EA File: EA1415-01

June 17, 2016

Note to File

EA1415-01
Prairie Creek All Season Road, Canadian Zinc Corp.

To: Parties

Re: Undertakings review and request for completion date

Please find attached the list of undertakings from the technical session held in Yellowknife June 13-16, 2016.

Undertaking from days 1-3 on June 13-15 were reviewed by technical meeting participants but day 4 undertakings from June 16 have not been reviewed. The compiled list is prepared by technical session facilitators and Board staff with the assistance of parties during the technical sessions.

Parties and the developer are asked to review the undertakings list for content. Comments are due as follows:

- Monday June 20 – comments from parties
- Wednesday June 22 – comments from Canadian Zinc Corp.

The Work Plan for EA1415-01 estimates that responses to undertakings will be submitted to the Review Board by June 30. If this due date cannot be met, please advise the Review Board when the undertaking response will be completed along with reasons why additional time is needed.

If you have any questions please contact Chuck Hubert at chubert@reveiwboard.ca 867-766-7052.

EA1415-01 Prairie Creek All Season Road Project
Draft Undertakings – Technical Session June 13-16, 2016

Undertaking #	Undertaking
Day 1	
Undertaking #1	CanZinc will identify implications (cost and other) of containing and disposing of brown water offsite (instead of using soak-away sumps).
Undertaking #2	Parks and CanZinc will discuss need for additional assessment of ecosystems that will be disturbed so as to tailor reclamation approaches (and potentially further examination of potentially permanent impacts, e.g. those associated with permafrost degradation) and report to the Board.
Undertaking #3	CanZinc will follow up with DFN in relation to recent changes to project (changes to alignment) and implications for aquatic resources, and report to the Board.
Undertaking #4	CanZinc will provide information (in table form) to correlate the habitat assessments conducted on specific water crossing areas in light of KP changes made recently.
Undertaking #5	GNWT will provide the water sampling program on the Inuvik to Tuk Highway (sampling during highway construction). • Completed.
Undertaking #6	DFO will provide report on No Net Loss projects and monitoring statistics.
Undertaking #7	CanZinc, DFO and Parks Canada will communicate on outstanding information requirements and analysis related to fish and fish habitat loss/gain (including impacts of blasting), to enable DFO to reach a determination and inform the board prior to the hearing phase (before technical reports). DFN/LKFN would like to be part of this conversation as well – but not the initial technical aspects.
Undertaking #8	CanZinc, Parks, and ECCC (and possibly GNWT) will meet and report back regarding appropriate water monitoring approaches including: parameters (turbidity, pH, DO), frequency, sampling locations and application of an adaptive management approach. [Unless this information is needed for the environmental assessment, Board staff recommends that this undertaking be changed to a commitment]
Undertaking #9	CanZinc will provide additional information on the removal of water from standing water, including identifying the water bodies, and how a maximum withdrawal of 10% of volume will be determined and over what time period.
Undertaking #10	Parks will provide additional vegetation data for the record.
Day 2	
Undertaking #11	CanZinc will 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 on rare plant assemblages.

Undertaking #	Undertaking
Undertaking #12	CanZinc will provide information on skills and experience available in the communities and show how these align with those required by the project (as listed in the DAR).
Undertaking #13	Review board will post 2009 rare plant report (from MVLWB registry) to the public record for this EA. • Completed
Undertaking #14	CanZinc will confirm whether the original effects assessment for the winter road considered loss of habitat and habitat fragmentation for migratory birds and avian species at risk.
Undertaking #15	Parks Canada will provide a written description to CanZinc on its expectations regarding baseline wildlife data collection, effective long-term monitoring, considerations for protection of critical habitat, and adaptive management – and when this information is needed (i.e. during EA, permitting, prior to operations, etc).
Undertaking #16	CanZinc and Parks will provide existing and known information on areas of sensitive wildlife and vegetation by road segment (including alternative segments and distinct borrow locations) in order to allow a risk assessment to account for these in terms of consequences from a spill.
Undertaking #17	CanZinc will provide their significance conclusions for each individual wildlife species that is a valued component in this EA.
Undertaking #18	Parks will provide information on what is important with respect to restoring natural drainage patterns at closure and why.
Undertaking #19	CanZinc will calculate missing curvature data for section KP34-39 and provide this information.
Undertaking #20	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.
Day 3	
Undertaking #21	CanZinc will provide a map indicating the location of the old winter access road to the old Wolverine airstrip (winter use airstrip).
Undertaking #22	CanZinc will describe its approach to end of winter season demobilization and shutdown of road construction including: when shutdown/demobilization will occur, the conditions that will trigger demobilization, who to consult on making this decision, drainage and surface water management considerations, and the removal of temporary infrastructure and equipment.
Undertaking #23	CanZinc will clarify: i) the exact footprint (in square meters) of the channel that is being lost and potentially degraded by the road in the area of the Sundog Creek realignment. Suggested addition from Parks Canada: ii) and the detailed methodology that was used to calculate these data. Description of the methodology should include aerial photography

