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October 23, 2015

Re: EA1314-01: Jay Project – Deninu Kue First Nation Closing Argument

Dear Mr. Hubert,

The Deninu Kue First Nation (DKFN) is pleased to provide the following closing arguments regarding the environmental assessment for the Jay Project that is proposed to be constructed and operated by Dominion Diamond Ekati Corporation (Dominion Diamond). The Jay Project is within the current and traditional socio-economic use areas of the DKFN and the lands around the Jay Project area have been used by our people since time immemorial for hunting, fishing, trapping and gathering. The DKFN is supportive of this and other projects in our traditional territory as we recognize the

potential benefits to our community and the Northwest Territories, but we continue to be optimistic that our rights, treaty, traditions and way of life continue to be paramount in any recommendations and final decisions of the Mackenzie Valley Review Board. We remained concerned about several aspects of the Jay Project as these pertain to residual and cumulative effects on ecosystems within our traditional territory that will ultimately affect our ability to practice our asserted Aboriginal and Treaty rights. Our closing arguments focus on air quality, fish and aquatic resources and the Bathurst caribou herd.

1. Air Quality

The DKFN is concerned about the amount of fugitive dustfall from project activities and its resultant effects on vegetation and caribou. Air and dust emissions and subsequent deposition can change the quantity or quality of plant forage and alter caribou distribution and behaviour. The amount of fugitive dust from mining developments is a major component on the zone of influence (Boulanger et al. 2012), so an effective mitigation and monitoring program is essential to ensure that effects are reduced and minimized to the extent possible.

The monitoring regime for air quality, and fugitive dust in particular, must be designed to test the predictions of the environmental assessment. In the conceptual Air Quality and Emission Monitoring and Management Plan (AQEMMP) for the Jay Project, the fifth objective was to provide data including dust deposition to evaluate effects to aquatic and terrestrial ecological receptors. To address this objective a systematic approach to dust monitoring is required, therefore we recommend that the Review Board impose the following measure as a condition of the environmental assessment approval:

Dominion Diamond must develop an effective air quality mitigation and monitoring program to test the predictions of the DAR. This program must set measurable thresholds that are consistent with applicable regulatory ambient air quality standards. Where standards are not yet determined for the NWT, Dominion Diamond must use appropriate regulatory standards from other jurisdictions.

To ensure the monitoring program is effective in testing the predictions, an adequate amount of monitoring stations, located in appropriate locations around the Jay Project area, must be employed. For example, for dust monitoring we recommend that a sampling station be installed at each end of the Jay Road, plus one additional station at the mid-point of the road. Sampling stations should be comprised of four samplers per station (two on each side of the road that are spaced 10 m apart and 10 m from the shoulder of the road). A systematic approach to dust monitoring within the caribou zone of influence must also be employed, which should include the collection of dust samples as well as vegetation and lichen sampling. Again, these sampling stations must be placed at appropriate locations within the zone of influence to measure the level of the residual effect and the effectiveness of mitigation measures.

2. Aquatic and Fisheries

The maintenance of health fish population throughout the life of the Jay Project and at closure and reclamation is important to the DKFN. There are several components of the aquatic and fisheries systems that we feel require further attention should the project proceed. These components, as well as recommended practices, are provided in the subsections below.

2.1 Stream Crossings

We recommend Dominion Diamond design all road crossings of streams that provide habitat for fish (e.g. spawning of arctic grayling [*Thymallus arcticus*] in stream Ac35) or other

mobile aquatic organisms as "bottomless" to maintain natural habitat conditions to the extent possible. In arctic environments of such climatic extremes, it is important to design stream crossings that will not result in "hanging culverts" and thus form obstacles to fish migration.

2.2 Sub-Basin Diversion Channel

The current proposal for the design of the sub-basin diversion channel is vague and does not include specific design features that would ensure a channel morphology that will be suitable for fish migration, rearing and spawning. To ensure effects to fish and fish habitat do not occur, the design of the channel will need to be reviewed in detail before it is implemented. We recommend that boulder (>30 cm diameter) placements should be part of the design to ensure adequate channel roughness and current velocity shadows.

2.3 Changes to Water Level

We remained concerned that water level changes between the Lac du Sauvage and Lac de Grass during project construction and operation may impact the movement of fish species between the two water bodies. We recommend that a detailed mitigation and emergency management plan to counteract these possible water level changes in the narrows and other shallow water migration corridors be a condition of the EA approval.

