.” (Undertaking #35: transport and containment suggestions). Also undertaking #46, page 106 of 121 (link) states that, in case of overturn, 5 tonnes to 20 tonnes of bulk transported concentrate, respectively one bag or several bags may become detached, leading to 2tonnes to 8tonnes spill.</p> <p>Incidentally, we note that based on our personal experience and site visits, the Red Dog haul road is set in a completely different topography, has different design parameters.</p> <p>Recommendation Question 10a: Could the Canzinc deliver the source of information used to evaluate the spill volumes stated in undertaking #46? Questions 10b: Could Canzinc deliver estimates for the spill volumes of all environmental hazardous cargo spills? Question 10c: Are those evaluation considered valid for an accident involving sliding/rolling down each of the slopes characterizations described in Table 4 and 5? For which maximum length?</p> | <p>intuition. In the case of bulk concentrate transport and a 40 tonne load, in the event of over-turn, it is considered unlikely that the full load would be spilt. More likely the spill would be small (5t) or up to half of the load (20t). Similarly, with bagged concentrate, it is considered more likely that detached bags would not split, but if they did, they would likely only loose a portion of the contents, hence the 2-8t range to account for a varying number of split bags and portion of contents spilt.</p> <p>10b: Spill quantities were provided for those cargos of environmental significance with a sizeable number of loads and relatively large container size (see Table 9-1 in the DAR). Lubricating oils and greases will also be transported, but these will be in small containers (50-200L) and the loads will be few. Mill and water treatment reagents (soda ash, copper sulphate, sodium sulphide, ferric sulphate, lime) and ammonium nitrate will be transported in 1t sacks. The number of loads/annum will be small (21 or less). These sacks, like those for concentrate, are unlikely to split in the event of a roll-over. However, in the event they did split, a spill range of 1-3t could be an appropriate assumption to cover the number of bags and proportion of contents spilt.</p> <p>10c: The evaluations are considered valid for fair to moderate slopes below the road, and irrespective of the length a truck may slide downslope. For such slopes, a truck leaving the road surface might be expected to over-turn, but the grade is not considered sufficient for the truck to roll downslope, although it may slide downslope on moderate slopes. One section of the road has slightly steeper slopes, from Km 13.4 to 14.9. The Km 13.4-13.6 section has a steep slope below, and a truck leaving the road here would likely rollover. The Km 13.6-14.9 section has a slope of about 25%, right at the boundary between a moderate and steep slope. A rollover here is considered unlikely, although a truck may slide further downslope. However, note that this road section is essentially straight, and therefore departure from the road is unlikely.</p> |
| 11 | Oboni #11: Mechanical failures | <p>Comment Past experience with mining access roads shows the significant effect of mechanical failures and cargo safety on road accidents.</p> <p>Recommendation Question 11a: How will Canzinc perform and enforce regular maintenance of vehicles, enforce daily reports by drivers on vehicle state and hazardous conditions observed on the road, near misses? Question 11b: How will Canzinc ensure cargo safety for all vehicles, including environmentally hazardous cargo?</p> | <p>Oct 11: See Allnorth report attached, section 2.9.</p> <p>Oct 13: Question 11a: CZN will rely on the systems which have been established by the federal and provincial authorities to regulate the safety and performance of the commercial transport industry. In Canada all commercial motor vehicle carriers are required to have National Safety Code Registrations. Part of the requirements of the National Safety code is to ensure the minimum requirements are met with respect to;</p> <ul style="list-style-type: none"> o Driver qualifications and regular certification, o Hours of Service Operations, o Vehicle Inspections (Daily and semi-annually) o Pre-trip Assessments o Maintenance Records and reporting. <p>The status of an operator can be measured by their National Safety Code Standing. The National Safety Code registration is required to register and insure a commercial vehicle. The status of this is automatically verified when the unit is insured or reinsured on an annual basis. In addition to this, as the status of a carrier changes due to poor performance, accidents or incidents the Commercial Vehicle Safety and Enforcement team will commence with various disciplinary tools available to them including;</p> <ul style="list-style-type: none"> o Audits o Suspensions |

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| | | | <ul style="list-style-type: none"> o Removal of National Safety Code Registration. <p>CZN is committed to ensuring the safe transportation of personnel and goods. CZN would adopt, at a minimum, and under the responsibility of a Road Operations Manager, standard industry operating procedures for all vehicles supporting the mine operation. These standards would include:</p> <ul style="list-style-type: none"> o Daily tailboard meetings with operators to review any specific or unique road conditions which can impact the safe and efficient operation of the transportation fleet. o Weekly safety meetings of all personnel utilizing the road regularly o Radio call procedures o Daily pre and post trip inspections of all commercial vehicles, which would include brake checks, and inspection reports, completed by the operator o Reporting procedures for all near misses and incidents and the appropriate actions to follow. o Procedures for routine inspections of cargo and general truck conditions to be completed during the daily transportation cycle. <p>Question 11b: Cargo safety will be the responsibility of the motor carrier. Cargo safety is regulated by both Transport Canada (Transportation of Dangerous Goods) and the provincial commercial transport regulations. As this haul will be transcending the border into British Columbia, the BC commercial transport act and regulations would be the dominant authority with respect to cargo securement. CZN will ensure that all carriers (including its own) that are transporting dangerous good will provide proof of Transportation of Dangerous training and certification of the drivers. In addition, it will be confirmed that the operators of the unit possesses appropriate TDG containment and response equipment. For the non-categorized dangerous good, CZN will ensure that all carriers are operating to the minimum standard of the National Safety Code Cargo Containment, Standard 10.</p> |