Undertaking #	Undertaking
	showing areas that were deemed to identify: i) areas lost and potentially degraded, ii) floodplain habitat, and iii) vegetated and non-vegetated areas within the floodplain of Sundog alignment.
Undertaking #24	CanZinc will provide a more detailed version of Table 2 in Allnorth memo (PR# 178) that shows the individual road segments and their contributions to the total estimated area occupying the active floodplain, or within the channel, to better understand and assess habitat lost due to encroachments.
Undertaking #25	CanZinc will provide information on design flow (return period) requirements for major temporary crossing related to the length of time the crossings are expected to be in place.
Undertaking #26	As requested by CanZinc during the Technical Session, this detailed wording has been prepared by Board staff and consultants to clearly outline the information being requested on this topic: CanZinc will provide additional information on the proposed Sundog realignment to understand how the channel will be constructed to maintain the natural hydrologic and sediment regime, and monitoring and maintenance plans, provide a document (signed by a qualified professional) that includes: • Definitions for key terms (e.g. wetted width and the associated flow, active channel, "active" and "active braided" flood plain, 100 yr floodplain, high water level/mark, valley flat etc.), preferably accompanied by aerial photography to show how these definitions have been and/or would be used in habitat assessments. • Descriptions of the alternative alignments that were considered, and why this particular option was selected. • Describe baseline conditions, including hydrology (monthly flows and peak flows), sediment transport processes and baseline channel characteristics (e.g. width, slope, typical wetted width at a range of conditions). Characteristics described should relate to those that will be replicated in the diversion to maintain water and sediment dynamics. Support for these characteristics should include site photographs, and historical air photo interpretation and mapping • Provide a conceptual design for the diversion that describes the characteristics of existing channel that will be replicated to maintain water and sediment dynamics, and fish habitat and passage. Include detail on the berms that will be constructed to prevent the channel reoccupying the existing channel. • Provide an outline for a monitoring and maintenance program, including but not limited to, o frequency and timing of inspections with rationale (i.e. how many inspections per year,

Undertaking #	Undertaking
	time of year for inspections) ○ Parameters that will be monitored and how the need for maintenance will be determined ○ description of expected maintenance works including timing, machinery, access and disposal of moved material • Design flood and freeboard for road in Sundog Creek outside the diversion (i.e. what is the flood level for the sections immediately upstream and downstream of the diversion)
Undertaking #27	CanZinc will provide a prioritized list of road crossings, in terms of likelihood of disruption. Hazards could include avulsion, rockfall, avalanche, etc.
Undertaking #28	CanZinc will provide information on how the design and construction of the realignment can minimize sediment impacts during construction and operation phases.
Undertaking #29	CanZinc will provide information on measures to minimize riparian disturbance during culvert and crossing installation and measures to restore riparian zones and areas around crossings.
Undertaking #30	This item was initially identified as an Undertaking, but the questions posed by Board staff and consultants regarding peak flows at crossings were resolved during discussion at the technical session.
Undertaking #31	Combined with Undertaking #29.
Undertaking #32	CanZinc will provide anticipated quantity and timing of sediment accumulation (signed by a qualified professional) related to the Sundog Creek realignment. Based on this information, CanZinc will provide the anticipated frequency, extent, and methods of dredging (and other maintenance activities, including disposal of dredged material), and estimates of impacts on fish, fish habitat, and other aquatic life due to these activities (annually and over life of the project).
Undertaking #33	CanZinc will provide the report on its offset project at Casket creek for the record.
Undertaking #34	Parks Canada will provide the Derek Ford report on karsts for the record.
Day 4	
Undertaking #35	ECCC to provide examples of mitigation measures to prevent release of contaminants during transport of lead zinc concentrate along roadways, including references to relevant Red Dog and Pine Point examples.
Undertaking #36	CanZinc will provide detail on assumptions on how effects to people (e.g. traffic and stationary crews) were considered related to geohazards (Table 7.2.2-1 in DAR Appendix 2).
Undertaking #37	Confirm whether road length calibration was completed in preparing Table A1 (PR#187), and if so provide the relevant details.
Undertaking #38	CanZinc to confirm its estimates of maximum potential traffic volume (or range) on the road to considered as part of the scope of this development.
Undertaking #39	CanZinc will provide information on the determination 13 hour cycle time estimated for the return trips