2.4 Fish-Out Data

The DKFN is very interested in following up on discussion of potential offsetting options near the community of Fort Resolution. To inform the magnitude of offsetting compensation required, all fish independent of size need to be enumerated during the fish-out of the diked area in Lac du Sauvage. This information is needed to verify population estimates and can be used to verify fish numbers for compensation or offsetting accounts.

2.5 Re-Suspension of Fines within the Silt Curtains

We are concerned that after construction of the dike, the removal of the silt curtain will likely result in fine sediment being re-mobilized by wind and wave action , which can smother lake shoal spawning locations. Before the silt curtains are removed, the accumulation of fines that have been deposited between the dike and the silt curtain needs to be monitored and removed or otherwise managed. We therefore recommend that the Mackenzie Valley Review Board suggest that Dominion Diamonds complete management plan for all fines that will be accumulated between the dike and the silt curtain.

2.6 Stability and Predictability of Meromictic Conditions in Misery and Jay Pits

To our knowledge, all examples for stable meromictic conditions in mine pits provided by Dominion Diamond are based on examples from pit lakes that were not directly connected to a natural lake or pit lakes that have not yet been built (e.g., Geller et al. 2012, DeBeers 2010). All model assumptions for the stability of the meromictic conditions are based on these unrealistic examples as well. We therefore ask the Mackenzie Valley Review Port to ensure that Dominion Diamond will provide examples for pit lakes that have similar conditions to those found in the Jay and Misery Pits. As a minimum, examples should be based on direct water exchange to a natural lake that proves the concept of water layering stability suggested to prevent high total dissolved solids (TDS) mine contact water from reaching Lac du Sauvage. In the absence of such examples, we strongly support the Lutsel K'e Dene First Nation's proposal of the formation of an independent review panel or alternatively the hiring of an independent expert that will advise on:

1. The stability of the meromictic condition in the Jay and Misery Pits.
2. The monitoring needed to ascertain that no mixing through the chemocline occurs.

3. Correlate how the uncertain meromictic status observed by Pieters and Lawrence (2014), in mine pits that were predicted to have formed meromixis, to the Misery and Jay Pit examples.

Based on well-known examples of TDS layering, a layer of >80m of low TDS freshwater is needed to keep high TDS water from penetrating a chemocline as in Powell Lake, on British Columbia's Pacific Coast. Based on the example of Quesnel Lake in British Columbia, the formation of internal waves or "seiching" along chemical or temperature separating layers can lead to the break-up of the separating layer and can cause water to penetrate typically stable layers in the water column. We recommend the Mackenzie Valley Review Board require Dominion Diamond to consider potential "seiching" in their approach.

2.7 Sampling of Large Fish Tissue to Determine Metal Accumulation

We support the Independent Environmental Monitoring Agency's recommendation that non-lethal large fish tissue sampling should be carried out to assess accumulation of metals in an apex predator such as lake trout (*Salvelinus namaycush*). Non-lethal tissue sampling of this species is possible with short gill net sets and continued attention to fish hitting nets for imminent removal, tissue sampling and release. Metal accumulation in apex predators is a very sensitive endpoint for metal accumulation through the food chain and should therefore be a permit requirement for the Jay Project. In addition, apex predators are often the species that are harvested by First Nations and high concentrations in apex predators can therefore have a direct human health effect.

2.8 Chronic Toxicity Testing of Mine Water

We recommend that in addition to the acute (rainbow trout 96 hr - LC 50) toxicity testing, as a minimum, chronic toxicity testing of the mine effluent should be carried out

following Metal Mining Effluent Regulations (MMER). In these tests, sub-lethal toxicity with endpoints such as a reduction in growth or reproduction, the sensitivity of a fish species, an invertebrate and an aquatic plant are tested when exposed to mine discharge for species specific periods of time.