| 12 | Oboni #12: Drivers behavior | <p>Comment Past experience with mining access roads shows alcohol and substances abuse, fatigue, distractions as prominent causes for road (trucks) accidents.</p> <p>Recommendation Question 12: How will Canzinc ensure that drivers are fit to work, rested and not under the influence of alcohol and substances? How will distractions during driving maintained to a minimum? Is there a program to be implemented?</p> | <p>Oct 11: CZN previously described a Journey Management System (JMS) that will be implemented to manage and control transport operations on the road (see Appendix I, 2nd IR round, EA0809-002). In addition, we have indicated that there will be a Road Operations Superintendent, responsible for overseeing road maintenance, transport operations and making decisions with respect to safety. The JMS already includes provision for ensuring vehicles are properly maintained and suitable for use. We will add provisions for checking on the condition of drivers before they start their shift, specifically, are they sufficiently rested and not sick. We will also make provision for driver relief during their journey if they do not feel fully able to drive safely for any reason. During orientation, all drivers will be warned about the dangers of distraction and not being alert. This will be reinforced in morning meetings prior to initiation of the days' transport activities. Drug and alcohol screening is a standard procedure for all employees and contractors, and will be rigorously enforced and monitored. Any suspicion of impairment noted in morning meetings prior to initiation of the days' transport activities will result in the driver being withdrawn from work that day and subject to testing.</p> |
| 13 | Oboni #13: Road signage and traffic calming | <p>Comment Based on presently available documents the proposed road includes narrow sections, steep grades, short radii, and various external geo-hazards.</p> <p>Recommendation Question 13a: What kind of signage (speed limits, blind curves, hazards, narrow section, do not stop, etc.) is foreseen along the project? At what locations?</p> | <p>Oct 11: See Allnorth report attached, section 2.10.</p> <p>Oct 13: Question 13a: As referenced above, for maximum effectiveness, signage along the Prairie Creek Access Road with be standardized as per the Province of BC, Ministry of Transportation and Infrastructure to ensure consistency in application and driver understanding. A detailed catalogue of typical signs that may be applied to this project can be found at the Ministry website (link)</p> |

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| | | Question 13b: How will traffic be “calmed” and protected in the narrow sections? | Question 13b: Traffic will be calmed through the use of signage and speed reductions to ensure safety |
| 14 | Oboni #14: Spill response | <p>Comment</p> <p>In Undertaking #45 (link) it was stated that CanZinc will provide a list of camp locations/intermediate rescue locations along the road, and a listing of substances and associated quantities that could be stored at these locations during and after construction. It was assumed that:</p> <ul style="list-style-type: none"> • a spill response team will never be more than 90 km from the site of a large spill; • responders would travel at approximately 40 km/hour, and therefore they would arrive at the spill site within approximately 2h15mins; • and maintenance crews will be working on the road and will be closer, and could respond to a spill faster than the other crews, thus lowering the response time. <p>Recommendation</p> <p>Question 14a: If the truck at the head of the convoy is stuck can the responders get access with their equipment even thus potentially many trucks would be in their way? How will the potential “jam” be managed? Is the 40km/hr a realistic speed in any post accident condition?</p> <p>Question 14b: 2h15mins seems to be the absolute theoretical minimum based on immediate alert, immediate depart, average speed higher than the declared average speed for the project, no obstacles, good meteorological conditions etc. Could Canzinc deliver an estimate which considers the normal uncertainties in this type of emergency action?</p> | <p>Oct 7:</p> <p>14a: If a truck has a problem, the next truck arriving at the location immediately becomes a responder, as does the next truck, as necessary. A response would be mounted immediately, as well as notifying 'Control' of the event. If a response team is needed, they will immediately depart. Control will then direct trucks on the road to proceed to a turn-out, or advance beyond the incident location, so as not to block the response team. We believe a 40 km/hr response team speed is more than realistic because they will be in a medium duty truck with a limited payload.</p> <p>14b: Given other truck traffic on the road, including maintenance crews and monitors, response time will likely be much less than 2h15. For the arrival of a response team, we would expect this to occur within 3 hours, likely much less, because an incident is more likely to occur closer to a team location than the 90 km maximum. A response vehicle and equipment would be ready, and the team would depart minutes after receiving notice by radio to do so. If haul operations were occurring, it is safe to assume that conditions are suitable for a response team to respond in a timely manner. Note, the declared average speed is for laden trucks, not a response team in a lighter vehicle.</p> |