Undertaking #	Undertaking
	from the mine to the Liard transfer facility.
Undertaking #40	CanZinc will provide general information regarding the range of instability conditions (e.g. landslide, rockfall, tension cracks, etc.) that may be encountered along the road and the appropriate mitigations to address them.
Undertaking #41	GNWT Department of Transportation to provide information on the following questions related to the developers use of highway 7: • Does GNWT have the information it needs from CanZinc to determine how much work and resources it will take to accommodate the proposed traffic? • How long would it take for the GNWT to make the necessary road improvements to Hw 7 and the Nahanni Butte access road? • Describe how local residents will be impacted by road construction, and over what period of time. • If improvements will occur over multiple years, what traffic volume and gross vehicle weight of haul traffic is appropriate while improvements are being made. • Has the GNWT determined if it will allow the larger payload vehicles (73.2T 9-axle vehicles) for use on the roads? If the larger GVW is approved by GNWT, how would this change the GNWT's schedule and impact to road improvements?
Undertaking #42	CanZinc to provide return periods for earthquake events of magnitude 4.0 or higher, and how many earthquakes of this magnitude have occurred in the last 10 years.
Undertaking #43	CanZinc to provide return periods for earthquakes of similar magnitude as the 1985 and 1987 events or higher.
Undertaking #44	As requested by CanZinc during the Technical Session, this detailed wording has been prepared by Board staff and consultants to clearly outline the information being requested on this topic: "The historic air photo interpretation identified slope displacements in areas of natural terrain along the road alignment. These areas are generally denoted on the terrain stability maps as 'slide blocks'; the areas are also defined by the mapped presence of tension cracks. These areas have been mapped between the following changes: Km 40.5 to 41.5 Km 69.25 to 70.25 Km 83.75 to 85 Km 97.75 to 99.25 Km 104 to 106 (preferred alternate alignment)

Undertaking #	Undertaking
	Km108 to 109.5 (preferred alternate alignment) The interpretation of these areas to date is based on a review of several years of historic air photos. Ground-truthing has not yet been undertaken. Different mechanisms of instability are inferred for the various areas. In some areas the instability is inferred to be within glaciofluvial deposits whereas, in others it is inferred that the displacements occurred within the bedrock. The presence of permafrost and the degradation of permafrost may be significant factors in explaining the ground displacements in these areas. The historic air photo interpretation identified recent displacements on the 1994 air photos at Km 69.5, as well as at Km 104 to 106 and Km 108 to 109 of the preferred alternate alignment. There is a concern that the road could be affected by future displacements of the natural terrain in these areas. There is also a concern that the formation of cuts or fills for the proposed all season road could adversely affect terrain stability in the areas of adjacent natural terrain, and the potential impacts in this respect are expected to be related to the nature of the instability at each area, which is uncertain at his stage. In addition, the appropriate mitigation solution in these areas could vary markedly, depending on the nature of the instability. It is suggested that a Terrain Stability Assessment (TSA) be undertaken for these areas to characterize the nature of the instabilities, analyze the risks and develop appropriate mitigation solutions. It is highlighted that the TSA would need to consider the risks of the road being affected by future instability developing in the natural terrain areas upslope or downslope of the alignment and also the risks of the formation of cuts and fills for the proposed all-season road causing instability in the adjacent areas of natural terrain. It is suggested that shallow sub-surface ground truthing be undertaken as part of the assessment in order to determine the nature of the slope instability in each area. It is possible that additional changes will need to be made to the alignment based on the findings of the TSA. It is therefore considered that the assessment should be undertaken prior to permitting."
Undertaking #45	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 (to support Oboni Riskope assessment).
Undertaking #46	To understand spill management for areas of very high and high risk levels (as noted in Table 7-3 of the DAR Addendum) and areas of significant karst terrain (approximately 53.6 to 64.5), CanZinc will provide more specific details regarding spill response, mitigations, and clean up including: the reasonable and worst cases for fuel, concentrate, and acid, during winter and summer conditions.

Undertaking #	Undertaking
	For the reasonable and worst-case scenario, please describe: a. the volume of spill; b. the assumptions about environmental conditions (e.g., day versus night, weather conditions, interactions with surface water, terrain conditions, etc.); c. the assumptions regarding spill response deployment and equipment; d. the estimated timeline for initial containment to mitigate mobility of the spilled materials.