3. Bathurst Caribou Herd

We recommend that the Review Board determine that the Jay Project will have a significant effect on the ability of the Bathurst caribou herd to be self-sustaining and ecologically effective. *This determination should be made given the fact that the* Bathurst caribou herd is experiencing an unprecedented population decline that is affecting the herd stability as well as the ability of local Aboriginal peoples to continue traditional use activities related to the hunting of caribou. Dominion Diamond has argued that impacts of the Jay Project were not likely to affect the resiliency of the Bathurst caribou herd. However, when herds are declining or at low numbers they are less resilient to changes in the environment and hunter harvest than when herds are increasing or at high numbers (Environment and Natural Resources 2015). Because of concerns of the stability and resiliency of the Bathurst caribou herd, the Government of the Northwest Territories and Aboriginal organizations imposed several management actions since 2010, which were primarily comprised of harvest restrictions. So, Aboriginal communities have agreed to do what is necessary in an attempt to preserve the Bathurst caribou herd despite the impact that the lack of harvesting caribou will have on the resiliency of social and cultural systems. Aboriginal communities and the GNWT cannot manage the fate of the Bathurst caribou herd in isolation. The herd is being impacted cumulatively and addressing these changes will require collaborative actions. An understanding of the interaction between human disturbance and natural disturbance and the resultant impacts on caribou herds is critical; therefore, it is imperative that range planning and cumulative effects assessment framework be developed to

translate disturbance patterns and thresholds into detailed recovery actions for government, First Nations and industry.

In this regard we recommend that the Review Board impose measures upon Dominion Diamond to ensure that any effects on the Bathurst caribou herd, whether these are assessed as significant or not, are not realized. We recommend the following:

1. It has been shown that caribou traditionally migrate through the area around the Jay Project. Going forward, the project must not act as a barrier to these caribou movements. Dominion Diamond must implement mitigation measures to ensure no sensory effects on caribou are realized and that no barrier effects from roads occur. This will relate to the timing of project activities, management of road traffic and construction and operation of the Jay waste rock facility.
2. To meet the goal of having the Bathurst caribou herd be a self-sustaining and ecologically effective population, Dominion Diamond must take specific actions to reduce the zone of influence. These can be related to dust monitoring and management, progressive reclamation of project infrastructure and/or timing of project activities when caribou are in the vicinity of the project.

4. Closing

We recommend to the Mackenzie Valley Review Board that should the environmental assessment of the Jay Project be approved, explicit measures be attached to this approval to ensure effective mitigation, monitoring and follow up is applied for the protection of air quality, aquatic resources and the Bathurst caribou herd. In this regard, many of the environmental monitoring management plans for Jay Project are proposed to be submitted following the approval of the EA, during the permitting phase. This approach puts the proponent into a

position of power over the response to comments by interveners. Once the EA has been approved, the consultation strategy typically changes from obligatory to cursory. We therefore think that all detailed monitoring plans and environmental management plans should be submitted before EA approval by the Mackenzie Valley Review Board. In closing, we remain committed to working with the Review Board and Dominion Diamond on the successful resolution of concerns. We look forward to further engagement in the review process of this project. Should you require any clarification on the information presented in our closing argument please contact our technical advisor, Dr. Marc d'Entremont, at mdentremont@lgl.com or 250-656-0127.

Sincerely,

Chief Louis Balsillie

cc. Rosy Bjornson, DKFN Resource Management Coordinator

Marc d'Entremont, LGL Limited (DKFN Technical Advisor)

5. References

Boulanger, J. K.G. Poole, A. Gunn and J. Wierzchowski. 2012. Estimating the zone of influence of industrial developments on wildlife: a migratory caribou *Rangifer tarandus groenlandicus* and diamond mine case study. Wildlife Biology 18: 164-179.

De Beers. 2010. Environmental Impact Statement for the Gahcho Kué Project. Volumes 1, 2, 3a, 3b, 4, 5, 6a, 6b, 7 and Annexes A through N. Submitted to Mackenzie Valley Environmental Impact Review Board. Yellowknife, NWT. December 2010.

Environment and Natural Resources. 2015. NWT State of the Environment Report. GNWT Environment and Natural Resources, Yellowknife, NT. Online report available at: www.enr.gov.nt.ca/state-environment. Accessed July 27, 2015.

Geller, W., Schultze, M., Kleinman, B. and C. Wolkersdorfer (Eds). 2012. Acidic Pit Lakes; The Legacy of Coal and Metal Surface Mines. Springer Heidelberg. 536pp. DOI 10.1007/978-3-642-29384-9.

Pieters, R. and G.A. Lawrence. 2014. Physical processes and meromixis in pit lake subject to ice cover. Can, J. Civ. Eng., 41: 569-578.